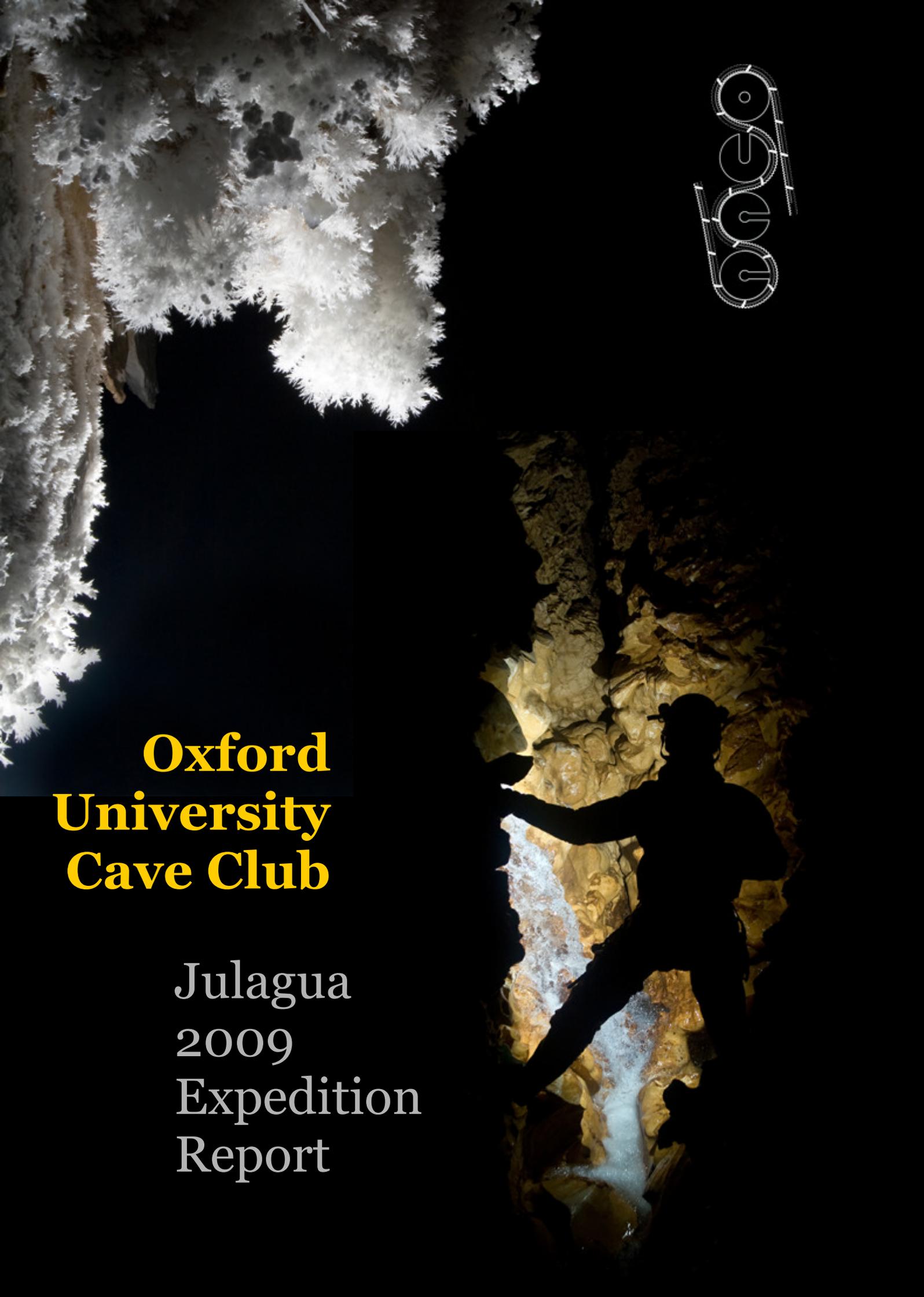




Oxford University Cave Club

Julagua
2009
Expedition
Report





Report prepared by members of the Julagua 2009 expedition and edited by Nick Edwards
Further copies available via <<http://www.oucc.org.uk>>

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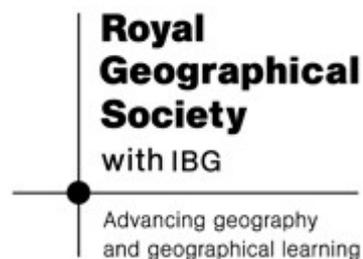
Cover photographs: Formations (Photo: Ben Lovett)
and *Cheesecake Streamway* (Photo: Hilary Greaves)

Abstract

In the summer of 2009 Oxford University Caving Club once again returned to the high karst of the Picos de Europa mountain range in the north of Spain to continue exploration of caves in the area. The expedition lasted 6 weeks, during which the 20 expedition members furthered exploration of the 1,050m deep “Sistema Julagua”.

Exploration continued in the phreatic passages above the “Who needs divers anyway” aven, approximately 800m below the “Asopladeru La Texa” entrance to the system. A 10m bolt climb led to approximately 75m of new passage and 3 pitches, the last of which landed in an inactive sump pool, plumbed to a depth of 20m. All known dry leads in the cave have been exhausted.

The downstream sump was dived to a water depth of 48m, and is estimated to be at least 60m deep. Exploration continued in the streamway past the upstream sump; a waterfall was bolt-climbed up, and the streamway continues at another waterfall.



Approved by University of Oxford Expeditions Council
and the Royal Geographical Society

Thanks and Sponsors

Oxford University

David Pierce Jones and the A. C. Irvine Travel Fund

Ghar Parau Foundation

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Humdinger Foods

Mornflake Oats

The Mail on Sunday

Thanks to everyone that provided advice and support from the UK, especially: Phil Leichauer for helping with equipment, drill batteries and recovering the vehicle, John Pybus for help with 'technocrap', Steve Roberts for acting as Home Agent and help with the vehicle, Gavin Lowe for help with the survey, Tom Evans for help recovering the vehicle, Simon Goddard for advice and general help and anyone else that I've forgotten!

Juan Jose Gonzalez of the "Federacion Asturiana de Espelologia"

..and of course all of the expedition members!

A special thanks to the Cangas de Onis Guardia Civil de Montaña

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Expedition members

In the Field

Nick Edwards (Leader)
Paul “A bit silly” Savage (Treasurer & Sponsorship)
Mike “Strap-ons are more versatile” Hopley (Medical)
Rosa Clements (T-Shirts)
Dickon “Bag in Hand” Morris
Hilary Greaves
Fleur “Four bags at last” Loveridge
Ben Lovett
Kayleigh “None of this vertical shite” Gilkes
Andy “Gibberbabble” Wright
Avelina “Armpits to meet you” Kunzel
Max Minckler
Toby Fox
Tom “Kitchen Sink” Langan
Chris “NO FRIGO” Sinadinos
Simon Welch
David “old fart” Rose
Robbie Shone

Cave Divers

“Uncle” Phil “Madphil” Rowsell
Tony Seddon

Support from home

Phil Leichauer (Gear)
Steve Roberts (Home agent)
Gavin Lowe (Reserve home agent)
John Pybus (Technology)

Field Agent

Juan Jose Gonzalez

Introduction & Background

For the past 48 years expeditions organised by the Oxford University Cave Club have been discovering and exploring deep underground cave systems high in the Picos de Europa Mountains of northern Spain. During this period the club has discovered a number of significant cave systems located on the slopes of the Western Massif (the *Picos de Cornion*), arranged around the Ario plateau. The deepest of these, Pozu Del Xitu (-1139m), was discovered in the early eighties and at that time was the deepest cave explored by a British team, and the tenth deepest known cave in the world. Since then the club has continued to discover major cave systems in the area, including a number of caves deeper than 1,000m.

Through this exploration the club has gradually been unravelling the mysteries of the hydrology of the area. It is thought that most of the water from the Ario caves emerges at the Cueva Culiembro resurgence, over a thousand metres below in the Cares gorge. Dye traces have proved the existence of a hydrological connection between the Ario caves and Cueva Culiembro and so a long sought after goal has been a direct connection between the two. Such a connection would represent a major breakthrough, and would create a spectacular through-trip, with cavers able to re-emerge into daylight in the Cares gorge some 1200m below.

The Julagua 2009 expedition returned to the Picos to continue this long history of exploration. The expedition's primary aim was to continue exploration of Sistema Julagua, a cave system located on the flanks of Cabeza Julagua, a mountain in the western Massif of the Picos de Europa.



Asopladeru La Texa entrance; Rosa Clements prepares to descend. Photo: Robbie Shone

The Asopladeru La Texa cave entrance is a large hole in a steep hillside overlooking the Cares gorge. It was first descended in 1980 by the Barcelona SIE club, but exploration stopped at a tight meander, *El Meandro del Guaje*, only 100m down. In 1995 the SIE returned and enlarged the meander with the aid of explosives. Over the next three years they explored the cave to a depth of 790m before exploration terminated at what was believed to be a sump. In 2001 OUCJ discovered a cave on the same hillside, Pozo la Tormenta. This was explored over the following two years and connected to Asopladeru La Texa in 2003 to form what is now known as Sistema Julagua.

the point at which the two caves meet, but sumped in both directions. The "Lower Streamway" was reached at the limit of 2005 exploration. A sump in the downstream direction and a huge waterfall in the upstream direction blocked further exploration. Dye trace evidence and a large difference in the volume of water in the two streamways suggested that they were not linked.

In 2005, OUCJ returned to the lower limit of the system. The lake that had been thought to be a terminal sump was passed and the system explored to a total depth to 1,061m.

By this stage in exploration two stream-ways were known of in the cave. The so-called "Upper streamway" was found 40m below

An expedition in 2008 set out with the aim of diving past the cave's three sumps. The downstream sump in the Upper Streamway was dived past, and then bypassed. The so-called Upper and Lower stream-ways were connected. The downstream-most sump, *Blue Again*, was dived to a depth of

roughly 40m, at which point no deeper progress could be made with the available equipment. The upstream sump, *Jam Sump*, was passed, and more streamway passage found beyond it. Exploration of this was halted by a waterfall insufficient time to attempt a bolt climb. The expedition also discovered a high level phreatic passage leading off from the top of an aven at the base of “Knife Pitch”, 830m below the Asopladeru La Texa entrance. A chamber containing spectacular crystal formations was discovered and beyond this the phreatic passage continued. Exploration stopped at the base of a climb, estimated to be 15m high.

This left a number of good leads, so the Julagua 2009 expedition returned to Sistema Julagua with the aim of continuing exploration in the phreatic passage, continuing exploration beyond the upstream “Jam” sump and continuing diving in the deep downstream *Blue Again* sump.



Cavers relaxing on a rare sunny day at the surface camp at *Vega de Ario*. Photo: Robbie Shone

Location

The Picos de Europa mountain range is located in the north of Spain, roughly 20km south of the coast. The expedition was based at Vega de Ario, in the western *Cornion* massif of the range. From the nearest town, Cangas de Onis it is a 22km drive to the end of the road at Lago Ercina, the higher of two lakes (Los Lagos). The road ends at the *Maria Rosa* bar and restaurant, the last place to fuel up before the 2 – 3 hour walk up to Vega de Ario (alt 1,600m). From Vega to Ario it is a further hour-long walk over rough terrain to the Asopladeru La Texa entrance to Sistema Julagua (alt 1,371m)



Figure 1: Location of the Picos de Europa National Park and Vega de Ario, Spain

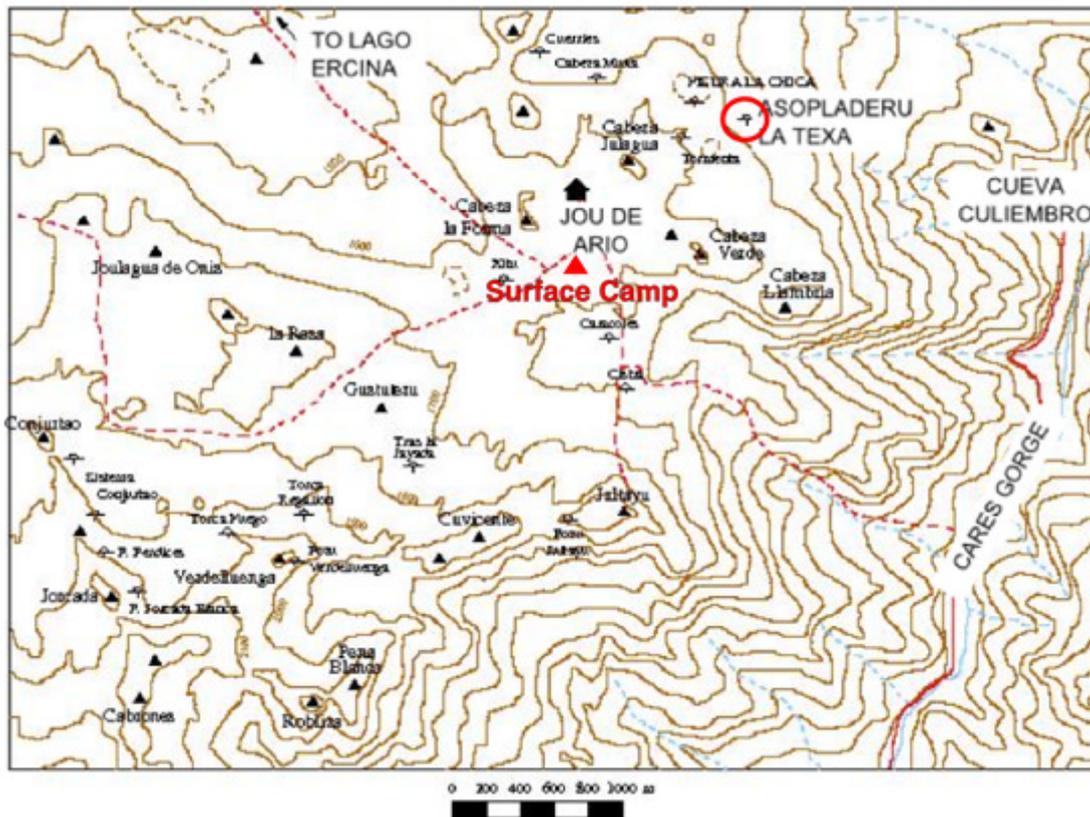


Figure 2: Map of the area surrounding Vega de Ario, showing the location of the surface camp and the Asopladeru La Texa cave entrance

Expedition Diary

Dark shade denotes trips originating from underground camp

4/7/09	HG, NE, MH	Expedition vehicle leaves Oxford
5/7/09	HG, NE, MH	Expedition vehicle arrives Los Lagos
7/7/09	RC, MM	Rigging to <i>Meandro del Guaje</i>
8/7/09	PS, SW	Rigging to bottom of <i>No Hay Cristal</i>
9/7/09	MH, DM	Abortive rigging trip – group forced to turn back at bottom of <i>No Hay Cristal</i> due to “irregular bowel movements”
10/7/09	PS, NE	Rigging to <i>Camp Rosa</i>
11/7/09	HG, FL	Rigging to Tormenta junction
12/7/09	DM, MH	Portering gear to bottom of <i>Siniestro Parcial</i>
13/7/09	TS, MH, RC, DM	Portering gear to <i>Camp Rosa</i>
13/7/09	NE, FL, PS	To Underground Camp
14/7/09	NE, FL, PS	Rigging to <i>Knife Pitch</i>
14/7/09	TF, MM	Portering to <i>Camp Rosa</i>
15/7/09	PS	Collect bags from <i>Camp Rosa</i> and return to Underground camp
15/7/09	NE, FL	Rig to <i>Jack Frost and the Tundra</i>
15/7/09	DR, RS, TS, RC	To underground camp
16/7/09	NE	Underground camp to surface
16/7/09	DR, RS, TS, FL, PS, RC	Re-rigging on <i>Who Needs Divers Anyway</i> pitches. Portering gear to <i>Blue Again</i> sump, photography and conservation taping in pretties
16/7/09	HG, MM	To underground camp
16/7/09	SW	Trip to underground camp; aborted at <i>No Hay Cristal</i> due to arm strain
17/7/09	PS	Underground camp to surface
17/7/09	FL, HG	Bolting climb: <i>Bad Day at the Office</i> beyond <i>Jack Frost and the Tundra</i>
17/7/09	DR, RS, RC, MM, TS	Photography
17/7/09	PR, DM	To underground camp
18/7/09	RS, DR, DM, TS	Diving in <i>Blue Again</i> sump (TS), photography and dive support (RS, DR, DM)
18/7/09	HG	Rigging to upstream <i>Jam Sump</i>
18/7/09	PR, MM	Pushing beyond <i>Bad Day in the Office</i>
18/7/09	FL, RC	Underground camp to surface
18/7/09	MH, TF	To underground camp
19/7/09	PR, TF	Portering gear to <i>Jam Sump</i>
19/7/09	TS, HG, DM, MH	Portering gear from <i>Blue Again</i> sump to underground camp
19/7/09	DR, RS, MM	Underground Camp to surface
19/7/09	BL, NE	To camp
20/7/09	NE, BL	Photography in <i>Jack Frost and the Tundra</i>
20/7/09	PR, DM, TF, MH	Pushing in <i>What am I gonna tell the boys?</i>
20/7/09	HG, TS	Pushing beyond <i>Jam Sump</i>
21/7/09	TS, DM, TF, MH	Underground camp to surface
21/7/09	PR, HG	Pushing beyond <i>Jam Sump</i>

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21/7/09	NE, BL	Pushing dry lead
21/7/09	KG	Portering gear to <i>Camp Rosa</i>
21/7/09	PS	To underground camp
22/7/09	NE, BL, PS	Pushing – bolt climb above <i>Jack Frost and the Tundra</i>
22/7/09	HG, PR	Photography in <i>Cheesecake streamway</i>
23/7/09	HG, PR, BL, PS	Underground camp to surface
23/7/09	NE	Collecting bags (and RC) from <i>Camp Rosa</i> and returned to Underground camp
23/7/09	RC	To underground camp
23/7/09	KG, AW, AK	Portering gear to/from <i>Camp Rosa</i>
24/7/09	RC, NE	Pushing – bolt climb above <i>Jack Frost and the Tundra</i>
25/7/09	RC, NE	Underground camp to surface
27/7/09	AW, AK, DM	To underground camp
28/7/09	AW, AK, DM	Derigging to <i>Camp Rosa</i>
28/7/09	NE	To underground camp
29/7/09	AW, AK	Underground Camp to surface
29/7/09	NE, DM	Portering bags to <i>Camp Rosa</i> and return to underground camp
30/7/09	NE, DM	Underground camp to surface
30/7/09	CS, TL	Acclimatisation trip to top of <i>No Hay Cristal!</i>
1/8/09	AW, AK, TL	Portering from <i>Camp Rosa</i>
1/8/09	NE, DM, CS	Trip to underground camp aborted due to high water levels
4/8/09	KG, TL, Justo*, Anthony*	Portering from <i>Camp Rosa</i>
4/8/09	NE, CS	To underground camp
5/8/09	NE, CS	Camp derigged, derigging to <i>El Balcon Fenris</i>
7/8/09	KG, CS	Collecting bags from bottom of <i>No Hay Cristal</i>
8/8/09	NE	Cave derigged to <i>Camp Rosa</i>
9/8/09	AW, TL	Portering gear from <i>Camp Rosa</i>
11/8/09	NE	Portering gear from <i>Camp Rosa</i>
12/8/09	KG, TL, AW, NE	Surface camp packed
13/8/09	KG, TL, AW, NE	Descend hill for last time; expedition vehicle breaks down in Cangas
18/8/09	NE	Fly home; expedition vehicle left in garage near Cangas
8/9/09	TE, PL	Return to Spain to collect vehicle

RC – Rosa Clements
 HG – Hilary Greaves
 NE – Nick Edwards
 PS – Paul Savage
 MM – Max Minckler
 SW – Simon Welch
 MH – Mike Hopley
 DM – Dickon Morris
 FL – Fleur Loveridge
 TS – Tony Seddon
 DR – Dave Rose

BL – Ben Lovett
 KG – Kayleigh Gilkes
 AW – Andy Wright
 AK – Avelina Kunzel
 TL – Tom Langan
 CS – Chris Sinadinos
 PR – Phil Rowsell
 TF – Tobias Fox
 TE – Tom Evans
 PL – Phil Leichauer
 RS – Robbie Shone

* Guardia Civil de Montana, Cangas de Onis

Expedition Summary

The expedition vehicle left Oxford early on the 4th July, driven by Nick Edwards, Hilary Greaves and Mike Hopley. They arrived at Los Lagos late on Sunday the 5th after ‘safety’ stop at the beach to allow the driers to rest before attempting the walk up to Vega de Ario. After a night bivvying at Los Lagos, the drivers met up with other expedition members the next morning, and the long task of carrying all of the necessary equipment up the hill to the base camp at “Vega de Ario” began.

Rigging

Keen to make the best use of available time the first rigging trip took place the next day on Tuesday 7th July. Rosa Clements took Max Minckler for his first taste of expedition caving, and they rigged down the first two pitches to *Meandro del Guaje*, a section of narrow rift roughly 100m below the entrance. Paul Savage and Simon Welch continued the next day, rigging down two short pitches in the rift followed by two huge pitches *Siniestro Parcial* and *No hay Cristal!*. Thursday’s rigging trip was less successful, as the “irregular bowel movements” of



Expedition vehicle and trailer with just a fraction of the gear to be carried up the hill. Photo: Nick Edwards

one of the team meant that the trip had to be aborted before any rigging took place. The rigging continued the next day: Nick Edwards and Paul Savage rigged down a 50m pitch *El Jardin*. This was followed by more easy rift with a few short pitches before a 17m pitch leading to the impressive and aptly named 50m pitch *Pozu Acrobatico*. Below this followed two shorter pitches ending at a small chamber with a stream: *Camp Rosa*. This marked the halfway point to the underground camp. A “Brew Stop” was established here, equipped with food and a stove to aid future trips.

The rigging continued apace on Saturday with Hilary Greaves and Fleur Loveridge rigging all the way down to the Tormenta junction in one mammoth trip. Below *Camp Rosa* are 6 relatively short Yorkshire-esque pitches in easy rift (*Pous-Electrics*) before the biggest pitch in the cave: *Cabo Mayau*



Rosa Clements packing bags to be taken into the cave. Photo: Robbie Shone

at an impressive 80m. Beyond are 3 shorter pitches with impressive wide shafts, before the cave’s character abruptly changes to be drier and more chossy. From here the pitches are all short but come at a relentless rate, until at last one pops out at *El Balcon Fenris* at the top of a large chamber from where the water of the Tormenta streamway can be clearly heard. Hilary and Fleur reached this point by midnight, leaving 4 tacklesacks and an impressive mountain of rigging gear, before beginning the long trip back to the Ario camp.

Meanwhile, other expedition members had been busy portering camping equipment and food into the cave, meaning that the next trip was in a position to establish an underground camp. For various logistical reasons this was delayed by a day until Monday 13th July when Nick Edwards,

Fleur Loveridge and Paul Savage set off to establish underground camp. They made swift progress down to the limit of exploration, picking up bags of equipment along the way. By the time they reached the limit of rigging they were carrying two bags each – a further four bags were not a welcome addition. Paul rigged the final four pitches down to the Tormenta streamway. From here it was a short climb up from the streamway, followed by a short Tyrolean traverse over the streamway to the welcome site of camp passage at a depth of 710m.

Underground camp was quickly established. The site chosen was ideal for underground camping: a wide flat passage with a soft sandy floor and very little draught. The addition of Hilary's wendy-house style tent made the camp into a relative paradise and over the course of the expedition many of the visitors found it to be much more comfortable than camping at Ario!



Making tea at underground camp.

Photo: Robbie Shone

To the limit...

The following day Paul, Fleur and Nick rigged to the bottom of *Knife Pitch* from where the bolt climb to the 2008 extensions began. A number of the traverse lines around the large pools lying along the route had to be replaced, as the originals were very worn. The next day, while Paul 'bounced' up to *Camp Rosa* to collect some supplies, Fleur and Nick rigged as far as *Jack Frost and the Tundra*, the extremely well decorated chamber in the 2008 extensions. Lacking conservation tape, they decided not to pass the chamber until a narrow route could be marked out, and instead rigged down to the downstream *Blue Again* sump. That evening Tony Seddon, Rosa Clements, Dave Rose and Robbie Shone arrived at underground camp. Whilst with 3 people camp had seemed cozy and spacious, with 7 it began to feel very crowded.



"Bad day at the office", the 15m bolt climb at the start of the newly discovered passage. Photo: Ben Lovett

Nick headed back to the surface the next day. The remaining cavers began work on two fronts. One team portered diving gear down to the downstream sump for Tony's dive, whilst the other returned to *Jack Frost and the Tundra*. Several of the pitches after *Knife Pitch* were re-rigged to make them more suitable for the passage of large numbers of cavers. A route through the formations was marked out and Robbie began taking photos. Hilary Greaves and Max Minckler joined the crowd at underground camp that evening.

.. and into the Unknown

The next day, Friday 17th July, exploration began properly. Hilary and Fleur carried out a 9m bolt



Fleur Loveridge admires “Gorse bush” formations in Jack Frost and the Tundra.
Photo: Robbie Shone

climb, which they named *Bad Day at the Office*. Beyond this the passage continued in a similar manner as before the climb: wide open phreatic passage. Paul headed back to the surface whilst Phil Rowsell and Dickon Morris joined the underground team, taking the number of campers to 9; an OUCJ record? The remaining cavers continued taking photos and portering gear to the downstream sump.

The next day Fleur and Rosa returned to the surface, whilst Tony began diving in the downstream sump *Blue Again*. Tony had dived this sump to a water depth of 43m the previous year but was unable to go any deeper with the equipment he had. This year he had returned with equipment for a deeper dive. Unfortunately 120m into the dive, at a water depth of 48m his re-breather failed, meaning the dive had to be aborted. Tony estimated that the sump continued to a depth of at least 60m, which would make for a very serious dive indeed and so the sump was left un-passed for another year. Meanwhile Hilary turned her attention to *Jam Sump*. This short shallow sump had been passed the year before leading to dry streamway. Exploration the previous year had been stopped by a waterfall that required bolt climbing. Whilst Hilary rigged down to the sump and began portering dive gear down, Phil Rowsell and Max Minckler took up the dry lead. They followed the passage at the top of *Bad day at the Office* climb for 30m before reaching a pitch. This was quickly rigged and dropped for 25m landing on a sandy floor. The passage continued for a further 30m as wide phreatic tube with a beach-like sandy floor, before dropping down a 7m pitch. Another 55m of passage followed, before Phil and Max came upon their worst nightmare: a 24m pitch down to a sump pool, with no obvious way on. They christened this *What am I gonna tell the boys?* before the pair returned to camp disheartened.

Late that evening Mike Hopley and Toby Fox arrived at underground camp. The next day morale at camp was low: the dry lead and one of the diving leads had been killed off. Phil and Toby portered dive gear to the upstream *Jam Sump* in preparation for a dive the next day. Tony, Hilary, Dickon and Mike portered the remaining dive gear back from *Blue Again* sump back to camp. Dave, Robbie and Max headed back to the surface, taking photographs in some of the large shafts along the way.

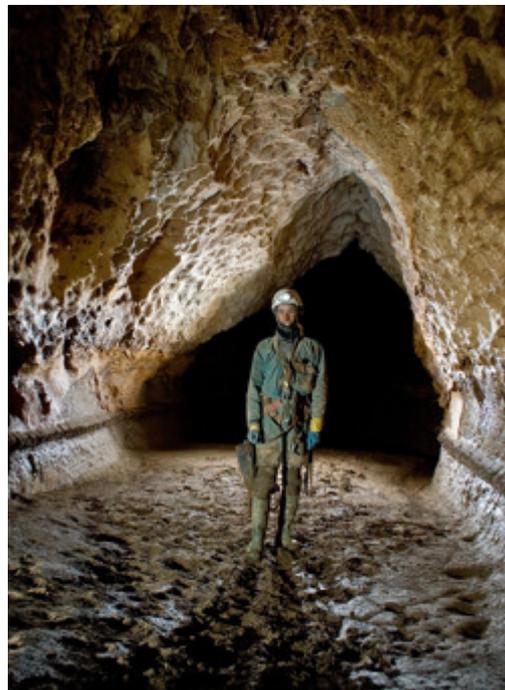
Nick Edwards and Ben Lovett arrived at camp (exhausted) at 5am the next morning, due in part to a very un-alpine start to the day and a lot of gear to carry down the cave. Phil, Toby, Mike and Dickon set off to look for a way on at the newly discovered sump. A number of climbs and crawls were explored and a bolt traverse made over the top of the sump, but no way on



Phil Rowsell in *Cheesecake Streamway*
Photo: Hilary Greaves

was found. After a few hours sleep Nick and Ben set off to take photos in *Jack Frost and the Tundra* and the new discoveries. Hilary and Tony dived past the upstream *Jam Sump* and began bolt climbing up the waterfall in the streamway beyond the sump. Some old rope was found in the streamway, a definite indication of a connection with a previously explored cave. A sample of rope was retrieved from the cave in the hope that somebody might be able to date the rope, which would give us a clue as to which of the Ario caves it came from. We have so far been unsuccessful in dating this rope.

The next day, Tuesday 21st, Tony, Toby, Dickon and Mike headed back to the surface carrying a large amount of Tony's diving gear whilst Paul Savage returned to underground camp. Nick and Ben went to explore the few remaining climbs along the route through to *What am I gonna tell the Boys?*. None of these proved to be successful, however on the way back Ben spotted a possible window high in the ceiling of *Jack Frost and the Tundra*. The hope was that this was an older high-level phreatic passage, which could lead over the sump. Ben and Nick climbed to the top of the chamber: a combination of tricky scrambling and bolt climbing. From here it was necessary to bolt traverse out along the roof of the chamber over the top of the pitch in order to reach the window. They began work on this traverse, but had to return to camp before it was clear whether or not the window would go anywhere. Meanwhile, Hilary and Phil continued the climb in *Cheesecake streamway*. They reached the top, only to be faced with another climb immediately. They decided not to start work on this, as it would have been unlikely to be completed in the time remaining.



Nick Edwards in phreatic passage near to *What am I gonna tell the boys sump*. Photo: Ben Lovett

Nick, Paul and Ben continued work on the bolt traverse in *Jack Frost and the Tundra* the next day, and although they made good progress were still unable to reach the window or say for sure whether it would go or not. Hilary and Phil returned to *Cheesecake streamway* to survey and take photos. On the following day everyone but Nick returned to the surface. Nick bounced up to Camp Rosa, met Rosa and returned to underground camp with her.

They continued work on the bolt traverse the next day. Nick completed the final tricky stage of the traverse and reached the window with only just enough gear and rope to do so. Unfortunately it went no-where; it was simply an alcove created by currents in the water as the cave was formed. From his vantage point at this window, 60m above the floor Nick felt a long way away from home. There was a difficult traverse to reverse to get back to solid ground, and after that a lot of cave to de-rig and not very many cavers left to do so...

The long journey home

Having killed the last remaining lead Nick and Rosa headed back to the surface, carrying as much gear as possible between them. Upon reaching the bottom of the penultimate pitch they were dismayed* to find that the pitch rope wasn't there. It was later discovered that the previous team leaving the cave had accidentally pulled it up. Nick and Rosa spent an uncomfortable night waiting at the bottom of the pitch, before leaving the cave after other expedition members came and threw the rope back down the next morning. The expedition members on the surface at the time of the incident called the Spanish rescue services, and they provided support to the exiting cavers. Nick and Rosa exited the cave unaided, suffering nothing that a hot meal and warm bath wouldn't put right. A full report on the incident is given on page 41.

* to put it lightly



Ropes drying in the sun before being carried back down the hill.
Photo: Nick Edwards

The de-rigging continued over the next week, with the now much smaller expedition team working hard to remove the vast amount of gear and rope from underground camp to the surface.

Progress was again hampered the following Saturday when an unusually heavy rainstorm caused water levels in the cave to rise to never before seen levels. The day of the storm Nick, Dickon and Chris were heading down to underground camp and Avelina, Andy and Tom were ‘bouncing’ to *Camp Rosa* to collect some tacklesacks. Before this storm, only

small trickles of water had been encountered in Asopladeru La Texa above the junction with Tormenta, and these had never been observed to respond to rainfall on the surface. The cavers were therefore quite surprised when a flood pulse passed down Asopladeru La Texa at about 5pm. Although the stream that now flowed down the cave was nowhere near large enough to pose a danger to a caver in horizontal passage, it made the pitches impassable as to attempt to climb a rope hung directly in the path of the water would have been extremely dangerous.

Chris and Dickon were close enough to the surface that they were able to exit safely. Nick, Tom, Andy and Avelina were less fortunate – they had made it down as far as *Camp Rosa* but in the flood water *Pozu Acrobatico* pitch had become impassable. The group were forced to wait overnight for the water levels to drop before exiting the cave. The Spanish rescue services had been called and provided assistance to the exiting cavers. A full report on this incident is also included on page 41.

By 13th August the expedition was packed and ready to depart Spain. The expedition vehicle had other ideas however, and burst its radiator in Cangas de Onis, less than 20km into the journey. It was over a month until the vehicle could be repaired and returned to the UK. An additional failure occurred on arrival back in the UK, meaning the vehicle had to be towed for the final leg of the journey.

The last of the expedition members ready to depart *Los Lagos*. It was shortly after this that the vehicle’s radiator burst a leak, delaying the expeditions return by a number of weeks
Photo: Spanish Tourist





Gour pools in the between *Camp Passage* and *Knife Pitch* in the lower sections of the cave. Model: Rosa Celements. Photo: Robbie Shone



Passing one of the pitches shortly above *Knife Pitch*. Photo: Robbie Shone. Models: Rosa Clements and Dickon Morris

Personal Stories

Rigging from Camp Rosa to Tormenta Streamway

Fleur Loveridge on a deep rigging trip

The previous Thursday I was coming back from a meeting in Leeds, feeling tired and unmotivated. Then I got a text from Hilary promising me a rigging trip to camp if I could get up the hill on Friday night. Suddenly I was motivated – I was off to Spain!

The flight on the Friday was late, turbulent and full of screaming children, but I caught the bus by the skin of my teeth and was in Cangas by 6.15. Finding a taxi was a challenge, but by 7.30pm I was staring at the clag of Los Lagos. I knew by the time I'd sorted gear and eaten it would be dark by arrival at Ario at the top of the hill, so in the end I decided on getting some sleep and an alpine start.

The morning dawned beautifully. The skies had cleared and the vista of the western massif was before me. I knew why I had come. Disturbing a sleeping Tony at the trailer I headed off for Ario, arriving shortly after 9am. By 11am Hil and I were walking to the cave entrance and by 12.30 we were heading into Texa to pick up the rigging at Camp Rosa. We picked up various bags of rope and camping gear, left by previous portering trips, en-route and got to work. We had 3 bags of rope and 2 of camping equipment. In terms of matching pace it worked best for the rigger to take one bag and the second the remainder. Finally I got to live up to my '98 expedition nickname of "4 tacklebags" Loveridge! I also got some good singing in as the acoustics at the top of the 80m pitch [Cabo Mayau] were fantastic. By the Spanish bivouac I was getting pretty tired and sceptical about whether we'd manage to rig all of the way to camp. But some energy drink revived me and in the end we got to the Tormenta water before turning around at about 11.30pm. We hadn't achieved our aim of rigging all the way to underground camp, but had set up the next team to get to camp with all the necessary provisions for a prolonged stay.

I don't function well after midnight and it was gone 2am by the time I reached Camp Rosa. Some "Pasta 'n Sauce" and noodles and flapjack made a really welcome Supper – now just the last 400m to go! Slower and slower. Tired and more tired. I finally exited about 7am and was rewarded with a beautiful sunrise. My elation lasted 10 minutes until I realised that we still had to walk up hill back to camp. Oh, and I had harness rub. I had decided never to go caving again. Well maybe. At least till the next day when I went down to camp.....

In Search of the Ultimate Through Trip

Dickon Morris on pushing at depth

The alarm brought me slowly and reluctantly awake. I had slept long and well but leaving the warm comfort of a sleeping bag to face the reality of a chilly cave is never easy even with an exciting pushing trip ahead. This was my fourth consecutive day underground and my first day of pushing. I was pretty excited! The day before last Phil Rowsell and Max Minckler had gone on the first of the pushing trips and found a couple of hundred of metres of new passage including four pitches. The final pitch dropped into a deep and murky sump but there were other leads, two un-pushed crawls and a cavity above the sump that it was possible might lead somewhere.

After the usual breakfast of pasta and hot chocolate, and an hour of so of aimless activity that only very slowly achieved a state of readiness, we were ready to go. The pushing team comprised of me, Phil, Mike Hopley and Toby Fox. It took under an hour to reach the bottom of "Knife Pitch", where the routes to the downstream sump and the high level phreatic passage diverge. The route to the phreatic passage, where the leads were, lay up a soaring 35m aven that Phil had bolt climbed the previous year. A rope hung down and stretched up far beyond the beam of my lamp.

It was a mildly unnerving experience getting onto a rope with no anchors in sight but a number of people had gone before without problems so I clamped my jammers to the rope and began my ascent with steady and deliberate frogging motions. I was soon cocooned in the strange sense of safety that comes with being on a rope in a huge shaft and after passing several rebelay and struggling up a very steep muddy slope I was at the top. A large passage led off. The wall was covered with huge scallops suggesting a slow flow-rate - it couldn't really be more textbook! We had just climbed an aven and were now staring down the most perfect phreatic tube that I had ever seen. Thousands of years ago this would have been the top of a phreatic loop, meaning that the water table had dropped at least 50m since this passage was formed. However the greatest visual treat was yet to come for at the top of the next climb the passage was festooned with stunning aragonite crystals growing out of the wall at all angles. Some grew as far as half a metre from the wall while maintaining a diameter of only a few millimetres. Everything was brilliantly white except the narrow marked path that we had trodden. Touching the wall was like putting your hand on a thistle head, as dozens of tiny needles pierced your skin. At one point the passage lowered to the point that you were forced to duck beneath hundreds of delicate aragonite crystals. A particularly fine stalactite decorated with crystals lay just to the left under a rock shelter. Phil stopped, turned around and announced that he would personally kill anybody that smashed it, however accidental. Beyond lay several more short pitches and more formations, insignificant compared to what we had just seen.

After a short section of grotty but interestingly sculpted passage we reached the short muddy climb that had thwarted the previous years expedition. It could probably have been free climbed with relative ease and had it been a sunny gritstone cliff then I would not have thought twice about lead climbing it. However at this depth the sense of remoteness is very keen, and the dire consequences of an accident are never far from ones mind. The



**Dickon Morris in passage near the downstream sump.
Photo: Robbie Shone**

passage at the top was dreary and muddy, a miserable continuation of a cave that had, albeit briefly, been very attractive. We descended another two pitches, discovered only two days earlier and we were at the limit of exploration. A sense of excitement that I had never before felt in caving gripped me; we could make a major discovery within the next hour!

While Mike and Toby redirected the rope of the final pitch to examine a crawl Phil and I continued down towards the sump. After a difficult, loose, free-climb we were in a large mud floored tunnel like passage with interesting oxbows that rejoined after only a few metres. The passage down here was about as phreatic as a passage can be, with almost no vadose development. Huge scallops covered every inch of the passage that was not buried under mud. A feature of the this type of passage is the dreaded alcove, a small passage that in a vadose cave would be a decent lead but in this type of passage almost always pinches out after a couple of metres, annoyingly often turning a bend before it does so. This is no problem if the passage is easy to access but if it requires a bolt climb to reach it is extremely annoying.

Phil pointed out the second un-pushed crawl and I bounded off to explore it. My excitement had reached a fever pitch as I dropped to the ground and hauled myself forward to be greeted by rock

meeting mud with not even a hope of a way on. I was slightly disappointed and followed Phil down to the sump feeling the expectant daring to hope excitement that comes with a long shot lead.

The sump was a very forbidding place indeed. Nowhere else in the cave did one feel so keenly the 1,000m of rock above ones head. The muddy phreatic tube simply took a sudden right hand turn and dropped vertically 30m into a very uninviting sump pool. On the previous trip Phil had rigged a rope down to the surface of the water but had not surveyed this drop due to lack of time. He now thrust a tape measure into my hand and explained the very simple task of measuring the drop whilst also commenting that rope failure on this pitch would not result in a quick death as it would from pitches with a rock floor but would dump one in the sump pool to a very slow but almost certain death. With this pleasant thought in mind I'll admit that I felt more than a little nervous as I lowered my weight onto my stop before abseiling down to the surface of the water, trailing one end of the tape measure while Phil held the other. I dropped the weighted end of the tape measure into the sump pool. It did not touch the bottom, meaning that the sump dropped vertically for at least 20m - a very final end. The pitch and sump were duly christened "What we gonna tell the boys".

Toby and Mike had since returned with the report that the second crawl ended in a similar manner to the one that I had already explored. There was now only one lead left and it was a definite long shot, but the cavity above the pitch into the sump deserved investigation.

To reach the mouth of this cavity required a bolted traverse so we watched as Phil put in a thru bolt and then transferred his weight onto it using a daisy chain. He then reached out as far as he could from this new bolt and put in another which he then transferred his weight onto. From this position he could see that the cavity was indeed an alcove. So that was it, all the major leads had been tidied up and the cave was practically dead.

I refused to give up this easily and on the way back to camp I spotted a small opening just before the final pitch. It looked to be a fairly easy free climb of around 8m to this opening and just my style of climbing as well; slabby and technical rather than steep and pumpy. However I soon realised that it was not as easy as it looked and was forced to smear on a shallow scallop mark while gripping a thin flake with the tips of my fingers. I looked down and with no small amount of unease realised that I could only go up. I was only about 5m from the ground but this is one place where you do not want to break a leg. After a couple more sketchy moves I finally found good holds on a huge thread. The cavity went nowhere but I didn't care. The adrenaline was pumping and I felt privileged to have experienced the isolation and remoteness of this place, a days worth of prussiking from sunlight and grass. As I called for a rope and abseiled off the thread I thought of not only of the food waiting back at camp but of the living world above that awaited my pleasure the following evening.

Caves are wondrous places and I expect I will continue to explore them for the rest of my life, but the joy I experienced when I saw sunlight pouring down the entrance shaft after over 100 hours underground was an overwhelming sensation, one that no one who has not been underground for a prolonged period can imagine.

We may have found very little but the carrot that was dangled in front of me before being denied was intoxicating. I will be returning to claim that carrot of discovery.

Back to the Blue

Tony Seddon on diving in Sistema Julagua

An interesting trip; pretty straightforward but with just a dash of incident to enliven the whole affair. The main lead for me, the terminal downstream sump that lies at -950m in Asopladeru la Texa, was pretty remote as a dive site and required a lot of help from many cavers to lug all the kit there. The pushing dive took place on the third day of my camping trip, and it took about eight person trips to get the rebreather, drysuit, tanks of mix etc from the underground camp to the sump; fortunately, this bit is the nicest passage in the whole cave!



Tony Seddon prepares to dive in *Into the Blue* sump. Photo: Robbie Shone

The dive itself was going swimmingly until about 120m in, at a depth of 48m, at which point the rebreather flooded. Without getting technical, this is a bad thing, which could result in death. Clearly, in this case it didn't! But it meant that most of my gas reserves were used getting out safely from that point. The sump, Blue Again, was left as a very large shaft dropping into blue / black obscurity to a depth that I'd guess to be a minimum of 60m deep; an impressive place.

Luckily, the ongoing upstream passage was still an excellent consolation prize. Kitted up for long deep diving, the logistics of doing a short shallow sump with caving beyond made for amusing kit choice. I opted for normal caving kit under a diving drysuit, dumping this after the 40m dive as the streamway beyond is pretty gnarly in places, a real gear ripper.

What I'd not twigged, is that the passage also has three sections out of depth! Even though I had the lighter bag of climbing kit, hand traversing around the edges of these, neck deep, was a bit of a fun experience. Spending the next few hours sharing the lead on a bolt climb next to a waterfall was just unspeakably fun...

An excellent lead, and still going in a major stream passage when I left the next day, after six days underground.

A trip to a Sultan's Palace

Chris Sinadinos on the final derigging trip to underground camp

The dawn dragged its feet, arriving meekly amidst a veil of mist, the clag clinging to surrounding nearby peaks and obscuring their more distant neighbours in a sea of grey. Ario was damp. So were, in fact, most of my meagre supply of socks, underwear and my remaining pair of non-shredded shorts. Travel light - a fine maxim in the Asturian sunshine, had come back with a wet bite in the bum. Nevertheless, a silver lining continued to shimmer stubbornly out of my Mornflake bowl in the form of an added impetus towards my impending ordeal to the bottom of Asopladeru with Nick, well-oiled caving machine of several weeks (and successive nights) in his now intimate love-child of a cave. You may as well, as they say, be muddy in the meanders and sodden in the swollen Tormenta streamway than suffer a slow, watery spoiling with the cows.

Nick's dreadlocks hung heavy as we rock-slithered our way out of the bowl and past the orange rock towards the gorge's precipitous lip. His route finding automated like his caving, efficient, reproducible, reliable. Unlike my lower back, dodgy enough to jeopardise my presence on this year's excursion just a month before. Whether the problematic muscle to the right of my 3rd lumbar and it's illegitimate trouble-child of a nerve would behave throughout the impending de-rigg was a question as open as my right index finger, self-sliced over the middle joint on my virgin deep expo trip into Tormenta in 2003. I had survived then and would do so again, no doubt, I told myself. Was that a slight twinge as I stepped over that rock? Double pink smarty and on we go..

And on indeed we went. Nick advanced down the cave, empty yellow sacks disappearing into the blackness, and down I followed. My new bobbin choked on gritty rope. The pitches slid past, I settled into my own groove, nurtured under a Dales xmas ice-mist and my previous two trips over the previous week, bouncing bags from Brew site at -300m to the surface with Dickon and Tom. Starting to enjoy myself in earnest, I exchanged stops with Nick lower down and whizzed through the terrific 80m pitch [Cabo Mayau] and the Yorkshire-esque Pous Electrics mini pitches towards the big streamway. The hours ticked by as we dropped near to the streamway, its roar filling the ears as I slipped up over and through an entertaining saddle-window. Nick pointed out the direction of the recently derigged lower extensions, the Spanish pitches, pretties and final point where exploration had ceased the week before. I momentarily dwelled on my misfortune, recalling Kayleigh of UBSS, who had greeted me upon my arrival beneath the blue tarp with the dreaded 'the cave has died' words.

But not for long did I frown. The awesomeness of the streamway gave way to something of a Sultan's camp, its secluedness, peacefulness and comfort to match any that I had stayed in before. Perhaps akin to Tim's Dreanen haunt with the multiple candled walls and lashings of whiskey to see you through. Not to mention its ingenuity (hats off Hils). We had spirits too, and lots and lots of food. Having made it down in the very early evening there was nothing to do but warm up and tuck in, reducing our fuel and food weight load for the impending less hunky-dory return journey on the morrow. And tuck-in we did, dreamy Oliver Twist eat your heart out, what a fab gooey cheese cake. Sorry to add too much water Nick, but to hell with it, it was good. I listened to numerous tales from Mr Jefe as we bedding down for an early night. Unaccustomed to deep camps, I listened to the distant streamway roar and, awed by my incredible surroundings, got little sleep but a good rest.

And the way out? An ordeal, of course. I paid for my awe in drop-dead thighs and back spasms (and worse) on the surface. I made friends with two mighty tackle backs, especially through the Meandro (happy days). I saw the light of day, started to heal, got more wet in storms and felt sick in a helicopter over the Cares, looking for rescued cavers on the hill-side. Every one a gem, as they say, and forget I shall not my one sleepless night, close but not quite close enough, in the race to Culiembro. AND I helped carry out some rope. Just don't go giving me a pat on the back.



Fleur and Paul prepare "Culiembro Tea" at underground camp.
Photo: Robbie Shone

Recipe: Culiembro Tea

1. Boil 400g pasta in 3 pints of water
2. Add 1 beef Oxo cube and 1 veg OXO cube
Try not to dissolve either of the cubes
3. Once pasta is cooked, discard
4. Distribute evenly in sandy mugs
5. Enjoy hot or cold!?!

From the underground log book



Above and below: Cavers passing the first large pool in the passage beyond camp.
Photos: Robbie Shone



Cave description

A survey of the Asopladeru la Texa entrance to Sistema Julagua up to the 2005 limit of exploration is included on page 35, and centreline surveys of the whole system are given on pages 36 and 37. A survey of the 2009 discoveries above *Who Needs Divers Anyway?* is given on page 38. A description and rigging guide for the complete system is given below, and topographical rigging guides are given in the appendix. A full survey of Sistema Julagua is currently in preparation.

The Muxa hypothesis

Before the expedition it was hypothesised that water from Cabeza Muxa fed the main streamway in Sistema Julagua, connecting somewhere above the sump. The survey data from 2008 and 2009 casts doubt on this hypothesis however, since the lowest surveyed point in the Muxa streamway appears to be 77m vertically *below* the furthest upstream point reached in *Cheesecake Streamway* in Sistema Julagua (with 279m horizontally between the points). The lowest surveyed point in Fissura la Chica is 294m horizontally and 153m vertically up from upstream Julagua, so it is possible that the Chica water joins Julagua. At the bottom of Chica the water descends vertically through a boulder choke, so it is unknown in which direction it is heading.

Old rope was found in *Cheesecake Streamway* by the first explorers, so we know for sure that the water in this streamway comes from a previously explored cave. A sample of the rope was brought back to the UK in the hope that it could be dated and correlated against dates of expeditions to the various Ario caves, but these efforts have been so far unsuccessful.

There are a number of plausible scenarios for the origin of the water in *Cheesecake Streamway*:

- Inaccuracies in surveying in either or both of the systems, or inaccuracies in locating the entrances of the two systems relative to each other mean that downstream Muxa is in fact higher than upstream Julagua, and the Muxa water flows into *Cheesecake Streamway*.
- The water splits in the upstream sump of Sistema Julagua (*Jam Sump*), with some of the water coming from Cabeza Muxa, and the rest from another cave system (possibly Fissura la Chica), joining via *Cheesecake streamway*.
- The water from Muxa misses Sistema Julagua completely, turning slightly south beyond Muxa's downstream sump and passing underneath Sistema Julagua to join the Culiembro system at some lower point.

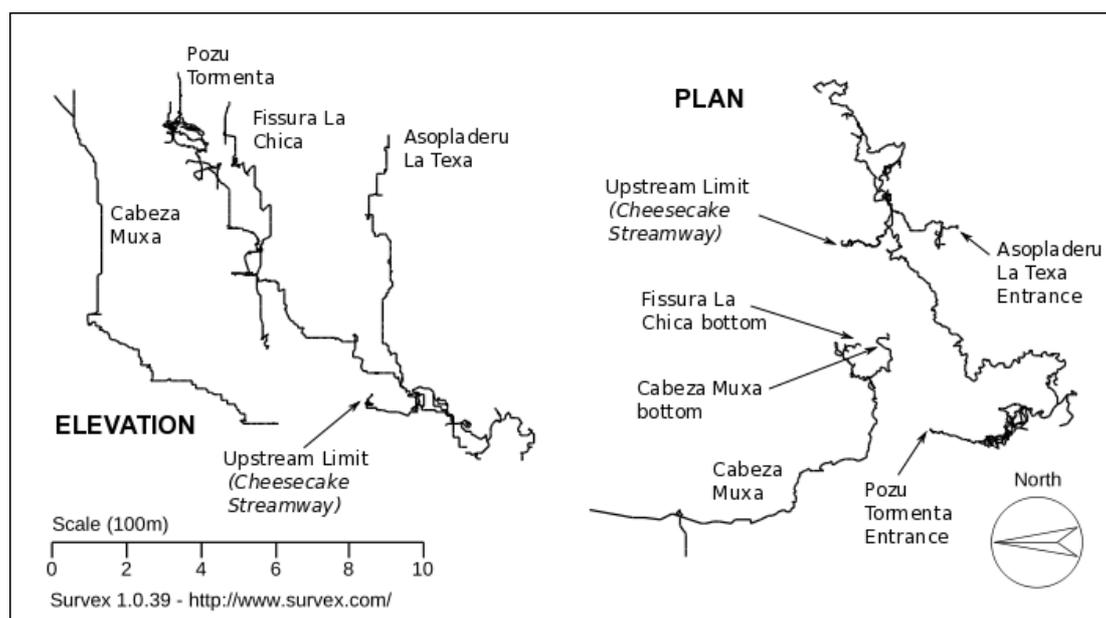


Figure 3: Elevation (left) and Plan (right) showing Cabeza Muxa, Pozu Tormenta, Fissura La Chica and Asopladeru La Texa.

Unfortunately without being able to carry out dye traces between Muxa, Chica and Julagua it is impossible to test any of these hypothesis. It is unlikely that any expedition in the near future will have the manpower to simultaneously rig all three caves in order to place and retrieve dye and detectors, so this will likely remain a mystery for some time.

Asopladeru La Texa cave description and rigging guide

The following description is updated from that published in the “Julagua 2008” expedition report, available from <http://www.oucc.org.uk>

Location

From the Ario camp, cross the ridge between Cabeza Julagua and Cabeza Verde. Follow the path as it descends, skirting to the right of the bowl containing orange rocks. Leave the path, and follow the ridge above; this ridge turns left, and descends over a rock arch to a col. Follow the path to the right, and then turn off to the left to descend a scree gully. Continue ahead, contouring across the shoulder of the hill, above a gully to the left, to reach the top of another, shallow, gully. This descends steeply, onto a steep scree slope. Descending the scree slope reaches the cave, at the top of a large gully, overlooking the hill below Ost_on. GPS 0345070 4789670, altitude 1369m.

From the entrance to *No hay Cristal!*

The entrance pitch (P36) lands on a large snow plug. This can be descended to a boulder floor. A climb up (depending on the height of the snow plug) and a traverse above a hole reaches the top of the second pitch (P42); care: the hole connects with the pitch.

The pitch lands on a boulder slope. Descend boulder slope and short climb; care: rocks dislodged from the slope fall down the climb. A short passage leads to a 5m climb, best roped.

At the bottom of the climb is the start of a rift, Meandro del Guaje. A point squeeze leads to the base of an ascending ramp, which leads to the top of a 5m pitch; the pitch can be bypassed by a constriction and two short climbs. Ahead 10m is a second short pitch (P7), with a constriction half way down; this pitch is also free-climbable, with care. Ahead, another ascending ramp leads to an awkward manoeuvre followed by a climb down into bigger passage.

A 57m pitch, Siniestro Parcial follows. This lands on a ledge overlooking a chamber. [The water disappears along a rift in the chamber.] The way on is to follow a gallery leading off from the ledge, which leads, after 20m, at the top of the next pitch, No hay Cristal! (P60). The top of the pitch is a knife-edge, which requires straddling; part way down is a three-bolt traverse along a ledge to the left.

Pitch Rope Rigging

Pitch	Rope	Rigging
Entrance pitch (P36)	45 m	Two thru bolts and one Spanish hanger for top of pitch. Bolt rebelay at -8m and -12m.
Second pitch (P42)	55 m	Spit bolt for traverse, single thru for short drop with spit for deviation, two thru bolts for good ‘y’ hang. -10m thru bolt rebelay - 20m bolt rebelay
C5	10m	Two natural back-ups, natural belay.
P5	10m	Spanish Hanger and thru bolt for ‘y’ hang
P7	12m	Spanish Hanger and thru bolt for ‘y’ hang
Siniestro Parcial (P57)	75m	Spanish hanger and thru bolt for backup, thread deviation at -3m, thru bolt rebelay at - 6m, thru bolt rebelay at -25, thru bolt rebelay at -50
No hay Cristal! (P60)	90m	Thru bolt and spit hanger for back up. Two old raw bolts with hanger for main hang. Thru bolt deviation. 3 Spanish

		Hangers for traverse, 2 thru bolts for 'y' hang at end of traverse across rift, thru bolt rebelay at -70
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No hay Cristal! to Pozo Acrobatico

No hay Cristal! lands in a boulder-floored chamber. At the end of the chamber is an awkward 8m pitch down a rift. [This pitch can be bypassed by climbing down through boulders at the opposite end of the chamber.] At the bottom of the pitch, the passage soon leads to the top of a blind pot. The way on is to turn right, and climb over or crawl under an obstruction into a small chamber, where a 6m hand-line climb ascends. At the top is another, easier, hand-line climb.

Walking forward soon reaches the top of a 50m pitch, El Jardinet, split by an edge half way down. This lands in a rift, with a small stream, leading to two 6m pitches. An old Spanish brew-site is passed, before the rift opens out to the left. [It is possible to follow the water ahead for some way.] The way on is to ascend 4m (hand-line useful) into a continuation of the line of the previous rift. This rift is narrow at first. It again opens out to the left, but the way on is to continue straight ahead, until the top of the next pitch (P17) is met.

At the bottom of the pitch, penduling reaches a traverse level, leading quickly to the top of Pozo Acrobatico (P67). This is split by a ledge at -30m. Ten metres above the floor, swinging right reaches a draughting window, El Fet Diferencial. [The way on at the bottom of the pitch is blocked; the water is lost at this point.]

Pitch Rope Rigging

Pitch	Rope	Rigging
P8	10m	2 bolts (Spanish hanger and spit).
C6 up	10m	Natural belays
C5 up	10m	Natural belays.
El Jardinet (P50)	80m	2 spits for 'y' hang, spit for rebelay near top, spit for rebelay -10m, descending to ledge at -25m. 3 Spanish bolt traverse, Spanish hanger and thru bolt for 'y' hang (potential rub point), 2 thru bolts for y hang in rift at -35m
P6	10m	Spanish hanger and thru for 'y' hang.
P6	10m	Natural and thru bolt for 'y' hang
C4 up	8m	Natural belays.
P17	35m	Natural and Spanish hanger for back up. Thru bolt for drop down, Spanish hanger and thru bolt at -9m for final drop to ledge.
Pozo Acrobatico (P67)	85m	3 Spanish Hanger traverse, 2 thru bolts at top of pitch for 'y' hang, Spanish hanger, Spanish hanger, 2 thru bolts in adjacent shaft. N.B. 1. Do not descent to bottom of pitch; way on is a window 10m up from base!! 2. Look out for Spanish hangers on opposite wall higher up on pitch which might give a better rig.

Pozo Acrobatico to Cabu Mayau

The window on Pozo Acrobatico is the start of a short tube, leading to the top of a 15m pitch, slightly constricted at the top. This lands in bigger passage, from where a 22m pitch follows almost immediately. The pitch lands in a small chamber *Camp Rosa*, with an inlet entering to the left. *Camp Rosa* has been used as a brew-stop in previous years, due to the availability of fresh water and it's position roughly half way to *Camp Passage*.

The passage continues ahead, as a series of eight short pitches, Pous Electrics (P14, P12, P16, P6, P10, P10, P7, P4), separated by fairly easy rifts. At the bottom of the final pitch, traversing forward leads to Cabo Mayau (P80).

Pitch Rope Rigging

Pitch	Rope	Rigging
P15	20m	2 bolts (Spanish hanger and spit).
P22	30m	Spanish hanger for back up 2 thru bolts for 'y' hang at head height
P14	25m	Thru bolt and Spanish hanger as back up, Spanish hanger and thru bolt for 'y' hang
P12	20m	Spanish hanger and thru bolt for 'y' hang
P16	25m	Natural and Spanish hanger for back up, Spanish hanger and thru bolt for 'y' hang.
P6	12m	Spanish hanger and thru bolt to Spanish hanger, Spanish hanger rebelay
P10	20m	Thru bolt and 2 Spanish hangers,
P10	15m	Natural, Spanish hanger followed by thru bolt rebelay
P7	11m	2 Spanish hanger Y-hang.
P4	7m	Spanish hanger and thru bolt rebelay.

Cabo Mayau to Sala Oston

Cabo Mayau (P80) descends via two ledges before opening out into a magnificent shaft. This is followed by two short pitches (P7, P5), and a bigger pitch: La Pica (P25). A rift descends a short climb, and traverses over a blind pot. Ahead, the ceiling dips to meet the floor, but there is a way on through a slot to the right. At the end of a slot, a short climb down leads to the top of a blind 15m pitch. In past this has been rigged to a ledge a few metres down followed by a short prussik back up the other side. It is however possible to traverse around the top of the pitch – a taught traverse line may be a better solution. A short section of rift leads to a 13m pitch, followed immediately by a 9m pitch. This lands in a chamber where the SIE set up a camp, often referred to as *The Spanish Bivouac*.

A rift is then followed to the next pitch, El Espajo (P31). Further rift leads to two more pitches (P6, P10), followed by more rift and two more pitches (P2, P11).

Suddenly the end of the rift is met at a balcony overlooking a large chamber, with the sound of a streamway below. An 11m pitch descends to a ledge, with a small inlet entering from above. [To the right is a blind pitch of about 12m.] The way on is through a window on the far side of the ledge. The pitch lands on a large ledge at -20m, where the Tormenta water enters. A final hang down a wide rift passage lands in the streamway.

Following the water, a short pitch is met (P4). Ahead is another short pitch on the right (P6). Penduling from the bottom reaches a dry passage leading to a window, which is the start of a 17m pitch in a large chamber, Sala Oston.

Two routes diverge in Sala Oston. One leads down to the main streamway, and one up to Camp Passage. [For the route down to the main streamway: Following the water leads along a rift passage to two short pitches down to the main streamway between Ham and Jam sumps. This route is described below (“Sala Oston/Camp Passage to Blue Again, via main streamway”)] For the route to Camp Passage: Climbing up a steep clean rock slope on the left (facing downstream) in Sala Oston gains a traverse level a few metres above the streamway. A short handline climb up is met, at the top of which is a Tyrolean traverse across a 2m wide chasm, leading to Camp Passage, a 5m diameter, sandy-floored phreatic tube. [Immediately after the Tyrolean, a passage down to the right leads to Poo Corner; this route is described below.]

Pitch Rope Rigging

Pitch	Rope	Rigging
Cabo Mayau (P80)	110m	(The pitch was rebolted in 2008 to move out of water and split the pitch up). 2 Spanish Hangers for back up, wire belay, thru bolt rebelay at -9m, 4 more thru bolt rebelays at roughly 15m spacing.
P7 & P5	25m	Spanish hanger and 2 thru bolts for y hang. Thru bolt rebelay tied into previous pitch.
La Pica (P25)	40m	Spanish hanger for back up, 2 thru bolts for 'y' hang, thru bolt rebelay at -6m and thru bolt rebelay at -15m.
Traverse	25m	Thru bolt, Spanish hanger, thru bolt, natural to protect traverse.
P13	25m	Naturals for 'y', natural rebelay, Spanish hanger and thru bolt for 'y' rebelay.
P9	18m	2 Spanish hangers for back up, thru bolt for main hang.
El Espajo (P31)	45m	Natural and Spanish Hanger for 'y' hang, 2 thru bolts for 'y' hang rebelay at balcony - 3m, Spanish hanger at -14m.
P6	10m	Spanish hanger and thru bolt for 'y' hang.
P10	17m	Thru bolt and Spanish hanger as back up, Spanish hanger for main hang, thru bolt and Spanish hanger for 'y' hang at -5m.
P2 & P11	25m	2 thru bolts for 'y' hang Spanish hanger for short traverse to 2 thru bolts for 'y' hang.
P11 & P27	60 m	2 Spanish hangers for back up, thru bolt for main hang to ledge. Spanish hanger back up for window, natural on top of window (not the best) 2 thru bolts for 'y' hang out of window to drop on 2 nd ledge. Spanish hanger and thru bolt to Spanish hanger rebelay 3 meters lower.
Blind pitch (P12)	15m	Two bolts.
P4	10m	Natural and Spanish hanger for back up Spanish hanger for drop.
P6	12m	1 natural for back up Spanish hanger and thru bolt for 'y' hang.
P17	35m	Spanish hanger and thru bolt for 'y' hang, Spanish hanger and thru bolt for 'y' hang rebelay at -4m.

To camp passage

P6 up	10m	Backed up to traverse, bolt, tied of to natural at bottom.
Tyrolean traverse	10m	Two bolts on each side.
Hand-line climbs	25m	Two bolts.

Sala Oston / Camp Passage to Blue Again, via main streamway

There are two routes connecting Camp Passage to the main streamway directly beneath.

The first route (probably preferable for divers heading for Cheesecake Streamway, as it is straightforward and avoids the aromatic Piss Pot) follows the water from Sala Oston. This flows along high rift passage and quickly reaches a 27m pitch, Pozo del cm3, followed by a 6m pitch, which lands in the main streamway. [The streamway sumps almost immediately in the downstream direction (Ham Sump). Following the water upstream leads through a pool after about 15m, then up a short cascade that is immediately followed by a rising sump (Jam Sump). The Spanish estimated the flow

rate in this streamway in 1998 as 200l/s. The flow rate just upstream of Ham Sump was estimated in 2008 as 33l/s. This discrepancy probably says more about the unreliability of flow rate estimates by cavers than it does about the time-variation of the flow rate in this streamway.] The route towards Blue Again ascends a 5m pitch (Diver’s Dilemma) just upstream of the point where the 6m pitch enters the streamway. From the top of this pitch, meandering phreas leads upwards, connecting with the base of the Piss Pot route.

The second route (drier but smellier, and more a direct route towards Blue Again) begins from the far end of the Tyrolean traverse into Camp Passage. A passage to the right from here descends into a chamber, Poo Corner, which leads to two separate pitches. [The first pitch is straight ahead. This connects to the base of Pozu del Guix on the fossil route to *Blue Again*. (This connection has not been surveyed.)] The second pitch is to the right as one enters Poo Corner from Camp Passage. This pitch, Piss Pot (P25), drops down a rift. At the bottom of the pitch, climbing down leads to horizontal phreas. Climbing down to the right leads to a short pitch (P5) down to the main streamway between Jam and Ham sumps.

Continuing to follow the phreas to the north-east from the point at which the Piss Pot and Spanish routes meet leads to a sump pool, reachable by diving in Ham Sump. Traversing past the pool on the right leads to a further pool, followed by a T-junction. [At the T-junction, the right-hand branch leads upstream in a pool; a rising sump, presumed to be the downstream end of Ham Sump, is met after approximately 10m.] Turning left at the T-junction, the passage continues downstream, through a further pool, to the head of a wet pitch, Good Things Come (P8). This pitch lands in a pool, which can be traversed around on the right. 15m further on, the passage widens; a pitch drops away below, while it is possible to traverse out over the pitch on ledges on the left or right, joined to one another by a rock bridge. This pitch (“Multilingual”, P50?) has been rigged from bolts on a large column in front of an alcove on the right. A short initial drop leads to a rock rib. Stepping over this rib, away from the water, leads to a rebelay, from where the rope hangs down the dry part of the shaft. A further rebelay is met 7m lower. From here, a drop of about 40m lands on a dry balcony with boulder floor. The rock here is poor quality; there is a rebelay from a single bolt in a boulder, followed by a drop of about 10m to rejoin the stream. A final rebelay allows a hang down a very steep calcite ramp, landing in waist deep water in a high stream passage. (This point was the upstream limit of exploration in the “Lower Streamway” in 2005. The flow rate in this passage was estimated in 2005 as 15l/s, and in 2008 as between 50 and 120 l/s.)

Following the water downstream, the water drops away on the left after 20m. Here, following the right-hand wall leads through a narrow passage, and then down and up a slope with a drop away to the left. At this point a small side-passage enters from the right; this is the route from Knife Pitch.

Facing out into the main passage from the side-passage junction, one is looking down a boulder slope. Climbing down leads back to the main streamway. [Following the water upstream leads to a pool, and then a choke. Also, from the base of the boulder slope, it is possible to climb up into the choke above, which leads up to a large roof chamber and balcony overlooking the water just downstream of Multilingual pitch. However, no routes on from this roof chamber appear promising.]

Following the water downstream from the base of the boulder slope, a pool is met, easily passed on the left to gain a wide, sloping rocky shelf. This shelf is the dive base for a large, forbidding sump (“Blue Again”). Blue Again was dived in 2008 to a water depth of 43m and in 2009 to a water depth of 48m, with the bottom not reached. It is estimated the sump is at least 60m deep.

Pitch Rope Rigging

Pitch	Rope	Rigging
Pozo del cm3 (P27)	48m	2 bolts, 3 bolt traverse at -5m, bolt at -13m, bolt at -15m.
P6 down to main streamway	10m	2 bolts.

Diver's Dilemma (P5?)	10m	Natural and bolt y-hang; bolt deviation
Pisspot (P25)	40m?	Bolt backup, bolt y-hang; bolt y-hang
P5 to main streamway	7m	2 natural backups; bolt
Good Things Come	15m?	?
Multilingual	~150m?	2 bolt y-hang; 5? Bolt rebelay

Jam Sump (“Upper Streamway Upstream Sump”) and Cheesecake Streamway

Jam sump is short (40m long), shallow (8-10m deep) and easy (5m diameter phreatic passage and excellent visibility). Diving this sump gains the upstream continuation of the stream passage. This can be followed upstream for approximately 100m of easy walking passage to a 5m pitch (Ambidextrous) up to a chamber. Continuing upstream, the passage becomes more contorted in nature, but opens out again to more rift style stream way before a 10m waterfall, bolt climbed in 2009. Another waterfall that requires bolt climbing follows. [Climbing up on the right gains a complex maze of high-level phreas that leads to an aven and eventually a connection back to the streamway further downstream.]

Camp Passage to Blue Again, via fossil route

At the far end of Camp Passage, the passage turns right and ascends a short, steep ramp before descending a similar distance on the other side (handline useful for both ramps). Shortly after the bottom of the second ramp, a large shaft is met. Dropping this shaft leads down “The Spanish Pitches” [while a traverse around the left-hand side leads to the “Mud Mines”].

A 38m pitch, Pozo del Guix, descends the shaft, via a large ledge. This lands in an abandoned stream passage, containing large pools. Thirty metres forward, a 3m pitch drops into a small pool. Twenty metres further, an awkward climb down a flake enters larger passage [where the pitch from Mud Mines enters]. This leads to two short pitches (P10, P7), down to the First pool.

It is possible to boat across the pool: some type of buoyancy device is strongly recommended; it is very useful to rig a doubled rope across the pool, so that teammates can pull you across.

At the far side of the pool is the start of a 5m diameter phreatic tube, *Entre-lagos*. This ascends a ramp, and then descends a 6m pitch. At the bottom of the pitch is another pool; it is possible to traverse around the right hand side. The cave turns sharply left, to the north, at this point.

The passage continues, descending a couple of ramps, before hitting a third pool after about 40m. This can be traversed on naturals on the left, but is best rigged with a rope for a Tyrolean traverse. The passage then ascends a ramp to a fourth pool, much shallower than the previous.

Ahead, the passage suddenly changes character: the muddy floors are replaced by brilliant calcite surrounding gower pools. A single path has been trodden through this section to minimise damage. After 20m, two short pitches are met (P6, P5), which descend calcite walls, to a brilliant stal flow formation.

Ahead are two more short pitches (P7, P6). The passage narrows, and then ascends a steep ramp (C8), to a narrow knife edge, the top of a 15m pitch *Knife Pitch*. Half way up the ramp, a small window looks through onto the pitch. Knife Pitch lands in a muddy chamber. [An aven above this chamber has been bolt-climbed and leads to Jack Frost and the Tundra. This route is described below.]

A muddy rift descends from the base of Knife Pitch. It is possible to rig a rope down here (P15), past the remains of a choke, onto a ledge overlooking a chamber. A further pitch (P7) reaches the bottom of the chamber. A small passage leads off through a catchy window from the bottom of the chamber at the far end, towards the sound of running water. A climb down reaches a small streamway in a very immature passage. An oxbow is followed, before the passage suddenly breaks out at the top of a short climb down to the main streamway, 30m upstream of the Blue Again sump. (See the description of “Sala Oston/Camp Passage to Blue Again, via main streamway” for a description of the streamway and sump.)

Pitch Rope Rigging

Pitch	Rope	Rigging
First Spanish pitch: Pozo del Guix (P38)	50m	Two bolts for sloping traverse, bolt for main hang, natural deviation at -8m, huge natural on ledge, spike deviation 5m lower.
2 nd Spanish pitch (P3)	5m	Natural belays.
3 rd Spanish pitch (P10)	15m	Bolt, bolt at -3m.
4 th Spanish pitch (P7)	11m	Two bolts.

P6	15m	Three natural belays.
P6	10m	Two bolts.
P5	10m	Two bolts.
P7	12m	Two natural belays.
P6	10m	Two natural belays.
C8	15m	Two bolts, one either side of ridge.
Knife Pitch(P15)	25m	Bolts shared with C8, bolt rebelay at -3m.

Muddy rift (P15)	25m	Rope backed-up to Knife Pitch, natural belay from huge boulder, bolt at -5m, bolt at -10m
P7	12m	Rope backed up to previous pitch, thread belay, bolt deviation.

Mud Mines

The *Pozo del Guix* shaft can be crossed via a traverse *Songs of Praise*, to the left. The traverse lands on a ledge overlooking the shaft. To the left is a choke, which appears not to go. Passing behind a large boulder leads to the other side of the ledge, from where a phreatic passage continues. The passage descends a 15m pitch, followed by a 10m rift climb. Ahead leads to the top of a 40m pitch, [which reconnects with the Spanish Pitches, two pitches above the pool]. Continuing ahead leads to a complex junction, and the bottom of a *pitch One Man and his Dog*. The passage continues through an old mud sump, to emerge at the top of a 5m pitch, overlooking the previous passage near the rift climb.

Pitch Rope Rigging

Pitch	Rope	Rigging
Songs of Praise	30m	Two bolts on first ascent, bolts on ramp, spike at top for descent, natural deviation.
P15	20m	Natural belays.
C10	15m	Natural belays.
P40	50m	Bolt, natural belays for scramble to pitch head, two natural belays, bolt rebelay part way down.
One Man and his Dog (P10 up)	15m	Natural and bolt at top.

Underworld

At the first pool, a small passage leads off, through small pools. This drops into a small chamber, with passages heading off in both directions. To the right a climb leads down to a 5m pitch into a chamber. [Alternatively, to the left, climbs and a short pitch lead to the same place.] A climb down through boulders reaches a small passage, which can be followed round several bends. Suddenly some water is met. The passage turns left through a duck, and meets a miserable sump.

Pitch Rope Rigging

Pitch	Rope	Rigging
P5	10m	Two natural backups, bolt.

Knife Pitch to Jack Frost and the Tundra

At the base of knife pitch and to the right, an ascending ramp has been climbed, to a short steeper section onto a ledge. From here a large aven ('who needs divers anyway') was climbed in 2008 on the side wall (well scalloped limestone) to a height of 38m where continuing passage was found. A short pitch of 4m leads to a chamber. Straight ahead a number of climbs were pushed to a series of chambers but no way on. To the right under a low natural arch another chamber is reached. A 10m climb up leads to a very pretty decorated and delighted 'L' shaped chamber / passage "Jack Frost and the Tundra".

Pitch Rope Rigging

Pitch	Rope	Rigging
P20 up	25	2 Thru bolts for 'Y' hang
P10 up	17	2 Thru bolts for 'Y' hang. (Needs rope protector as rub on gritty moon milk flow stone)
P10 up	15	2 Thru bolts
C5 up	15	2 Thru bolts for 'Y' hang as back up for high angle climb
P4 down	10	2 Thru bolts for 'Y' hang (needs rope)
C10 up	20	Naturals (old climbing rope used, needs replacing)

Jack Frost and the Tundra to What am I going to tell the boys?

At the end of the passage a P15m to another chamber with a P7, P7 and a P10 drop down in quick succession to an old sump (now dry). Continuing on through the old sump leads to *Bad Day at the Office* a P15 up. Beyond this the passage turns to the right and continues as a large phreatic passage for 30m before a P24m is met. [Climbing a ramp on the right hand side where the passage turns to the right leads to a bold step over the passage to an alcove. This reconnects above the pitch. A draughty window in the back of the alcove could be an old aven, but is too tight]. The pitch lands in a sandy floored passage. 20m later another pitch is met (P7). From the base of this the passage continues for 55m round a few corners to a final pitch to water *What am I gonna tell the boys?*. The water level is met 24m down the pitch. The water was plumbed to a depth of 20m but may well be much deeper. Traversing across the top of the pitch reaches a blind alcove. Several crawls and climbs were explored in this area in 2009, but not way on was found.

Pitch	Rope	Rigging
P15	10	2 natural belays

P7	10	Natural and thru bolt belay
P7 & P10	50	Natural and thru bolt Y hang, thru-bolt rebelay, thru-bolt rebelay, thru-bolt Y hang
Bad Day at the Office (P15 up)	25	2 naturals for traverse line, thru bolt Y hang, thru-bolt rebelay
P25	30	Natural and thru-bolt for Y hang, thru-bolt Y hang
P7	15	2 naturals for Y hang, Natural Rebelay
What am I gonna tell the Boys? (P24)	40	2 thru-bolt for Y hang, thru-bolt Y hang. Ends in water

Expedition Song – “The Culiembro Express”

To the tune of *National Express* by *The Divine Comedy*

Take the Culiembro Express
 When you're ropes in a mess
 It will make you smile
 All the cavers are here
 From the old guys with beards
 To the young and wild
 To the cave diving eels
 Manhandling their reels
 With paternal (/maternal) pride
 To the student who knows
 That to use one of those
 Would be suicide

And everybody sings “Da da da da da da da
 Da da da da da da da
 Da da da da da da da”



Top left: Hilary and Phil prepare to dive in *Jam Sump* (Photo: Ben Lovett). Top right: Dickon Morris with formation in *Jack Frost and the Tundra* (Photo: Ben Lovett). Right: Fleur with formations in *Jack Frost and the Tundra* (Photo: Robbie Shone). Bottom: Phil in *Cheesecake Streamway* (Photo: Hilary Greaves)



Area Survey



Figure 4: Plan view of caves on the Picos de Cornion. It is believed that the majority of this caves resurge at Cueva Culiembro

Survey: Asopladeru La Texa Survey to 2005 limit

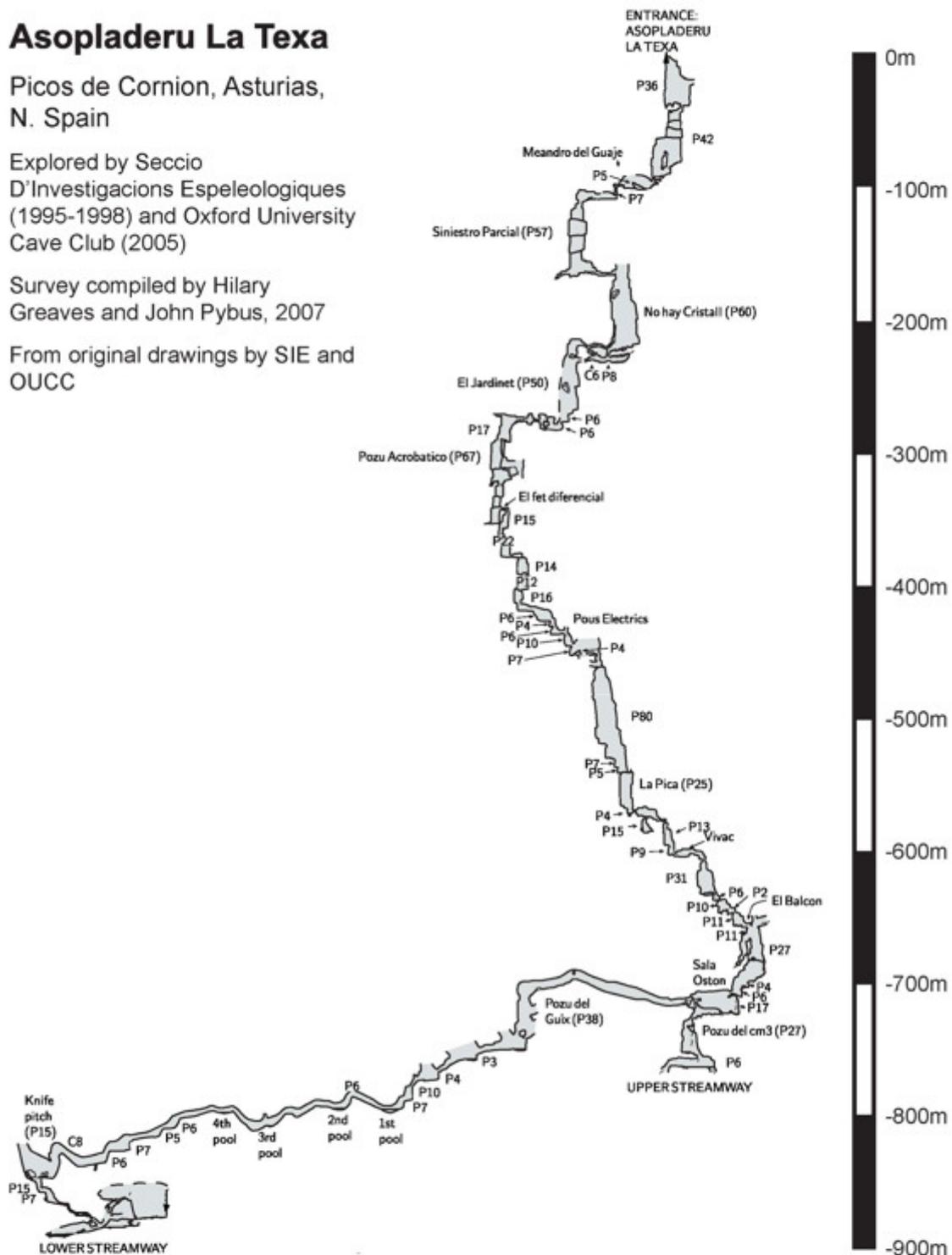
Asopladeru La Texa

Picos de Cornion, Asturias,
N. Spain

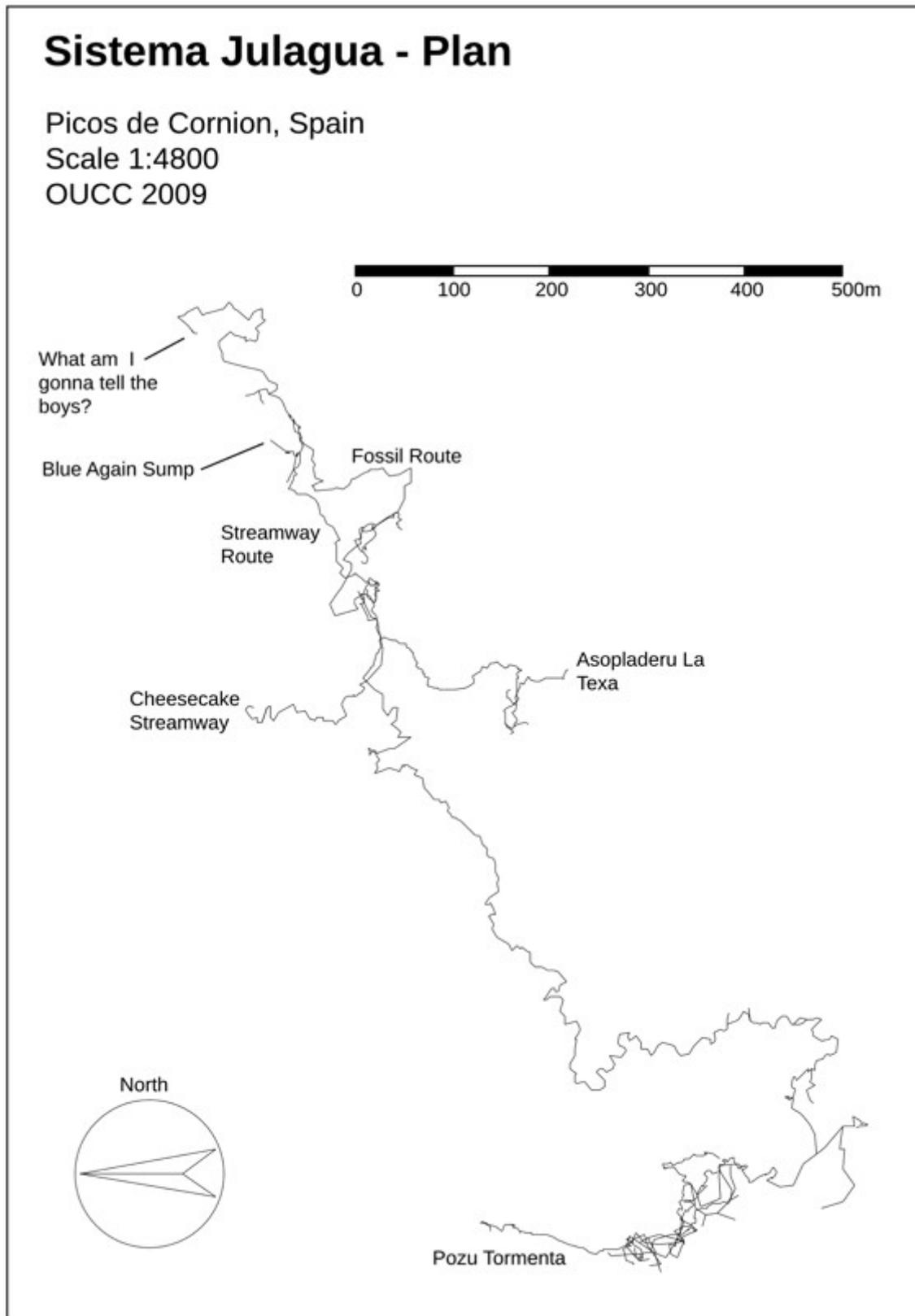
Explored by Seccio
D'Investigacions Espeleologiques
(1995-1998) and Oxford University
Cave Club (2005)

Survey compiled by Hilary
Greaves and John Pybus, 2007

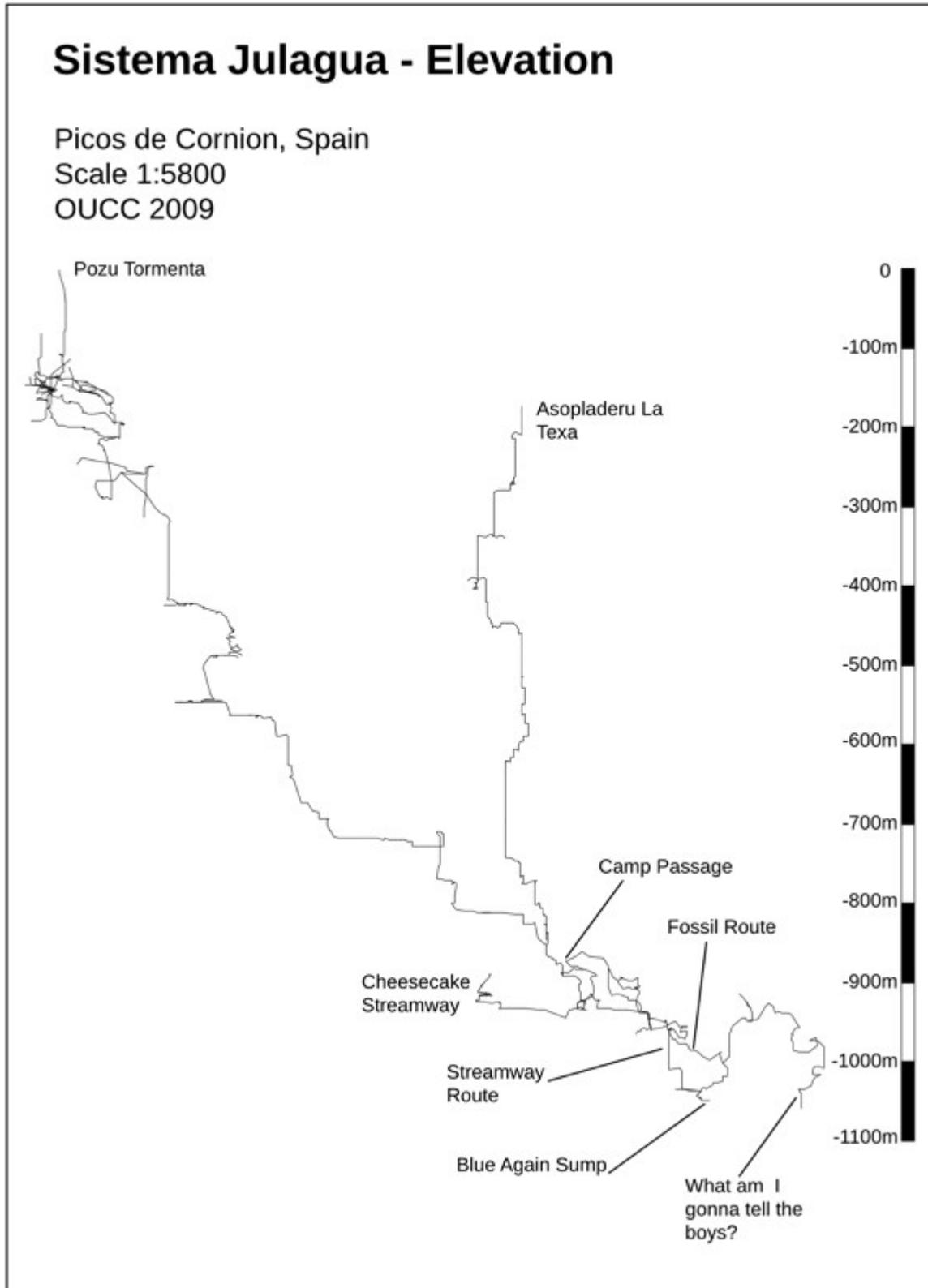
From original drawings by SIE and
OUCJ



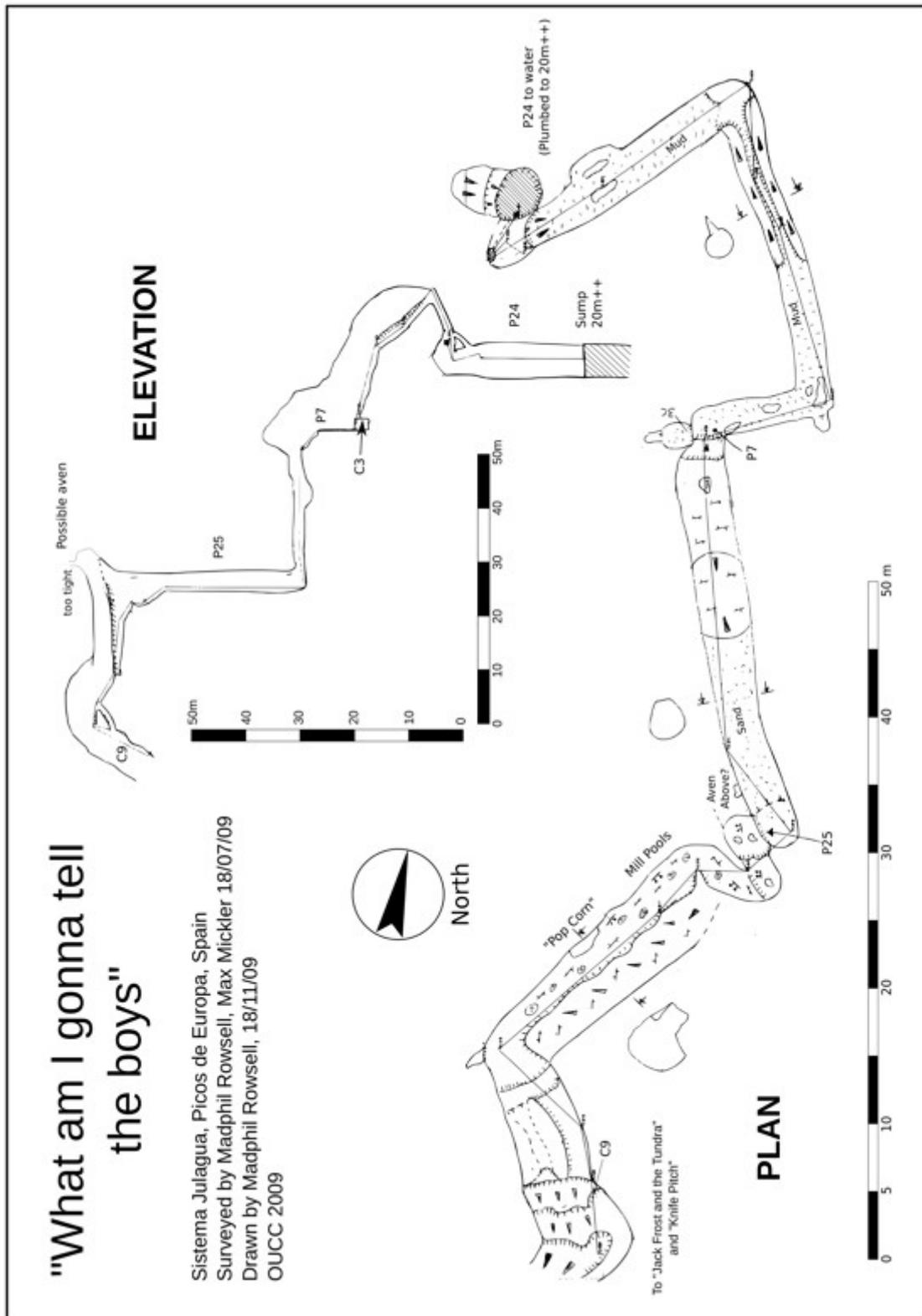
Sistema Julagua – Plan



Sistema Julagua – Elevation



Survey: *What am I gonna tell the boys?*





Formations in Jack Frost and the Tundra. Photos: Robbie Shone (top and bottom right), Ben Lovett (bottom left)



Rescue / Incident Reports

Incident report, 25/7/09 - 26/7/09

On Saturday 25th July Oxford University Cave Club cavers Rosa Clements and Nick Edwards set off from underground camp in Asopladeru La Texa (at a depth of 735m). Having departed underground camp late afternoon, they arrived at the bottom of the second pitch (P42) shortly before 2am to discover that the rope had been pulled far up the pitch. At this point Nick and Rosa were unsure of why or how the rope had been pulled up, but had no option but to sit and wait for help. Luckily they were carrying supplies out from underground camp, and so had with them a sleeping bag and a 2-person tent in addition to the personal survival bags carried by expedition members whilst underground. With these they were able to remain relatively warm and comfortable for the duration of the night.

Remaining on the surface were four expedition members. Although all are competent and experienced cavers, they had limited experience of expedition caving. Three of the four had only recently arrived on expedition, and so were not yet familiar with the cave. With the underground team now more than 8 hours behind their expected time back at surface, and feeling that they were unable to mount a rescue with the manpower and experience available, the surface team fell back on the established callout procedure for caving in the UK and notified the rescue services. They felt it best to call the rescue at this point to avoid losing further time in the event of an injured person below ground. Attempts were made to phone Steve Roberts, the expedition "Home Agent" and also another experienced expedition caver in the UK for advice, but were unsuccessful. The rescue services were called at approximately 8:30am from the radio at the Vega de Ario Refugio.

Meanwhile Andy Wright (UBSS) and Kayleigh Gilkes (UBSS) walked over to the cave entrance. Voice contact was made between Andy and the trapped cavers at 9.20am. Although the distance was too long to communicate properly, they were able to convey the fact that a rope was missing and that they were not injured. Unfortunately neither Andy nor Kayleigh had their caving kits at the cave at that point, and so had to walk back to Ario to collect them. Having done so Andy descended the first two pitches, freeing the caught rope on the way down. Nick and Rosa were then able to exit the cave unaided, and were kindly provided with re-hydration drink and food by the rescue service.

We suppose that the rope had got caught up in the tacklesacks of the previous caver exiting the cave, been pulled up past the rebelay and then become caught over the loop of the upwards rope. Although this seems somewhat implausible, we witnessed it happening again on a later trip; luckily on this occasion the caver noticed and threw the rope back down. Following this we tied off loose rope ends to prevent them being pulled up.

Incident report, 1/8/09 - 2/8/09

Andy Wright, Avelina Künzel and Tom Langan entered the cave at 13:00, planning a trip to the "Brew Stop" at approximately -400m to collect some tacklesacks. Nick Edwards entered the cave shortly after 15:00, followed half an hour later by Chris Sinadinos and Dickon Morris (UBSS). It had been raining off and on all morning, but cleared up in the early afternoon. Shortly after all of the teams had entered the cave there was a thunderstorm accompanied by extremely heavy rain. The sudden influx of a large amount of water caused areas of the cave that are normally dry to become very wet. A flood pulse passed Chris and Dickon at the bottom of "El Jardin" (-257m) shortly before 17:00. The pitch that they were about to descend had suddenly become a waterfall, which would not have been safe to pass. They decided to exit the cave and did so safely, arriving at surface camp early evening.

Andy, Avelina and Tom had reached the brew stop and began progress out of the cave when the flood pulse passed them. Avelina, in the lead, had begun the prussik up Pozu Acrobatico. This pitch also began to take a lot of water, with the section of rope above the lowest rebelay passing through the

main flow of the water. Avelina wisely decided to turn back, and the party returned to the brew stop, a dry and safe place to wait.

Nick had reached the Tormenta confluence at -680m when the flood pulse came through. The cave, normally almost completely dry at this point, now took a sizeable stream. It was still possible to move up and down the lower half of the cave; the stream was at a level that would be considered moderate for a British stream cave. Being so close to the underground camp, Nick considered progressing down to the camp (his planned trip), however the pitches leading down to the Tormenta streamway were extremely wet and not safe to pass. Nick instead headed back out of the cave. All pitches between the confluence and the "Brew Stop" had been rigged in a way that put rope far away from the (unexpected) water.

Nick arrived at the brew stop at about 19:30, and met Andy, Avelina and Tom. With survival bags, a stove, and plentiful supplies of dried food they were able to remain relatively warm and waited for the waters to go down. They checked the water levels on Pozu Acrobatico periodically, but it wasn't until 7am that the levels had dropped sufficiently for the group to begin to exit the cave. At this point the group departed for the surface, arriving between 11 and 12 am on the morning of Sunday 2nd August.

Meanwhile, on the surface, Chris and Dickon had arrived back at camp at around 8pm. It was still raining moderately, and the team were concerned for the safety of the trapped cavers, given that this cave, which we'd never previously known to take any water, had suddenly become extremely wet. There was concern that they may have been on one of the pitches when the flood pulse came through and had got into trouble. Attempts were made to contact experienced cavers in the UK, but unfortunately the team could not get through to anyone. They decided to alert the rescue services to the situation. Three members of the cave rescue team walked up to Ario that evening, and stayed overnight in the Refugio. They then descended the cave in the morning, and met the exiting cavers in "Meandro del Guaje" (-80m). The trapped cavers were able to exit the cave unaided.

Incident Report 25/7/09

Andy, Avelina and Kayleigh departed Ario camp mid morning to go shopping in Cangas de Onis. Dickon told them he would help the divers leaving the expedition to carry their gear down the hill, then either meet Kayleigh, Andy and Avelina at Los Lagos or go back to camp. Instead of returning up the hill Dickon decided to go to Cangas for the night with the divers without telling any of the other expedition members. When Kayleigh, Andy and Avelina arriving back at the Ario camp at 10.30pm, they assumed Dickon was asleep (and didn't check). The next morning Avelina went to wake him at around 09.30am and found that he wasn't there. The group checked around the surrounding area to check that he wasn't there. Andy went to check at the Refugio in case he had stayed there for the night. At the Refugio Andy had to admit that the group hadn't seen him for 24 hours. Laura (one of the Refugio wardens) called Los Lagos to see if they had seen him. When they heard that he had been missing that long they called a helicopter (without the expedition members present requesting this). Meanwhile Avelina and Kayleigh had gone to check our phones and had eventually managed to call one of the divers who told them that Dickon was on his way back, but by then the helicopter had already arrived.

This incident was caused by a failure in communication between expedition members. It is our policy that people should tell other expedition members when leaving camp to go to town. This procedure was not followed in this case. A simple note left on the expedition vehicle or a text message to one of the other members would have avoided an unnecessary call out.

Leader's Report

Preparations for the expedition began as usual at the start of Michaelmas term 2008. Although preparations generally went well, problems were encountered finding sufficient volunteers to fill all of the normal committee roles. In particular, the expedition lacked a deputy leader, secretary and initially a medical officer. This put a much larger burden on the committee members, and in some cases lead to delays in the organisation. Mike Hopley kindly volunteered to help out with the medical preparations, but due to not living in Oxford was unable to co-ordinate arranging medical training sessions. The organisation of the medical training fell to the expedition leader, but was left somewhat later than it should have been. This meant that it was not possible to arrange medical training for a small number of the expedition members. Although we do not feel this jeopardised the safety of the expedition as these members were experienced cavers who had previously undertaken advanced medical training, it was a less than ideal situation as it put us in breach of University regulations. Following discussions with the Expedition Council it was agreed that an exception could be made, but this is not something that the Council will be willing to agree to in the future.

Recruitment of expedition members was a slow and difficult process. Not enough club members were interested in or able to participate in the expedition to make our aims viable, so the decision was taken to recruit from outwith the club. This was not as successful as we had hoped, although some external members were recruited, mainly from the University of Bristol Speleological Society (UBSS). Overall the number of expedition members was good for the first 3 weeks, but suboptimal for the last 3 weeks. We had put in place a policy that members should come out for the start or stay until the end of expedition, so that everyone took a share of the "donkey work" of the expedition. Exceptions were made for those unable to meet this, or those coming for a very short period (1 week or less). Unfortunately many people were only able to come out for the first three weeks, so we were still in the undesirable situation of being left with too few people towards at the end of the expedition. This was a contributing factor to some of the incidents that occurred towards the end of the expedition.

Fast progress was made once the expedition arrived in the field. Despite having a relatively inexperienced team for the first week, the cave was rigged and the first underground camping trip began within one week of arriving at Ario. This allowed exploration to begin quickly and made best use of the next two weeks when numbers on expedition were at a peak. Although we had hoped to discover more passage than we did before reaching an impassable sump, it is satisfying to tick off another lead. Good progress was made with the diving project beyond the upstream "Jam Sump", although it is a shame that the upwards nature of the streamway, requiring time consuming bolt climbing, and diver-power constraints limited the amount of passage discovered here.

The expedition was fortunate to have two excellent cave photographers amongst its members, Ben Lovett and Robbie Shone. This allowed the formations in "Jack Frost and the Tundra" to be well photographed, our new discoveries to be documented, and some of the formations in existing parts of the cave to be further photographed. Dave Rose, an OUCJ 'old-lag' and journalist with the Mail on Sunday "Live" magazine joined the expedition with the aim of writing an article for the magazine. Despite Dave's last expedition being the year that I was born (!), Dave was able to spend some time at underground camp and participate in the exploration. The magazine subsequently published an excellent feature article including some stunning photos of the cave. I think this article successfully communicated the excitement of deep exploratory caving and gave some much-needed good publicity to the sport.

One of the major successes of expedition was the number of expedition first timers who were able to descend to underground camp and spend productive time there. In total seven people had their first experience of underground camping. A number of them had been caving for under a year, so this should be seen as a big achievement, both for them personally and for the expedition in enabling them to get down to camp and back to the surface safely.

Unfortunately very little 'shaft bashing' (exploration of new cave entrances) took place. This was due in part to the large proportion of expedition members at underground camp during the first half of the expedition and the shortage of manpower during the second. Two shaft-bashing trips did take place; unfortunately those involved had no experience of shaft bashing or the Ario area and were unable to locate good areas to look, and so nothing of note was found.

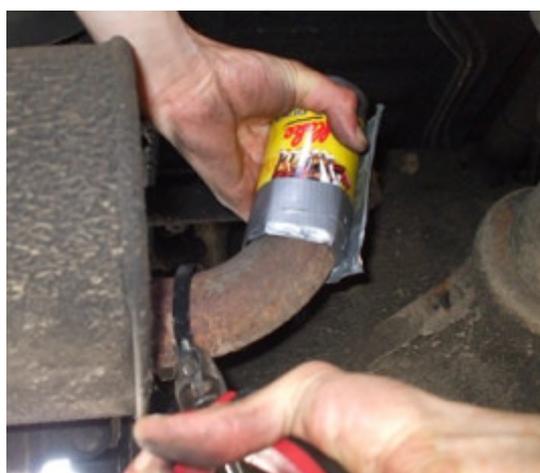
Nick Edwards, March 2010

Logistics

Transport

In past years OUCJ expeditions have been fortunate to be offered the free loan of a Landrover by the Gordon Foundation. Unfortunately we were not able to use the Landrover this year, so other arrangements had to be made. A number of options were explored. An appeal was sent out to OUCJ members to see if anyone knew of a large vehicle we could borrow for the expedition; this was unsuccessful. Various hire options were considered, but proved to either be too expensive or unfeasible. In the end the decision was taken to purchase a vehicle, which would then be sold off at the end of expedition. A 1995 Vauxhall Frontera was purchased for £1100. We reckoned on making a £500 loss on the sale of the vehicle, and spending a further £1000 on tax, insurance, breakdown cover and any repair costs.

Although the Frontera was a fine beast for hauling the club trailer and carrying vast amounts of equipment out to Spain, under the bonnet all was not well. Shortly before departure the starter motor failed and had to be replaced. Around half way through expedition the tail-pipe came apart from the rest of the exhaust system, and had to be mended with Mornflake tins and jubilee clips (yet again proving invaluableity of taking well over my body-weight in Mornflakes on expedition!). As the expedition was due to depart Spain, the radiator sprung a leak and had to be replaced at vast expense. This also meant the expedition leader had to spend an additional week in Cangas de Onis arranging for the repairs. We certainly got our money's worth from the somewhat expensive breakdown cover we had purchased! Finally, on the return journey to the UK the water pump failed at Santander docks, and the vehicle had to be towed from Plymouth to Oxford. Selling the vehicle has proved to be problematic, due to unavailability of expedition members in Oxford to facilitate the



Mornflake can to the rescue! Temporary repairs being made to the Frontera. Photo: Paul Savage

selling. All in all the vehicle has proved to be a lot more expensive and troublesome than we had anticipated. Future expeditions should consider buying a vehicle only as a very last resort and should allow a very large contingency for repairs and breakdowns. Hiring a vehicle for 7 weeks would have cost far less overall than was spent on the Frontera, and would have been much simpler.

New National Park regulations regarding vehicle access to "Los Lagos" were in force this year. The upper car park at the Maria Rosa has been made considerably smaller, and a fence erected around it. The park authorities were not happy with us leaving the expedition vehicle and trailer there for the duration of the expedition. After negotiation, we were able to use one parking space for the trailer for the first two weeks and final week of the expedition. At other times the trailer had to be left in the bottom car park (where the bus station is) along with the expedition vehicle and other expedition members' cars. This adds at least 30 minutes onto a round trip from Ario to the trailer to collect supplies, and made doing more than one carry in a day difficult. Also, the fence surrounding the car park and small size of the bays presented problems with unloading and sorting

gear from the trailer. Additionally, for the month of August the road from Covadonga to Los Lagos is closed between 8am and 8pm, with a frequent (every 10 minutes) bus service ferrying tourists up to the lakes. This presented problems as we did not have the correct pass to use the road during these hours. On a number of occasions shopping trips had to wait at Covadonga until 8pm to be allowed up the road - this meant the walk up to Ario had to be done in the dark. Future expeditions should negotiate with the National Park regarding parking in the top car park, and obtaining a pass to enable us to use the Los Lagos road during the daytime.

Ario camp

As per usual, a surface camp was established at Vega de Ario. For the first half of the expedition we were able to obtain drinking water from the tap at the Refugio, though they asked that we used this only for cooking and drinking.



Relaxing in the Ario camp kitchen shelter. Photo: Robbie Shone

This dried up approximately half way through the expedition, after which we relied on snowmelt. All of the usual problems with bad weather, flooding, cows destroying tents, cows eating clothes, cows eating wetsocks and cows destroying the kitchen were encountered, but coped with.

Food

As usual, some dried food was purchased in the UK prior to expedition, with fresh food being purchased in Cangas de Onis on weekly shopping trips. Although people have suggested in recent years a move to carry only dried foods and meals, I believe the current system works very well. Shopping trips provide a welcome break for expedition members who've spent too long living on top of a mountain, and a varied and exciting diet is very much a morale booster.

Cave food for underground camp consisted of dried pasta meals and rice meals, noodles (as snacks), tuna fish, custard, angel delight and of course flapjacks, mars bars and other chocolates and sweets. For longer camping trips we found that Spanish cheese and chorizo transported well and provided a good morale boost, as did cheesecake (made from packet mix). Plain pasta, onion, garlic chorizo, cheese and stock cube also made very good cave dinners when we were running low on packaged pasta meals, and the novelty of cooking a meal from scratch underground didn't wear off! We found Spanish pasta meals to be of superior quality to ones brought from the UK, but much more expensive at €1 per pack.

This years sponsorship efforts were very successful. Mornflake oats donated a very generous quantity of quick oats, perfect for fuelling a days caving or carrying! We were lucky enough to be donated large amounts of Flapjacks in a variety of exciting flavours from "Dorset Flapjacks" and "Blackfriars flapjacks". These went down very well with our friends from the Spanish "Guardia Civil": in their own words "1 bar, 800 calories!*". I was very surprised that we almost got through the entire stock of donated flapjacks by the end of the expedition. "Humdingers" and "Farmhouse biscuits" also provided tasty treats.

* I'm not sure there are actually 800 calories per bar, but they definitely fuelled me through a lot of 20 hour epics!

Equipment

Phil Leichauer organised the annual club gear order, despite being unable to come on expedition, so many thanks to Phil for taking on this time consuming and often thankless task.

Broad Sword....



... Calling Danny Boy

Cavers at underground (top) and Ario (bottom) camps communicate using the "Sistema Nicola" cave radio. The ability to relay messages between surface and underground camp made logistics far easier and made multi-day underground camping trips far more flexible. Photos: Robbie Shone

Since we anticipated a lot of bolt climbing, a drill was purchased to enable rapid placing of anchors. We were able to get a suitable Makita drill second hand from eBay for just £30. Phil L volunteered to make us high capacity rechargeable battery packs. One huge 9Ah battery was constructed, along with two 4Ah batteries. Although the 9Ah provided almost limitless power, it's weight and size was perhaps too much for ferrying up and down a 1000m deep cave (read "It was a huge pain in the arse to lug around, especially when making airy manoeuvres bolt traversing"). The batteries were charged from two 40W 12V solar panels. These panels provided plenty of power, and enabled people to charge caving lights, batteries, phones and even laptops via an AC inverter. Many thanks to Phil and John for help with the techno crap!

The club's "Sistema Nicola" radio was again put to use to enable communications between underground camp and Ario. As was the case last year, it was found that communications in the evening were almost impossible due to interference, whereas morning communications worked well. The ability to communicate between underground camp and the surface was a great help with planning and organisations, and allowed for long camping trips.

Medical Report

Mike Hopley, Acting Medical Officer

This report comes in three parts: first, an overview of our medical preparation; second, a record of medical incidents in the field; and third, some thoughts and recommendations for future expeditions to consider.

This year, I took responsibility for only part of the work that a Medical Officer would normally do. Nick Edwards, the Expedition Leader, took responsibility for the rest. Consequently, I do not have knowledge of the specific details of some aspects of our preparations this year. Moreover, as I was in the field for the first half of the expedition only, my first-hand accounts of events in the field are limited to that period.

1. Preparation

OUCJ expeditions are long established, and hence our medical preparation varies little from year to year. These are the main aspects of our preparation: arranging basic first-aid training for all expedition members; medical screening of expedition members; obtaining guidance about vaccinations and anti-malarial chemoprophylaxis; maintaining our group first-aid supplies; and providing personal first-aid kits for individual expedition members.

In addition to these medical preparations, the expedition makes other preparations that help to safeguard the health and safety of its members. For example, the expedition prepares a risk assessment, maintains rescue guidelines, and runs a rescue practice. Although these activities are outside the scope of this report, I mention them to illustrate that safety is an ever-present consideration.

All expedition members received basic first-aid training, unless they were deemed to have sufficient recent first-aid training already. The adequacy of each member's first-aid training was assessed by the Director of Training for OU First-aid Unit, Dr. Tariq Qureshi, who reports to (and is a member of) the University Expeditions Council.

This basic first-aid training is our minimum standard. In addition, some expedition members have had more advanced medical training, such as the Advanced Medicine for Remote Foreign Travel course (AMRFT), from the company Wilderness Medical Training (WMT). Although there is no University requirement for doing so, in practice we make sure that at least one person with advanced training is present on expedition at any given time. Typically, more than one such person is present. Nick Edwards, who has in-date WMT Part 1 training, was present throughout the whole expedition; I have out-of-date (but still useful!) complete AMRFT training, and was present for the first three weeks; and some other expedition members also had advanced training.

Pre-expedition medical screening of each expedition member was carried out via a questionnaire. This information is normally returned to the Medical Officer; in this year, it was returned to Nick Edwards, who had taken responsibility for this task. These questionnaires document important information, including allergies, medication, and current and past injuries and illnesses. By default, this information is kept confidential: only the Medical Officer is allowed to see it (this year, Nick Edwards). However, in recent years, we have implemented an opt-in system whereby an expedition member can elect to make some or all of this information public among the expedition. For example, it can be useful to know that the person you are caving with carries an EpiPen to remedy anaphylactic shock.

As usual, we sought guidance about vaccinations and anti-malarial chemoprophylaxis from Dr. Chris Conlon of the OU Occupational Health Service; and as usual, no such vaccinations or prophylactic drugs were required.

Our group first-aid supplies are extensive, and are divided into a variety of kits, for the camps both above and below ground. Surface camp first-aid kits include a general-purpose first-aid kit, a water-purification kit, ordered kits to be taken down the cave in the event of a rescue, and an injections kit (the use of which is restricted to those with suitable training). Another general-purpose kit is kept at underground camp.

As in previous years, we made an inventory of all our first-aid kits, which allowed us to find out-of-date medication, dispose of it, and replace it. We also carried out some minor reorganisation of the first-aid kits. I made up a number of personal first-aid kits for those expedition members who didn't already have one. These are compact kits that all expedition cavers carry with them when underground; the expedition also recommends carrying them when walking on the surface, especially when prospecting for new caves. This year, we reviewed the contents of these kits and replaced a few useless items with useful ones.

2. Incidents in the field

As usual, there were no significant injuries. There were two "rescues" (after I left), but I gather the cavers involved suffered nothing worse than getting cold and tired.

There were quite a few minor injuries – perhaps more than usual. Most of these were minor cuts and grazes from the sharp rock, foot blisters, and sunburn. One patient sustained a troublesome foot wound from walking (or perhaps running) barefoot across an area of sharp karst close to camp. This small wound became infected, but remained manageable in the field; I helped him clean and dress the wound regularly at surface camp, until the infection subsided enough to allow him to go caving safely.

There were two cases of diarrhoea. One was prolonged and rather debilitating; the patient rested on the surface and recovered gradually over about a week. The patient also self-medicated with loperamide (although I recommended against this).

The other case of diarrhoea was during a caving trip. The patient, believing himself to be well, initially determined to continue the caving trip, but was soon persuaded to turn around by his caving partner. The patient took loperamide offered from his partner's first-aid kit, and they left the cave with no further difficulties.

For obvious reasons, we did not allow these individuals to take part in food preparation during their illness, or for several days afterward. Camp hygiene remained good this year, so it is no surprise that these gastric infections failed to spread among the expedition.

3. Thoughts and recommendations for future expeditions

My first recommendations are hardly novel, and are intended as reminders to help expedition cavers (especially new ones) avoid the common, minor injuries:

- Wear gloves while caving. The most ragged hands invariably belong to those cavers who don't! Look for the tougher marigolds (not just the usual yellow washing-up gloves).
- Wear good walking boots and socks; the modern, thinner socks are more expensive but do seem better. Clean socks are better than socks thick with sweat residue, so consider bringing several pairs and washing them when the weather is good. Bring your own supply of blister plasters.
- Bring your own sunscreen, apply it early, and reapply.

My remaining comments concern the medical preparation for expeditions.

In preparing for this year, we greatly reduced the quantity of dressings to be taken on expedition. This was in response to a perception, shared among several members (including myself), that previous expeditions had been taking "enough bandages to mummify the entire expedition". The concern is

valid; we should avoid taking excessive amounts of medical equipment. However, in treating minor wounds this year, I found myself running low on dressings. I recommend that future Medical Officers take into account the following two issues:

First, a good dressing usually requires three different parts: a non-adherent (film) dressing placed in direct contact with the wound; some padding on top, such as gauze, to protect the wound and absorb any exudate; and something to secure the dressing, such as a crepe bandage and a safety pin.

Second, a single wound may require daily changes of dressing (as was initially the case with the foot wound described earlier). Each time, you need all three of these dressing components; and you also need medical cleansing wipes, which we ran out of (I used baby-wipes as a fallback, which I had brought for my own convenience).

Effective pain relief is essential for managing injuries in a remote setting. We have traditionally brought tramadol as our strongest oral painkiller, with our absolutely strongest painkiller being injectable tramadol. This year, I found cause to question the efficacy of (oral) tramadol in treating severe pain, from personal experience: it proved entirely ineffective at treating the moderately severe knee pain I experienced on one occasion walking up the hill. It would be useful to gather other OUCJ members' experiences relating to this drug.

It may be worth assessing the viability of obtaining restricted painkillers (such as morphine or oxycodone) for emergency use on expedition. If someone breaks a leg, I very much doubt oral tramadol would be sufficient to control the pain. Our current policy is essentially, "order the strongest painkiller that WMT will allow us", but I do not know to what extent we have investigated other (legitimate!) sources of painkillers, or the laws relating to obtaining, storing, and distributing restricted painkillers, and transferring them across national borders.

We also might be able to find unrestricted painkillers that are stronger than tramadol (although I can't think of any). It would be helpful to discuss the issue with a consultant anaesthetist, or a pain management specialist, as these are the real experts in understanding pain.

I also suggest that we order some prescription-strength co-codamol (30/500), as this would fill an important gap in our painkiller ladder: currently, we have nothing between paracetamol/ibuprofen and tramadol.

Prior to expedition, there was some email discussion about whether we should be taking injections and intravenous equipment (which may be used, in an emergency and by a trained person, for administering fluids or medication). Besides the hoary old crystalloids vs. colloids debate (which I'm convinced is irrelevant for us), there seems to be a genuine lack of consensus among OUCJ members about whether these preparations are potentially life-saving or potentially life-threatening. My opinion is the former: I believe that this equipment, provided there is at least one trained person on expedition to use it, significantly increases the standard of care that we can provide. But perhaps it is time for us to review the case for taking this equipment. I strongly suggest that any review be conducted in consultation with Dr. Tariq Qureshi.

Finally, I must note that we did not actually have an official Medical Officer this year – I'm writing this as the "Acting" Medical Officer. The Expedition Leader, Nick Edwards, is to be commended for taking up the additional burden; but it is obviously preferable that the Leader should not have this extra workload. Assigning responsibility early means that our preparations will be better; my late involvement led to a reduction in the quality of my share of the medical preparation (although the quality was still good enough).

Of course, it's often difficult to find someone to do the job! Perhaps a good option would be to split the role, as a reduction in individual workload may make it easier to recruit to the committee.

Summary of Accounts

Kitty contributions, which members pay weekly in the field to cover food, fuel and other camp sundries, were raised to €35 this year to account for rising food costs. Kitty came in well within budget, and we were able to enjoy a comfortable diet with plenty of cheap "Vino Tinto". Costs associated with the expedition vehicle were far greater than we had budgeted for. This was covered by the contingency and slight savings in other areas. Overall the expedition broke even, with a slight surplus.

EXPENDITURE	Gross	Income	Net
Administrative costs	234.43		234.43
Personal Equipment	3,076.59		3,076.59
Lost and damaged equipment	82.19	30.85	51.34
Common Equipment (caving)	375.44		375.44
Common Equipment (rigging)	632.08		632.08
Common Equipment (Underground camp)	151.07		151.07
Common Equipment (Surface camp)	516.06		516.06
Vehicle insurance and tax	822.85	412.00	410.85
Vehicle breakdown cover	166.90		166.90
Vehicle maintenance	1292.00		1292.00
Vehicle recovery [1]	374.18		374.18
Vehicle sundries [2]	115.35		115.35
Expedition T-shirts	133.38	88.92	44.46
1st Aid Equipment	125.68	49.00	76.68
Channel Ferry	170.00		170.00
Subsistence and Petrol	1,570.79	1,653.89	-83.10
Total Expenditure	9,838.99		7,604.33
 INCOME			
Mail on Sunday contribution		1,500.00	
Ghar Parau Foundation Grant		700.00	
Oxford University Expeditions Council Grant		1,000.00	
Members Contributions		4,411.72	
Total Income		7,611.72	
 Total surplus / loss		 7.39 (surplus)	

[1] Costs over and above that covered by breakdown, including accommodation and travel for those recovering the vehicle

[2] New trailer lock, numberplate for trailer, oil, warning triangles, trailer keys, oil etc

Typical expenditure of an expedition member

Based on a student spending 6 weeks in the field

Contribution to expo costs	£70
Travel	£130
Kitty Contribution (€210)	£180
Gear purchase / maintenance	£300
Insurance	£30
Total	£710

Oxford University student members of the expedition received support towards their personal costs from the A.C. Irvine Travel Fund.



Paul Savage, triumphant after a long caving trip. Photo: Nick Edwards



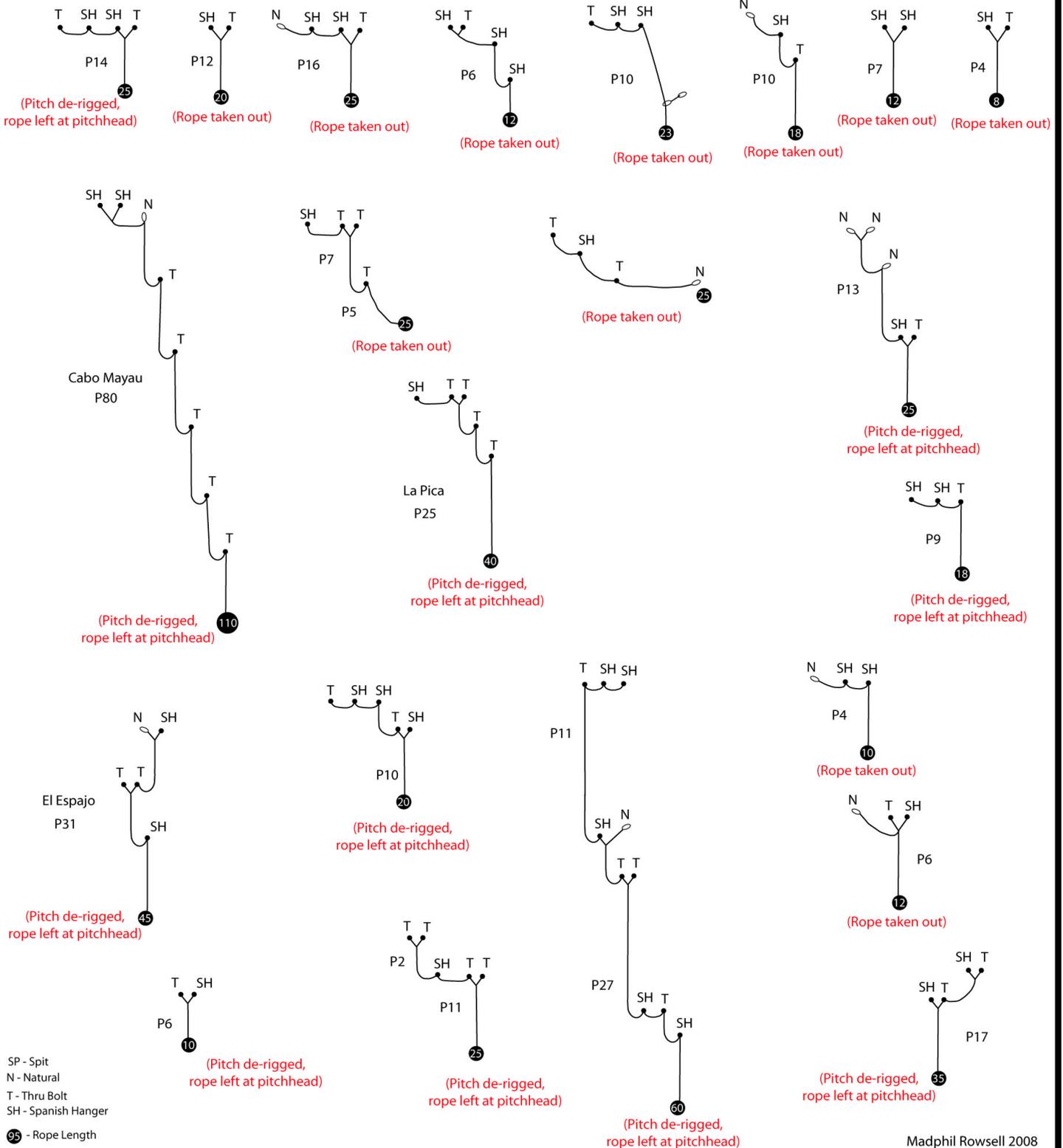
Follow OUCJ to the rainbow's end! Photo: Robbie Shone

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Rigging Topo

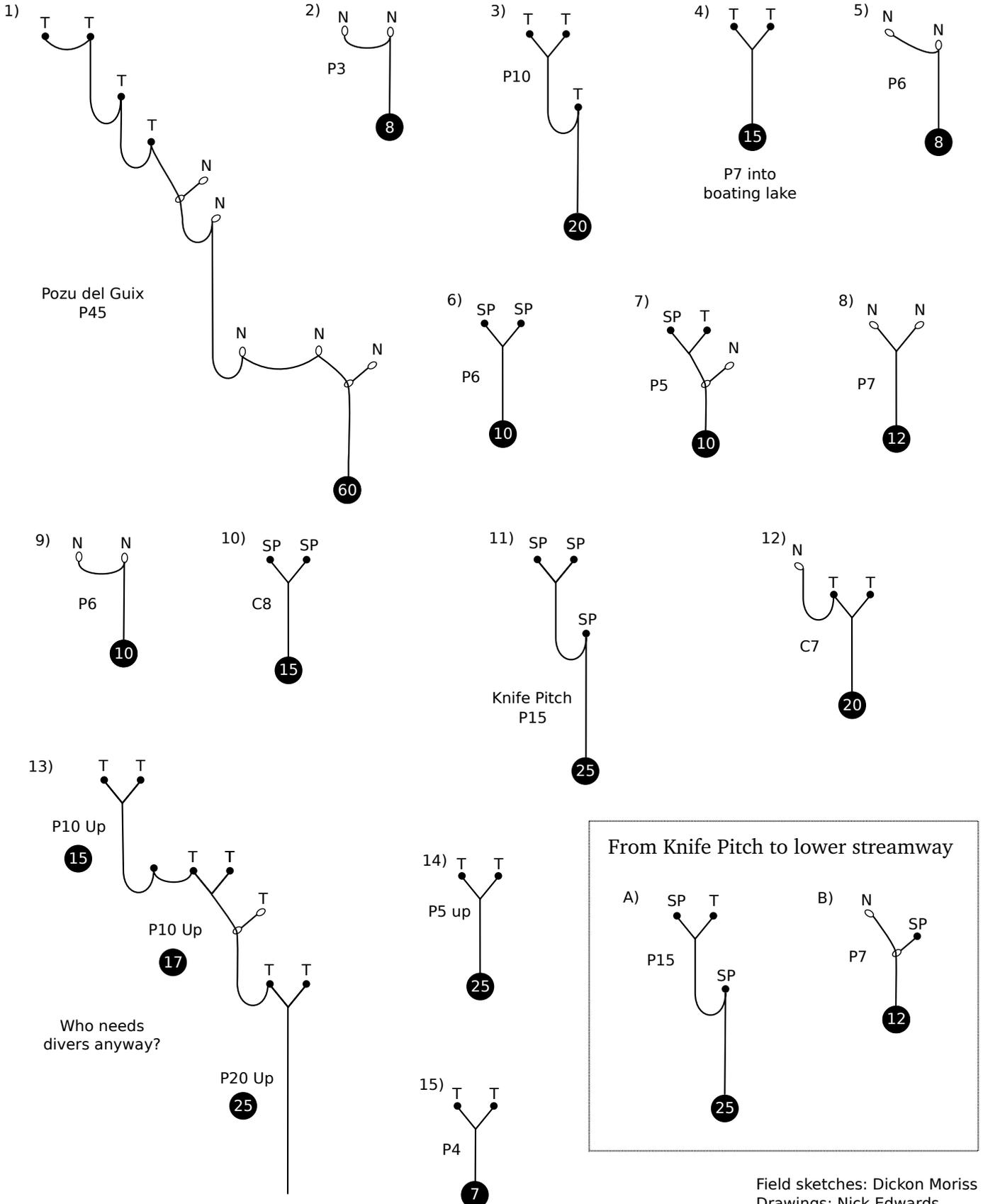
(Camp Rosa to Camp Passage)

LPous Electrics (P14,P12,P16,P6,P10,P10,P7,P4)



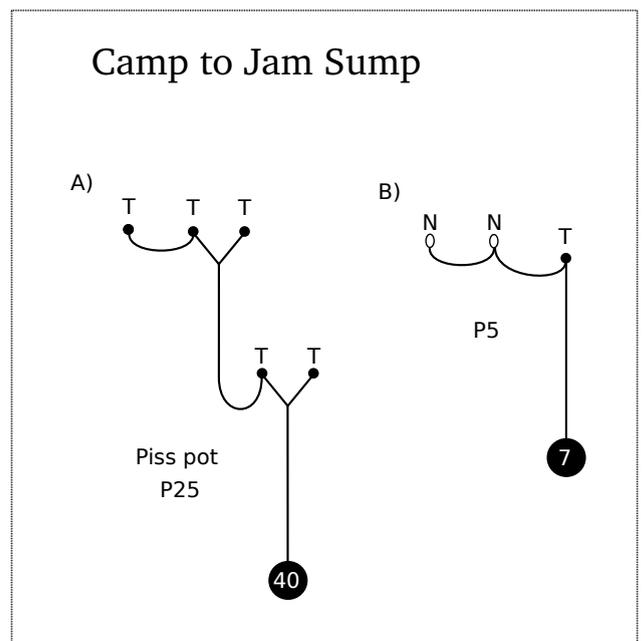
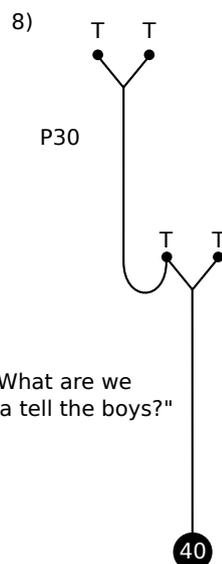
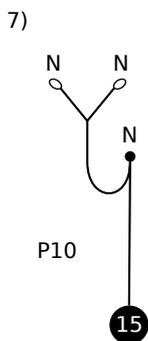
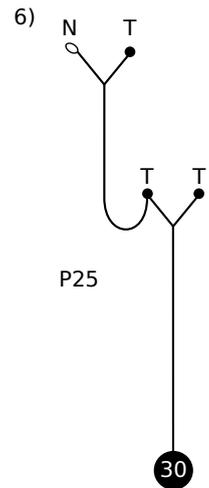
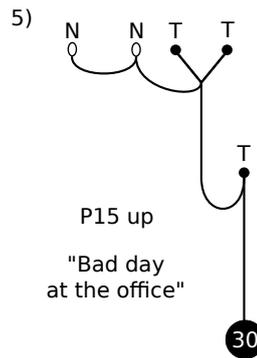
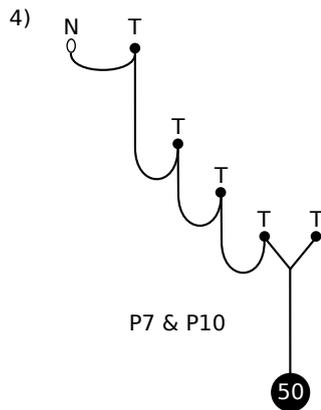
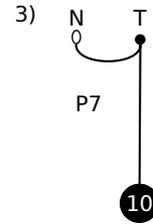
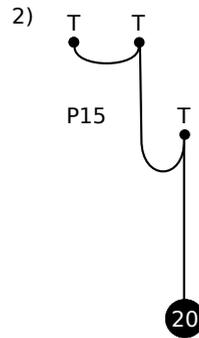
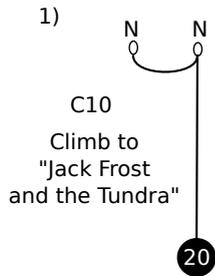
Asopladeru La Texa Rigging Topo

Camp passage to top of "Who needs divers anyway"



Asopladeru La Texa Rigging Topo

Top of "Who needs divers anyway" to "What am I gonna tell the boys?"



Sistema Julagua

2008 & 2009 Extensions beyond

"Who needs divers anyway?"

PLAN

