Ario Caves Project Expedition - 2013

Final Report

Picos de Europa, Spain

Pozu'l Hitu - Name in Asturian
Pozu'l Xitu - Name in Spanish

28 June - 3 August 2013

The Ario Caves Project's Mission Statement

To facilitate and further the exploration of caves associated in the region of Vega de Ario and the hydrology of Cueva Culiembro.

To investigate the potential for a hydrologically integrated, 'super deep' (over 1500m) system in the Massif Occidental of the Picos de Europa.

To provide a central point for organising access and collating information to these ends.

Report compiled by the expedition members and edited by Stephanie Dwyer

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Acknowledgements

We would firstly like to thank our two financial sponsors - the Ghar Parau foundation and the Speleological Union of Ireland for their very much needed and appreciated financial support. Without them this expedition might not have been possible.
http://www.gharparau.org.uk/
http://www.caving.ie/2013/06/ario-caves-project-2013/

We are greatly indebted to the Federacion de Espeleologıa del Principado de Asturias (FESPA) for their support and to the National Park in the Picos de Europa for granting permission for this expedition to proceed. In particular, our field agent, Xesús Manteca, who was not only a great help with our application, but also took time out from his personal affairs to help carry the countless bags of expedition kit from Los Lagos to camp.

Aside from these, we would also like to thank the following people:

- our gear and food sponsors, whose contribution made this expedition a better one and fuelled our cavers during their long hours underground;

- the wardens of the Refugio Vega de Ario, Laura and Ignacio, for whose friendship and hospitality we are very grateful;

- Mike Bottomley (the unofficial committee member) for all his assistance and work towards an expedition he could not even attend and mostly for the thankless and arduous task of keeping the expedition leader sane. This expedition would not be what it is without his contribution;

- Tony Seddon, Ursula Collie, Fleur Loveridge and David Rose for all their help, guidance and support, we could not have done this without you;

- the clubs and persons that lent the expedition kit and consequently made it cheaper for everyone else – Beardy, Chris Jewell and the Huautla expo, BPC, DCUCC, UCDCPC, David Ryall, Fleur Loveridge, CPC & Adam Spillane;

- Rowan Scott who lent the expedition his transit van and saved the expedition hundreds of pounds and the committee hours of searching for a feasible transport option; and

- most importantly the committee that actually made this happen, this being the small proportion of expedition members who unconditionally put in so much more than most and asked for nothing back in return. Oxford University Caving Club and the members of which whom continue to be an invaluable help to this expedition.

Sponsors and Supporters

SPONSORS

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Xesús Manteca
David Ryall

Summary

Primary aims

1. To re-rig Xitu to its terminal sump at -1,148m;
2. To establish a camp capable of hosting multiple groups in order to conduct exploration of the cave at various levels simultaneously;
3. To conduct exploration at every available opportunity in Xitu, in the hope of finding a tributary of the main route of the cave that would offer a backdoor into the lower reaches of the 2/7 system; and
4. To continue surface prospecting and investigate any leads that may contribute to our wider goal of pushing the master system.

All the above aims were successfully carried out, each to varying levels of conclusion.

Key achievements

1. Xitu was successfully re-rigged to the bottom despite the many unforeseeable setbacks;

2. A camp capable of sleeping 12 members at any one time was set up. This allowed for much needed rest and recuperation, but also for clothing to be dried, and therefore made it possible for people to camp for periods of up to 5 days at a time. This proved very beneficial to the efficiency of exploration at depths of below -600m;

3. The materials required to set up another camp in the further reaches of the cave were brought to Chunder Pot (-950m) thus facilitating exploration that will take place near the sump next year;

4. Lots of exploration took place in many other locations within the cave, some of which was at shallow depth and allowed the less experienced caver to participate in exploration at non committing depths. Many of these cavers, some on their first expedition, later bottomed the cave; and

5. Xitu was beautifully documented by the expedition photographer.

Most notable discoveries

- *The crystal maze*
  A series of chambers and passageways containing outstanding formations. This was discovered after climbing into the roof part way along the Teresa series. This lead was left un-pushed due to the delicate nature and extent of the unusual formations that were unavoidable if one were to explore further.

- *Avelina's bit and Avelina's tunnel*
  This is a draughting but reasonably tight rift passage leading off the main line of the Teresa series ending in a T junction to another rift and in a small rift chamber. In the floor of the chamber a short pitch (with a stream visible at the base) was left un-descended. This is a very promising lead for next year as it is a candidate for horizontal development towards the 2/7 system.

  There was also another tube just off the main line, at floor level. This was a crawl on compacted sand, leading through a wet looking pool. There was a strong draught and this is certainly worth exploring next year.

- *Slí na Síofra*
  A vertical inlet leading off the main streamway of the cave, downstream of the emerald lake traverse. This was pursued due to the large quantity of water coming from it compared to the main streamway. It was free climbed for 75m and bolt climbed after a constriction (which required enlarging) for a further 14 metres. This aven issued a considerable quantity of water from what was described as a hole in the roof. Measurement with a disto X estimated another 15m height above the limit of aid climbing. Despite the scale and unique nature of this new passage, when compared to the parent cave Xitu, there is nothing in the analysis of the survey data that would suggest this is anything more than an inlet to Xitu and therefore does not offer much promise as a horizontal backdoor into 2/7.

- ***Up all night to get lucky - the hole above the terminal sump***
  This was the most significant find of the 2013 expedition and was pushed on the advice of Paul Mackrill who discovered it whilst diving from Culiembro to Xitu during the previous year. Exploration of the Culiembro stream cave upstream from its confluence with the Xitu stream yielded two pertinent and interesting facts.

  1. The main streamway of Culiembro is synonymous with the main streamway in 2/7 (i.e. they are the same cave), and that a relatively insignificant looking branch off this leads to the bottom of Xitu[1].

  2. There are geological features that suggest that the active parts of the Culiembro streamway are in fact the bottom of a much older vadose and phreatic passage with an ancient phreas following above the sumps.

If these two hypotheses are proven then this would open the way for both a super deep 'dry' through trip and also the possible use of Xitu as a lower entrance into the 2/7 master system. The discovery of a phreatic tube over the top of the terminal stag pool sump in Xitu therefore offered exciting prospects.

Exploration of this passageway yielded a complex of passages; one that carried back over the old sump, but was filled with a silt-like sediment, and another which led in the direction of the known streamway of upstream Culiembro.

- *Chunder Pot*
  A lead discovered by David Rose in 1981 above Chunder Pot was searched for. This was thought to be a potential side branch passage which could connect to the 2/7 system. The rift was climbed for some time and there was interesting development but it was all within the plane of the hading rift. The lead may still be ongoing although it probably becomes too tight.

Introduction

Background

Oxford University Caving Club (OUCC) has been exploring the caves of the Picos de Europa (pictured in map below) in Northern Spain for 53 years. Since 1979, exploration has been centred around the Ario bowl of the western massif. Xitu was the first cave to be discovered in this region (area 5 in OUCC notation; hence, Xitu is 1/5). Over the next three years, it was pushed to a terminal sump at a final depth of -1135m, the deepest cave in the world explored by a British team at that time and the first over one kilometre deep. OUCC has been one of the main driving forces behind the exploration of the caves in the Western Massif of the Picos de Europa, and the successful link between Xitu and Culiembro (first made in 2010 by members of the Cave Diving Group[1]) was a significant step forward in their knowledge of the area.

In 2011 the OUCC expedition once again returned to Pozu'l Xitu to mark the 30th anniversary of the 1981 expedition and the 50th year of Oxford led expeditions to Spain. Despite continuous difficulties (persistent and significant storms), the cave was rigged to circa -900m. However, little exploration was done, and the diving aims had to be abandoned. It was agreed before the de-rig began to return in 2012 to finish the job.

The progress made in the last three years in the Xitu-Culiembro system has made it possible that in the years to come we will be able to connect a system in excess of 1800m. Culiembro is the resurgence cave for Xitu, Jultayu (2/7), Cabeza Muxa and likely Asopladeru la Texa; the lower reaches of Xitu are now a possible base for discovering a way into Pozu Jultayu - 2/7 (the entrance to which is around 1200m above Culiembro – exploration has stalled at a boulder choke (-800), that bypasses some or all of the sumps between Jultayu and Culiembro. During the 2012 expedition a world record was achieved, the world's deepest cave diving traverse, where two members of the expedition successfully dived through Culiembro into Xitu and excited out onto the Ario bowl. This was then repeated in reverse in order to retrieve the diving bottles. The following year the expedition was led for the first time by a non-member of OUCC who had been attending previous expeditions. In light of the fact that it would no longer be an official University sponsored expedition, it was renamed the Ario Caves Project. The ethos, however, and the central point for information collation remained the same.

Figure 1 – Location of the Picos de Europa

The Ario Caves Project is born

The Ario Caves Project is therefore a continuation of 50 years of Oxford University Cave Club's exploration in the Massif Occidental of the Picos de Europa. The "ACP" is an extension and expansion of this work, whose primary aim is to facilitate and further the exploration of caves associated with the Vega de Ario and the hydrology of Cueva Culiembro. The goal is ultimately of yielding a super deep system in excess of 1,800m. This would be the deepest in Europe and one of the deeper caves of the world.

The scientific justification for this super deep system comes from the culmination of many years of exploration, surveying, geological studies, shaft bashing, careful GPS documentation and dye tracing. This work has uncovered many systems which, in their own right, range in depth from several hundred metres to >1,000m (namely C3-C4, 2/7, Xitu and Culiembro). Some of these are already connected, either by overlapping survey data,

physical connection or positive dye tracing. C3's survey overlaps with upstream 2/7 and upstream Culiembro is 2/7 (dye confirmed), together they form a system with a vertical range of 1,564m. Pozo del Xitu is a significantly deep cave in its own right, but is merely a tributary to the 2/7 – Culiembro system. C3/C4 is a cave whose survey data overlaps with a branch of 2/7 and currently ends at an unascended waterfall whose volume of water is described as significant. The ACP's aim is to determine which of the many promising leads/shafts uphill of these caves are the most likely to connect in the aforementioned system and these will be explored, bolted and dye tested to Culiembro.

Permissions

Our on-going relationship with the Parque Nacional continues to be a very good one, for which we have the work of FESPA and Xesús Manteca in particular to thank. We hope that this good state of affairs will continue, for without them and their crucial work there would be no expedition.

Aims

1. Re instate the ropes and rigging left in Xitu by the previous 2011 and 2012 expeditions and re-rig Xitu to the terminal sump.

2. Set up a long term sustainable camp for 10+ members in the Hall of the mountain Dwarf.

3. Investigate leads within Xitu, at the below mentioned areas, in the hope that we might intersect cave passage that offered a back door into the 2/7 master system:
    a. The Gap;
    b. William's Bit;
    c. Teresa Series;
    d. El Puritan;
    e. Ferdie's Delight area;
    f. Chunder Pot;
    g. Cross rifts below -1000m; and
    h. The tube over the terminal sump (stag pool).

4. Continue "shaft bashing" i.e. looking for prospective surface leads:
    Shane's cave

5. Continue to push and re-evaluate the existing surface digs:
    29/5
    Jenga
    9/4

6. Conservation - old rope, rubbish and spent carbide were removed from the cave and brought off the hill to a commercial rubbish site.

Logistics

Travel

All the expedition equipment was transported to Spain by both a transit van and a ford focus equipped with a roof box. The ferry was taken from Dover to Dunkirk and the journey continued through France and Spain to Los Lagos, the nearest road head to the Ario bowl.

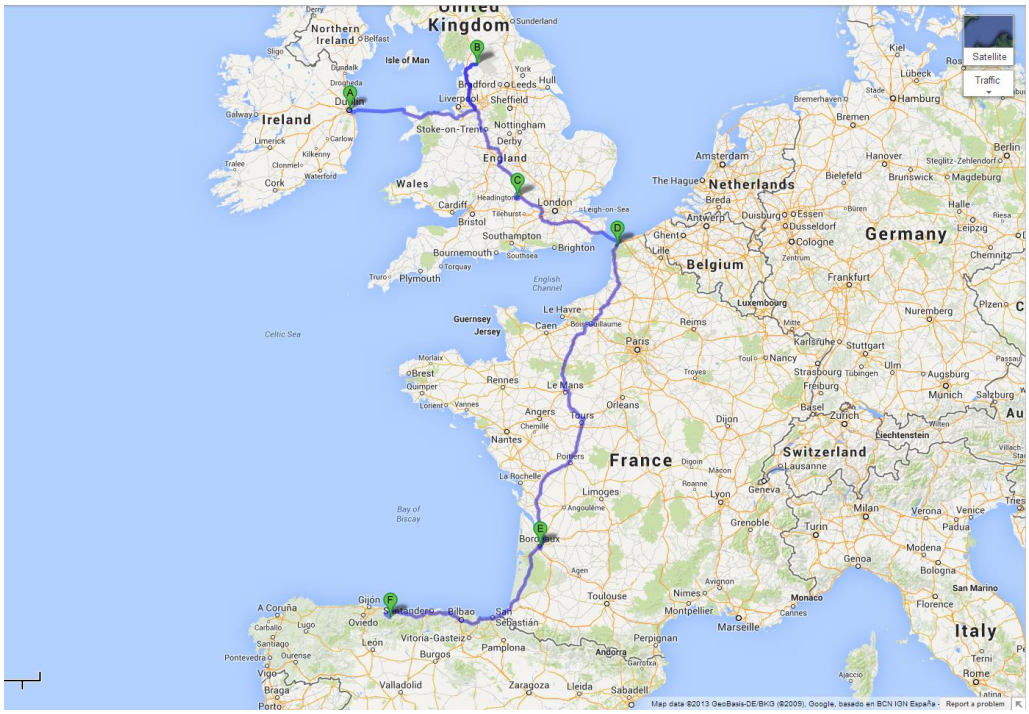


Figure 2 – A map showing the route taken by the vehicles from the UK and Dublin to Spain.

Figure 3 – The van packed to maximum capacity before its departure.

Accommodation – a change of format

Above ground

Historically on the OUCC expeditions, the majority of the expedition members were students and opted for free camping. The expedition's above ground base was situated within some of the abandoned shepherds' huts of the Ario bowl, see picture below.

Figure 4 – Inside and outside the shepherds' huts at Ario.

These offered an adequate base for the expedition, but it was felt that use of the Refugio a few hundred metres away might be preferable, especially as protection from the elements should the weather become inclement. This also offered an opportunity to help promote local business and relationships. The wardens at the refugio, Laura and Ignacio, were incredibly helpful and allowed us to rent an entire room in the building exclusive to the expedition for a very competitive price.

They also lent two tents to the expedition for outside bases to store our gear and for cooking expedition food. Inside the Refugio, we were allowed to use one of the walls as an expedition organisational base – here we hung up callouts, surveys, progress sheets and emergency management plans and contact details. This proved very beneficial to the expedition in comparison to the shepherds' huts.

Drawbacks – the reality of using tents as bases for cooking and storage did not work as intended for the following reasons:

- Noise – the tents were too near the Refugio and sound at night was at times disturbing to those trying to sleep. The huts are far enough away so as not to cause disturbance when returning from caving in the middle of the night and cooking and chatting;
- Appearance – during the day people's kit and food utensils would spill out into the surrounding area. Although there were no complaints this was very indiscrete and, in

the leader's opinion, was an eyesore to such a beautiful area. The huts are more discretely located and so our visual impact would be less obvious; and

- Protection – the tents offered very little protection from the soaring heat which is frequent in the Ario bowl. This also caused considerable problems when keeping food fresh and protecting the food from intruding animals i.e. dogs, cattle and hens. The huts are made of stone and are cooler inside. Whilst the huts are home to mice, they are better at excluding larger animals.

Recommendation: Use the Refugio as our sleeping and organisational base, hence allowing for beds at a very low group rate and a shelter when the weather is bad, but have our food prep and gear storage at the shepherds' huts a few hundred meters away. Security of the gear will be solved by allowing a few members to camp beside the huts.

Below ground

An important objective of the expedition was to achieve a system whereby several groups of people could work at different leads within the cave simultaneously and for extended periods of time thus maximising time and energy efficiency. In order to achieve this there needed to be a comfortable & large enough camp that balanced cost, size and weight with an efficient means to keep warm and most importantly get dry again.

The camp consisted of a floor made from the extra tough plastic – visqueen - that is used to line concrete foundations, on top of this was a layer of sound proofing material to serve as an equivalent to thin roll matting (this was more cost and weight effective). Areas where people were standing and laying had cut up Inglesport bags to protect the matting from wear and tear. The shell of a living area big enough to sleep several people was made from a cut up cargo parachute given to us by Wilderness Leisure, a model based on the principles of keeping warm within a storm shelter. Inside this we had a washing line for our wet clothes, ample space to cook, eat & store food and two tent inners for sleeping up to 12 people. We dried our clothes by stripping down to our thermals and drying off over a petrol MSR stove that burned most of the time we were in the tent. Fumes did not prove an issue as a hole was cut in the middle of the tent to function as a chimney.

Figure 5 – Campsite at the Hall of the Mountain Dwarf, July 2013, photos: Jeff Wade.

Figure 6 – Communal camp cooking, July 2013, photos: Jeff Wade.

Food and water

A fairly large shop of dried food and the occasional luxury items such as honey, Nutella, jam and condensed milk were purchased from ASDA in the UK. In addition to this, a couple of large containers and a scoop was bought so that we could have a system whereby these would be filled with high energy foods such as - nuts, sweets, dried fruit and seeds, and people could replenish their personal Nalgene bottles before going underground. Feedback from this idea was very positive and people found it a good and tasty means for food on the go. Also worth noting is that no one reported issues with the performance of their (circa 500ml) Nalgene bottles. For underground camp we purchased 100's of individual sachets of hot chocolate and complete coffee sachets with milk and sugar or some with just coffee and milk. These also proved to work very well. Another item worth mentioning was the condensed milk, this was a very useful high energy item that made most tasteless and dull food a little more edible. It also served as a very good alternative to milk in hot drinks and porridge. I would recommend that we replace some of the powdered milk we buy with this in the future as it was a lot more versatile and easier to keep and work with, although it is more expensive.

We had sponsorship of a lot of flapjack for the expedition (Inglesport & staff and Your piece baking company) which was very much appreciated and needed. These, despite the heat and not being stored in the fridge, held up perfectly fine for the duration of the expedition. These are a definite staple to be continued with in the future.

As usual, all additional food in Spain was bought in Cangas de Onis, the nearest town with anything more than a newsagent.

Breakfasts generally consisted of honey with Mornflake Oats, supplied by our sponsor, Morning Foods Ltd. Meals at underground camp were based around sachets of dried food – pasta, cous cous, beanfeast, custard and similar.

Despite the consistently hot weather this year, water supplies were only a minor problem.

The tap outside the Refugio supplied us with water for the whole 5 weeks and an abundance of snow in the Ario bowl meant water was plentiful.

The expedition purchased a new Coleman dual fuel stove for use at the surface camp and proved to be very reliable. Ignacio has kindly offered to keep this at the Refugio for us until next year, for this we are very grateful.

Photographers Report

It was quite the privilege when I was initially asked to be the expedition photographer for the Ario Caves Project, with the main goal to take up to date pictures of Xitu. However, with half a year ahead of me until the expedition, I knew that I needed to pull my finger out to get ready and up my game. Up until this point I had very limited experience of taking photos of big caves and when I had, I had begged, stolen and borrowed better equipment than my own. Due to the length of the expedition and myself no longer being an impoverished student, I thought I should finally think seriously about what I needed. Having used a camera and flash gun setup of less than £100 for several years I had eventually succumbed to buying a decent compact a year or so ago. However, what I had found is that the sensor in the camera was not suitable for picking up low light levels clearly and that it did not capture the full picture, only having a 24mm equivalent lens. Also, I was limited by the power of my electric flashguns.

So I had a plan of action, buy some new flashguns and use these with my compact in the UK to check they are suitable and then think about a new camera. I ended up with buying equipment in stages, 2 large flash guns by Yongnuo and then my first SLR a Canon 100D. Along with these I also bought some radio frequency firers, so that when I pushed the button all my flashes would go off together via these hot shoe mounted devices, which magically took AAA batteries. Unfortunately I had bought the camera with the standard lens, which was hopelessly narrow as I found out on a test trip into Gaping Ghyll main chamber, where I was unable to get the chamber in properly. At this point I knew I had a problem with this 18-50mm standard lens, so on the Monday after the weekend I weighed up getting a wide angle lens. This turned out to be a good choice, but on its arrival only two weeks before heading out to the Picos, I had my work cut-out to get used to my new setup.

Once in the field and based upon the multiple conversations with previous exploratory cavers of Xitu, I had a long list of places to go and photograph. My main worry was Flat Iron due to its size and the difficulty to communicate, so to give myself some time to think prior to taking any pictures I went on a camp set up trip to then continue rigging on down to the top of Choss Chock pitch. This gave me chance to view all this section of the cave from the top down and the bottom up. Once back on surface I could then plan and dream whilst in bed of the photos that could be taken!

I was then ready to go on the photography trips. Firstly, I was lucky enough to ascertain various teams that would be willing to help out on the photos as part of exploratory tasks that needed to be done, which was critical for gaining any pictures. All of the initial trips I did using my SLR and after a steady day taking shots in the Teresa Series, I was ready to tackle the big pitch shots. I already had an idea in my head of what I wanted, but translating this to the photo team who would in some cases be 60m away during the shot was essential. So before doing any photos I always gave a run through all the flashguns and an

idea of what the typical things I might ask for were; power up, power down, point it over there, etc. On top of this I made sure everyone could use the PMR radios so that we could all communicate clearly. Thankfully this worked and the shots I gained on Flat Iron and Pythagoras pitches made me very happy. It is also worth noting that the radio frequency firers worked perfectly, and I only ever used my tripod once for looking up Flat Iron from Eton Palais, where I didn't want to lose the camera angle, not in an effort to keep it still as is normally the case. I was happy with my SLR setup but the quality of the photos at very long distance still was not of high resolution. However, they did give a good idea of the size and shape of the cave.

For much of the lower sections of Xitu, I only used my compact camera, a Panasonic LX5, as the weight and space saving was significant and meant that going to the sump and back out was not such an ordeal. Many of these lower pitches were smaller in nature and not having a camera sensor as sensitive as my SLR was not detrimental. It also turned out to be much more efficient as I kept the camera round my neck and then gave the members of the team a flash gun so that these could be pulled out at short notice for a shot on the way back up and out.

All in all I enjoyed the experience of being expedition photographer and it presented a number of different challenges to that of a normal expedition where I would typically be at the pushing front of exploration. It has also been a learning curve and I believe that for the larger sections of cave I would adopt different methods for getting clearer pictures, which would need to revert to longer exposures and brighter light sources, and not be reliant on the instantaneous radio frequency controlled flashguns. It is technology that will dictate what will fill this gap, be that old flash bulbs, or new LED light panels for example, both have their cost implications (and security of supply for flash bulbs) compared to the relatively simple electric flashguns that most cave photographers are used to. This will be the challenge for my next expedition, should I be allowed to boss people about as an expedition photographer.

Lastly many thanks to all the poor souls who had to put up with my demanding instructions, often ending up tired and cold by the end of a photo session. Without these volunteers the whole process would be a non-starter, but they do at least get to become a minor celebrity for the expedition.

Jeff Wade

Financial report

I (Richard Cole) took over as treasurer in the field after Shane left mid expedition, in order to keep everything running smoothly. As this was the first year OUCC was not involved, the financial situation was difficult as there was a lot of equipment to buy and Steph had really tried to keep the costs down so that as many students as possible could come along. In the end, the expedition fee was probably too low and we ended up charging more for food on a weekly basis to cover the costs of transport of equipment in the van. Next year we will try having a slightly higher expedition fee and lower weekly food costs, and also try to avoid collecting food money on the hill as it led to a great deal of confusion. Overall the expedition's finances are running smoothly, roughly breaking even with a slight surplus to be kept in Euros in an Irish account to go towards expenses in the next year.

Accounts summary

	INCOME	**EXPENDITURE**	
Expedition fee	£ 2,111.47		
Ghar Parau grant	£ 400.00		
SUI grant contribution	£ 255.00		
Equipment expenditure		£ 2,130.00	
Subtotal	£ 2,766.47	£ 2,130.00	£ 636.47
Accommodation			
Contribution to refugio accommodation	£ 1,827.15		
Payment to refugio for accommodation		£ 1,785.00	
Subtotal	**£ 1,827.15**	**£ 1,785.00**	**£ 42.15**
Field			
Food contribution	£ 2,551.65		
Food costs		£ 1,593.11	
Additional field costs (camp/other)		£ 209.60	
Transport costs (van fuel+insurance+tolls)		£ 811.50	
Depreciation of van payment		£ 150.00	
Donkeys for Sherparing		£ 174.42	
Donation to refugio for tents		£ 206.04	
Subtotal	**£ 2,551.65**	**£ 3,144.66**	**-£ 593.01**
Total after expedition			£ 85.61
Placed into Irish (Euro) account		£ 85.61	

Pozu del Xitu

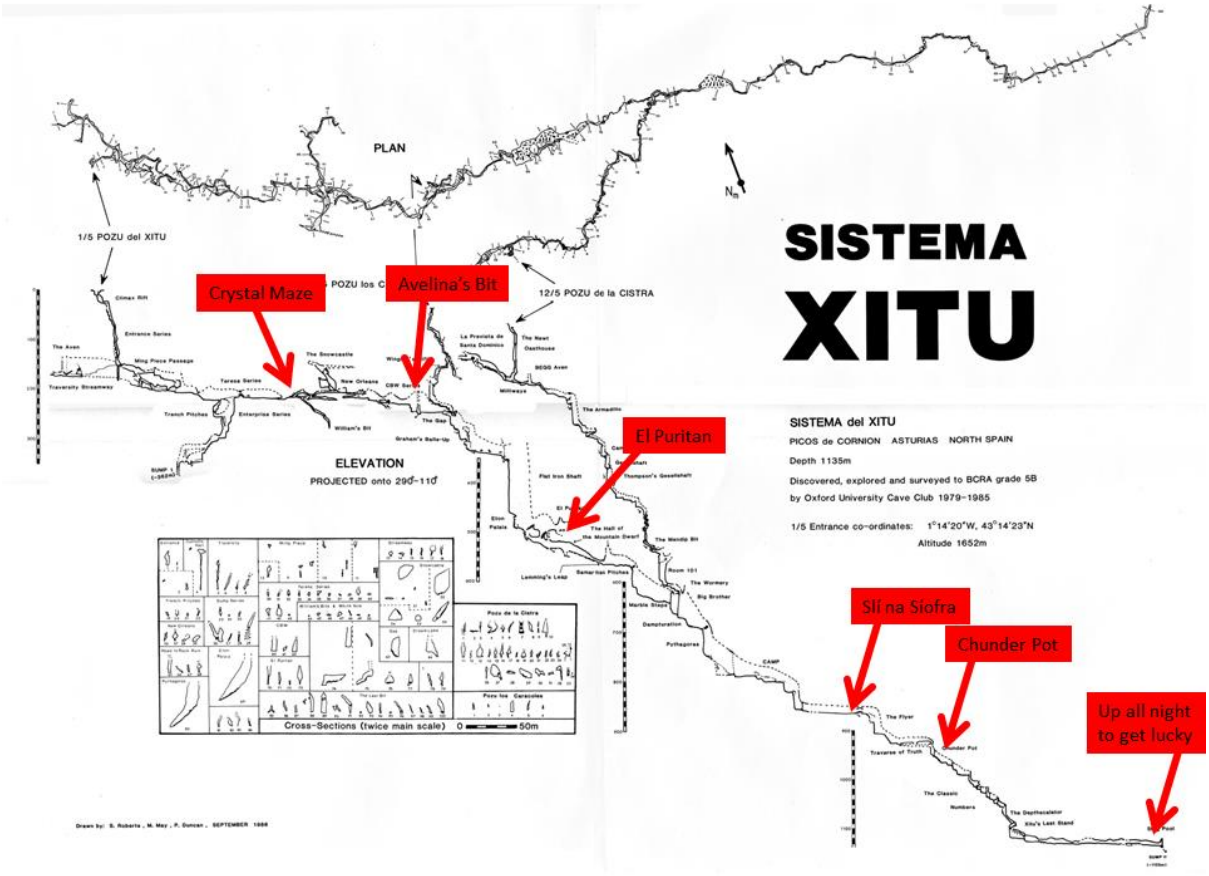


Figure 7 - A pictorial view of the main leads explored in Xitu.

The Crystal Maze and the Torture Chamber

Primary contact for this lead – James Armstrong and Jeff Wade

To get to the chamber from the main passageway, follow the Teresa series, and look for a large flowstone on the left just after the big slope with the handline. Then climb up the flowstones using the handline at about 5m. The last part of the climb is very exposed with no line. Once up on the ledge, there are several tight climbs further up which quickly close off, but a small chamber can be found on the left. SRT kit should be taken off at this point. Crawl straight ahead through the chamber following the strong draft into a tight crawl for about 10m. The crawl dips and the walls and floor become covered in shimmering crystals which appear untouched. They are very painful to crawl on. You then come to a very pretty chamber with many thick stalactites studded with crystals (where Jeff's photos were taken). The crawl goes for a couple of metres beyond the chamber and then gets too tight. As the formations are very delicate, I would not recommend large numbers of people visiting this chamber.

James Armstrong

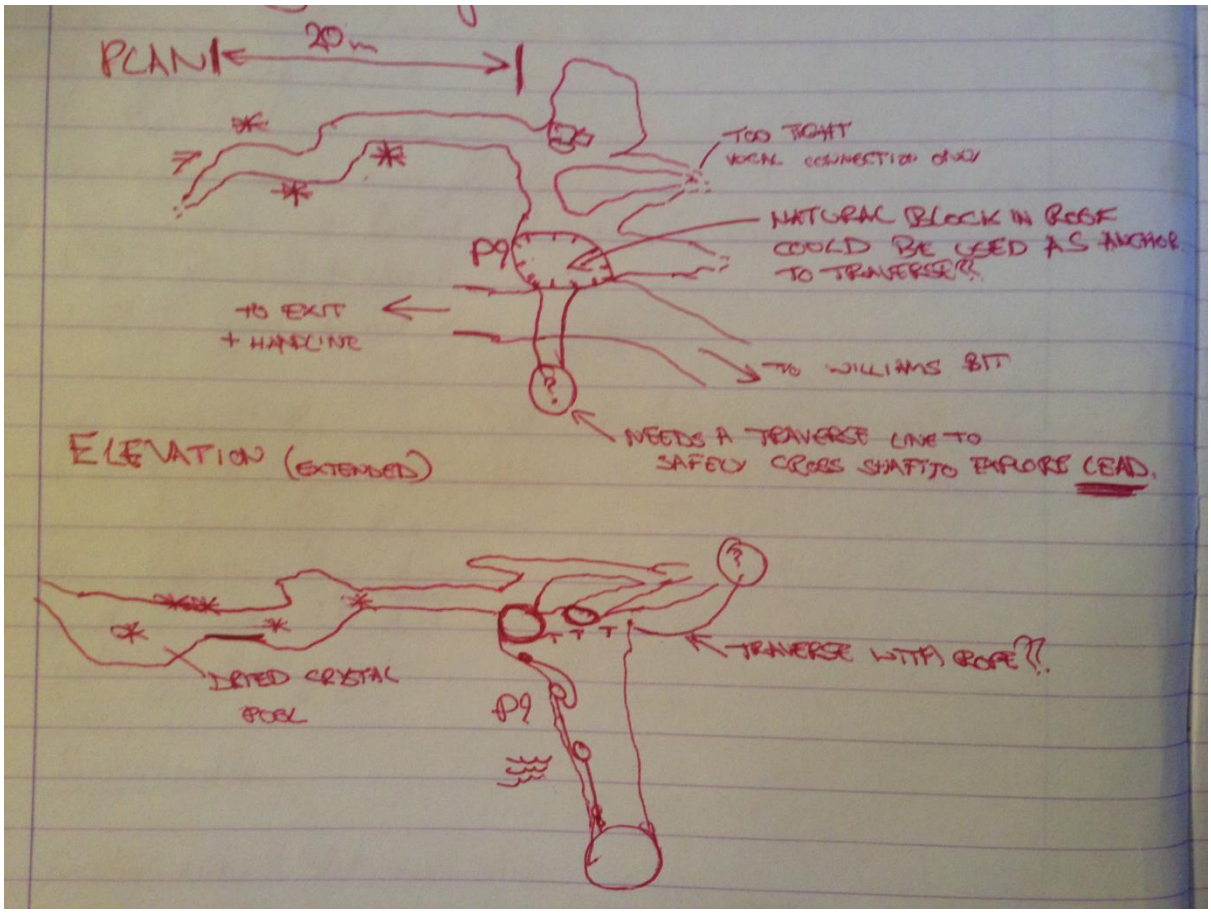


Figure 8 – A hand drawn survey of the crystal maze and the torture chamber.

Exploration from the Teresa series to the Gap

Primary contacts for these leads – Avelina and Andrew Wright

Andrew Wright (APW) and Avelina Wright (AW) explored any possible leads from the Gap to the start of the Teresa Series (as if exiting the cave, so all descriptions are to be read as such)

The Gap lead (as initially explored in 2012)

The rope immediately above the head of the pitch of the Gap was ascended plus the traverse line followed and next rope descended by APW. AW descended the rope on the Gap pitch itself to light the roof of the chamber for APW to gain a better view. APW continued as far as he felt comfortable, but with no rope or bolting kit, no further rigging was put in place. However, neither of us could see an obvious way on across the chamber, despite both our sten lights being on full power.

If further exploration is considered a viable potential by others, it may be easier to descend the Gap and bolt climb on the far side of the chamber with a car headlight!

At the top of the in situ rope we ascended (ie not the normal pitch), we also followed the passage/rift back towards the Teresa series at the high level. This reaches an inlet which looks climbable, but very wet. It looks as so it might go, but it would initially be quite tight. This inlet is the same that people drink from as it drops further down and lands near the top of the pitch of the Gap.

Hole in the floor a little way back from the Gap

AW descended a 2m climb with a little water, crawled to the right and popped out a little way down the Gap pitch.

Climbs to the left of the passage between the Gap and Servicio

APW tried several climbs and ground which seemed undisturbed, but no promising leads were found.

The U-bend (the hole at the foot of the pitch at Servicio)

AW climbed down the small hole in the floor near to the bottom of the pitch, containing a carbide dump and rusty sardine tins. The hole spiralled downwards and a crawl, in which some conglomorates had to be removed to get through, led to a very small chamber of 2m x 2m. A crawl led off into a completely different direction to the main passage up above. However, although it looked as so most of the crawl would be passable, an initial obstacle would require some persuasion with a hammer first! Given the proximity to the main passage, it would at least be worth popping in to survey the direction the passage is heading towards.

Passage from Servicio to the next small pitch (name unknown)

Nothing much found - a small hole, but it was choked.

Avelina's bit - passage from the small nameless pitch to the start of the Teresa Series

From the top of the pitch, you start a traverse where the normal route takes a right turn and then immediately a left turn to bring you to the start of the Teresa series. Before you take the above mentioned right turn, there is an obvious option to go straight on. Given how obvious this is, we assumed someone must have been there before, so did not look at this, but it may be worth having a look in the future.

Instead, we took the initial right turn, but not the left. We carried straight on which leads to a climb into the top of a tight rift where you can crawl/traverse reasonably comfortably. The crawl was maybe 15m long and passed a mud choked passage on the left. It continued, sometimes rather tightly, and white, foam formations which reminded of squirty cream/meringe sadly had to be crawled over to continue. Clearly no one else had been here before as this damage was completely unavoidable. This crawl was rather drafty! The small rift ended at a T junction into a spacious cross rift. This was spacious for perhaps 15m before tightening at both ends, although it was rather tall, perhaps 10m, and may have just been wide enough to squeeze through at the top if it had been possible to climb to it. A draft

could still be felt. There was also a pitch down a drop of maybe 7/8m with a trickle of water at the bottom. No obvious way on was visible from above, but without a rope, we were unable to explore any further.

Avelina's tunnel

On the return from the exploration of Avelina's bit and on reaching the bottom of the climb back to the main passage just before the Teresa Series, there is a little tunnel at floor level going off to the left (when coming back from Avelina's bit). It had a lovely draft coming from it, and is a sandy crawl with an uninviting pool which looked rather damp! APW's tummy ruled out AW's further exploration, although obviously not due to APW's tummy size, only due to its emptiness!

Start of Teresa Series

No further leads were searched for due to APW's raging hunger, but we did attempt to find Snowcastle. Following the first sandy crawl when entering the Teresa Series on the way out, we reached a sandy chamber and ascended the slippery climb to the right of the chamber, which corresponds with the survey and looked reasonably well travelled. At the top of the slope, we traversed over a big bolder to cross the main passage below. We then climbed up and up, through a small hole into a large chamber. A further separate chamber was reached by turning right instead of going through the small hole, this chamber being fairly well decorated and had a few options to explore, none of which seemed to lead to Snowcastle.

Avelina Wright

William's bit

Primary contact for this lead – Ian Holmes

Whilst Ian made a single cursory trip into this section, he only reinvestigated a passageway that had been explored and surveyed previously as he was unsure about where the potential leads in this area were located. Given this, following discussion with the original 'William' post expedition, the directions to the 'Hungarian Extensions' and a possible unfinished aid climb have been ascertained and a return trip during July 2014 is now planned. The route to the pushing front drops down a short obvious pitch (approx. 10m) immediately off the main Xitu drag, into a three way junction with a medium sized descending passage leading off perpendicular to the original course above. After a short way, a drafting tube on the left marked with carbide 'X' marking leads to a small upward free climb within a pot shaped feature. Although Ian did not venture any further than this point, it is understood that the aid climb exists somewhere beyond.

Ian Holmes

El Puritan

Primary contact for this lead – Ian Holmes and Eabhá Lankford

A number of short excursions were made into El Puritan by Eabha and Ian to determine whether a high level continuation of this area was likely. The previous rigging was followed and adjusted as required, and a short pitch (10m) into the back of the camp was also relocated, albeit it dropped directly into the designated toilet area – fortunately not whilst engaged! The old route from Eton Palais comprised two short downward pitches (approx. 10m each), followed by a short upward pitch (approx. 5m) and then an awkward section of thrusting. Upon reaching the 'bold step' noted in earlier descriptions, Ian rigged the feature and then dropped the blind pot beneath (approx. 15m), being unsure of the way on. Although the route over the top gained a sizeable descending chamber after a short, tight, upward squeeze, visiting parties were unsure whether the area had been explored previously. Furthermore, exploration had to be terminated in this area after a significant number of boulders fell through roof holes in the section of main passageway just beyond camp. Earlier descriptions of the El Puritan lead suggested that this area was probably high level cave above the main route below and given the danger posed by falling rocks, this does appear to be case. In the event that it is safe to do so during 2014, a return trip will be undertaken in this area to finish off the lead for certain.

Ian Holmes

Slí na Síofra

Primary contact for this lead – Steph Dwyer & Gaelan Elliffe

This lead was found a night that Gaelan and Steph were searching meticulously for any new passages leading off the main line of the cave. We started in the cheese grater and looked high and low from there until we found our new find. Much virgin cave, some of which was spectacularly decorated was found but nothing that was not a higher level of essentially the same fault, until….we got to the streamway again below the emerald lake traverse. Water levels in the cave were very low at the time but yet there was a relatively significant stream. It was a vertical inlet leading off the main streamway of the cave, downstream of the emerald lake traverse. This was pursued due to the large quantity of water coming from it compared to the main streamway. It was free climbed for 75m and bolt climbed after a constriction (which required enlarging) for a further 14 metres. This aven issued a considerable quantity of water from what was described as a hole in the roof. Measurement with a disto X estimated another 15m height above the limit of aid climbing. Despite the scale and unique nature of this new passage, when compared to the parent cave Xitu, there is nothing in the analysis of the survey data that would suggest this is anything more than an inlet to Xitu and therefore does not offer much promise as a horizontal backdoor into 2/7.

Chunder Pot

Primary contacts for this lead – Richard Cole & Vicki Lim

In 1981 David Rose climbed up above Chunder Pot in the hading rift, during the de-rigging of the cave. He recalls reaching the roof of the rift and a flat floor which seemed to be the original phreatic tube. There was then a vertical slot which he was not able to free-climb down, with ongoing passage leading away from the direction of the hading rift. In 2011 the area was investigated again but the lead was not found.

This year some investigation was done during the initial rigging trips and nothing found. Later in the expedition Vicky Lim and Richard Cole climbed up from the site of Camp 2 – above 'Climb pitch down into canyon' i.e. the pitch before Chunder Pot itself. They climbed up the hading rift for about 2 hours encountering several places where there were boulders or a floor blocking the way on. A flat floor in the rift made of calcite was found and after a small squeeze this could be followed to the right (in the downstream direction relative to the cave stream). At this level there was some apparently artificial breakage of stalactites – snapped off horizontally – with regrowth of straws around 5cm in length below. This was reckoned as reasonable growth for a straw in 32 years. There was also a small dump of carbide. It was postulated that David Rose had been here in 1981.

There were some significant formations made of flowstone around 1m high which were climbed over to continue. With a climb down of around 1.5m on the far side, it was suggested that this could have been where Mr Rose turned around in 1981. There was a climb up a cascading slope of flowstone which had fractures in from previous exploration, which were enlarged by Richard's 85kg presence. This was followed up to a point where the rift narrowed to around the size of Vicky while still heading upwards at the angle of the hading rift. Standing on Richard's shoulders then attempting to wedge higher, Vicky reckoned that it could have carried on, but it may just become too tight. Climbing straight back down they emerged at the far end of the Ferdie's Dismay traverse.

The area warranted further exploration and surveying, which were unfortunately not accomplished this year as there were other more promising leads to follow. The explored area was without any active water flow and did not leave the plane of the hading rift.

Richard Cole

Up all night to get lucky, and we were!

Primary contact for this lead – Paul Mackrill

Prelude

This lead came about following the traverse made from Culiembro to Xitu [and back] in 2011 by Tony Seddon and Paul Mackrill. I [Paul] was particularly interested in looking for the much sought for high level leads that OUCC had dreamt of that would lead to a through trip

from the bottom of Xitu to the surface. I now had the privilege of making the connection by diving but any exploration of the 2/7 streamway upstream [which is encountered in Culiembro] would need a dry access for cavers.

Exiting sump 4, the cave changed dramatically from a mainly phreatic cave to a huge vadose canyon above the 10m cascade. The canyon was at least 30m high and the 10m cascade had been conquered by finding a high level route that allowed the explorers to drop back into the streamway beyond the cascade. As Xitu lay at the **same** level as the streamway above the cascade, there is a strong chance these ancient high level passages might connect across above the sumps and might even hold a key to bypassing **all** the sumps at a higher level.

So, I had my eyes to the sky [well, roof] as I made my way up the passage above the cascade. After turning from the 2/7 streamway into Xitu streamway, the passage, high at first, turns left and lowers to sump 5 which is 35m. On the far side the passage again gains height until it reaches a similar height to the 2/7 streamway where breakdown is met and this may be a sign of high level passages. Further on there is an aven before the roof drops rapidly and we had to crawl briefly before meeting the start of sump 6, the final 60m sump into Xitu. This sump is low(ish) but suddenly enlarges enormously as it enters the base of the stag pool giving the feeling you have entered another passage underwater.

On exiting the sump my eyes went to the roof again and lo and behold there looked to be an aven above the sump and a definite borehole a little further along the streamway pointing back to Culiembro. After return to the UK, some Oxford members had vague recollections of seeing “something” but that was all...

So, on my arrival in 2013 in a convalescent state, I had expected to hear that this had been checked out, but no. A team was keen to bottom and have a look [Ian, Eabha and soon Jack] and I said I would see how far I could get [I had expected to do shallow stuff and wander around top camp but this side was being covered so it was back to the front line for me]

Climax rift seemed too simple but I was soon getting hung up on the thick ropes of the entrance series with its sharp angled deviations and too short free lengths at pitch bases. Rigging had evolved over the last few years and has become more strenuous to use. I would have hung it more in the water line as the swings back from the rebelays put you back in the main flow in any case, but I digress.

We chose to camp on the way down in order to be fresh, which was the right decision as we all slept long and deeply.

Finally, we arrived at the sump ready to go. We split into two teams: Ian and Eabha attacking the climb directly and Jack and I going back upstream to see if we could traverse up into the higher levels further back. We went back about 150m but kept finding the roof pinched out although small holes did lead upwards.

Back at the sump progress had led the first pair to a ledge above the sump leading up the ramp to the passage I had spied the year before. This led up a short climb to an easy traverse into the base of a real aven with a passage leading off [this is the other end of tube I had seen last year].

Ian volunteered to attack the aven. He created protection points around a series of flakes formed on a hollow calcite flowstone providing moral mental encouragement. It took a few bold moves using fragile popcorn formations to the right to get himself installed in a side tube we had spotted where he place a “thank god” bolt for protection. This led to a low sloping ledge to a platform looking directly down the 18m pitch.

Now for a strange aside: the pitch name! Eabha was testing a prototype oversuit that had suffered remarkably badly and was completely shredded from her lower back to upper leg. Her undersuit had suffered the same fate. This left a final layer that had resisted, a layer that had large print writing on it and without thinking I looked to reveal the full text. Neither of us thought this odd but Ian was rather concerned his belayer was potentially being harassed whilst he teetered above us. However, I did get to the “bottom” of my researches of the full text, thus the climb was named “Strip Search” …

I seconded Ian up the climb and removed all the gear which allowed us to set up a Y hang to let the others up, although what we saw had us romping off into the unknown virgin passage before we let the other two up!

Firstly, as I exited the top of the climb up the aven, I saw a roof with beautiful scallops pointing back over my head. The aven had intersected a passage going in both directions. The passage was a phreatic tube and downstream looked like it was going over the sump!!!

So what did we find? Well, the downstream passage is larger than the upstream side, suggesting the water rose up the aven and into this passage. Once we’d crossed the head of the aven we saw this downstream passage dived down. Being at -1135m [well-1100m as we had climbed up a good way] we thought it appropriate to abseil down the steep slope on a 6mm diameter cord tied to a small thread [well it was thicker than the 5mm cord that I had done exactly the same thing in the Berger on a similar “wow it goes” trip]. The descent led to a disappointing sandy floor with the way to the left blocked but a narrow rift to the right issuing a small draft. A dig here would be a mammoth task indeed, but there is more to tell.

Upstream seemed to be aligned with the inlet fault and indeed further on, it develops the same hading rift characteristic. At the start it is an oval phreatic tube with a rift leading down to the left which rejoins the main passage further in. The tube steps up to the right at this junction and a short way forward has another junction with a passage to the right. This passage is mud lined and leads to a further junction with a rising tube to the left [blocked] and a rift rising ahead which is blocked with boulder fill.

Back on the main line the tube drops down and is beautifully clean washed with deep scallops in the roof and floor showing a large flow of water through this zone. Beyond the passage it levels and develops into the hading rift, assumedly in the line of the streamway below. It then divides, forward is stal filled but upwards it continues as an oval tube, a tube which sports a draught. Yes a draught at this depth, interesting, very interesting.

Some way up this tube is a weird rift that is slashed into the floor. The rift is uncharacteristic of the rest of the passage, it has mud cover and a draught. It needs a rope or it is likely to retain you a while before you can exit and this remains unexplored by any of the parties …

Above the tube continues through small chambers with side passages until it is necessary to use a tube to the right to shunt a climb. This arrives at the base of a low wall into a rift chamber with snow falling ... ! The tiny particles are in fact a fine and light deposit on the walls which actually came off when walking past. I blew on the wall in one place and it blew away completely down to the bedrock a centimetre behind. I would be suspicious of breathing in too much as it is unlikely to be easily expelled by the lungs [I suspect it is an aragonite or gypsum deposit precipitated from the air]

The rift continued at floor level unexplored [I believe others found this to close in]. The rift above also continues and others [Gaelan et al] explored to a point where a roof passage led back towards the direction of the sump. It needs a rope. It may close down, but it needs a look.

<u>Some thoughts on what is going on:</u>

- The hading rift leading to the sump at stream level is likely to connect with the new finds upstream of the sump.
- Further back in the Depthscalator cross rifts were found, which have not been revisited. These might be parallel rifts to the final rift [interesting] or just higher up the main hading rift [still of interest if it leads to a high level sump shunt]
- The sump [stag] pool is nearly at 90 degrees to the hading rift. From above you can see the dive line leading off across the width of the sump pool [perpendicular to the pool length] at about midpoint. I have the impression that the massive sump pool is the same passage that continues up into the aven and back over into the mud choke and the present dive link is a “modern” smaller drainage route out of the base of the ancient collector.
- The first passages off to the right which are blocked by chokes are blocked from above suggesting collapse from a larger feature above [higher level passage?]
- The rift that crosses the rising oval tube further on in the passage is out of character and is stepping sideways in a way resembling the dive route out of stag pool. Its very odd nature suggests that the water once found an alternative route across to the 2/7 streamway from here. This is of course pure conjecture but you never know and its still an open lead...

To finish, I would note that I was not the last person to be down there and others will surely have their comments. I feel that the area below where the Depthscalator starts to the sump

should be given a thorough examination as an open high level route across the sumps could exist at this level given what we have already found. This said, to be of any real use, we need to connect the upper phreas passages together to find a way over all the sumps, dream, dream.

Paul Mackrill

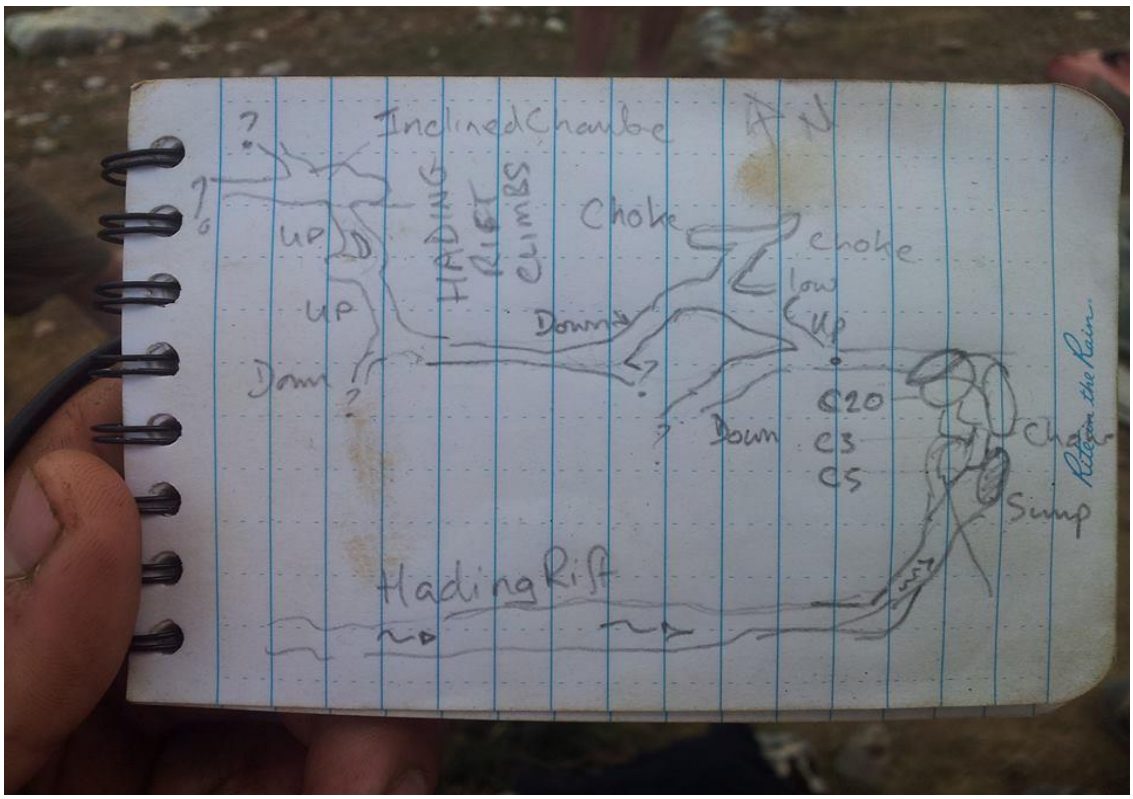


Figure 9 – A hand drawn survey of overall 'Up All Night to Get Lucky' lead

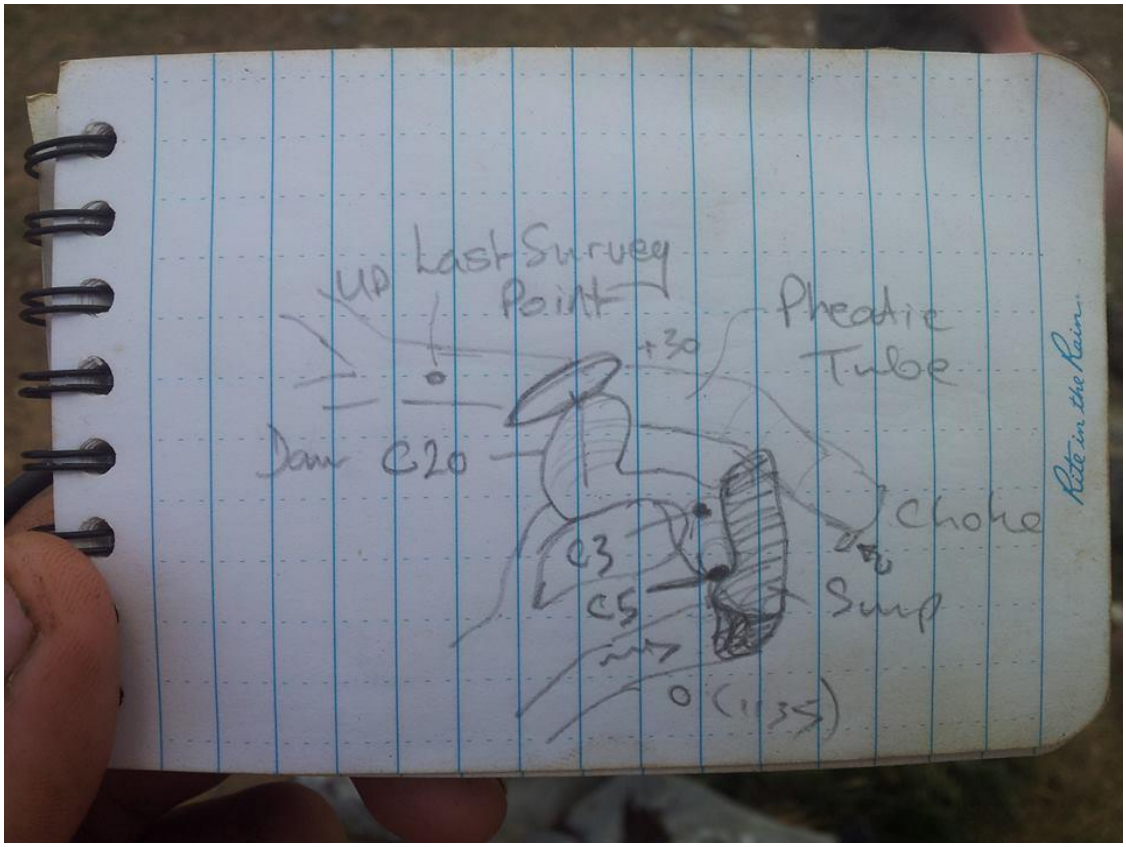


Figure 10 – Plan View - Detail of the climb area above the 'Stag Pool' sump

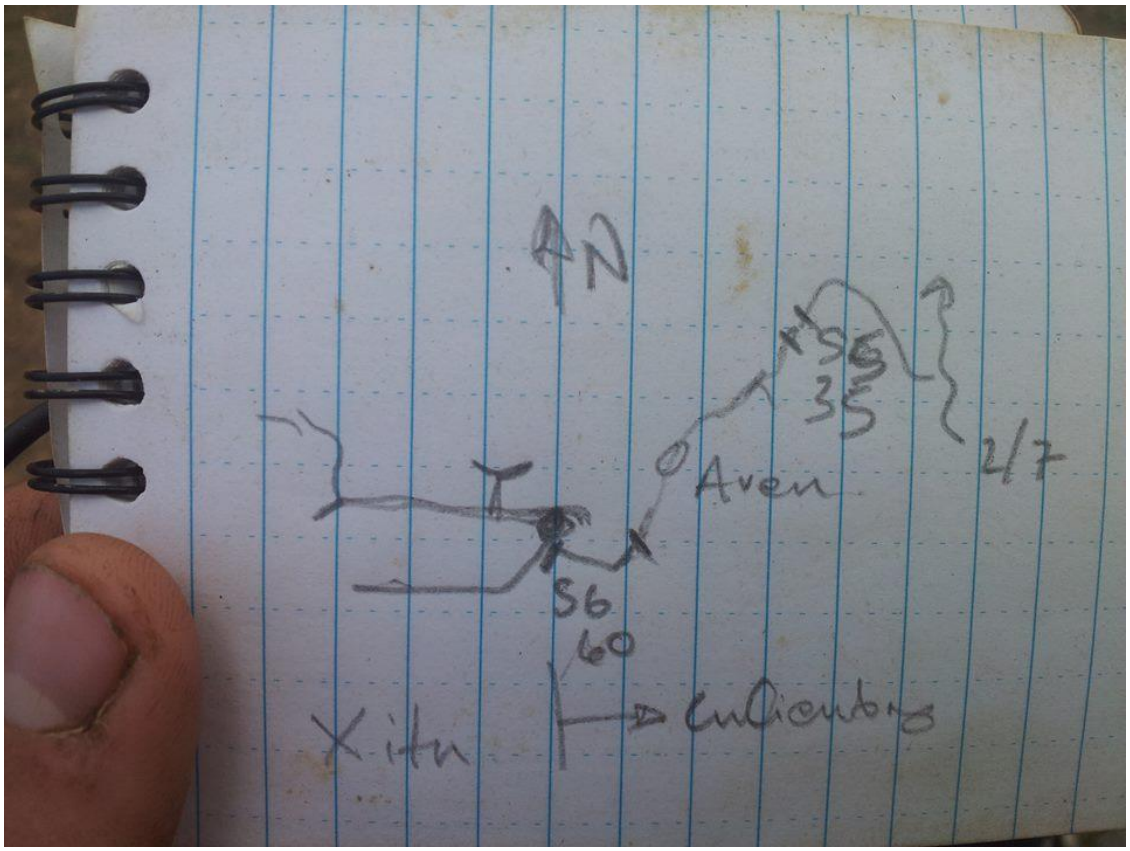


Figure 11 – The Plan View Layout of the area with the find and approximately the layout beyond the sumps to the 2/7 streamway

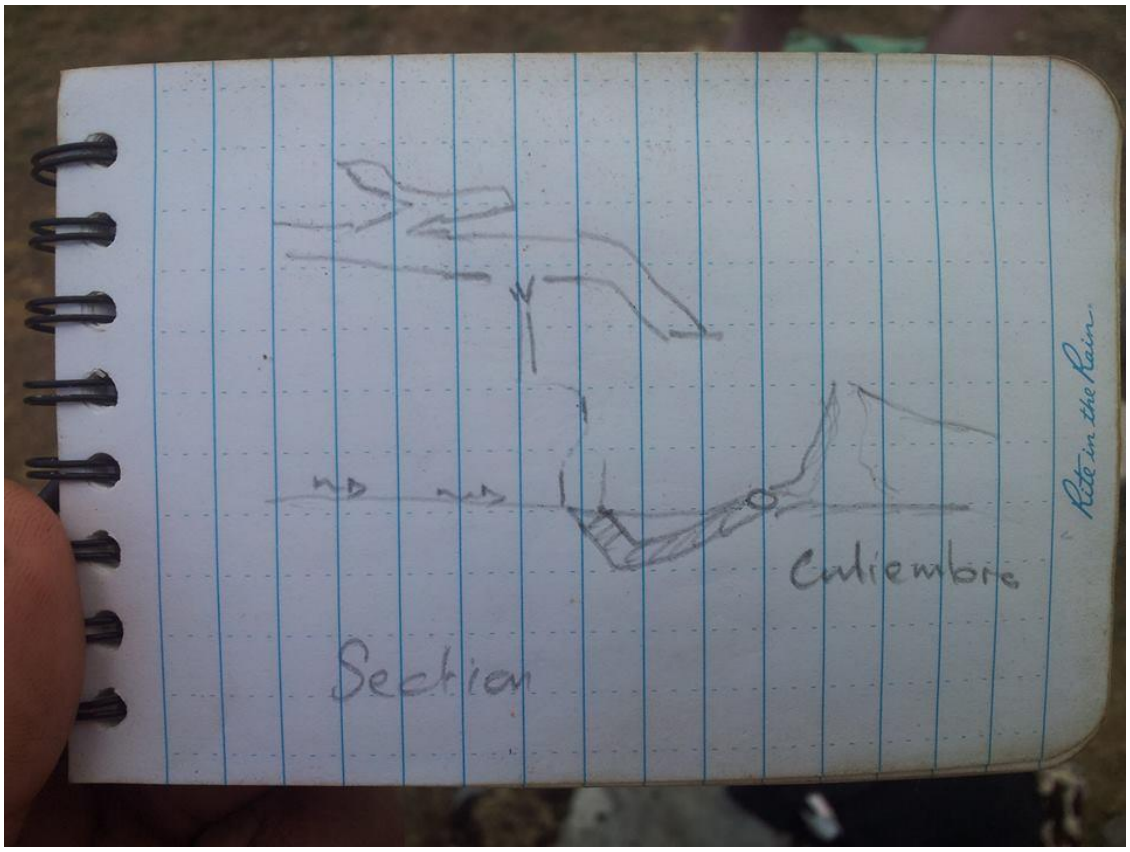


Figure 12 – Section View of new passage in relation to passage beyond the sump

Caves explored/discovered other than Xitu

29/5 – In search of THE place to dig into 2/7

WGS84 coordinates: 30T 344388E 4788677N

Primary contact – Paul Mackrill

Over the last few years there has been work done on 29/5 which lies to the North of the Trea path to the East of a valley just below the col [Collau las Cruses] where the Trea path breaks off from the path to Jultaya. I went on a trip to 29/5 to help open up a narrowing and used the opportunity to assess the cave and have a general look around. I really hate descriptions of how to find things and I prefer a map, so here's a map.

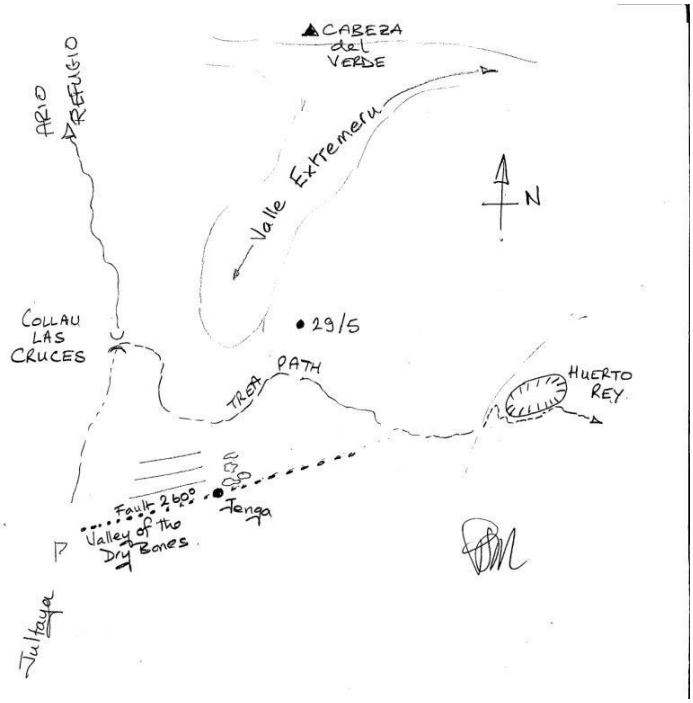


Figure 13 – Sketch Map

The cave has a fine entry, this year to a pile of snow following the long winter. Two passages lead off to the East but choke or narrow. The way on is to the West to a hole which opens out into a fine shaft which says "this is going somewhere". The problem is that the god of caving saw fit to paint the walls with beautiful calcite / mondmilch flowstone which goes all the way to the bottom of the shaft, and, of course, due to the calcification, it blocks with a little pool floored with mud.

A second, parallel shaft, cleaner, intercepts a tight vadose trench and it is this that the interest has been poured. A good look suggests that the diggers are working the upstream branch, which has a light draft. Having all the kit to hand I set to and cracked off the wall on the left, then right sides allowing Jack, myself and Jo to have a look. It looks like the rift

narrows again around a right hand bend. The draft kept the fumes of the chemical rock reshaper clear of the rift. There was no sign of an echo from a hoped for shaft.

My assessment is that the dig is following what may well be an inlet. The light draft could well be from the shakehole on the East side. To carry on work here would be a major undertaking with no sure outcome. For me I would tend to concentrate elsewhere which leads to the next subject.

Jenga – a possible backdoor beyond Choke Egbert

WGS84 coordinates: 30T 344245E 4788465N

Primary contact – Paul Mackrill

Older members of OUCC have frequently mentioned a hole in the valley of the dry bones which emits a howling draught, but is rather on the loose side with a name that only helped to sell its unstable side, Jenga. For two reasons I had never bothered looking for it. One was that the valley of the dry bones was explained as being close to Extremero and, thus for me, would drop into Xitu. The descriptions of looseness left me with an image of a failed game of Jenga where all the bricks bar the last block had been placed and it had given way leaving the bottom of the valley with a garbage grinder ready to swallow up any adrenaline junky ready for a trip.

This fabled hole lies in the “valley of the dry bones” but nowhere was this valley mentioned on our maps. However, there was a GPS coordinate for it and after learning the mysteries of the OUCC GPS and finally finding a way to enter the coordinates, I set off on a true treasure hunt for this mythical place.

To my delight, the pointer kept me to the south side of the Trea path and led me directly to a superb area of Karst with deep faults and deep erosion.

I traversed deep clefts with the distance counter decreasing until I finally climbed a steep edge and looked down into the now uncloaked valley of the dry bones expecting to see rock bourne mayhem.

The valley seemed “nice”. I scurried down and found a series of small holes with solid rock surrounds. Surely this was too “nice”. Each of these holes contained an open freezer feeling exhaling a cold draft out on my bare legs. The furthest hole to the East sported a hanger and bolts in the wall and a narrow shaft leading off down. ‘Was Jenga actually a nice place?’ I thought.

To the West an excavated bedding invited me in and I bottomed it to be greeted by a steady cold blast and, removing a few blocks, I could see it continued on down and down. I was starting to get excited and had to leave the hole for a pee!

Further up the valley another rock filled cleft breathed on my legs and higher still was a shaft, partially excavated, which I climbed down. It ended in a small, low meander which blew enticingly at me. There is definitely something here. The climb out revealed the Jenga nature of the place. I pulled bits off the wall and had to climb around the entrance block I had lowered myself in on as it was now also ready to come away. The nature of the place had finally revealed itself but I felt these problems are containable and not a bar to working the place.

Beyond to the East and North the whole area has the remnants of old vadose passages leading into the ground. Although none of these draught, they point to a lot of ancient drainage activity.

I then took a bearing on the valley which is situated on a fault and got a reading of 260 [or 80 if you look the other way!]. I then followed this to the East finding a few more drafting holes and I kept going on the same bearing until it drew me to the northern side of Huerto Rey, the huge pit next to the Trea Path below which Choke Eybert is supposed to lay. The significance of the Jenga site went up another notch!

The rock around Jenga is very black and finely fractured, almost marble type. Inside the holes the walls come off in flakes. The draft is outwards [during summer] and would be inwards [during winter] and thus the caves would freeze in winter and there will be gelifraction [ice shattering] of the rock [hence the flaking nature]. The draught is dispersed through many small holes suggesting the main passage is somewhat deeper down and bleeding air to the surface through a weakness created by immature sinks above it rather than just one huge collapse as I had first feared. The Shaft Bashing guide actually talks of removing mother rock as a way of progressing but the shattered nature of the walls does offer this as a possibility.

Apparently Jenga is derived from the Swahili word meaning ”to build” which puts a more positive outlook on working in the place. You just need a constructive attitude and you’ll be fine.

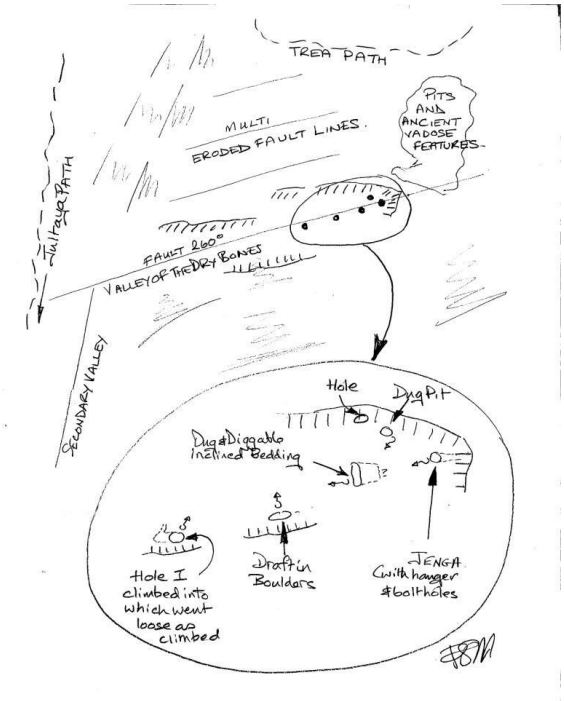


Figure 14 – Sketch Map

Paul Mackrill

9/4

Primary contact – Andrew Wright

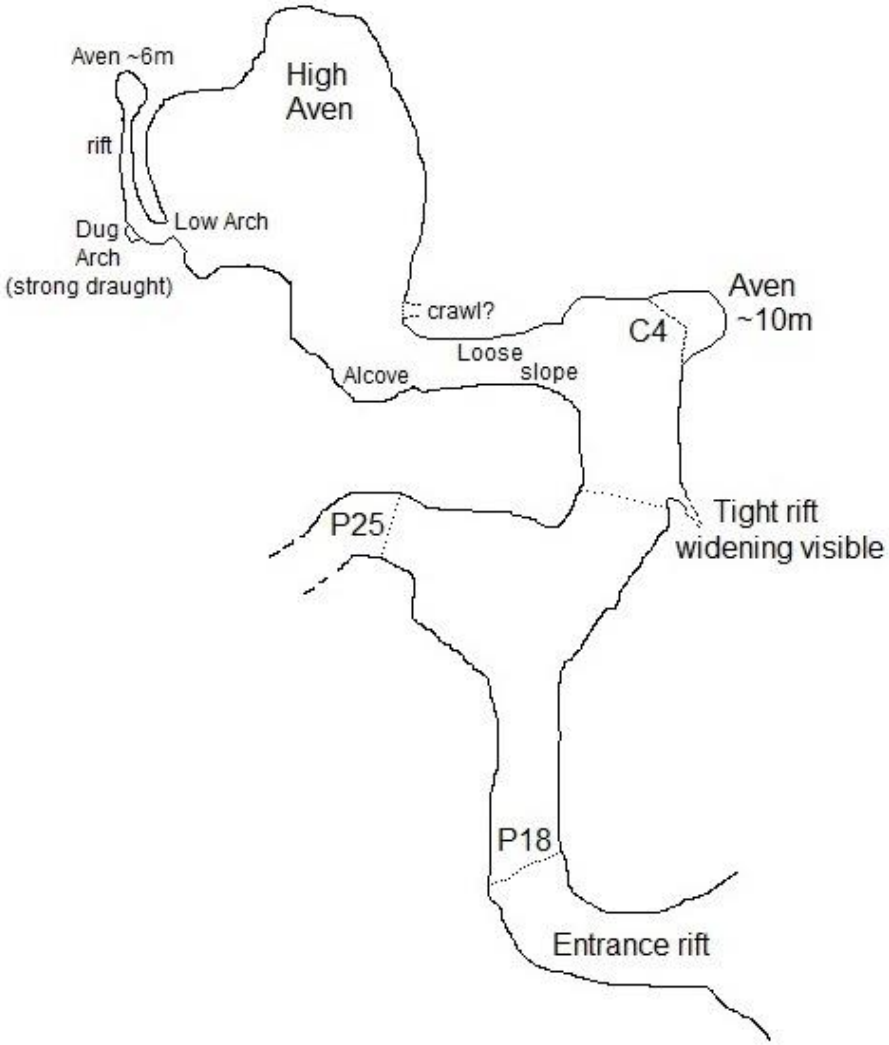


Figure 15 – Sketch Map

On the 9th July, Sandy and Steve had spent a pleasant afternoon prospecting in Area 4 with the general aim of locating the entrance to 9/4. This cave was of interest because it sat at the top of the list of sites worth investigating further in the shaftbashing guide we had at camp. This stated that, as it lay near the probable route of 2/7 towards Culiembro, and had been investigated but not concluded, it was an ideal place to start hunting for glory when you were too knackered for a trip to the bottom of Xitu, or at least words to that effect. Having found the entrance we returned to camp for tea and to have another good read of the guide. Next morning, suitably excited, we set off with ropes and hand-bolting kit to go

and look at a climb on the outside of the second left-hand bend beneath the second pitch on the right-hand route.

The rusting 1982 vintage spits on the entrance pitch being best left alone, we put two shiny new ones in to rig a y-hang that could be backed-up off plenty of naturals on the surface. At the base of the entrance pitch (18 m) there are a choice of ways on, both vertical, the left-hand of which was said to be a blind pot by the shaftbashing guide. We therefore descended the right-hand route, a steeply sloping slab of ~8m with the tail-end of the entrance-pitch rope rebelayed to a natural anchor. Halfway down this pitch we noted a very tight rift leading off, which could perhaps be forced if desperate, but was not pushed on this occasion. At the base of the pitch a steeply sloping and loose rubble-floored passage leads to a sharp bend, on the outside of which we found what we took to be the un-climbed climb mentioned in the guide. Sandy volunteering, went up for about 4 m or so of thrutchy loose nastiness before being able to stand on solid rock at the base of an aven estimated to be ~10m high by 3-4m in diameter. Attempts to climb here were largely futile, but a good view of the roof could be had and no possible way on could be seen.

Descending, we both carried on for a quick look at the rest of the cave. After a further 20 m of passage or so, and round another sharp bend the cave apparently ended at a tall, un-free climbable aven. Looking around we found many fine and large crystals (potato to grapefruit size) in alcoves in the wall here and also a low arch in the true left-hand wall which was draughting. Clearing some loose rocks from the floor we managed to squeeze through into a narrow rift running parallel to the main passage. Following this for a short way led to another ~6m high aven, separate from the main cave, but equal in its terminal impassability. Having now lost the draught we retraced our steps back to where we had entered the rift, eventually identifying the source of the draught as coming through the opposite wall of the rift below the height of the rubble floor. Ten minutes of clearing away rocks and we had exposed a further low archway, opening out beyond, through which the draught was now howling. Unfortunately, at this point we appeared to be digging up into more compacted infill and without tools or shoring of any kind progress was quickly becoming more difficult and more dangerous, with the distinct possibility of eventual self-burial being the likely outcome.

In all honesty it is not with great regret that we never got to return to 9/4 in 2013. Although there does remain a draughting dig at about ~35m below the surface to go back to in the future, we both thought it safe to put a second cross through the circle first painted on the entrance more than 30 years ago.

Andrew Wright

Shaft bashing

GPS coordinates of caves 2013		All WGS84	
Shane's Orifice	30T	344330E	4789172N
Dig to too tight cave			
In area 5: will be numbered 80/5			
Jack's Cave above scree slope	30T	344562E	4788838N
Shane's Crack	30T	344447E	4789161N
NOT the same as Shane's orifice which was dug, this is just a crack between 2 big boulders with no cave. [photo attached.]			
Shane's Wood	30T	344179E	4789063N
not a goer			

Several trips to look for new caves providing a possible backdoor into 2/7 were undertaken this year. The focus was mostly around the OUCC area 5 as this was the area above Choke Egbert and a way to enter the cave past the choke was desired. The table above summarises the findings, the only one which was an actual cave and not already numbered by OUCC being Shane's Orifice - this will be known as 80/5.

80/5 was found by Shane, Gaelan, Steve and Richard by an approach involving PMR radios and a group on each side of the gorge. Four candidate caves were found and GPS positions logged, but three turned out to just be small holes looking deceptively like cave entrances. Pictured is Shane's Crack which turned out to just be a gap between boulders. The entrance to 80/5 is a hole in the side of a cliff, an easy climb up from the grass. There was a boulder about 50cm across in each direction blocking the entrance, which was split up and removed on a second visit by a group of about 6 equipped with slings and crowbars. The cave could then be entered, and it was a meandering rift that went horizontally and became too tight. It was thought this cave was caused by fissuring in the rock and unfortunately was not the inlet to 2/7 we were looking for.

Next year more spotholing should be done in the area, and I would recommend taking a GPS with all known cave coordinates in the area. A Google Earth file containing all these coordinates and most of the area 5 caves with known locations can be accessed at http://ariocavesproject.com/caves.kmz

Richard Cole

Figure 16: Shane's Crack – just a gap between boulders unfortunately

Top camp recce

Primary contact – Paul Dummer

Following the vague track to top camp cairn is easy, basically start at the cattle trough, best way to get there is walking past and behind the Xitu entrance towards the mountains, once you are at the cattle trough you can see the path going up and the further you go the more cairns on the track there are and easier it is to follow
When starting off, if you put in to a GPS the top camp cairn or snow pole coordinates following the arrow really does keep you pretty much on the track.

The track is easy enough, only a gradual incline and could be fairly easy once you know it, but I cannot remember how long it took to get up there – about an hour and a half.

There are other possible places to camp, but the snow pole area is right on the track, very easy to spot and has plenty of grass and is close to where you want to be.

I will keep the track on my GPS so if I do not find a lead to download it, I can lend it to you next year if I cannot make the trip

GPS Points for route up to top camp area
Cattle trough - 30T 0343228, UTM 4788906
Snow Pole - 30T 0341908, UTM 4788060
Top Camp Cairn - 30T 0341751, UTM 4787925

Figure 17: snow pole area, not too far from the top camp cairn - probably best place to camp - with the cows

Figure 18: top camp cairn - very easy to spot, has been rebuilt

Figure 19: small sheltered area to camp - standing at the cairn looking towards Perdices entrance

Top camp Area Comments

Primary contact – Paul Mackrill

Top camp was used about 20 years ago in the early 1990's for exploring the high drainage area near the ridge that separates the Ario plateau from the steep drop to the Cares gorge and the village of Cain.

The area used to camp was situated around a rock platform with a small cairn on it as shown in the photo above. There is also a drilled hole next to the cairn which was used as the survey point to locate all the caves. The Shaft bashing guide gives polar co-ordinates from this point.

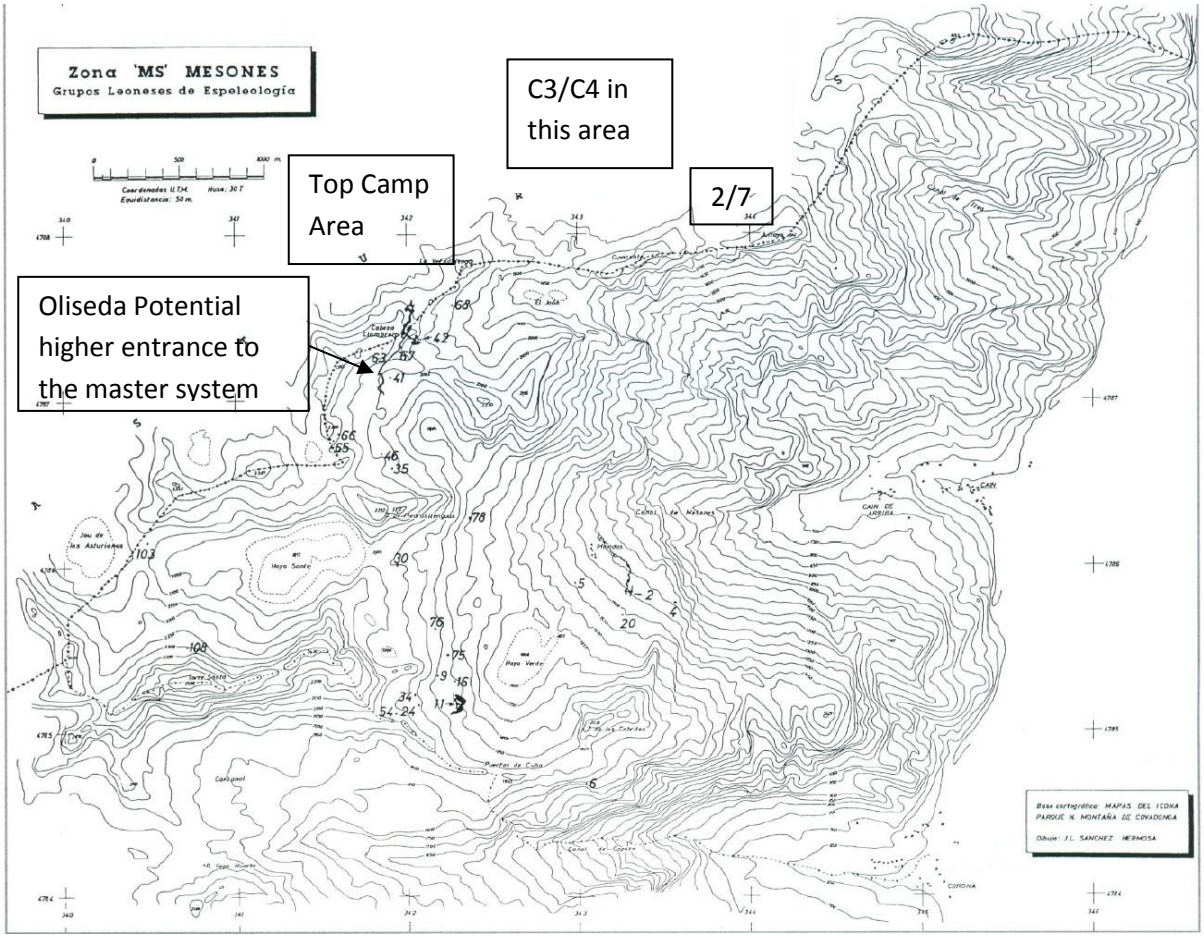
There is very little flat ground to camp and more importantly, there is no flowing water. All the water was collected from snow melt either from surface snow patches or snow in the caves. This, and the limited camping space, reduced the numbers of people who could be supported in this area. Also setting up a camp here would require a commitment to resupply the camp by man carrying and this is likely to take at least one good carry a day.

Access is possible from the refuge as described above, but access is also possible directly from Los Lagos.

There is a real question as to whether the caves in the immediate area (from the camp up to the Verdelluenga ridge) are part of the same drainage basin as Culiembro. This has yet to be proven. However, the original camp is high enough to give access to the high entrance of SIL DE OLISEDA. This cave was found by the Spanish in 1983 at an altitude of 2064m. It lies on a fault which is aligned with the top end of C3/C4 but reputedly ends 50m lower than the steam-way entering in C3/C4. This could well be explained by topographical error. In any case, the water volume rising at Culiembro is only partially accounted for and the vast majority comes from the 2/7 streamway. This makes the area beyond the top camp ridge extremely interesting. The main area of interest looks to be the area circled in red on the map below.

Approach to Oliseda and the area of interest could be made directly up from the village of Cain. However, this would require a 1700m climb from the village. Also, the village of Cain is not easily accessed, requiring a long, windy road to be negotiated. Another possible route is over the col between summits of Jultayu and la Verdelluenga. There is a reasonably good footpath that passes this col (NB Avelina and Sandy walked up this route to explore this bowl and to then go on to the top camp area earlier in the expedition).

For the ultimate objective of finding the highest feeds to the "sistema del Culiembro", the area to the south east of Top Camp looks to be well worth detailed investigation.


Zona 'MS' MESONES
Grupos Leoneses de Espeleología
C3/C4 in this area
Top Camp Area
2/7
Oliseda Potential higher entrance to the master system

Issues Arising

Bolt problems in the Xitu rigging bolt sleeves

In 2011 the decision was taken to re-equip all the bolted belay points in the cave as they had been placed during the original explorations in 1979-81. These old bolt sleeves were of mild steel and either corroded or poorly positioned for use in modern rope techniques. The new bolt sleeves were made of stainless steel to give them a higher lifetime underground.

A number of the new bolt sleeves pulled out during the expeditions of 2012 and particularly in 2013 during the re-rig. No bolt sleeve pulled out of the wall whilst being hung on, but came loose whilst being screwed into or were found to be loose during use.

A separate incident occurred in 2012 during the diving traverse when Paul Mackrill fell 5 to 6 metres when a bolt became undone by unscrewing. No injury occurred due to the backup bolts holding and being well placed. This could be put down to the bolt being on a short traverse section. As Tony Seddon put it: "If you put a very small loop on a bolt a short distance below and offset to the right of the preceding bolt, then there is a risk of it unscrewing itself". You are effectively undoing the bolt by a ratchet motion. This is a separate but important point to that of the bolt sleeves coming loose, which is discussed below.

The bolt sleeves used are stainless steel Raumer [Rainox diam.12x30 for M8 bolts] which require the hole to be pre-drilled in the rock as they are not self drilling. Otherwise they are exactly the same as the self drilling bolts made by Spit. The bolt sleeves are of the expansion variety where a cone placed into the end of the sleeve is driven into the body of the sleeve as the sleeve is hammered home into the pre-drilled hole.

Investigation of the pulled bolt sleeves showed that the sleeve ends had not fully expanded. The cavers who returned these bolt sleeves explained the sleeves were at least level with the rock or even partially sunken into the rock before they attempted to use them.

For the bolt sleeve to be fully locked into the rock the cone must enter the sleeve to within about a millimetre of the end. This creates and interference fit of the bolt sleeve to the rock where the steel is stressed so it is always pushing out against the rock. If the cone is not fully entered into the sleeve, the locking force on the rock is dramatically reduced.

So why were the bolts driven in incorrectly?

Before starting, it is very important to note that the following analysis and comments are common for ***all*** bolts of the Spit and Rainox types where the cone is fitted into the base of the sleeve. The cone is driven into the sleeve ONLY when the cone hits the bottom of the pre-drilled hole.

Where holes are pre-drilled using an electric drill, it is extremely difficult to stop at the correct depth. This is compounded by the fact the caver is frequently hanging on a rope in a difficult position and it is unsurprising that drilling can be stopped at exactly the right depth. Pre-drilling the hole by hand, as with the case of a Spit, is a slow process, requiring frequent stops, so the depth can be checked regularly against the depth markers on the driver.

The process of drilling and fitting the bolt sleeve ***is critical to within a millimetre*** [Case 1]. Where the hole is under-driven this causes the bolt sleeve to protrude [Case 2] from the rock which in turn causes the anchor plate to hang in shear mode from the bolt sleeve. The anchor plate should be in contact with the rock so the plate itself is put into friction with the rock itself by the force of the fixing bolt screwed into the sleeve.

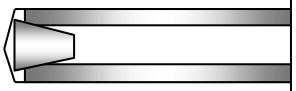
Other bolt sleeves were found to be below the rock surface [Case 3] and in this case the number of threads screwing into the bolt sleeve can be reduced to a point where it will strip the few threads that enter and thus detach the anchor.

It is suspected that many of the bolt sleeves that failed were in over drilled holes where the bolt sleeve was not fully driven against the cone and hammering of the bolt sleeve was stopped when flush with the rock [Case 4].

The various bolt sleeve configurations described above are shown in the following diagrams.

Case 1

Drilled Hole **Correct** Depth

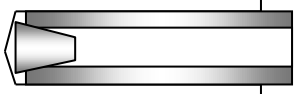


Cone Fully Entered

Sleeve Flush
Looks OK
Is OK

Case 2

Drilled Hole **Shallow**

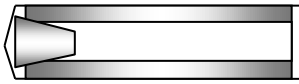


Cone Fully Entered

Sleeve Protruding
Looks Poor
Anchor Plate Under Shear load
Possible anchor plate / bolt failure

Case 3

Drilled Hole **Deep**

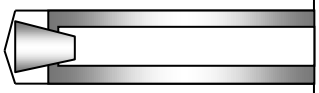


Cone Fully Entered

Sleeve Sunken
Looks Poor
Bolt threads minimal hold
MAY FAIL by thread failure.

Case 4

Drilled Hole **Deep**



Cone ***PARTIALLY*** Entered

Sleeve Flush
Looks OK [!!]
SLEEVE MAY PULL OUT !!

The vital point to retain in placing these types of sleeves, Rainox or Spit [***either by manually or power drilling the hole***] is that the hole must be **EXACTLY** the correct depth. This can be achieved by shallow power drilling the hole and finishing with a manually driven sleeve to the correct depth. Alternatively, a hard stop is required on the drill bit to stop it going in too far. Painting a mark on the drill bit is **NOT** accurate enough unfortunately.

If the hole is too deep and the sleeve placement has started, then it is ***imperative*** that the sleeve is fully driven until the cone is locked, that is, until the sleeve stops penetrating into the hole. Practice will give you the feel when this occurs. The surrounds of the hole then have to be dressed back. Under-driven sleeves will become loose and dangerous!!

In all cases the drilled hole must be blown clear of dust. The team used a small tube that fits in the hole [with clearance for dust to blow out round the tube] for this or just by putting our mouths to the hole and blowing.

The bolts used are at the URL:

http://www.raumerclimbing.com/eng/prodotti_dettaglio.asp?prod=rainox-bolt_in_stainless_steel_(diam.12x30)&qi=0-2-20

Correctly used, they provide an excellent long term rigging bolt sleeve.

Paul Mackrill

Artificial Anchors Notes for Xitu (based on 2013 Expedition)

Please note, as with all bolts in caving, it is the sole responsibility of each person to inspect each bolt as they pass it.

Many factors can change the quality and strength of artificial anchors over time including:

- Natural erosion on the surrounding rock and/or anchor
- Wear and tear over time by general usage

That said, a well placed (stainless steel) artificial anchor in suitable quality rock should withstand numerous expeditions if subjected to correct usage.

Stainless steel Spits (Raumer), stainless steel through bolts (expansion bolts) and non stainless spits and through bolts were also used on this expedition. I believe stainless anchors were used for all of the main rigging. (S.S. from here on refers to Stainless Steel).

The following has been compiled from memory over seven months after the expedition. It is likely the list contains some inaccuracies; it is by no means intended to be a definitive list. To the best of my knowledge a second opinion was sought when placing each of the progression bolts on this year's expedition.

A new S.S. through bolt was placed to create a second deviation in the entrance series. This was judged necessary by three different people to keep the progression line out of the water.

A new artificial anchor was placed at the head of Customs Hall to create a Y-hang.

A new (S.S.) through bolt was placed on the short hand line in the entrance series. In my opinion, ideally this should be backed up (to create a Y-hang) at the start of the 2014 expedition. This anchor was replaced when upon inspection it was found that the sole spit used was driven too far into the wall. There were approximately 2/3 threads holding the bolt.

A new S.S. through bolt was placed in the entrance series, as the rock arch used as the main anchor was found to be extremely loose upon inspection by three different people.

I believe a new anchor was placed two-thirds of the way down Pythagoras series (at the top of the boulder ramp). This was a single anchor where the caver would be suspended on it for quite some distance. I believe the bolt came out of the wall into someone's hand with minimal force. This was on the rigging trip at the start of this year's expedition.

When prussiking up the cheese grater bypass downstream pitch, the Raumer bolt made a pop sound. Upon inspection at the top of the rope, the Spit could then be slid in and out of the hole, nearly the complete way. It could be spun 360 degrees also.

Below the -1000m mark on a traverse line/part of the Y-Hang, when attempting to check a bolt without putting any force on a Raumer Spit, it came out of the wall. This means the rigging is now in an unorthodox manner.

On the Depthscalator/Death Series, one of the Spits (left of Y-hang) is spinning and can be moved quite considerably in and out of its hole. This half of the Y-hang was re-rigged using naturals on the final bottoming trip. This needs to be re-bolted at the start of the 2014 expedition.

Rigging notes:

At the top of Flat Iron, during the middle of the expedition, the rope was found to be fairly frayed. This was most likely due to user error. An ad hoc deviation was placed and then replaced using various old spits. (This might need re-visiting at the start of next year's expedition).

An extra rope length is needed for the bottom of the big pitch with two deviations (below camp). On the 2013 expedition, it resulted in an awkward swing with some sideways force on the chest jammer.

Notes from some of the rigging trips at the start of the 2013 expedition.

In most cases, the hangers were in place.

After encountering the single spit hand-line (which was replaced – mentioned above), for a while each anchor was being inspected, but as this was taking too much time, it was then changed to inspecting only one of the Y-hang Spits, if this was found to be adequate then each of the remaining spits would be secured (tightened with two fingers).

However, if one of the Y-hang spits was questionable then the surrounding spits were looked at. As a result, not all of the anchors were inspected on the 2013 expedition.

Upon discussion with a couple of different people there was some uncertainty over the quality of the rock surrounding some of the anchors on the Samaritans pitches.

This is not a definitive guide. As always, the person caving should be adequately experienced to inspect and judge each artificial anchor, and carry out their own risk assessment.

Gaelan Elliffe

Objectives 2014

The following objectives are planned for the 2014 expedition, albeit they may be subject to change following confirmation of attendee numbers and experience:

- Continue exploring 'Up all night to get lucky' and complete the aid climbs and limited digging work required in this area;
- Check all remaining leads and cross rifts in the bottom section of Xitu, particularly within the Death Series;
- Follow up the leads in William's Bit, Avelina's Bit, Avelina's tunnel and El Puritan to suitable conclusions
- Complete the aid climb required at the 'Way of the Fairies' and link the survey into the main Xitu streamway;
- Re-dive the Xitu sumps and traverse to Culiembro in order to review the possible leads between the sumps and obtain more photographic records and possible film of the traverse;
- Strip all rigging and camping equipment out of Xitu at termination of remaining leads;
- Complete re-rig of C4, to gain access and allow exploration of the upstream C3 streamway, which includes a short (approx. 10m) aid climb at the previous limit;
- Dye tracing C3 / C4 sumps to downstream 2/7 streamway via Culiembro or Hoy la Madre;
- Possibly attempt to dive the connection between C3/C4 and 2/7;
- Further work in promising surface digs above Choke Egbert and particularly in respect to Jenga;
- Familiarisation trips into Culiembro to prepare for joint diving and aid climbing expedition during September 2014; and
- Additional activities on the cliff entrances above Culiembro to determine exploration potential.

ACP would also like to establish a permanent equipment storage base on the Ario Plateau to avoid unnecessary material transportation. It is hoped that the expedition may be able to gain use of an old shepherd's hut following discussions with the appropriate stakeholders.

Members' contributions

Sidetracked Article - Steph Dwyer

Most people think we are crazy. I have come to think they're probably right, but it is from this very place of madness and unconventional bravery that I believe true adventure is born.

I am an adventurer, a dreamer, a passionate outdoor enthusiast but most of all a caver.
But - why caving? I could have devoted myself to the many other loves of mine like climbing, fell running, canyoning, which are all far more civilised and respected sports. So what is it about gruelling sleep deprived 30 hour trips, chafed, exhausted and broken that makes me feel so euphoric? Why do I spend all my money and free time preparing for a 'summer holiday' that involves camping 5 days at a time without any natural light? When an expedition departs it has no idea, no minds view of what lies ahead because cave exploration by its very nature is not only unknown in terms of its journey but also its destination. It is always a total mystery and it is this very essence that intrigues me. What we find around the corner is often beyond our wildest imaginations.

So many people are terrified of caving because caves aren't places people can easily imagine or relate to. One doesn't have to be a climber or mountaineer to know at least what a mountain looks like, but for caving, people rarely know what to expect and so their blank canvass is often painted with fear. Indeed, caves can be remote and committing places to explore but often spectacularly beautiful launching you unexpectedly into the most unique of physical and sensory experiences.

On one such occasion I find myself curiously following a stream along an unexplored passage 860 metres below ground in Spain's, Pozu del Xitu. It is who knows what hour of the night, 4 days into our camping trip and I'm starting to lose all sense of day or time. Deep underground, sleep and rest are determined not by the cycles of day or night but by the cycles of adrenaline and exhaustion.

Gaelan and I were on a mission to meticulously search for any new passages leading off the main line of the cave. Searching high and low one location in particular caught our attention. Climbing up to investigate further, it seemed that we'd discovered an inlet carrying more water than was in the main streamway below. It continued vertically upwards but fortunately we were able to make swift progress by free climbing and linking crumbly hand holds. To my delight, it was exactly what we were looking for - a significant and independent development to the main cave.

What could this mean? Where could this be going?
My heart was pumping with excitement but I tried to steady myself so as not to lose concentration; an accident at this depth could be very serious. Gaelan called out for me, but all he could hear was hysterics of laughter and the announcement "it's going Gaelan, its going……..wait till you see this." I quietly smile to myself, this is what it's all about, moments like these when you first set your eyes upon pristine unexplored cave, to stand where no man has stood before. For the first 100 metres the cave consisted of enormous, well

decorated chambers; the walls twinkling in our lights. Further up however the walls appeared to pinch in, could we have rejoiced too soon? The passage eventually closed in until the only way on was a very narrow slot off to one side. It looked ridiculously tight and the bottom of it filled with water. Our adventure it seemed had come to an end. Defeated I was about to turn around but then curiosity spurred me on to see if anything might lie beyond. The approach up into the constriction was quite awkward forcing me onto my side with the delightful welcome of water now dripping down my neck. I tried to slide my head into the narrow slot but the only space that allowed room for my helmet forced my head down. Unable to see ahead I shouted instead. A lofty echo returned. Holy $**7 that chamber must be massive! A rush of adrenaline came over me and what appeared earlier as tight and hideous was now scary but possible. I just *had* to find my way into that black unknown. My heart was pounding with fear and anticipation as I forced myself down into the widest part of the squeeze, which had to be in the water, obviously! The whole lower half of my body was saturated to the tip of my ear, briefly at one point I had to dip my entire face into the water to move forward but the grimness was instantly forgotten once I emerged the other side into a massive chamber, bigger than my light could fill. I shouted again then began to sing, the sound seemed to disappear into the enormity of this lonesome aven only to reverberate back as a more eery echo of itself.

Gaelan enthused by my hyperactivity decided he wanted to give the squeeze a go. In an instant my elation was replaced with irrational images of a wedged Gaelan and me shivering, sopping wet on the wrong side of a squeeze no one else even knew existed yet. I being miniature compared to Gaelan had a desperate enough time getting through so I eagerly asked him to let me come through first. With the ethereal cloak of adrenaline now gone, I cautiously inched my way back through – my chest bigger now with uneasy breaths. I emerged looking like a drowned rat and we decided it was time to turn around. After a very sketchy descent, requiring much concentration due to crumbling foot and hand holds, we dust ourselves off in the main streamway or in my case wring out my fleece undersuit. Gaelan the gentleman gave me the dry top off his back to keep me warm. Hours later, we arrived back in camp at 550 metres, tired & elated to hear of the simultaneous finds had by others elsewhere. We called our new discovery Slí na Síofra - the way of the fairy in Irish.

On any given day, a snapshot of the expedition would involve many things.
People furiously packing gear in the searing heat of the ario bowl - drills, batteries, bolts, aid climbing gear etc – all the tools necessary to drop that unexplored shaft or scale an unclimbed aven. Others might be busy ferrying exploration kit and camp supplies through narrow rifts, crawls and up and down countless pitches. One common ferry stop was the top of Flat Iron, a 138m shaft above camp whose loose walls meant that only one person could progress at a time for fear of surprising the person below with a shower of rocks. At camp people would be emerging from their sleeping bags early in the morning to attempt communication with the surface using a Nicola phone – a sophisticated piece of equipment that utilised low frequency radio waves to carry signals through rock and allow contact with those above ground.

Life at camp was a surprisingly good one. How, you might ask, when one arrives soaked to the bone with no change of clothes after a day's exploration. Our underground camp however was this expedition's pride and joy. It was a carefully designed haven that balanced

cost, size and weight with an efficient means to keep warm and most importantly get dry again. To achieve this we erected a living area big enough to sleep several people using a cut up cargo parachute given to us by Wilderness Leisure, so essentially we were living inside a massive storm shelter half a kilometre beneath the mountains. Inside this we had a washing line for our wet clothes, ample place to cook and eat and two tent inners for sleeping in. We dried our clothes by stripping down to our thermals and drying off over a burning stoves.
It was from here that many adventures began.

The purpose of our efforts has many dimensions but if I were to summarise it in one line I'd say - "to unearth and document one of the world's deepest cave systems."
This is not a blind hope but an eventuality 53 years already in the making. The alluring fact that keeps me coming back to the Picos de Europa, year and year again is the knowledge that water sinks high up in limestone peaks and doesn't appear again until the Cares Gorge thousands of metres below. To date the Oxford University Caving Club expeditions have discovered over 1,500 metres of this subterranean world and yet caves higher up the mountain are still wide open, their outward drafts beckoning the eager caver. The thought of this is what motivates us when our backs ache from countless days hiking 30 kilogram packs, when we're delirious from caving all through the day & bolting all through the night, when we're lugging 100's of metres of rope through awkward, arduous cave, or when we're enduring our worst fear having an accident underground.

To many, having an accident deep underground would epitomise their worst fear. Some might even imagine a fracture in such a remote setting a prelude to a multi-day rescue and label such risky activities as reckless. However, expeditioners understand this and prepare and train for such making the prognosis for an otherwise serious incident far less dire. I unfortunately can prove this through experience.

I left for the surface after a multi-day camp in Xitu. Eager to see the sun again Ian and I set off ahead of the rest. Making my way through a boulder choke (best described as a human scale jenga game, but with rocks) a boulder slid from underneath me and sent me tumbling almost to my demise. It all happened so fast that I cannot remember what actually happened save the terrifying feeling of weightlessness as I fell backwards into open space knowing that a large drop, floored with jagged boulders lay beneath. I remember dangling from a large boulder, holding on for dear life but unable to move whilst Ian below was precariously trying to keep me from falling further. "Steph, you need to pull yourself up" but I was speechless, completely immobilised by the intense wave of pain I was in. Eventually I managed to pull myself up out of danger and sprawled myself across a rock to assess the damage I'd done. The downward force of my fall onto an outreached hand caused me to dislocate my thumb. With the pain in my knees I was terrified I wouldn't be able to stand back on my feet again. Moaning and scolding myself I shuffled my way to the bottom of Flat Iron, that spectacular 138m pitch I was telling you about earlier. Well, it was far from wondrous to me now, but one of the many barriers of pain and grit that lay between me and the surface. I was trembling, the adrenaline wearing off now and being replaced with searing pain. I felt an overwhelming urge to exit quickly, before all traces of bravery were worn down by the constant use of battered limbs. I tried not to think what lay ahead but instead take it one small step at a time.

On a normal day it would take someone between 5 – 8 hours to get out from camp depending on what they had to carry. It required over a half a kilometre of vertical ascent and several kilometres of demanding and varied caving including rope climbing over 43 pitches, traversing between the walls of narrow canyon passage and exiting sideways out through a narrow rift affectionately referred to as 'Climax Rift'. How could someone with injuries to their hand and two legs do this?

The funny answer to this question is the avoidance, at any cost, of the embarrassment of having to be rescued. The real answer is a culmination of a few things.
I was faced with two choices: sitting at the bottom of Flat Iron waiting in the cold for someone to do that 5 – 8 hour ascent, make the call for rescue, wait for them to assemble and then come down the cave. Alternatively I could try and exit under my own steam but not without the help of a friend and a small first response kit comprising adequate protection against the cold, plenty of food and most importantly appropriate pain relief – this was the critical tipping point between being able to get myself out and a full scale rescue. I opted for the latter and 10 testing hours later I emerged on the surface exhausted but safe.

The X-rays afterwards showed that I'd broken two bones in my foot, damaged the cartilage in both my knees and chipped bone off the knuckle of my thumb. The doctors in A&E were shocked by my story but it is amazing how the brain works, how its sophisticated hierarchy can prioritise its responses. I should have been so much more debilitated by my injuries but somehow once my pain was reduced I was able to do the necessary to get myself to safety. The ordeal wasn't actually as bad as one might have imagined.

And so it was back to the UK and work for me, but the expedition continued to make a breakthrough that had been sought after for many, many years - a way over the final downstream sump towards the master cave we'd always dreamed to see. And so the story continues, another piece of the puzzle close to being solved and others still to uncover!

Fin

Pythagoras pitch, -800m underground

"I can't do this."

"You don't have much f***ing choice."

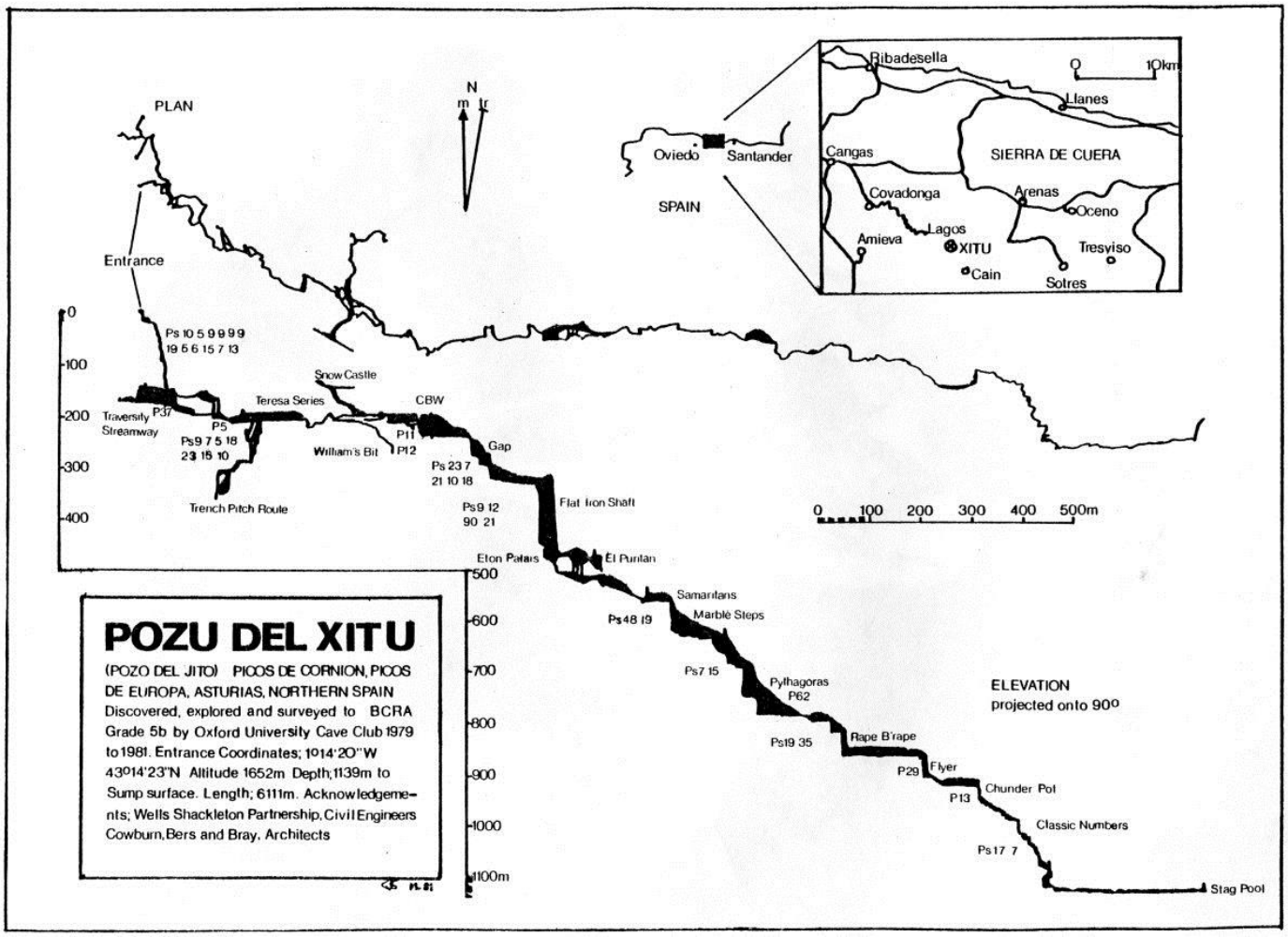
"Maybe someone could carry me out."

"You better be dead or paralysed before that happens."

"Please, I can't do this anymore."

"Man up. You're getting out of here and under your own steam so get a move on."

I was 800m underground, in Pozu del Xitu, one of the deepest caves in the world, hours from the surface, hours even from our underground camp, and I was having the worst sugar crash of my life. Dangling on a rope with an endless sloping boulder pile below me and a ceiling less pitch above, I finished arguing with myself and started to cry.



Survey of Pozu Del Xitu, the cave OUCC has been re-exploring for the last three years.

The day before – on the surface

"Let's get going! If we can get down to camp in three or four hours, we'll be there before the others get back from pushing and can steal the inside sleeping spaces."

Thus motivated, Jeff, Jack and I headed across the Ario bowl, caving gear slung over our shoulders, towards the entrance to Xitu. We were going underground for the next three days, the first day to descend to camp and spend the night, the second day to do a pushing trip down the lower reaches of the cave, the third to haul our asses back out.

Jack and I had only been on the mountain about a week, after a group of us flew into Asturias airport then made the cross country trek on four buses to Los Lagos, where roads end and torturous track began. After carrying our caving gear, clothes, and anything else we'd brought to survive the next few weeks, up this three hour rocky hike to the Refugio, we'd done the same trek again for the next two days, bringing up food supplies and extra caving gear that was needed at camp as the expedition kicked off.

Above: Me leading the way up a steep bit of track. (JH)
Right: Jack enjoying the rare luxury of an ice lolly, or two, before heading up the mountain. (VL)

I'd been to the Picos in 2011, also to explore Xitu, and so with some minor diversions, managed to lead the group I was with, a mixture of Oxford cavers and Irish students recruited by Steph the expedition leader, up the trail.

Settling into expedition life had been a fun readjustment. No phones, no internet, no showers or bathrooms. Everything that you ate, used or wanted was painstakingly lugged up, and all rubbish, gear and waste had to be carried back down too. Cleanliness was a distant dream, as was any meal that didn't involve beans, rice, pasta, and tomato. We were lucky enough to stay in the Refugio each night, although we mostly stayed outside to cook, sort gear, and plan trips. Cows, chickens, donkeys and even a cheese-stealing dog (it's a long story), all ran amok and the too frequent sight of a filthy caver stripping off behind a rock became sadly normal.

My first trip had been an acclimatisation one, taking me and Jack, who was on his first expedition, down to Flat Iron and back out to leave some gear for underground camp. We'd scrambled around happily, getting inevitably lost as I was the one leading, but managing the challenging entrance rift, fiddly entrance pitch series, and long, complicated, horizontal sections without too much trouble. On the way out we amused ourselves (and I use the term loosely) by guessing what the blobs of carbide on the walls, left by cavers in the 80s to show the way, could be. One racoon eating a strawberry, constipated squirrel, and dinosaur sitting on a pi (the mathematical shape, not the food) later, we regained the surface, eager for the chance to get back down and do some real exploration.

Getting underground is no small undertaking. It takes a long time to sit around, planning, then procrastinating in the sun. Further time is then required for "faff" that all-encompassing activity which may involve but which is not limited to: finding your gear, putting it down, wandering around a bit, wondering where you left you gear, stopping for some lunch, rediscovering your gear, getting half changed into caving kit, dropping one sock, looking at the survey, packing your bag, writing in the log book, leaving, returning, searching for lost sock, leaving again, returning for other miscellaneous gear.

Left: Me faffing before a trip. (RH)

Below: Cavers faffing at the entrance to Xitu. (JW)

By the time we had completed this ritual, Jeff, Jack and I were eager to be off and, after a condensed version of faff at the entrance, finally got into Xitu. We wrangled our way through the entrance series which, with some imaginative rigging, required nothing short of gymnastics to traverse. We stomped through the narrow streamway, rubbing up against the walls with shoulders and bags as we passed the racoon, squirrel and dinosaur. We clambered along the Teresa Series, stopping to crawl, bridge, and climb, following the luminous strings tied at each junction to show the way. But just as we were nearing camp, having slid down five or six larger pitches before the main shaft of Flat Iron, we hit a small

snag. Jeff and I, at the bottom of the 120m pitch, began to wonder what Jack was getting up to high above us.

I peered up, “Do you reckon he’s OK? He’s taking a while up there.”

“It’s the first time he’s done Flat Iron and there’s a lot of rebelays, he’ll be down in a bit.”

clunk

Jeff cocked his head, “That sounded metallic...”

“Oh dear.”

“JAAACK...AAAARE...YOOOU...OOOO...KA AAAY..?” (Flat Iron is an absolutely massive avon so communicating over long distances requires a lot of patience, decent lungs, and the ability to interpret garbled echoes. Even more so when the person you’re with has a strong Irish accent that you only just learnt to decipher yesterday.)

From high above, “IIIDRRPPEDMMJMMMRR”

“He what?” I asked, confusedly.

Jeff considered. “Well that wasn’t a scream or panicky shouts for help so he’s probably fine.”

I decided to give it a go, “JAAAAACK... WHAAAAT’S...GOOOOING...OOOOON?”

“III...DRRRPPED...MMMM...JMMMRRR”

Looking up at Flat Iron as cavers progress down. (JW)

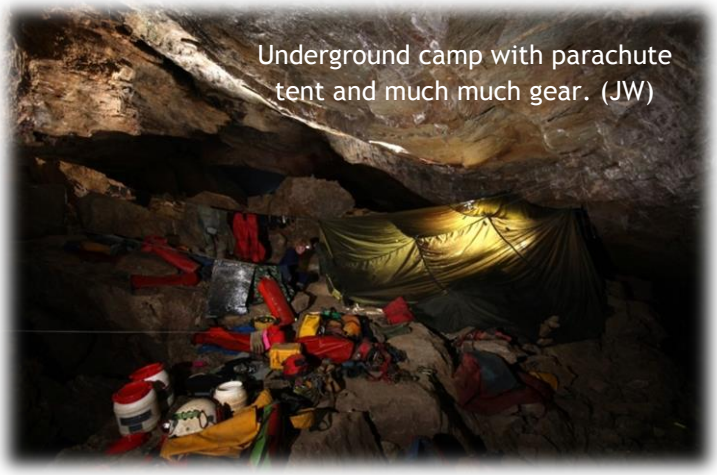
Comprehension dawned, for Jeff at least. “I think he’s lost his ascender on the ledge above Pregnancy Pitch, I’ll shimmy up to see if I can find it.”

So Jeff bounced off up the 40m bottom hang, his light bounding up the darkness as Jack’s made its way down in erratic bursts. I sat at the bottom and made a cairn with three spikes because I figured the single spike ones must get lonely. I watched Jeff’s light pass the rebelay at the top of the pitch, then detach from the wall to wander across the ledge, flashing in and out of view as it swung back and forth. After a while, the light paused, focussed on the floor of the ledge, then turned back the way it came, picking its way over the bouldery mass and sliding down the long pitch. It came towards me and materialised into a grinning Jeff, triumphantly holding up a handled ascender. Jack followed soon after only to have no explanation as to how his ascender detached from his SRT kit and fell 40m down a pitch. It also, miraculously, managed to survive the fall, only bending slightly in the handle, which makes it both the luckiest and unluckiest hand jammer alive.

Small dramas aside, we reached camp to find it deserted but for a mound of washing up, which we (by which I mean Jeff) dutifully did before we settled in for some food.

A caver's concoction at underground camp. (JW)

Eating down at underground camp is a dangerous and creative experience. The first major hurdle is lighting the stove, which can be both perilous and frustrating, particularly when said stove is balanced on an uneven rock inside a tent made of a parachute, and surrounded by spilt petrol from previous stove lighting attempts. After some impressive pyrotechnics however, we had fire, and a pan of water perched precariously atop it. The creativity of the affair then came with trying to mix and match as many instant meals/instant soups/beanfeasts/instant packets of anything, as possible into a single pan, in such a way as to be edible, filling, nutritious and tasty. Bear in mind many of the packets required milk and butter (for which we substituted a random amount of squirty condensed milk), precise quantities of water (for which we substituted as much water as would fit in the pan with the ingredients), and constant stirring (for which we substituted the occasional poke with a mangled spork). Needless to say, our meal tended more towards the edible and less towards the tasty.



Underground camp with parachute tent and much much gear. (JW)

As we finished up our seafood pasta/chicken soup/instant mash amalgamation we heard the unmistakable thuds and giggles of a returning party. A sopping wet Steph flopped into the tent (it's underground so the shelter is for warmth rather than protection from the elements), and announced she and Gaelan had found a lead. After following an inlet of water around the Flyer, they found an ongoing route that just went up and up and up into the rift for about half an hour's hard climbing, culminating in a very small wet squeeze that popped into a large undiscovered avon. There's no way to describe the buzz you can get from finding something new. Especially something new that looks likely to continue. On Steph, the buzz looked something like euphoria, hysteria, and a touch of madness (though that may have been an existing condition). Whatever it was, it had kept her perky through a serious dousing in the wet squeeze, up the long pitches from the Flyer to camp, and through yet more wetness at the Marble Steps, so it must have felt pretty good.

In short order, our minds were made up that the next day, Jeff, Jack and I would head down there ourselves to assess the lead, rig a handline for the climb if necessary, and push the squeeze to see if the avon above was scalable or if it required bolt climbing.

Shenanigans ensued at underground camp as more and more cavers returned from trips deep in the cave, attempted to light the stove and mix dinner, and get dry and warm in the somewhat inhospitable conditions. Lacking the usual avenues of entertainment, we amused ourselves by singing Disney songs and Irish folk tunes(badly), piling ourselves into one large mound of bodies in an effort to conserve heat, and searching at various points for lost socks, sporks, batteries, wellies, headtorches, etc.

The next day, feeling more squashed than really rested, the three of us left camp for the new lead, named by Steph in Irish as, “The Way of the Fairies” because of its flighty upward nature. I hadn’t eaten much for breakfast, partly because I don’t have a huge appetite normally, and partly because what appetite I did have was discouraged by the food on offer. After over a week on the mountain, my cravings for more solid food were starting to emerge. We also had caving snack foods packed, chocolate bars, raw jelly, trail mix, a can of tuna, but again, on the trip I didn’t have much to eat because I tend not to get too hungry in caves. I’ve done eight or nine hour trips without needing more than a chocolate bar or two and never felt short on energy, so I didn’t really worry about eating little. With hindsight, that was a big mistake.

The way down from camp was fun but passed quickly as we zoomed down pitch after pitch, some of them pretty long, but none of them any trouble when all you were doing was getting on a rope and abseiling away. I’d only been below camp once before, in 2011, and at the time had been more concerned about flood risks on the way up, so had probably forgotten just how far and tiring the reverse journey could be.

A caver descending Choss Chock pitch below camp. (JW)

By the time we got to the area above the Flyer we were all eager to get exploring. Walking along the bottom of a tall rift before the pitch head, we picked our way over the damp floor, keeping an eye on the occasional drips or trickles of water coming in from high above or slithering down the walls. On the left, just before the Flyer itself, there came in a significant stream, with a steady flow of water coming down the wall from behind a protruding boulder. A tacklebag and a note left by Steph and Gaelan the previous day confirmed this was the mysterious climb they’d done, although from the main route, it didn’t look like much, disappearing out of sight not three metres up.

Still, with mounting excitement, we dropped our bags of excess rigging and bolting gear at the bottom of the rift and started to climb.

By following the path of the icy water and clambering underneath and behind a large boulder, we found a slippery scramble up that gave access to the higher, and much taller, part of the hading rift. The darkness overhead beckoned and the route up was traversable, unlike the other steep walls that were all that could be seen from below.

Seeing the way on, Jeff began rigging a handline for the more treacherous parts of the ascent as I followed behind bringing the required gear. Richard (who had decided to come after us and caught us up as we neared the lead) and Jack took a closer look at the surrounding rift, seeing if there were other routes up or crossrifts that intersected the main route. The higher we climbed, the steeper it got, and while, on the early parts of the route, there was a gully slanting up next to the path of the water, we found that after a slight constriction, the best path was directly in the water.

The holds were slippery and freezing water ran over my hands as I tried to pull myself up. We'd already divested ourselves of our harnesses and SRT kits to lighten our load as we climbed but in my increasingly waterlogged fleece undersuit, tough but heavy and stiff oversuit, and flooded wellies, each pull up was an effort. Using knees, elbows, and at times even the ceiling behind me where the rift closed down, I eventually reached a portion steeper still than the rest which ended in what looked like a small window. Beyond that lay darkness.

"Do you want to lead this section and rig the handline for it?" Jeff asked me.

I looked at the almost smooth rock face in front of me, covered in a sheet of falling water.

"Umm sure. Sounds fun."

I took the end of the rope with me as I began to climb, searching out any small protrusion for my washing up glove clad hands and tiny ledges for my clumpy wellies.

You don't climb in caves unless it's nice and knobbly and easy like this section above the Samaritan's pitches. (JW)

It's worth mentioning here that fiddly is not something cavers do all that well. Our equipment is not fast and light like that of a climber, and we are, in general, more inclined to use fixed aides or just prusik where the going gets tough. A fall in a cave is not worth the risk. Not when typical rescues take a matter of days and hundreds of volunteers to get an immobilised person back out. So I'd never really free climbed anything underground that would give me more than a moment's concern until it came to a point where I myself was doing the pushing and being the one to secure the climb. I looked down. It was a long way. Sloping rather than sheer of course,

but sheer enough to slide down and far enough that it would hurt. Jeff moved in behind me to spot me as much as possible when balanced himself on a narrow ledge high above stable ground. At least he was clipped in.

Taking a deep breath I concentrated on the climb. Above me the way was easier, merging back into the main path of the water where the rock was more pitted and knobbly, it was just the stretch I was on, relatively smooth and very steep, that was the issue. I sought out a small sloping ledge with one hand, and jammed the other to my right in a bit of a crack. Scrambling and thrutching got a knee up to about waist level on the smallest nub imaginable, and pushing up off that I managed to grab a better hold with my right hand.

Breathe. My left foot scraped the rock, seeking purchase but finding none. Pulling hard on the good hold, I substituted knee for foot and from there fairly threw myself up towards the water and what I hoped and prayed were decent holds. Splashing stream in my face, my flailing hands found purchase and I scrambled up the rest of the climb without too much trouble.

At the top the window beckoned, bottomed with, as Steph had promised, a muddy puddle of water. Jeff, on my newly rigged handline, came up and joined me at the top, peering through but not seeing much with the beam on his lamp.

“You can go first. I’m already soaked so I reckon it’s your turn.” I offered, generously.

“I think you could get through without coming out as wet as Steph, just sacrifice one arm to keep yourself out the puddle and you’ll be fine,” he mused.

“Off you go then, I’ll believe it when I see it.”

With some splashing, a few grunts, and a fair bit of hammering to widen out the squeeze, Jeff wriggled through.

“What’ve you got?” I called.

“Come and see.”

I squirmed through, Jeff’s camera flashing in my face as he took advantage of what was clearly a good moment for me. Clearing the puddle, I scrambled to my knees and looked around me.

Me getting through the squeeze or, as Jeff saw it, a good time for a picture. (JW)

“Oh wow. This is big.”

The chamber stretched above us, going up far enough that my weaker lamp couldn’t quite find the ceiling. From the right, the water that was entering the cave poured over some sheer flowstone, some twenty metres high. Dark space above and no clear view of where the water was from was dizzyingly promising.

I started to climb again, to the left of the flowstone, hoping to find a way around the vertical face. About ten metres up the holds I was using flattened out to a shallow ledge with no clear way on.

“It’s going to need bolt climbing. With dynamic rope and a drill.” I called down.

“Ok, well we rigged the handline and I’ll take some pictures to catalog the find, then we should start heading back.” Jeff replied.

Jack, who had by now joined us up the climb, held flashguns while I posed on the ledge and Jeff clicked away, then down we climbed, squeezed back through the wet window (which required a backwards three point turn with face in one puddle and feet in another), and shimmied back down the long rift with the aid of our new fixed ropes. Richard, who had declined the wet squeeze had preceded us back and was leaving ahead of us so as to avoid traffic jams on the long pitches.

Jeff, Jack and I, upon reaching the bottom, paused for snacks, canned spam and chocolate bars (is it surprising I didn’t have much?), then prepared to head out with the plan being that Jeff would stay with us for the more complicated lower sections, then as the pitches started to come closer together and the route finding was simpler, bomb on ahead and leave us to our own slower pace.

By now however, we’d been going for five or six hours, and a couple of pitches up, I was beginning to slow down. There’s a point where you body feels much heavier and the little things that used to expedite your technique, like being able to pull yourself upright with one arm while on the rope, or hold your weight off a cowstail for a moment as you unclip it, start to become mammoth tasks. Prusiking on the shorter pitches had me tired, and the inevitable contortions at the top started to end with me flopping against a nearby wall as soon as I was untangled. Wet, cold and heavy, the vertical sections were wearing me out and my energy levels were running low.

We were on Pythagoras, the second longest pitch in the cave, so named for the interminably long boulder pile at its base which formed the hypotenuse of a massive triangular chamber, when I started to really worry. Clambering up the boulders with a jammer on the handline, I could see Jeff’s light far above me and Jack’s down below. Like scaling the side of a massive scree slope, the rocks were unstable, the path was steep, and

the route was slippery. Hauling myself over boulders that I'd simply slid down on the way past, and having to clip in and prusik in places where I just did not have the energy to climb, I began to feel like I didn't want to go on. By the time I reached the top of the slope, my legs ached, my body wanted to lie down and sleep, and my head was in a dark place (no pun intended).

"Rope free!" I hollered back to Jack. The dangling line in front of me had been vacated by Jeff long ago and his light seemed miles above me, faintly illuminating patches of wall as he ascended. After Pythagoras he was meant to leave us behind and I had a sinking feeling that if he did, and I struggled on all the pitches as I did now, poor Jack may be stuck with me for a long long time.

Beginning to prusik, I managed to muster enough energy to pass the first couple of rebelays but as I continued the repetitive sit, stand, sit, stand motions that propelled me up the rope, I knew I was slowing down, taking smaller steps, dying for a break.

"You have to keep going. It's the only way out and you're the only one who can get you there." I chided myself.

Trying my usual motivation methods, I negotiated,

"Just up to that white streak on the wall, when you're level with that you can stop a while."

It wasn't happening.

"Ok, the streak was quite far, how about ten steps up, ten seconds rest?"

I just couldn't keep going. My arms felt like lead stuffed with marshmallow, simultaneously heavy and weak and my legs were just about ready to disown the rest of my body for abuse. I'd never felt so low, so tired, or so helpless in a cave.

"I can't do this."

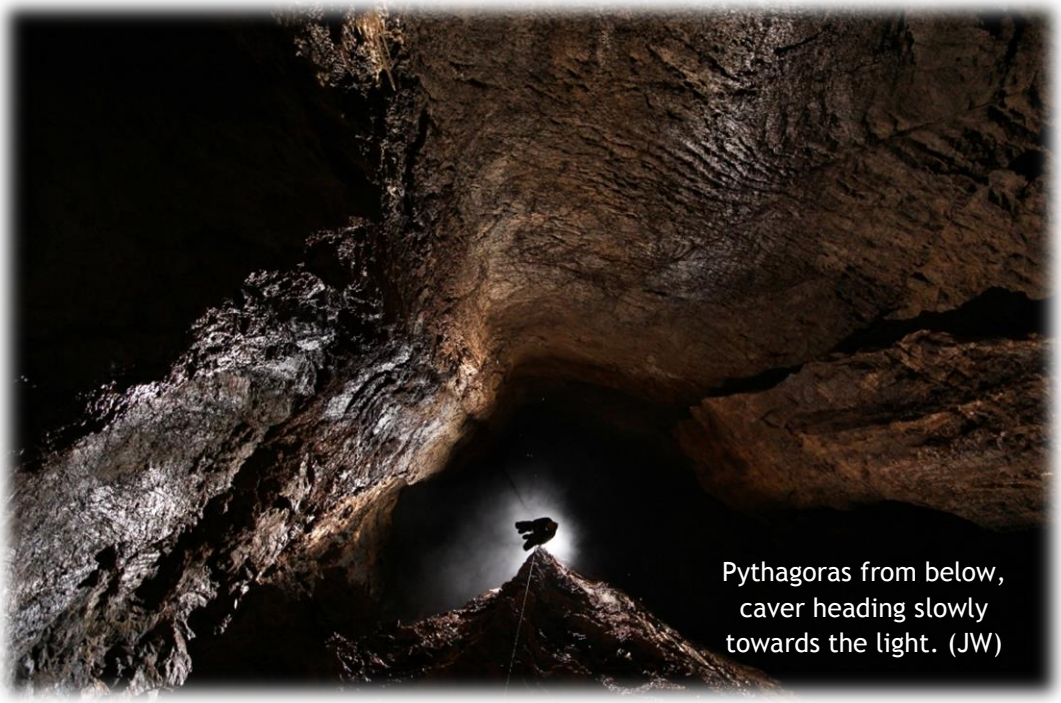
"You don't have much f***ing choice."

"Maybe someone could carry me out."

"You better be dead or paralysed before that happens."

"Please, I can't do this anymore."

“Man up. You’re getting out of here and under your own steam so get a move on.”



Pythagoras from below, caver heading slowly towards the light. (JW)

I started to cry. Jeff’s light above me seemed to have reached the top, or at least I hoped to God that was the top, and was hovering tantalising far over my head, giving me a beacon to aim for, while torturously reminding me just how far I had to go. Below me, Jack had caught up and was hanging idly at a rebelay waiting for the long hang rope I was on to become free.

Ashamed to be the weakest, miserable to have no alternative, and angry at myself for slowing the team down, I pushed deep and tried to force myself on. I watched my light inch over the rock face as I crawled upwards, pausing as often as I would let myself to hang limply in my harness until I could motivate myself to go on. Desperate alternative ways to get out of the cave ran through my head. Maybe someone could haul me up a pitch? Clip me to their harness and prussic me up like a tacklebag? Carry me in their arms?

But the thing about caving, the thing you accept when you go underground, is that it is committing. No one, unless you are seriously injured, is going to get you out of any cave but yourself. You work in a team, you support each other, but at the end of the day, if there’s a pitch, you need to get up it, however tired you are or however long it takes, because that is the only way out, and a helping hand just isn’t possible.

I knew that. And I knew that whatever happened I was going to get back to camp eventually, even if it took another ten hours. And then, the next day, I knew I’d go the last 600m out to the surface too. But hanging there, on a rope dangling in space, with a seemingly impossible stretch above me and more to come, I truly started to doubt I could do it.

It took maybe forty minutes for me to get up Pythagoras. It was the longest forty minutes of my life. I alternately wept, felt numb, and despaired. The light at the top edged ever closer and I realised Jeff had never gone on. Jack waited patiently below me, not complaining at the time it was taking. As I hauled myself over the pitch head, completely drained, and set about untangling myself from the lines, I was terrified I might fall back down, not so much because I could die, but because if I didn't I'd have to get back up.


Me navigating one of the last pitches before camp as Jack waits below. (JW)

Jeff sat at the top and I started to apologise. I'd never been so slow and weak before. Not eating enough since going underground a day and a half ago, combined with a fading adrenaline rush from exploration, had utterly tapped my reserves and left me a quivering wreck. Not knowing what I was doing, I even automatically clipped into the end of a handline that was just a hanging end of rope (luckily I was in a safe place otherwise the handline would have continued, I just didn't notice).

Jeff fed me trail mix (he called it squirrel mix which was ironic because I was feeling none too squirrelly) and Kendal mint cake, coaxed me to drink water and swallow down more food, and talked to me until I started to become more responsive and aware. Jack, when he joined us, helped me up and didn't moan about the lengthy delays or the zombie-like trance the sugar low had reduced me to (hey, maybe he was just glad I'd shut up).

Between us, we got back to camp, two hours or so behind Richard and far more cold and weary than he had been. Jeff had used our slow pace to set up more photos which I suppose was some consolation, but mostly he stayed with us to check I was ok despite the fact that he ended up freezing at the top of every pitch as he waited for our ascent. Jack had carried the second tacklesack and stuck behind me the whole way, even though it meant stopping at most rebelays if I was still on the rope above.


Me and Jack staring at formations just below camp. I'm trying really hard to look interested but that gormless look is pretty much how I felt. (JW)

We got warm and dry at camp, had some dinner, and caught up with the other underground teams some of whom had just arrived and were planning trips for the next day. Gradually I cheered up, though I was still embarrassed by my performance and concerned about the trip out the next day.

After a deep night's sleep and having force fed myself as much as I possibly could, I managed to fly out the cave in just a couple of hours the next afternoon, doing double the distance of the day before in about half the time.

Sunlight was a blessed relief and as I came out the entrance, I found myself laughing and spinning around on the karst. Although I'd been at my lowest, although I'd felt like giving up (and probably would have if there had been an alternative), and although I was still pretty knackered, I'd made it. With the help of an amazing team, some squirrel mix, and sheer goddamn determination I'd got out.

And that's why caving is so addictive. The discovery can be dangerous, the commitment is definitely scary, and the physical trails are not to be underestimated, but that challenge, that adventure, is what drives you onwards. It's the fact that you have to see it through, you have to push yourself to your limits and beyond, and you have to conquer your despair and exhaustion and fears until you crawl out the other end a muddy mess, that makes me proud to do it, and a better person because of it.

The next trip I did, Richard and I went down past camp and below the Flyer to Chunder Pot, looking for a 30 year old lead originally discovered by one of the 80s OUCC explorers. We did a fifteen hour straight trip down to -900m, scrambled around in yet another hading rift for hours successfully rediscovering a passage that could well take us on, and got back up to camp for a nap before heading out the next day. I learnt my lesson and ate excessively and came out far happier in the knowledge that I could still cave hard.

But I don't regret that trip, other than for the trouble it caused my teammates, because it showed me I can be tougher than I thought, as strong as I need, and can consume enough Kendal mint cake to get me through pretty much anything.

Me at the entrance to Xitu before my final trip. (OH)

With thanks to photographers, Jeff Wade (JW), Ross Hemsley (RH), Jack Healy (JH), and Orla Hennebry (OH).

Further information

www.ariocavesproject.com
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https://www.facebook.com/ArioCavesProject
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