

Julagua 2008

A caving and cave diving expedition to the
Picos de Europa, Asturias, Spain

28 June - 3 August 2008



Expedition Report

Report prepared by members of the
Julagua 2008 expedition. Edited by Hilary
Greaves.

This report is available online via
<<http://www.oucc.org.uk>>.

For further information, contact:

Hilary Greaves
Somerville College
Oxford OX2 6HD

Cover photo: Madphil Rowsell (left) and
Chris Jewell preparing to dive in Jam
Sump, Sistema Julagua. Photo by Hilary
Greaves.

Abstract



Julagua 2008 was a 5 week, 28 person caving and cave diving expedition to the 1050m deep Sistema Julagua in the Picos de Cornion, Asturias, Spain. The expedition continued the work of the Oxford University Cave Club Asopladeru La Texa 2005 expedition.

The objectives of the Julagua 2008 expedition were to extend the known extent of the system by diving in three known sumps at depths of -887m, -800m and -800m, and bolt-climbing both upstream in a streamway at the bottom of the cave and in a dry aven just before the cave's lower limit.

The expedition met with significant success. All three sumps were dived; two were passed (one was also bypassed), while the third, the lowest, descended to a water depth of 43m and continues. Two sections of streamway passage, previously believed to be carrying distinct streams, were connected. Bolt-climbing in the dry aven led to a well-decorated high level series; this continues, and may afford a bypass to the (deep) downstream sump. A total of 1124m of new cave passage was explored and surveyed.

Oxford University Cave Club plans to continue exploration of this system in 2009.



Julagua 2008 ha sido una expedición que se ha realizado a lo largo de cinco semanas y en la que participaron veintiocho personas entre espeleólogos y espeleobuceadores, esta expedición se ha llevado a cabo en el Sistema Julagua de 1060 metros de profundidad (Picos de Europa, Asturias, España). La expedición continuó el trabajo realizado por el Oxford University Cave Club en la expedición Asopladeru La Texa 2005.

Los objetivos de la expedición Julagua 2008 han sido ampliar el conocimiento del sistema mediante el buceo en los tres sifones conocidos situados a -887m, -800m y -800m, y la escalada en artificial de dos galerías remontantes, así como el meandro activo final y una galería fósil situada justo antes de la galería terminal.

La expedición ha obtenido notables resultados. Los tres sifones han sido buceados; dos de ellos han sido superados, (en uno también se ha encontrado un paso aéreo alternativo), mientras que en el tercero, el inferior, se descendieron 43 metros y el sifón continuaba. Se conectaron dos galerías que anteriormente se creían independientes. La escalada artificial en la galería fósil condujo a una serie de galerías superiores con muchas formaciones que aun no ha sido totalmente explorada y puede constituir un paso alternativo al sifón terminal. Un total de 1124 metros de nuevas galerías fueron exploradas y topografiadas.

El Oxford University Cave Club tiene previsto volver el año 2009 para continuar los trabajos de exploración.



В ходе 5-недельной Экспедиция Хулагуа 2008, в которой приняли участие 28 человек, была исследована пещерная система Хулагуа глубиной 1060 метров в национальном парке Пики Европы, Астурия, Испания. Экспедиция продолжила работу, начатую Спелеоклубом Оксфордского Университета во время экспедиции Асопландеру Теха 2005.

Целью экспедиции было исследование засифонной части пещерной системы (сифоны находятся на глубине -887, -800 и -800) и восхождение в донной части пещеры, а также вверх по течению подземного потока.

Экспедицию можно считать довольно успешной. Были произведены погружения во все три сифона, два из них удалось пронырнуть (второй можно обойти), третий, самый глубокий был пройден до глубины 43 метра и продолжается дальше. Были соединены 2 ветки подземной реки, которые раньше считались разными потоками.

Восхождение в сухой части пещеры привело к серии ходов с красивыми натечными образованиями, эти ходы явно имеют продолжение и вполне могут обходить третий, самый глубокий сифон. Общая протяженность открытых и исследованных ходов составляет 1124 метров.

Спелеоклуб Оксфордского Университета планирует продолжить исследование пещерной системы в 2009 году.

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Overview

Hilary Greaves

Introduction and rationale

Oxford University Cave Club (OUCC) has been exploring deep cave systems in the high karst of the Picos de Europa for thirty years. During this time, an impressive number of deep caves have been found and explored. The deepest, Pozu Del Xitu (-1139m), was, at the time of its original exploration in the early 1980s, the deepest cave explored by a British team and the seventh deepest known cave in the world. Since then, many further systems have been explored, and the continued efforts of successive generations of Oxford cavers have pieced together an increasingly good understanding of the area's hydrology and speleology.

Throughout this time, the cave explorers' "holy grail" has been a connection between one or more of the caves of the High Picos on the one hand, and Cueva Culiembro, the area's main resurgence down in the nearby Cares Gorge, on the other. "Dye trace" experiments have proved the existence of hydrological connections. Yet, to date, the holy grail itself has remained elusive: not a single High Picos cave has been successfully connected to Culiembro by continuously explored cave passage.

Several of the High Picos caves terminate in sumps. Partly due to the logistical challenge and manpower required to mount a diving expedition to the bottom of a deep cave, and partly because OUCC consists almost entirely of "dry" cavers rather than cave divers, none of the sumps in caves explored by OUCC had been dived prior to 2008. At this point, these sump leads offered some of the most probable routes to significant further exploration progress, and some of them certainly offered the greatest chance of the elusive connection to Culiembro.

The downstream limit of Sistema Julagua, in particular, was (at the end of exploration in 2005) a mere 850m horizontally and 75m vertically from the known upstream limit of Cueva Culiembro. There thus seemed to be a real prospect that diving the downstream sump in Sistema Julagua may lead to a connection with Cueva Culiembro, creating a combined system with a depth of 1175m — the deepest in the Western Massif, and the first ever connection between Culiembro and any of the high caves of the Ario area.

Location

The Picos de Europa is a mountain range in northern Spain, roughly 50km south of the coast and halfway between the cities of Santander and Oviedo. The Western Massif is approached from the small town of Cangas de Onís, from where a road winds up past the village of Covadonga and into the mountains. (See Figure 1.)



Figure 1. Location of the Picos de Europa National Park, Asturias, Spain.

The driveable road stops at Lago Ercina, the upper of two lakes. From here, it is a two to three hour walk to a large bowl, the Jou de Ario, where it is possible to camp or to stay in a Refugio. It is then a further one hour walk across some steep terrain from the Jou de Ario to the

entrance of Asopladeru La Texa. (See Figure 2.)

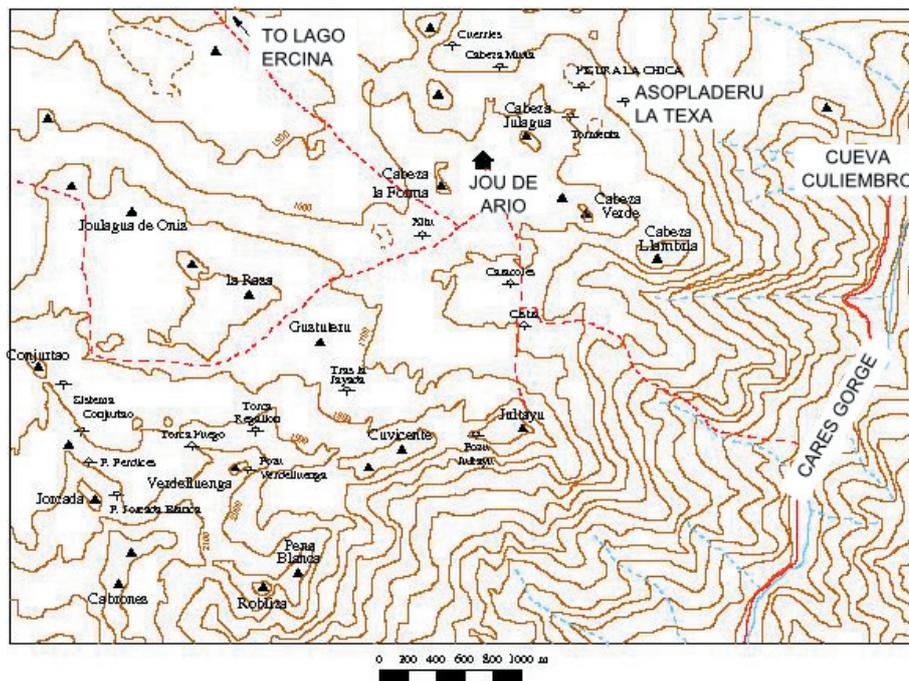


Figure 2. Map showing the upper part of the walking route from Lago Ercina to the Jou de Ario, and the relative locations of Ario, Asopladeru La Texa and Cueva Culiembro.

Asopladeru La Texa: Brief description and exploration history

Asopladeru La Texa is the lower of two entrances to Sistema Julagua. Its entrance is at an altitude of 1372m ASL, near the top of an increasingly steep slope leading down into the Cares Gorge.

Asopladeru La Texa was originally explored by the SIE club of Barcelona, during expeditions in 1980, 1986 and 1995-1998. By 1998, the SIE had explored the cave to a depth of 794m. In 2003, OUCC connected the nearby Pozu Tormenta (a higher entrance, at 1535m ASL) to Asopladeru La Texa, creating a combined system of 964m. In 2005, OUCC returned to the lower limit of the system; a lake that had been thought to be terminal was passed, and passage discovered beyond extended the system's total depth to 1,056m.

The Julagua 2008 expedition used the Asopladeru La Texa route rather than the Pozu Tormenta route into the system, since Asopladeru La Texa is both a lower entrance and easier going than Tormenta. The Asopladeru La Texa route is fairly vertical, and progress is easy relative to the depth passed.

Following the pitch series down from the entrance leads to Sala Oston, a chamber at -720m depth measured from the Asopladeru La Texa entrance. (The connection with Tormenta is just above Sala Oston.) From Sala Oston, the route splits in two. The first route continues to follow the water. This leads to a 31m pitch down into the sizeable Upper Streamway, which quickly sumps in both directions. The second route involves a climb up from Sala Oston into a dry, sandy passage (the location of camps in 2005 and 2008). From here, several hundred metres of passage (including a net 180m of descent) lead down to the Lower Streamway. This quickly sumps in the downstream direction; upstream, the passage was found in 2005 to lead to a 10m high waterfall that was not climbed, with open passage visible at the top. Shortly before the Lower Streamway is reached, a large aven (at the bottom of "Knife Pitch") appeared to take a draught, but in 2005 was judged too difficult to climb, due to moonmilk and mud on its walls. (See the survey on page 4.)

Prior to the 2008 expedition, our speculations were that:

- (a) The Upper Streamway did not flow into the Lower Streamway. (The reasons for thinking this were that (i) Spanish explorers had reported the flow rate in Cabeza Muxa as being 200 l/s, while OUCC estimated that in the Lower Streamway in 2005 as being only 15 l/s, and (ii) a dyetrace experiment between the two streamways in 2005 returned a negative result.)
- (b) The Upper Streamway contained the water from Cabeza Muxa.
- (c) The Upper and Lower streamways were likely to join one another at a confluence downstream of the known portion of either.

On the basis of these speculations, we expected that:

- (a) Diving upstream in the Upper Streamway may lead to a connection with Cabeza Muxa.
- (b) Diving downstream in both the Upper and the Lower Streamway should lead towards, and ultimately could lead to a connection to, Cueva Culiembro.
- (c) Bolting upstream in the Lower Streamway should lead into blank mountain, not heading for any predictable connection to other known

streamways or cave systems.

(d) Dye placed (by the OUCC Fisura La Chica 2008 expedition) in the streamway in the nearby cave Pozu Chicago, which is believed to flow into Cabeza Muxa, should be detected in the Upper but not in the Lower Streamway in Sistema Julagua.

Aims and objectives

The aims and objectives of the expedition were as follows.

Aim

To continue exploration of Asopladeru La Texa, with a particular focus on leads that are likely to lead towards Culiembro.

Objectives

1. To dive the sump at the downstream end of the Lower Streamway, and explore beyond.
2. To bolt-climb up the waterfall pitch at the upstream end of the Lower Streamway, and explore beyond.
3. To dive the sump at the downstream end of the Upper Streamway, and explore beyond.
4. To dive the sump at the upstream end of the Upper Streamway, and explore beyond.
5. If possible, to scale the aven at the bottom of Knife Pitch, and explore beyond.
6. To carry out a dyetrace experiment from Fisura la Chica to the Upper and Lower streamways of Sistema Julagua.

Achievements

All of the stated objectives were tackled, with (technically) the exception of (2):

1. The Lower Streamway's downstream sump (named "Blue Again") was dived to a depth of 43m (extending the explored depth of Asopladeru La Texa from 887m to 930m, and of Sistema Julagua from 1,056m to 1,099m). At the limit of exploration, the passage was still descending, with no immediate sign of levelling out. It was evident that, with the diving equipment that we had with us on this expedition, pushing this sump further would not be sensible. A return, with equipment suitable for deeper diving, is planned in 2009. (See the dive writeup on page 18, and Tony Seddon's article on page 34.)

2. This waterfall pitch was descended, rather than climbed! (See (3), below.)

3. The Upper Streamway's downstream sump ("Ham Sump") was passed (70m length; dive writeups on page 20); a sump bypass (which could have been found by sufficiently persistent dry explorers in 1998 or 2005!) was then immediately discovered. Beyond the sump, continuing stream passage was explored for 357m, down several pitches, to connect with the waterfall previously known as the 'upstream limit of the Lower Streamway' (see Hiulary Greaves' article on pp. 34-6, and Paul Windle's on pages 38-9). This development came initially a surprise, since, for reasons given above, we had previously believed that the so-called 'Upper Streamway' and 'Lower Streamway' were distinct water courses.

4. The Upper Streamway's upstream sump ("Jam Sump") was passed (40m length; dive writeups on pages 19-20). Beyond the sump, continuing stream passage was explored upstream for 300m, terminating at an 8-10m climb requiring bolting. (See Chris Jewell's article, pp.44-6.) The stream passage appears to continue beyond the climb. A return is planned in 2009.

5. The aven at the base of Knife Pitch was noted in 2005 as possibly being the continuation of the large phreatic passage that runs from camp to Knife Pitch, and apparently taking the draught, but the 2005 team judged the aven too difficult to climb, except possibly with ice axe and crampons to climb on slippery mud. In 2008 (however), climbing over several days using a drill and several batteries gained a high level horizontal passage, whose size and character suggests that it is indeed the continuation of the just mentioned phreas. (Part of this phase of exploration is described in Noel Snape's article on pages 36-8.) Despite the fact that the lead was wide open and offered easy progress in an extremely interesting direction, exploration here was called off for 2008 after 385m. The reason was that the passage is extremely well decorated, and hence a good cave photographer should be recruited to document the formations while the cave is still in its pristine undisturbed state. Conservation tape should also be laid by the first team to return, in order to localize (and hence minimize) the damage that will inevitably be caused by the passage of cavers during further exploration. Oxford University Cave Club plans a return, with extreme care, in the summer of 2009.

6. This dyetrace experiment was carried out. Dye placed in Fisura La Chica was successfully detected in Asopladeru La Texa and in Culiembro, confirming that all three systems are hydrologically connected. A full writeup of this experiment appears on pages 16-7 of this report.

In addition to the planned objectives, a brief reconnaissance of Cueva Culiembro, the fossil entrance to the area's major resurgence, was carried out. This was to aid the planning of a proposed diving expedition to Culiembro in 2009. (This reconnaissance trip is written up on pages 21-2.)

Survey: Asopladeru La Texa to 2005 limit of exploration

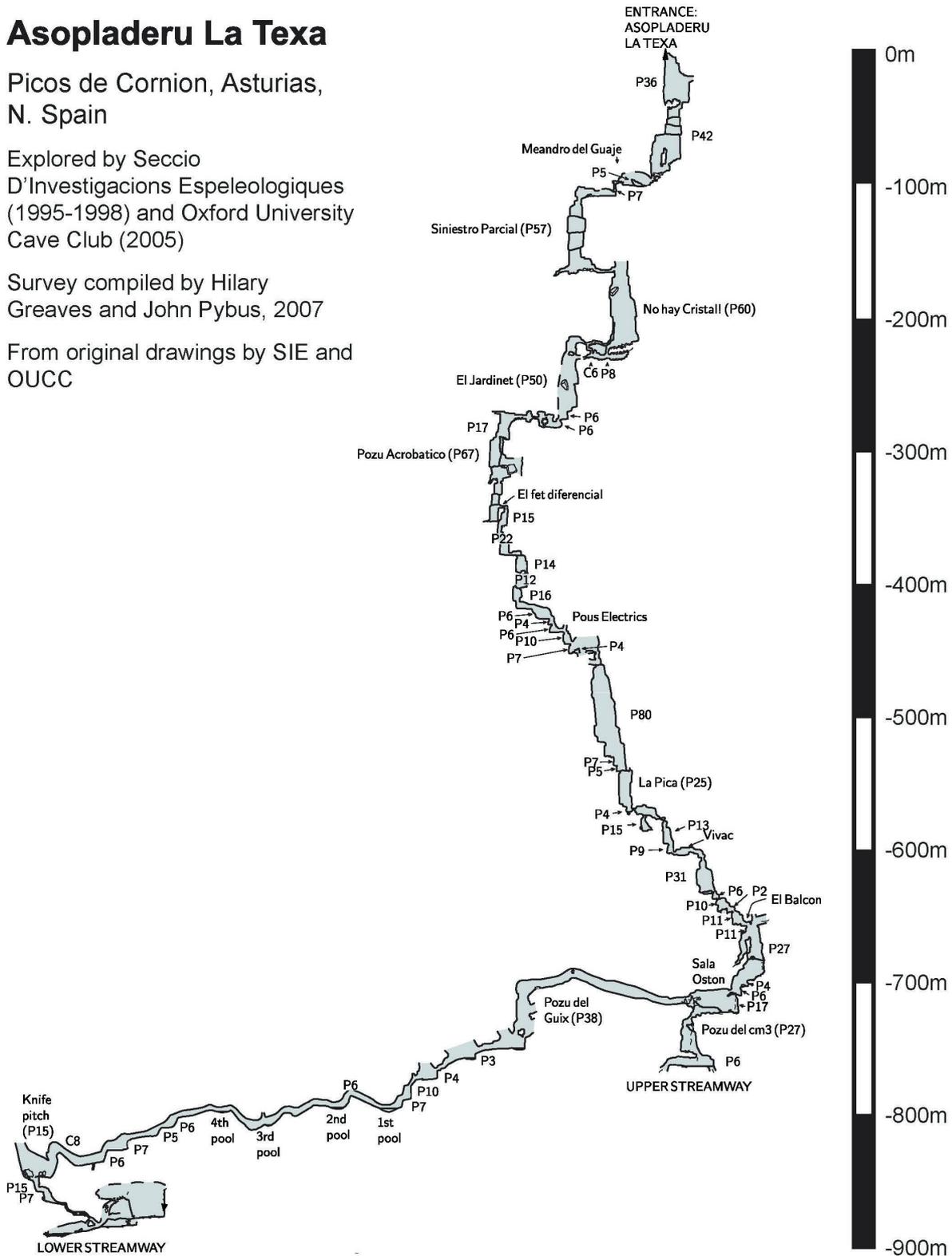
Asopladeru La Texa

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
OUCC



Expedition members

Members of Julagua 2008 expedition

IA	Ilya Akhmetshin	
EA	Earlene Armstrong	Medical officer
RB	Rich "Cave Pornographer" Bayfield	Treasurer
MB	Matt "Martin" Bazire	
HB	Hilde Blancke	
AC	Aileen Connor	
SC	Simon Cornhill	Diver
DD	Damien Datry	
RD	Rudi Debbaut	
MF	Matej Fresard	
RG	Rob "Bouncy bouncy bouncy" Garrett	Deputy expedition leader (field)
HG	Hilary "Bomber" Greaves	Expedition leader; diver
CJ	Chris Jewell	Survey officer; diver
SK	Svetlana Klimenko	
CM	Conal "Pinky" McCartan	
SM	Steve McCullagh	
RO	Richard Overton	Photographer, T-shirt officer
DP	Dmitry "It's normally" Parshin	
MPR	Madphil "Special needs" Rowsell	Food officer; diver
TS	Tony "Giant expensive teabag" Seddon	Diver
AS	Andy Sewell	
NS	Noel Snape	
VS	Vladimir Solomentsev	
WS	Will Stewart	
MT	Martin "Matt" Trerise	
PeW	Pete "Original" Whitaker	
PaW	Paul Windle	
AW	Andrew "Keith" Wright	

Members of OUCC Canal Del Montica 2008 expedition involved in work in Asopladeru La Texa

NE	Nick Edwards	
CR	Chris Rogers	
PR	Pippa Rogers	
OK	Olly "Blackbird" Kreitman	

Expedition diary

Date	Who	What
28.06	SC, HG, MPR	Leave Oxford in expedition Landrover (7.30am)
29.06	SC, HG, MPR	Arrive Cangas (12 noon). Food shop. Drive to Lago Ercina. Carry to Ario. Bivvy at Bufferera
30.06	SC, HG, MPR	Carry, find cave, start marking route from cave entrance to Ario col, repack trailer. Bivvy at Bufferera
01.07	SC, HG, MPR	Carry. Start setting up Ario camp. Carry to cave entrance. Continue marking route between Ario and cave
02.07	SC, MPR	Rig to 'C4 up' below El Jardinet (-280m)
02.07	IA, DP	Set up Ario camp
02.07	HG	Pick up permit (Cangas), meet Juan Jose Gonzales Suarez (Oviedo), pick up first OUCC arrivals, food shop. Bivvy at Bufferera
03.07	HG	Carry
03.07	SC, MPR	Rig to bottom of Cabo Mayau (-540m)
03.07	HG	Porter to El Fet Diferencial (-350m)
04.07	IA, DP	Rig to top of P13 below Cabo Mayau (-580m)
04.07	HG	Finish marking route from Texa entrance to Ario col
04.07	SC, MPR	Carry
05.07	IA, SC, DP, MPR	Food shop, carry
05.07	HG	Set up Ario camp
06.07	IA, SC, DP, MPR	Prepare gear for underground camp
06.07	RG, HG, TS	Sort dive gear at Lagos
06.07	AC, RG, HG, SM, CM, TS	Carry
07.07	IA, SC, DP, MPR	Ario to underground camp (U)
07.07	SC	Radio checks (underground)
07.07	RG, HG	Radio checks (surface)
07.07	RG, HG, TS	Carry
07.07	SM	Porter to camp (-700m)
07.07	AC, CM	Porter to Pous Electric (approx. -430m)
08.07	IA, SC, DP, MPR	Rig and porter to Knife Pitch (-770m) (U)
08.07	RG, HG, TS	Porter to camp (-700m)
08.07	AC, CM	Radio checks (surface)
08.07	SM	Airport pickup
09.07	SC	Retrieve extra rope from higher up cave (U)
09.07	IA, SC, DP, MPR	Rig to bottom of cave (-960m). Porter to Lower Streamway downstream sump ("Blue Again"). Preliminary assessment of Knife Aven and Lower Waterfall climbs (U)
09.07	SC	Recce Lower Streamway downstream sump (U)
09.07	RG, HG, TS	Prepare gear for underground camp
10.07	IA, SC, DP, MPR	Check out 'Dima's lead' (connects to Mud Mines) and left-hand pitch from Poo Corner (connects to base of first Spanish pitch below camp). Underground camp to Ario
10.07	AC, RG, HG, TS	Ario to underground camp (U)
10.07	SM, EA	Place dye detectors at Culiembro resurgence
11.07	AC, RG, HG, TS	Porter to Lower Streamway downstream sump (U)
11.07	TS	Dive Lower Streamway downstream sump (43m depth, 85m line laid). (U)
12.07	TS	Search for shallower ways on in Lower Streamway downstream sump. No success. Lead abandoned for this year (too deep) (U)
12.07	HG	Dive support. Place dye detectors and estimate flow rate in Lower Streamway (U)
12.07	AC, RG	Hand-bolt climb from top of Knife Pitch. Does not go (U)
12.07	AC, RG, HG, TS	Porter from Lower Streamway downstream sump back to underground camp (U)
12.07	DD, CM	Ario to underground camp (U)
13.07	TS	Dive Upper Streamway downstream sump ("Ham Sump"; 34min, <10m depth, 30m line laid). Still going — routefinding complicated (U)
13.07	HG	Dive support. Place dye detectors and estimate flow rate in Upper Streamway (U)
13.07	DD, CM	Check out right-hand shaft (Piss Pot) from Poo Corner. Free-climb down 5m. Might go
13.07	AC, RG	Underground camp to Ario (U)
14.07	TS, HG	Dive Upper Streamway downstream sump, find bypass! Push/rig Diver's Dilemma to head of Multilingual. Out of rope (U)
14.07	DD, CM	Underground camp to Ario
14.07	GL	Place dye in Pozu Chicago
15.07	HG, TS	Survey from head of Multilingual back to base of Spanish pitch in Upper Streamway (1/2 U)
15.07	SC, SM, MPR, NS	Ario to underground camp (U)
15.07	SC, MPR	Continue Knife Aven climb (U)
15.07	SM, NS	Tourist trip to Lower Streamway (U)
15.07	HG	Underground camp to Ario (portering)
16.07	TS	Dive Upper Streamway upstream sump ("Jam Sump", 10m depth, 40m length). Sump passed. 100m of stream passage pushed beyond, to 5m climb ("Ambidextrous") (U)
16.07	NS	Check out phreas around head of Diver's Dilemma. Nothing goes anywhere new (U)
16.07	SC, TS, NS	Push first 17m of Multilingual. Figure out that Piss Pot connects to Lower Downstream sump bypass... (U)
16.07	MPR	Continue climbing above Knife Aven. Push rope climb (U)

16.07	MF, SK, VS	Bounce to Camp Rosa (-380m). Porter equipment down, remove rubbish from Camp Rosa and old Spanish brew site
17.07	SC, NS	Check out leads from top of P17 down into Sala Oston, and near Piss Pot (U)
17.07	SK, VS, PW	Ario to underground camp (U)
18.07	SC, SM, NS, MPR	Push pretty extensions beyond Knife Aven climbs. Lead abandoned for this year (too pretty). Underground camp to Ario
18.07	SK, VS, PW	Rig Piss Pot. Recce route from Piss Pot to Multilingual (U)
18.07	NE, RO, AW	Leave Ario, intending to go to underground camp. Turn back at -200m due to exhaustion of RO. NE returns to Ario to call out reinforcements
18-19.07	HG, RG, TS, GL, DL, GP	Callout. Food, stove, water, sleeping bags taken down cave. HG and RO sleep overnight at head of No Hay Cristal! Exit in the morning without further significant difficulty, with assistance from TS
19.07	SK, VS, PW	Push remainder of Multilingual; push on to bottom of following 20m pitch
20.07	SK, VS, PW	Push downstream; make connection to Lower Streamway. Survey and derig back to head of Multilingual
20.07	NE, CR, PW, AW	Ario to underground camp (U)
21.07	CR, AW	Re-check phreas in sump bypass — nothing goes anywhere new. Preliminary investigation of possible leads in camp passage. Photography (U)
21.07	NE, PW	Check out lead at head of Multilingual. Does not go (U)
21.07	SK, VS, PW	Underground camp to Ario
21.07	RB, HG, CJ	Ario to underground camp (U)
22.07	HG, CJ	Dive through and survey Cheesecake Streamway, from Upper Streamway upstream sump to base of Ambidextrous. Climb Ambidextrous. Push a further 150m upstream, to the base of an 8-10m climb. Check out phreas leading off from enormous passage/chamber at base of climb (U)
22.07	PeW	Porter for divers (U)
22.07	RB, PeW	Survey Piss Pot route into sump bypass (U)
22.07	MPR	Ario to underground camp (U)
22.07	RD, OK, WS	Acclimatization trip
22.07	NE, CR, AW	Underground camp to Ario (portering)
23.07	CJ, MPR	Dive through and survey Cheesecake streamway, from base of Ambidextrous to limit of exploration. Preliminary investigation of 8-10m climb at limit of exploration (U)
23.07	HG	Porter for divers. Photography in Upper Streamway (U)
23.07	RB, HG	Collect dye detectors from Upper and Lower Streamways and Sala Oston. Photography en route from camp to Lower Streamway. Replace rope on climb above Knife Aven. Preliminary photos of passage towards pretties. Derig from Lower Streamway back to First Pool (U)
23.07	RD, WS	Ario to underground camp (U)
23.07	PeW	Underground camp to Ario (portering)
23.07	RG, SK, VS	Collect dye detectors from Culiembro resurgence
24.07	RD, WS	Underground camp to Ario (portering)
24.07	CJ, MPR, RB, HG	Derig from First Pool back to camp. Wash ropes. Pack bags. Porter packed gear from underground camp to Camp Rosa, hauling up the pitches (U)
24.07	RG, VS	Bounce to -620m (portering), where derig team is met
25.07	RB, HG, CJ, MPR	Dismantle underground camp. Derig and porter all remaining gear from underground camp to Camp Rosa. Exit cave (portering)
25.07	SK, OK, CR, PiR, PeW	Bounce to Camp Rosa (portering)
26.07	MB, AS	Bounce to -200 (portering)
26.07	PiR, VS, MT	Bounce to Camp Rosa (portering)
27.07	RB, HG, CJ, MPR, WS, PeW	Derig/porter from Camp Rosa to entrance. Porter gear from entrance back to Ario
27.07	MB, RG, SK, MT, PaW	Porter gear from entrance back to Ario
28.07	All	Carries from Ario to Lagos
29.07	All	Carries from Ario to Lagos. Rope- and metalwork-washing in Cangas
30.07	RG, HG, CJ, MPR	Cangas to Cain. Recce route to Culiembro cave. Find entrances to active and fossil resurgences
30.07	MB, MT	Ario to Culiembro (via Trea path)
30.07	MB, RG, HG, CJ, MPR, MT	Recce route through cave to first sump. Survey from duck back to entrance
31.07	RG, HG, CJ, MPR	Porter dive gear between entrance and first sump
31.07	CJ	Dive through first sump and recce passages beyond
31.07	HG, MPR	Survey from first sump back to duck
31.07	RG	Check out side passages between entrance and duck
31.07	RG, HG, CJ, MPR	Cain to Lagos (by road)
31.07	MB, MT	Cain to Ario (via Trea path)
01.08	All	Pack Landrover and trailer at Lagos
01.08	HG, MPR, PaW	Visit Juan Jose (Oviedo). Start drive home (3pm)
02.08	HG, MPR, PaW	Arrive back in Oxford (9pm)

(U) indicates work carried out by teams sleeping at underground camp on the night in question.

Cave documentation

A survey of the Asopladeru La Texa route into Sistema Julagua, to the 2005 limits of exploration, is included on page 4. The combined Sistema Julagua survey (including Pozo Tormenta, Asopladeru La Texa, 2005 and 2008 extensions) is currently in preparation.

Asopladeru La Texa cave description and rigging guide

Madphil Rowsell and Hilary Greaves

The cave description and rigging guide below are updated from that published in the OUCS Asopladeru La Texa 2005 expedition report. (Many pitches were rebolted in 2008 to make the SRT easier for portering dive gear.)

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 Oston. UTM 0345070 4789670, altitude 1372m.

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 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 is a second short pitch (P7), with a constriction halfway 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
Entrance pitch (P36)	45m	Two thru's and one Spanish hanger for top of pitch. Bolt rebelay at -8m and -12m.
Second pitch (P42)	55m	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.
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 -25m, thru bolt rebelay at -50m.
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.

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 Jardinete, split by a ledge 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 this 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
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) Some Spanish hangers were missed in 2008, higher up on the pitch. Using them would give a better rig.

Pozo Acrobatico to Cabo 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. An inlet enters at this point, the site of a brew-stop in 2005.

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
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 thru bolt rebelay.
P7	11m	2 Spanish hanger Y-hang.
P4	7m	Spanish hanger and thru bolt rebelay.

Cabo Mayau to Sala Oston and Camp Passage

Cabo Mayau 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. Scrambling and traversing leads over a blind 15m pitch, to a 13m pitch, followed immediately by a 9m pitch. This lands in a chamber ("Vivac"), where the SIE set up a camp.

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
Cabo Mayau (P80)	110m	2 Spanish hangers for back up, wire belay, thru bolt rebelay at -9m, 4 more thru bolt rebelays at roughly 15m spacings.
P7 & P5	25m	Spanish hanger and 2 thru bolts for y hang. Thru bolt rebely tied into previous pitch.
La Pica (P25)	40m	Spanish hanger for back up, 2 thru bolts for 'y' hang, thru bolt rebelay at -6m, 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	60m	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 2nd 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.
P6 up	10m	Backed up to traverse, bolt, tied of to natural at bottom.
Tyrolean traverse	10m	Two bolts on each side.
Handline 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 flow rate in this streamway was estimated by the Spanish 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 down-cave 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 Pozo del Guix. (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 the horizontal phreas that connects 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 depth of 43m; exploration continues.

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?	?
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 that requires bolt-climbing. [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 and steepness 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 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 float 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 the Second 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 the 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 the Fourth Pool, much shallower than the previous.

Ahead, the passage suddenly changes character: the muddy floors are replaced by brilliant calcite surrounding gour 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
First Spanish Pitch:Pozu 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.
2nd Spanish Pitch (P3)	5m	Natural belays.
3rd Spanish Pitch (P10)	15m	Bolt, bolt at -3m.
4th Spanish Pitch (P7)	11m	2 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 up	15m	Two bolts, one either side of ridge.
Knife Pitch (P15)	25m	Main Y-hang bolts shared with C8 up, 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 shaft at the top of the Spanish Pitches can be crossed via a traverse, Songs of Praise, on the left. The traverse lands on a ledge overlooking the shaft. To the left is a choke that 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
Songs of Praise (traverse)	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 partway down.
One Man and his Dog (P10 up)	15m	Natural and bolt at top

Underworld

From the dry bank on the right of 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 leads down a climb 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
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') can be ascended via four pitches (P20 up, P10 up, P10 up). A further short climb (C5 up) immediately followed by a short pitch down (P4) leads to a chamber. [Straight ahead a number of climbs have been pushed to a series of chambers, but with no way on.] To the right under a low natural arch another chamber is reached. A climb (C10 up) leads to a delightful, well-decorated, 'L' shaped chamber/passage, "Jack Frost and the Tundra". At the end of the passage a pitch down (P15) leads to to another chamber followed by three

further pitches (P7, P7, P10) in quick succession to an old sump (now dry). Continuing through the old sump leads to a relatively easy free climb that has not been ascended.

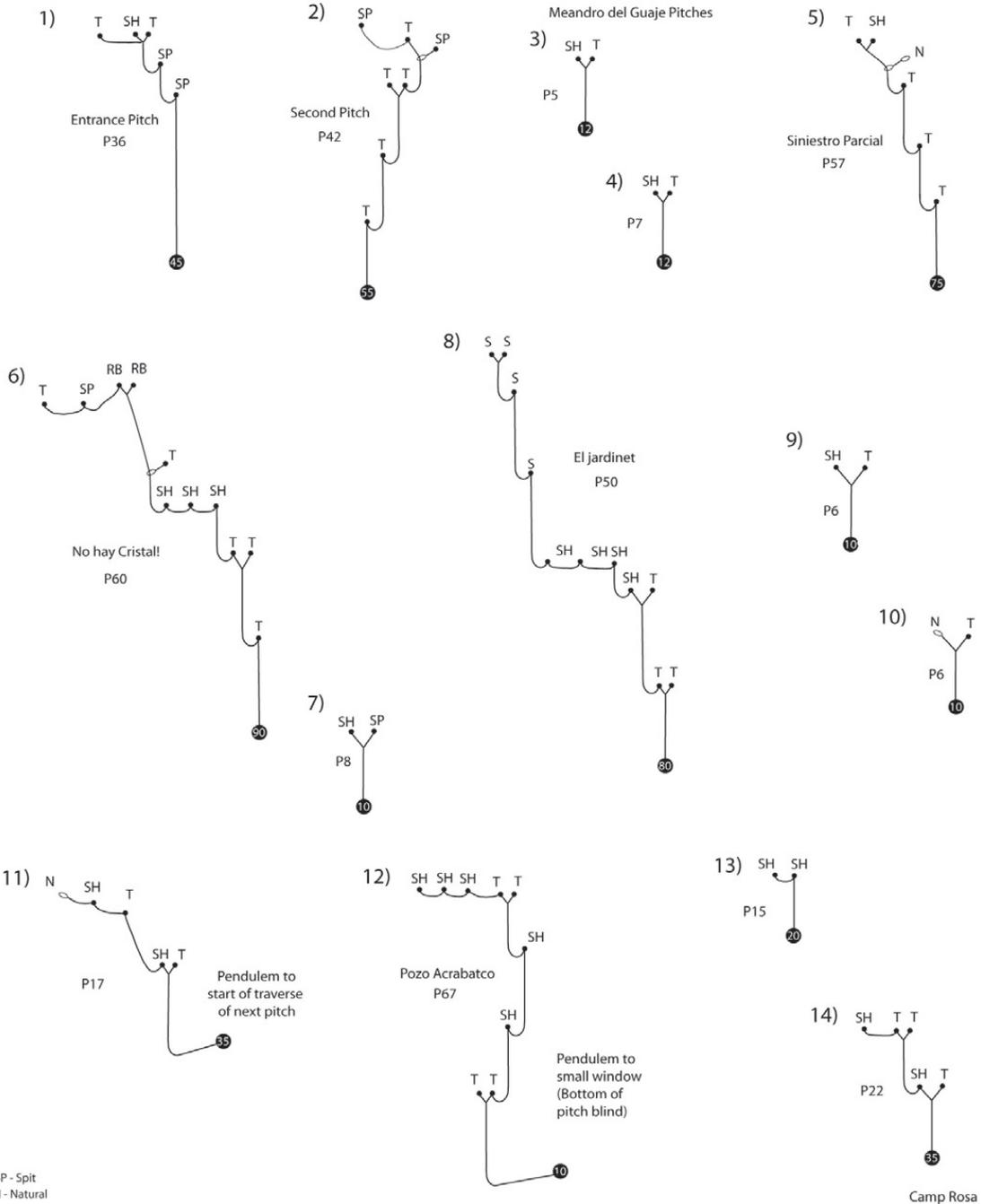
NB Apart from the aven pitches, all other pitches were rigged in 2008 with minimal gear, and require re-rigging properly.

Pitch	Rope	Rigging
P20 up	25m	2 Thru bolts for 'Y'hang
P10 up	17m	2 Thru bolts for 'Y'hang.(Needs rope protector as rubs on gritty moon milk flow stone)
P10 up	15m	2 Thru bolts
C5 up	15m	2 Thru bolts for 'Y' hang as back up for high angle climb
P4	10m	2 Thru bolts for 'Y' hang (needs rope)
C10 up	20m	Naturals (old climbing rope used, needs replacing)
P15		(Minimal in 2008)
P7		(Minimal in 2008)
P10		(Minimal in 2008)

Rigging topos: Entrance to Camp Passage

Madphil Rowsell

Asopladeru la Texa Rigging Topo (Entrance to Camp Rosa)



SP - Spit
N - Natural
T - Thru Bolt
SH - Spanish Hanger
35 - Rope Length

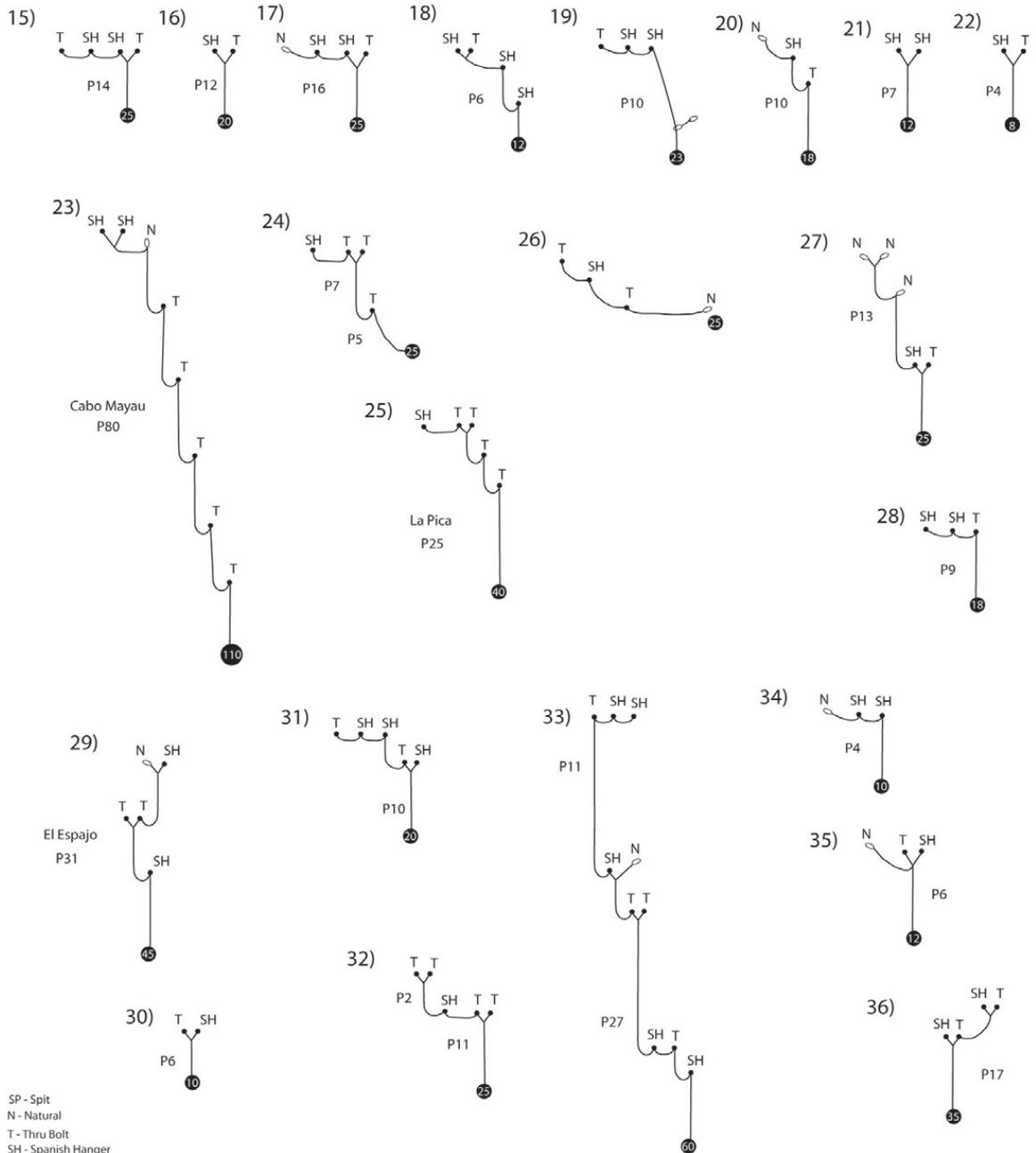
Madphil Rowsell 2008

Asopladeru la Texa

Rigging Topo

(Camp Rosa to Camp Passage)

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



SP - Spit
 N - Natural
 T - Thru Bolt
 SH - Spanish Hanger
 95 - Rope Length

Madphil Rowsell 2008

Dyetrace report

Lou Maurice and Hilary Greaves

Dye tracing study

The objective of the tracer test was to establish whether the streamway above Vamos pitch in Fisura La Chica is connected to either the 'Upper Streamway' (now known as the section of the main streamway between Ham and Jam sumps) or the 'Lower Streamway' (now known as the section of the main streamway just upstream of Blue Again sump) in Sistema Julagua. These pairs of sites are, respectively, 455m and 516m apart horizontally, and 462m and 577m apart vertically. The secondary objective was to confirm that both Fisura La Chica and Sistema Julagua are connected to the Culiembro resurgence, which is 2km horizontally from the injection point and approximately 700m below it.

100ml Sodium Fluorescein dye tracer was injected into Fisura La Chica above Vamos pitch by Gavin Lowe on 14th July at approximately 1400 hrs. Two charcoal detectors were placed each of the Lower Streamway (12th July, approx. 1400 hrs), Upper Streamway (13th July, approx. 1400 hrs) and Sala Oston (13th July, approx. 1800 hrs) in Sistema Julagua, all by Hilary Greaves. These were retrieved by Hilary Greaves on 23rd July at approximately 1300 hrs (Lower Streamway) and 1800 hrs (Upper Streamway and Sala Oston). Single charcoal detectors were placed in Culiembro resurgence by Steve McCulloch and Earlene Armstrong on 10th July at approximately 1500 hrs. One detector was placed as a control on the true right of the river, about 15m upstream of the resurgence; a second detector was placed on the true left, about 5m downstream of the resurgence (just upstream of the bridge). These were collected by Rob Garrett on 23rd July at approximately 1500 hrs.

Back in Oxford, charcoal from the detectors was placed in an elution buffer solution. The sample from Lower Streamway had a faint green fluorescent tinge under a fluorescent lamp. The elutant from each sample was decanted and put into a fluorometer to measure the fluorescence. Raw elution buffer was measured for comparison. Results are presented in Table 1. The first batch of analysis was undertaken on samples for which there were two detectors. The second batch of analysis involved analysing the second sample from these sites and the two single sample detectors from Culiembro.

The elution buffer provides a rough indication of the "background" fluorescence, although actual background fluorescence of charcoal detectors placed in streams is likely to be higher.

The fluorescence of the samples from Sala Oston is not substantially higher than that of the elution buffer, and therefore tracer was almost certainly absent from this site.

The first charcoal detector from Lower Streamway was strongly positive (132 mV) indicating that tracer was definitely present at this site. The second sample had a much lower reading (22 mV). This could be because the elutant was prepared several weeks before the samples were analysed, and the fluorescence could have degraded. However, the sample contained a lot of charcoal pieces that may have affected the reading.

The two samples from Upper Streamway had similar fluorescence (~ 4 mV). Although it is clear that tracer was present at this site, the concentration appears much lower than that at the Lower Streamway site. We are not sure of the reason for this. One hypothesis is that this is due to an additional input of tracer between the Upper Streamway site and the Lower streamway site. However, the only known inputs of water between these two sites is water entering from Sala Oston, which had very low fluorescence as mentioned above. While it is possible that there is an additional input of water somewhere in Ham Sump, it seems unlikely that the water course from Fisura La Chica is splitting somewhere upstream of Sistema Julagua and then rejoining in Ham Sump. A second, and more probable, hypothesis is that the difference is due to flow speeds at the respective detector locations. The amount of dye absorbed onto the charcoal detectors is proportional to the amount of flow that passes the detector. It is therefore likely that the Lower Streamway samples were in a faster flowing section than the Upper Streamway samples causing the differences in the amount of tracer measured. This is plausible on the basis of memory, although flow speeds at the detector sites were not measured.

The charcoal detectors were retrieved 9 days after the injection, indicating that the travel time between Vamos in Fisura La Chica and the Lower/Upper Streamway in Sistema Julagua is less than 9 days. However, given how close the monitoring sites are to the injection site is likely that the travel time was substantially less than 9 days.

Single samples from two sites at Culiembro resurgence were both positive and contained similar quantities of dye (~ 90 mV). The charcoal detectors were recovered 9 days after the injection indicating that the travel time to Culiembro is less than 9 days. For comparison: tracer testing by Oxford University Cave Club in 1989 established that the throughput time between the main streamway in "2/7" (Pozu Jultayu) and the Culiembro resurgence is between 6 hours and 52 hours (see OUC Proceedings 13 for a full writeup of this test).

Table 1: Results of charcoal detector analysis

Sample	Samples analysed	Samples analysed
	23rd January 2009 (Millivolts)	24th February 2009 (Millivolts)
Elution buffer alone	0.59-0.79	0.63-0.73
Sala Oston	0.8	0.88
Lower Streamway	132	22
Upper Streamway	4.8	4.2
Upstream Culiembro	-	89
Downstream Culiembro	-	97

Dive reports

Chris Jewell and Tony Seddon

Divers: A D Seddon, H Greaves, C Jewell, P Rowsell

Sherpas: Julagua 2008 and OUCC Canal del Montico 2008 expeditions

10.07.08 Sistema Julagua, downstream sump at -960m ("Blue Again")

Diver: A D Seddon; Support: A Connor, R Garrett, H Greaves

A steady carry from the camp saw the last items of kit transported to this impressive sump pool. Assisted by H Greaves the diver kitted up in a semi-drysuit plus buoyancy bag. Gas available was air, in two 7l composite high pressure cylinders, plus one 5l stage. A 3l oxygen cylinder was also taken for decompression.

In very good visibility the diver reeled out line in what seemed to be a large stream canyon, clean washed and with a few large blocks on the floor. At a depth of 6.3m the oxygen was dropped, approximately 20m from base. S Cornhill had previously free-dived at the end of the sump pool and described two small holes in the floor which seemed to be the way on. At this stage the diver saw no sign of small holes, but did become very aware of a large dark void ahead and below. At c. 23m from base a shaft was encountered of unknown, but obviously significant depth, approximately 10m in diameter.

Uncertain as to the capability of his buoyancy bag, the diver swam across the shaft hoping for a shallow horizontal continuation; a domed 'ante chamber' was found, well decorated with soft, white, pristine 'popcorn' formation, but no way on. The line was reeled back to the lip of the shaft, and a cautious descent made. Gradually, the passage was revealed as a fine oval tunnel, mainly clean washed but decorated in places with 'popcorn', especially in the roof area. The floor of the tunnel, still easily 10m in diameter, was reached at 37m and the line belayed.

The diver intended to stage his 5l cylinder here, but concerns over the gas delivery of one main valve caused a change of plan, and the stage was used while more line was laid to a distance of c. 85m from base. At this point, at a depth of 43m, a step down in the passage was encountered. This increase of depth – no floor being in sight – in conjunction with concerns over cold, narcosis, and buoyancy on the return up the shaft, prompted a retreat.

The line reel was tied off but left in situ, and an uneventful return was made to base. No decompression obligation was showing on the computer, but a safety stop of three minutes was observed on oxygen, which was then breathed back to base and on the surface for a further three minutes while the diver was de kitted.

A sketch was made of the sump at this time, including the bearings and depths taken from memory (and maximum depth from computer).

11.07.08 Sistema Julagua, Blue Again sump

Diver: A D Seddon; Support: H Greaves

A second dive was made at this site using the 7l cylinders to confirm that no shallow passages had been missed, and to locate the two holes in the floor previously described by S. Cornhill.

Rather than follow the line down the main flow of water, the true left wall of the sump pool was followed (with airspace above) for c. 30m at an average depth of 3m. At this point a blank wall was encountered ahead, and immediately before this two holes in the floor were located. These clearly connected with the shaft below, so only a cursory exploration through one of these apertures was made.

Returning to base, the line was followed downstream to the top of the shaft. In very good visibility – and several metres away from any cave surface – the diver swam off the line to inspect the domed 'ante chamber' (discovered the previous day) in greater detail. No further passage was found at this depth, but swimming upwards a hole in the roof was encountered. Swimming through this, surface was reached and a positive connection was made with the holes at the end of the left hand side of the sump pool.

Swimming back down into the shaft, a depth of 14m was reached, from where it could be seen that the phreas is derived from the streamway above, and is not a submerged trunk passage in which the Texa sump pool is only a window. The dive was turned here in order to conserve gas in the cylinders for dives at other sites.

This major and very promising site has been named 'Blue Again', the diver having a fondness for both music and referential names. A return is planned with more suitable technology.

12.07.08. Sistema Julagua, downstream sump at – 700m ("Ham")

Diver: A D Seddon; Support: D Datry, H Greaves, C McCartan

While a strong team of Sherpas brought the last elements of diving equipment back to camp from the Blue Again sump, the diver ferried kit from the camp to the short section of streamway 30m below the camp, where both upstream and downstream sumps had been located in 2005.

The sumps were of similar good visibility to that already encountered, but surprisingly were of significantly less discharge; reports had

suggested that this upper streamway was much larger than that found at the bottom of the cave, but the reverse was in fact the case.

Once reunited with all his kit the diver began laying line in the downstream sump. In this case, visibility deteriorated somewhat due to a combination of low flow, kitting up in the streamway, and the presence of significant amounts of 'popcorn' in some parts of the sump, which when disturbed turn the water milky. After laying 60+m of line at a maximum depth of 9m, the diver realised that he had created a pleasant but pointless round trip. Returning to base he informed H Greaves of his progress, dumped his 5l stage cylinder, and began reeling in the line for another attempt. At this point a line belay was found difficult to undo, so it was cut out and the ends reknotted.

The sump has little sediment and the current seems not sufficiently strong in this area to leave any useful signs of flow in any sort of ripple mark or scalloping. After 34 minutes of diving, with 30m of line laid and diminishing visibility, losses were cut and the dive turned. A frustrated and embarrassed diver returned to base, only to find back at camp that neither stove was working.

13.07.08. Sistema Julagua, Ham sump

Diver: A D Seddon; Support: H Greaves

The day before, the reel had been left in 30cm visibility at a point where the diver hoped that a junction had been located and the way on found. The dive began with the diver noticing, next to the reel, the line remnants where a belay had been cut out on the last dive.

Not disheartened, the diver worked on the assumption that the strongest flow was to be found in the area with least surviving 'popcorn'. Taking a completely different direction and with some zigzags, and avoiding gaining depth, the correct route was rapidly located and at c. 40m from base a large airbell with 1m deep water was reached.

Still not convinced by the performance of one of his main valves, the diver dumped the 5l cylinder in an above water alcove and swapped valves. The dive continued in clean washed passage and decent visibility. A maximum depth of 10m was reached before surfacing once more in a 4m diameter pool, with walking sized dry passage in two directions and the sound of a significant streamway in the distance. The sump was found to be 70m long in total, although no water flowed from it—once again, the way through with the main flow had been lost(!).

In one direction, following the sound of water, pools were passed to a T junction with a major stream. To the right, an upstream sump was located after 10m; this is assumed to be the outflow of the sump already passed. To the left a high rift was followed in a large and aqueous passage, down minor cascades to a very wet pitch of approximately 8m depth which was clearly impassable without rope.

Back at the sump pool, a mainly dry passage was followed uphill, passing a couple of significant climbs, to an area of highly eroded narrower rifts. Here the sound of running water ahead encouraged the diver as the passage dipped once more. Progress was halted at a pitch head, with a significant stream running a few metres below. A suspicious diver, feeling that only so many major streams can be found in one day, found a large rock and lobbed it into the stream, expecting to see debris somewhere in the known cave at some later point. A querulous shout from nearby raised suspicions further, and a second large rock and gratifying splash prompted the appearance of H. Greaves from her vigil by the sump pool.

Attempts at climbing proved impossible, so the diver returned for a line reel, while HG fetched more rope and a bolt kit from the camp. Lowering down the end of the line, the necessary kit was hauled up and the pitch (Diver's Dilemma) rigged, creating a sump bypass.

While ADS returned to camp for a vital cave/surface communication, HG pressed on to the downstream limit, rigged the pitch (Good Things Come) and followed the streamway down further cascades to the head of a significant and wet pitch. Joined by ADS, a start was made on the rigging of this obstacle, hampered by the availability of only 8m of rope for a pitch at least 15m deep [*"Multilingual"—in fact, as it turned out, 60m deep—Ed*]. A return to camp was made at this point.

15.07.08 Sistema Julagua, Upstream Sump at -700m ("Jam")

Diver: A D Seddon; Support: S Cornhill, N Snape

Assisted by S Cornhill and N Snape the diver entered the large and impressively blue pool, equipped with the remnants of the air in the composite cylinders. As the sump clearly dropped away immediately, and with limited gas reserves plus a very battered line reel (shattered courtesy of HG), expectations were not great.

In the event, the passage dropped immediately down a large clean washed pot to 10m depth. As with the downstream sump, the way on was found halfway up the other side of the pot, where an ascending passage reached airspace after a total dive of just under 40m. De kitting rapidly (but carefully, spare dive kit being back at the surface) the diver explored upstream in a high stream passage reminiscent of Lancaster Hole main drain for somewhere over 100m, to a slimy 4m cascade that was left for the next generation (or at least for the divers who had not yet had a chance to push passage on this trip). Higher levels were also explored before the cascade, but further progress without a bolt kit was deemed foolish.

Returning through the sump, the line was belayed more securely, and it was noted that a sub 2-minute transit time was to be expected in these optimum conditions.

Informed of the shortness of the sump, NS floated across the sump pool in his Russian exposure (gimp) suit to locate a dry bypass; none was found. Other leads at the top of the Divers Dilemma pitch (only 5m downstream) were investigated with similar lack of success. SC then perpetrated a particularly diverting climb near the sump pool. Not directly above it (which would cushion any fall) but near enough for his broken body to roll into it, the climb proved to lead to ascending passage to a mud sump. A tentative retreat was then successfully made.

These two sumps were named Ham (downstream) and Jam (upstream). Twin aqueous objectives, close together and reached from above,

the reference will be clear to students of military history and those associated with the old Ox and Bucks Light Infantry. The diver intends no other comparison between the acts of genuine heroes, and the games that folks play on their holidays.

22/07/08 Sistema Julagua, Jam sump

Divers: H Greaves, C Jewell; Support: P Whitaker

Carrying SRT gear, bolting kit, ropes and a survey instruments the two divers passed the sump to survey the passage found by TS previously and attempt to pass the 4m high waterfall which had halted exploration.

Each diver used one full 300bar 3ltr cylinder and one partially filled 7l composite cylinder left over from previous exploration. With a bag of gear each, plenty of lead and no buoyancy both divers were fairly negative in the large clear sump.

Once safely on the other side CJ and HG followed the passage to TS's limit of exploration and hatched a plan for getting up and over the waterfall before doing the survey. Due to a broken compass, the survey had to be done with a diving compass instead. HG then dived back through the sump to take the survey kit to waiting cavers who needed to survey another section of the cave whilst CJ started on the climb. By climbing up some 10m back from the waterfall it was possible to place a bolt on a ledge and progress horizontally with several more bolts until over the stream way, upstream of the cascade. The divers were then able to abseil down into the stream way. From here they explored approximately 200m of very fine and beautiful streamway which was named the 'cheesecake stream'. This was because this is what the moon milk/calcite which covered everything resembled and because of what was cooked at underground camp the night before!

The cave was left at a large waterfall (8m approx) which the divers did not feel they had time to bolt up. In this area several other small passages were followed which provided various loops and also intercepted a large dripping aven.

On their return both divers left 1 kg of lead on the far side of the sump but both still found the near vertical ascent out of the sump hard work!

23/07/08 Sistema Julagua, Jam sump

Divers: C Jewell and P Rowsell; Support: H Greaves

CJ and PR surveyed the section of cave explored by HG and CJ on the previous day. Combined with the previous section the cheesecake stream was estimated to be around 300m. The divers also carried a bolting kit but due to time constraints decided not to bolt up the 8m high waterfall.

Still being too heavy, for the return dive PR and CJ left another 1kg of lead each. However all the lead was retrieved from the far side by CJ who dived back through with TS's buoyancy bag in a tackle bag. By filling the bag with lead and inflating the buoyancy device it was possible for CJ to ride the tackle bag back through the sump! 3kg of lead was left at dive base with the rest (18kg) left at camp.

31/07/08 Cueva Culiembro

Diver: C Jewell; Support: H Greaves, P Rowsell, R Garrett

Teh diver used 2 x 7l cylinders and took a fully loaded dive reel. After posing for photos CJ dived following the thin white dive line left by previous divers. This didn't last long however and so CJ tied on his own reel. Shortly ahead the diver began to encounter the remains of line left in the sump. As the sump was large and clear the decision was made to lay line well away from the old remains in order to pass the sump, with the view that a full re-lining job will need to be undertaken. After 150m and a maximum depth of 13m the diver surfaced on thirds. Here he followed the stream up the 4m cascade to the head of active sump two (the square window) before doing the bypass climb and reaching active sump 3 (passed by Rick Stanton in 2000). Above this sump a vertical tube was noted. CJ then returned to look at the round window and reached the start of static sump 2 very quickly.

A straightforward return was made using only 40 bar between the two 7ltr cylinders.

Culiembro reconnaissance

Chris Jewell

Culiembro is the resurgence for all of the caves discovered on the Ario Plateau. The active resurgence is at the bottom of the Cares Gorge, but there is a fossil entrance some 100m or so higher, very close to a tourist path connecting the villages of Cain and Poncebos. Starting from this fossil entrance, passage can be followed for about an hour's caving upstream to a rising sump. Several diving expeditions have visited Culiembro over the past 25 years to dive through this sump and explore beyond, but have been turned back by lack of time and resources rather than any termination of the cave. The current situation is that there are two main branches of the cave beyond the first sump. These are known as the Round Window and the Square Window. The Round Window contains a series of static sumps which leads eventually to a stream way, an unclimbed waterfall and an undived sump. The Square Window leads to a 290m long 36m deep sump passed by Rick Stanton in 2000 which leads to another undived sump.

Having completed a diving project at the bottom of a 900m deep cave, with the associated large logistical and manpower requirements, the diving contingent of the Julagua 2008 team was keen to attempt the complementary strategy (*vis-a-vis* the search for a connection) of pushing upstream in Culiembro, which we suspected may yield easier or at least comparable progress. With a view to mounting such an expedition in 2009, we therefore took the last few days of the 2008 expedition to carry out a brief reconnaissance, both to familiarise ourselves with the cave itself and to make a preliminary investigation of access and logistical issues.

Reconnaissance trip objectives

The main aims of the reconnaissance trip were to determine the following:

- Cave location
- Location of suitable accommodation and supplies
- Logistical requirements for moving large numbers of cylinders to the cave
- Potential for placing compressor near the cave.
- Condition of path along the Cares Gorge
- Distance and time to first sump
- Condition of first sump
- Gas requirements to pass first sump

Findings on each of these points are reported below.

Location and access

The resurgence is located at the bottom of the Cares Gorge whilst the fossil entrance is 20m below the path down the Cares Gorge. The nearest town is Cain. There is a popular tourist path along the gorge. The path along the gorge is excellent, wide and mostly flat apart from some very short sections. However the final descent down to the cave entrance from the path is steep and over very rough ground (a handline is advisable, especially when carrying heavy loads). The entrance itself is a large fossil passage out of sight of the path with a small flat area in front which can be used for getting changed.

Potential Expedition base: Cain

Cain is a small village popular with tourists as it is the start of the walk down the Cares gorge. There is a single road in and out of the village which is narrow in places but has a good surface. This road was being worked on when we visited, the work taking place at night, which meant the road was closed after 10pm. Cain has few amenities except for lots of bars, restaurants and tourist shops. The bars and restaurants were open in the evening, potentially making for a good expedition base.

Cave reconnaissance

The team spent the first trip familiarising themselves with the cave and conducting a line survey from the entrance to the main sump. It takes approximately 1 hour to reach the main upstream sump once the route is known and the caving is fairly straight forward. On the first trip, expecting to dive later, CJ wore a wetsuit to avoid carrying both sets of kit. This proved to be a good move with an entrance lake immediately and a long pool before a duck later on.

On the second trip, a team of four carried equipment for one diver (CJ) to pass the first main sump to familiarise himself with the sump and passage beyond. This dive is written up on page 20.

17kg of lead were left at the cave entrance. 4kg of lead and numerous 'snoopy-loops' were left at dive base.

Summary

This reconnaissance trip proved invaluable in assessing Cain and it appears that it would make an excellent expedition base; the route to the cave from here is very straightforward. The cave's close proximity to both the path and the village will surely play an important part in the logistics of exploring a cave which has a 150m+ long sump as the initial barrier. Possible options being considered are locating a compressor suitably close to the cave in an abandoned hut, in order to make passing this sump repeatedly on open circuit equipment feasible without the logistics becoming onerous. This would also remove the necessity of camping beyond the sump, which presents additional logistical challenges. Passing the first sump provided some important information about its length and depth and the time required to pass it, thereby allowing us to calculate the gas requirements of exploring the cave. It also informed us that the first job will be to re-line this underwater passage. Finally the survey produced allowed us to make sense of the original data and will prove a sound basis for continuing the survey work next year.

Logistics

Hilary Greaves

Transport

The expedition was fortunate to have support from the Gordon Foundation, in the form of a Landrover lent free of charge to the Julagua 2008 and OUCC Canal Del Montico 2008 expeditions jointly. Three members of the Julagua 2008 expedition drove it, and a trailer, from Oxford to Lago Ercina.

Other expedition members flew to Oviedo, Bilbao or Madrid, and made their own way to Lago Ercina by public transport (or, if they were lucky, got picked up from Oviedo by others already on the expedition). A few drove from the UK in their own cars.

Accommodation

Accommodation in the Jou de Ario was mostly in tents (expedition members' personal one- to four-man tents and an expedition patrol tent). It is also possible to stay in a Refugio at the opposite side of the Jou de Ario from our surface camp, for a modest daily charge. Abandoned shepherds' huts, roofed with tarpaulin, served as a kitchen area and equipment shelters.

Food

Food was bought in supermarkets in Cangas de Onis and Oviedo and, in the case of items more difficult or more expensive to source in Spain, at a "cash and carry" wholesale depot in the UK. This was then carried up the hill from Lago Ercina to the Jou de Ario by expedition members. A day's food on the surface would typically involve bread, spreads, fruit, biscuits, and some sort of vegetable and/or bean stew with rice or pasta. Food at underground camp, for obvious reasons, was lighter on the fresh fruit and vegetables and heavier on the dehydrated foods typical of lightweight expeditions.

Underground camp

The expedition set up an underground camp in a large, dry, sandy passage at a depth of -743m, just above Sala Oston. (This was the same site as that used by OUCC in 2005.) This is an extremely comfortable campsite, and is well located both in terms of distance from the surface (exiting from camp takes approximately 4–6 hours), and proximity to the expedition's exploration objectives (Sala Oston is the point at which the routes to the 'Upper Streamway' and 'Lower Streamway' split off from one another; it is only a few minutes from the Upper Streamway, and less than an hour's caving from the Lower).

The camp used a home-made seven-man tent. With four or more cavers at camp, this was amply warm at night, and could also be made extremely comfortable at breakfast- and dinner-time by cooking or simply running the stove inside the tent (a technique learned from Russian cavers on recent expeditions elsewhere).

Communications

The expedition used a set of Systeme Nicola Mark II radios to communicate daily between the surface camp at Ario and the underground camp just above Sala Oston. We had thought that attempting such communications was a bit of a long shot, and were surprising that the radio connection over this distance was successful (see Simon Cornhill's article on page 26-7 for further discussion). Our good luck in successfully attaining a connection was extremely useful, as it enabled evolving needs at underground camp (for specific personnel, rope, food and so forth) to be communicated to the surface quickly enough for required items to be delivered to camp less than 24 hours later, and enabled plans to be discussed between underground and surface teams more fluidly as exploration progressed, rather than committed to three or four days in advance (as would often have to be done in the absence of radio contact). Radio communications would also have greatly enhanced the efficiency of a rescue, in the unlikely event of a serious accident deep underground.

Documentation

Cave passage found was surveyed to the highest reasonable standard (usually BCRA Grade 5B, except underwater). A combined survey of the Tormenta and Texa routes into Sistema Julagua, including the 2008 extensions to the system, is currently being drawn up using Therion.

Photography was also used to document the cave. However, we did not have a sufficiently good cave photographer on the team this year (serious cave photography being a highly skilled enterprise). As a result of this, we halted exploration in one extremely well-decorated part of the cave ("Jack Frost and the Tundra"), as we felt that this passage should be photographed properly in its pristine state, before the passage of more cavers inevitably caused some damage to delicate speleothems.

Cave diving

The diving on the 2008 expedition was planned in the spirit of a reconnaissance. Having no idea how deep and/or long the sumps were likely to be, but knowing that we had three independent sumps to explore, we planned to take relatively lightweight kit and to explore to a maximum depth of 30m this year. Accordingly, divers used open-circuit SCUBA equipment (as opposed to rebreathers), and semidry/wetsuits (as opposed to drysuits). There had been a plan to have a rebreather and drysuit sitting in the car at the road head for use if the cave demanded it, but in the event this did not materialise due to logistical difficulties.

We did not have access to a compressor, either our own or at nearby dive shops. Rather than plan to remove cylinders from the cave, carry them down the mountain and then return them to the cave when refilling was required, we therefore decided to take to Spain more full cylinders

than we thought we could possibly use during one expedition, to obviate the need for refilling during the trip. This was a convenient arrangement once we were out in Spain, although it did make for quite a heavily laden Landrover. (29 cylinders were taken; 7 were used.)

The cylinders used in Asopladeru La Texa were a mixture of 6.4l fibreglass composite cylinders, and 3l and 5l steel cylinders. Carrying any one of these cylinders down and up the cave was an entirely reasonable one-person job, although sufficient care was required that we were reluctant to give the composite cylinders in particular to non-divers to carry. (Few complaints were received about this reluctance.)

The breathing gases taken to Spain were air and nitrox. Our plan for the nitrox was to use it in combination with dive computers that were programmed for diving on air, so that the decompression schedules calculated would be more conservative than usual (since the prospect of developing decompression illness at the bottom of a 1,000m deep pothole did not bear thinking about). Air, however, has the advantage that it can be breathed at greater depths. The choice between the two gas mixes was left to the discretion of individual divers (subject to the inevitable fact that often the cylinders most readily available would be those left in the cave but still full after previous dives, perhaps by other divers). In the event, only air was used.

Contact with host country cavers

Two Spanish groups have worked in the same area in recent years: the Seccio Investigaciones Espeleologias (SIE), who explored Asopladeru La Texa between 1980 and 1998, and the Equip de Recerques Espeleològiques del Centre Excursionista de Catalunya (ERE del CRC), who had joined OUCC on several Picos expeditions between 2002 and 2007. Data is freely shared among all these parties. Members of both Spanish groups were invited to join the Julagua 2008 expedition. None accepted, but two members of the ERE del CRC joined the OUCC Canal del Montico 2008 expedition.

Permissions

Exploratory expeditions in the Picos de Europa require permission from the Parque Nacional Picos de Europa (the national park authority responsible for the area in which our caves of interest lie). This permission also carries with it a licence to camp in the Jou de Ario. Permission is straightforward to obtain, via the Federacion Asturiana de Espeleologia (the provincial caving body), provided that the group in question has 'rights' to the area for which permission is desired. To have the relevant rights, it suffices to have been carrying out exploration (with permission) in the same area in the preceding two years. Oxford University Cave Club meets this condition; both expeditions were treated by the Spanish authorities as affiliated with OUCC for the purposes of securing permission, and permission was issued to the two jointly.

Visas

The four Russian expedition members travelled to Spain on tourist visas. These were reasonably straightforward to obtain with letters of invitation from the Spanish caving federation.

UK and Irish nationals do not require a visa to visit Spain.

Insurance

The insurance situation—what types of cover would be useable, and exactly which were included in any given policy—was, as is usual for cave exploration expeditions, not entirely clear. (Experience has shown that most insurers do not understand the needs of caving expeditions, and that crucial exclusions rendering the policy next to useless to cavers (e.g. the exclusion of original exploration) are often hidden in the small print or (worse) present but not printed at all.)

Research prior to the expedition, aimed at facilitating informed decisions about which types and levels of cover were and were not worth purchasing, established that:

(i) There is a Spanish cave rescue service. It does not pass on the costs of a rescue to rescuees, EXCEPT in cases in which it thinks that the accident was a result of irresponsibility on the rescuee's part; and

(ii) UK and EU nationals are entitled to the same free healthcare in Spain as Spanish nationals, PROVIDED they have a "European Health Insurance Card". The EHIC does not cover medical repatriation.

This information was passed to expedition members; each member made his or her own decision as to what cover to purchase. The two most popular options were the following:

- Austrian Alpine Club (www.aacuk.org.uk). Annual membership costs £36/year, and includes rescue and repatriation insurance. There is a limit of 22,000 Euros on claims for rescue. It is not clear from the wording whether or not the policy covers caving, but the AAC has stated on the telephone that it does.

- ADAC (www.adac.de). Annual membership costs 79.50 Euros ("Plus" membership). The "Plus" policy covers repatriation. It is possible to add "health insurance" for 11.50 Euros. It is not clear whether or not this covers cave rescue services' bills

Relationship to Oxford University Cave Club

Julagua 2008 was an independent expedition, not formally affiliated with any caving club or university. It did, however, work in close collaboration with Oxford University Cave Club (OUCC), both by cooperating with the concurrent OUCC expedition to the same area, and in the sense that it continued the work of the OUCC Asopladeru La Texa 2005 expedition.

OUCC's own expedition this year was "OUCC Canal del Montica 2008"; its main aim was to continue exploration of the nearby Pozu Chicago. The two expeditions shared transport, surface camps and food. Caving equipment and underground camping equipment was organised separately by each of the two expeditions, and each caver was formally a member of one or the other expedition (never both). There was no prohibition on cavers from one expedition caving in "the other expedition's cave", but in fact this happened only a few times. Shallower projects in caves other than the respective expeditions' main objectives and "shaftbashing" trips, however, were often undertaken by mixed teams.

The reason for there being two separate expeditions this year was that some of us were keen to undertake a cave diving project in the Picos, but OUCC felt that the main aim of its own club expedition should be "dry" cave exploration, so that its undergraduate cavers could be directly involved in the main exploration aims, rather than playing primarily a support role.

Cave radios

Simon Cornhill

With multi-day camps and diving in remote sumps planned, it was deemed to be a good idea to have radio communication between the surface and underground camps. A pair of Nicola Radios was kindly loaned to the expedition by the Oxford University Caving Club.

Installing the radios

[Our first task was to work out which surface and underground locations would give us the most conveniently located pair of points between which we could still transmit messages with adequate clarity. We did not expect to be able to send a signal all the way from the Ario surface camp to our planned underground campsite in Asopladeru La Texa, so we arranged to spend one day transmitting from Ario while an underground team steadily progressed down the cave, and then, if necessary, a second day transmitting from underground camp while a surface team moved around to try to find the closest point to Ario from which a connection to underground camp could be obtained. As Simon describes, however, surprising success on the first day obviated the need for a second day of tests. — Ed]

Because of the potential distance involved between the radio sets, it was decided to have prearranged radio checks at set times as the installing team progressed underground. In the event of an unsuccessful communication attempt, the surface radio team was to transmit from ten minutes to until ten minutes past the hour every hour, until contact was remade or 22:00 was reached.

1. The first communication attempt was from the fixed location of the surface camp on the Ario plateau, to the surface entrance of the cave. This was successful.
2. The next communication attempt was from the chamber at the bottom of No Hay Cristal!, and was also successful.
3. An attempt to get comms from just below the 80m pitch (Cabo Mayau) to Ario was unsuccessful. It was difficult to deploy the radio, as the antenna wires had to be strewn through 4-5 small pitches with unsatisfactory earth points. In addition, several pitches still remained to be rigged, so further attempts at radio contact were abandoned until the camp was reached.
4. On arrival at the camp we had around 5 minutes to set the radio up on the last radio check of the day. As the antennas reached maximum length a faint voice was heard. Some fast dampening of the earth contacts improved the signal, and communication was restored.

This was an outstanding achievement for the Nicola radio, considering that the estimated straight-line distance between the surface and underground camps is 1.4km.

Antenna orientation: The underground camp antennas were fixed by the nature of the passage, at approximately due south and due east. The surface team experimented with the orientation of their set, settling on an east – west configuration.

Antenna length: The surface team fully deployed both antenna wires, so that the two surface contacts were approximately 60m apart. Underground the antennas were initially fully deployed, but the east-ish one was reduced by around 4-5m with a slight improvement.

Ground connections: The surface team used two large angled metal tent pegs with a 10cm piece of wire soldered between them and a large crocodile-clip connecting the wire.

Underground, the east antenna was buried in wet mud using a length of electric cattle tape and a round tent peg, whilst the south one was earthed using the active streamway, again with a length of electric cattle tape.

Coupling setting: Both radio sets could only get a signal when operating with the coupling set to the maximum (3). This was presumably due to the large distance.

Due to operating the radios on their extreme limit, a conversation was just about intelligible, but the audio quality was fairly poor. So any improvements would certainly make things a lot easier.

Radio Checks At Different Times of Day

During the early part of the expedition, contact between the surface and underground teams was made both in the morning (0900 or 1000) and evening (2100 or 2200), usually with little difficulty. Later, the connection was sufficiently poor in the evening that conversation was barely or not intelligible, whereas the morning communications remained fairly clear.

We are not sure of the explanation for this difference. One suggestion was that it is due to the fact that, except after heavy rainfall, the ground tends to be wetter in the morning, thus improving the contact between antennae and bedrock. However, an article written by Graham Naylor, one of the radio's developers (http://naylorgr.perso.cegetel.net/cave_radio/article.html#Noise; also printed in the Cave Radio and Electronics Group Journal, 13), recognises the phenomenon of superior communications earlier in the day, and attributes the deterioration later in the day to 'atmospheric disturbances'.

Powering the Radio

An external battery pack holding ten AA size batteries was used to power the radios. Alkaline cells were placed in it providing an initial maximum voltage of 15V.

As there is only a rough indication of the battery state, the surface team used a multi-meter to periodically measure the voltage. When it had dropped to 12V (1.1 to 1.2V per AA cell), audio was received but it was evident that the outgoing transmission was not being picked up by the other set.

At some point the underground team used a complete set of rechargeable alkaline batteries with success.

Build Quality Of The Radio

There were several issues with the build quality of the radio:

- The battery case (both were cracked/broken when the author of this article left the expedition, and that was with 2 weeks to go!).
- The battery connection inside the underground radio battery case broke off.
- Several connections broke off inside the surface radio.
- A wire broke inside the surface set's fist mike.
- As the surface antennas had to be rolled in and out after every use on the surface (to avoid cow damage), the wires suffered several breaks.

Luckily a soldering iron and the expertise to repair the less trivial problems with the surface radio were available.

General comments

Having communication between both camps proved to be invaluable, enabling requested equipment and supplies to be sent in without too much delay, and regular up-to-date progress reports from both camps to be exchanged. We were also able to communicate reassurance that cavers in transit in either direction were on their way or had safely reached their destination.

It appears that we were very lucky with the geography of the area, being comprised of a large solid limestone karst with little conglomerate to reduce the radios' range.

Recommendations For The Future

- It was very wasteful using alkaline batteries, and there was potential confusion changing them (making sure depleted batteries were not placed back in the power pack). As the Nicola radios can be powered from a 12V–15V source, a lead acid battery might be a better choice for the next expedition, or perhaps a battery pack that will take 12 rechargeable 1.2v AAs. *[Since this article was written, Graham Naylor has commented that the radio is supposed to be able to run fine on a 12V source, 9V being the minimum, and "the reason that there is space for 10 AA cells in the box is specifically so that you can run off either rechargeables or alkaline cells" — Ed.]*

- Have at least one extra battery pack per radio, with batteries pre-loaded into it to enable a quick battery change during the transmission period.

- Have some means of checking the battery level with each radio set. (i.e. a multi-meter) and make using it part of the 'radio induction' for new operators.

- Have at least one spare set of antennas on the surface, ready to deploy in case of a broken wire.

- Take three complete radio sets, so there is a spare available in case of failure.

Medical Report

Earlene Armstrong

Overview

Although I have been caving for several years, this was to be my first expedition abroad. I was planning to travel with four other members from the Irish group and as a qualified doctor was invited to act as medical officer. The majority of the members on this expedition had significant cave rescue experience and first aid training. My role was to add some medical backup.

With the anticipated three hour hike from camp to civilisation, preparation was essential. Correspondence with the Oxford University Cave Club (OUCC) medical officer prior to departure ensured adequate medical kits were organised prior to the trip. Dave Legg's (OUCC) experience as a medical officer on previous expeditions proved invaluable. He organised the medical kits prior to departure with input from myself and key members of the group. The contents were bought via Wilderness Medical Training and the Nomad Pharmacy group. A GMC registered doctor was required to sign for medications.

During the expedition, the scenarios most likely to occur included dehydration, minor cuts, strains and sprains. Planning of the first aid kits also had to take into account the possibility of falls, fractures and hypothermia occurring up to 900m underground. Five medical kits were devised; their contents are listed in full below. The main surface kit included rehydration powder, analgesia, antiemetics, anti-diarrhoeals, antibiotics, and equipment for basic first aid. The underground kit and rescue kit had similar contents plus suturing equipment. Separate intravenous kits for fluids and drugs were available for surface use and rescue for those appropriately trained.

No major incidents occurred during the expedition. Several members suffered from dehydration and stomach ache, mainly while acclimatising to conditions. Oral rehydration solution and analgesia was sufficient. More people suffered from sprained ankles at various stages, treated with simple analgesia and support. One individual suffered from diarrhoea while underground, treated with loperamide.

Contents of first aid kits

Ario First Aid Kit

Antimicrobials

- 3 x 4g tubes chloramphenicol ointment
- 20 x Ciprofloxacin 250mg
- 32 x Clarithromycin 250mg
- 42 x Co-amoxiclav 375mg

Painkillers, Local Anaesthetics and Sedatives:

- 20 x tramadol, 50mg (Zydol)
- 40 x co-codamol (30/500)
- 100 x paracetamol (500mg)
- 20 x aspirin (300mg)
- 100 x ibuprofen (400mg)

Other Medication:

- 32 x prochlorperazine, 5mg (Stemetil)
- 1 pack Strepsils
- 1 pack antacid tablets
- 10 x laxative sachets (Movicol)
- 25 x rehydration solution (rehydrat/dioralyte)
- 48 x loperamide (4mg)
- 30 x chlorphenamine, 4mg (Piriton)
- 1 x Salbutamol inhaler

Cream and Ointments:

- 1 tube Anusol cream
- 50g tube Aqueous cream
- 2 tubes Bactroban cream
- 10ml Betnesol-N ear drops
- 1 tub vaseline

- 1 tub athletes foot powder
- 1 x bottle of Optrex eye-wash

Dressings:

- 2 x wound dressing, no. 14 medium
- 2 x wound dressing, no. 15 large
- 2 x non-adherent dressings, 5cmx5cm
- 2 x non-adherent dressing, 10cmx10cm
- 2 x melolin dressings, 10cmx10cm
- 3 x 5 pack of gauze swabs, 5cmx5cm
- 50 plasters, assorted
- 2 x plaster strips
- 4 x packets of Steri-strips
- 2 x roll of zinc oxide tape
- 2 x roll of micropore tape
- 20 x sterile wipes
- 2 x crepe bandages, 7.5cm
- 1 x cohesive support bandage
- 2 x triangular bandage
- 1 x eye dressing no. 16
- 3 x 5 packs of Compeed blisters dressings
- 15 x antiseptic solution sachets
- 15 x sterile saline sachets

Misc:

- 5 pairs latex gloves
- 5 pairs sterile gloves, medium
- 1 x tweezers
- 1 x Tuff Cut scissors
- 2 x disposable scalpels

1 x digital thermometer
 1 x otoscope
 1 x dental first aid kit
 1 pack cotton wool
 1 pack tampons
 5 x condoms
 1 x pencil
 1 x waterproof notepad
 1 x marked 250ml mug (for rehydration solution)
 1 x copy of the Rescue Guide
 2 x packs of duct tape
 1 x roll of athletics tape

Ario Injections Kit

* ONLY FOR USE BY A TRAINED EXPEDITION MEMBER

* Purpose: To remain at Ario, for use on any patient requiring treatment by injection.

6 pairs of latex gloves
 5 pairs of sterile examination gloves
 1 x guedel airway size 2 (1: 2009 – 04)
 2 x bic razors
 1 x yellow waste sack
 1 x notebook
 1 x pencil
 1 x 5 pack of 7.5cmx7.5cm swabs
 1 x 5 pack of 5cmx5cm swabs
 20 x sterets pre-injection swab
 10 x 21g green needles (2: no date)
 10 x 25g orange needles (2: no date)
 10 x 18g green cannula (3: 2011 – 08)
 10 x 22g blue cannula (3: 2011 – 03)
 10 x 2ml syringe
 10 x 5ml syringe
 10 x 5ml ampoules of sodium chloride 0.9% for I.V.
 10 x 2ml ampoules of Zydol (tramadol hydrochloride) 100mg ampoules
 10 x 1ml ampoules of adrenaline (epinephrine) injection BP 1 in 1000
 10 x 1ml ampoules of chlorphenamine injection, 10mg
 10 x 1ml ampoules of Stemetil (12.5mg of prochlorperazine mesylate)
 10 x 1ml ampoules of lidocaine hydrochloride injection 1% ampoules
 10 x 2ml ampoules of hydrocortisone (100mg hydrocortisone)
 1 x 1g ampoule Rocephine powder (ceftriaxone, 2008 – 10) to be reconstituted with:
 1 x 10ml ampoule of water for injections (out of date)
 2 x 500ml sodium chloride 0.9% I.V. infusion B.P.
 2 x 500ml glucose I.V. solution

Underground First Aid Kit

* Purpose: to stay at an underground location (probably camp) in case of accidents

Sam splints: 2
 Wound dressings, large: 4
 Wound dressings, medium: 4
 Melolin dressing, 10x10cm: 2
 Non-adherent dressing, 10x10 cm: 3
 Non-adherent dressing, 5x5 cm: 3
 5 pack gauze swabs, 5x5cm: 2
 Plasters: 10, assorted
 Plaster strip: 2
 Zinc oxide tape: 1 roll
 Micropore adhesive tape: 1 roll
 Sterile wipes: 10
 Crepe bandage: 3
 Triangular bandage: 2
 Minim Tetracaine (amethocaine hydrochloride 1%) eye drop: 2
 Fluorets sterile ophthalmic strips: 5
 Eye dressings: 2
 Steri-strips packs: 3
 Antiseptic solution (Tisept): 3
 Purified water (Normasol): 3
 Bactroban cream: 1
 Burn bag: 1
 Betadine paint (or iodine): 1
 Adjustable neck brace (stored separately)
 Latex gloves, non-sterile: 3 pairs
 Latex gloves, sterile: 3 pairs
 Note pad & pencils
 Gaffer tape: 2 small rolls
 Tough cut shears
 Safety pins: 6
 Antiseptic hand wash: 1 tub
 Dental repair kit
 Suturing kit: 1 set tools, 2 needles & thread -- **trained people only**
 Tramadol 50mg: 12 tablets
 Paracetamol 500mg: 20 tablets
 Aspirin 30mg: 5 tablets
 Ibuprofen 400mg: 20 tablets
 Loperamide: 10 tablets
 Stemetil: 10 tablets
 Piriton (chlorphenamine 2mg): 20 tablets
 Rehydration powder sachets: 5
 Antibiotics, Clarithromycin: 12 tablets
 Antibiotics, Ciprofloxacin: 12 tablets
 Epinephrine pen: 1

Rescue kit

* Purpose: to stay at Ario, ready for surface or underground

incidents

a trained expedition member will be available to administer treatment by injection.

- Sam splints: 2
- Wound dressings, large: 4
- Wound dressings, medium: 4
- Melolin dressing, 10x10cm: 2
- Non-adherent dressing, 10x10 cm: 3
- Non-adherent dressing, 5x5 cm: 3
- 5 pack gauze swabs, 5x5cm: 2
- Plasters: 20, assorted
- Plaster strip: 1
- Zinc oxide tape: 1 roll
- Micropore adhesive tape: 1 roll
- Sterile wipes: 10
- Crepe bandage: 3
- Triangular bandage: 2
- Minim Tetracaine (amethocaine hydrochloride 1%) eye drop: 2
- Fluorets sterile ophthalmic strips: 5
- Eye dressings: 2
- Steri-strips packs: 3
- Antiseptic solution (Tisept): 3
- Purified water (Normasol): 3
- Bactroban cream: 1
- Betadine paint (or iodine): 1
- Adjustable neck brace (stored separately)
- Latex gloves, non-sterile: 3 pairs
- Latex gloves, sterile: 3 pairs
- Note pad & pencils
- Gaffer tape: 2 small rolls
- Tough cut shears
- Safety pins: 6
- Antiseptic hand wash: 1 tub
- Dental repair kit
- Suturing kit: 1 set tools, 2 needles & thread -- **trained people only**
- Tramadol 50mg: 12 tablets
- Paracetamol 500mg: 20 tablets
- Aspirin 30mg: 5 tablets
- Ibuprofen 400mg: 20 tablets
- Loperamide: 10 tablets
- Stemetil: 10 tablets
- Piriton (chlorphenamine 2mg): 20 tablets
- Rehydration powder sachets: 6
- Antibiotics, Clarithromycin: 12 tablets
- Antibiotics, Ciprofloxacin: 12 tablets
- Epinephrine pen: 1

- 5 x 5ml syringe (2: 2008 – 11)
- 5 x 2ml syringe (1 x 2009 – 01)
- 10 x 21g green needles (8: no date)
- 10 x 23g blue needles (6: 2010 – 12)
- 10 x 25g orange needles (3: no date)
- 2 x blue cannula (1: 2011 – 03)
- 2 x green cannula (1: 2011 – 08)
- 2 x grey cannula (2: 2010 – 10)
- 2 x orange cannula (2: 2009 – 10)
- 1 x 500ml sodium chloride I.V.
- 5 x 5ml ampoules of sodium chloride 0.9% for I.V.
- 5 x 2ml ampoules of Zydol 100mg ampoules (100mg tramadol hydrochloride in 2ml colourless aqueous solution)
- 5 x 1ml ampoules of adrenaline (epinephrine) injection BP 1 in 1000
- 5 x 1ml ampoules 10mg chlorphenamine maleate Ph. Eur.
- 5 x 1ml ampoules of Stemetil (12.5mg of prochlorperazine mesylate)
- 5 x 1ml ampoules of lidocaine hydrochloride injection 1% ampoules (10mg of lidocaine hydrochloride in each 1ml of colourless sterile solution)
- 5 x 2ml ampoules of hydrocortisone (100mg hydrocortisone)
- 10 x pre-injection swabs (5: no date)
- 2 x 5 pack of 5cmx5cm swabs
- 1 x roll of micropore tape
- 5 pairs sterile gloves
- 1 stethoscope
- 1 blood pressure gauge
- 1 thermometer
- 2 pencils
- 1 waterproof notebook

Rescue Injections Kit

* ONLY FOR USE BY A TRAINED EXPEDITION MEMBER

* Purpose: additional first aid kit, to be taken with the rescue kit if

A few reflections on manpower management

Hilary Greaves

A cave diving project in a cave with the remoteness and depth of Asopladeru La Texa requires a strong support team. Recruiting sufficient support for such ventures is often difficult, in large part because dry cavers are (understandably) usually more enthusiastic about dry exploration projects than they are about dive support, and many take the view that they have better things to do with their summers than “serve as sherpas to others’ goals” (as one declining caver put it to the leader of this expedition). What follows is a description of how the Julagua 2008 expedition fared with respect to this difficulty, and some musings on whether and how resulting problems (which are also often faced by caving expeditions more generally) could be dealt with better than we dealt with them this year.

The fact that we had agreed not to recruit from OUCC (so as not to jeopardise the manpower strength of the official club expedition), while OUCC members form the majority of those with existing connections to the Picos, did not make our recruiting task easier. For a long time during the planning phase of this expedition, it was unclear whether or not we would have sufficient manpower for the expedition to go ahead. It is normal on caving expeditions for significant proportion of the team to commit to the trip only a few months beforehand, but usually at least a critical mass of expedition members have committed to the trip four or six months in advance of the departure date. In the case of the present expedition, with six months to go we had still only managed to recruit five “definite” expedition members, and found ourselves in the position of trying to decide on a cutoff date on which we would cancel the expedition if sufficient numbers reasonably to take on a minimal core of the expedition’s aims had not yet been recruited.

This situation led to a rather desperate recruiting drive, involving many cold-call phone calls and emails to secretaries of caving clubs and friends of friends. The outcome was a team that was (eventually!) amply strong on numbers, but variable in terms of experience, and (more importantly) consisted of many individuals who did not know one another or one another’s experience levels very well before the trip. This made it difficult to select appropriate team compositions for trips to underground camp.

One particular type of difficulty arose from the following circumstance. Again in purely general terms (i.e. quite aside from the issue of diving or anything else specific to this expedition), the derigging phase of any deep caving expedition requires a lot of manpower. There is a natural tendency, however, on expeditions that are long enough for most members to be able to join for only part of its duration, for manpower to strength to form a “bell curve” peaking in the middle of the expedition, and often the numbers trail off drastically towards the end of the expedition in particular. All too often, the last ten days to two weeks of an expedition consist of far too few stalwarts working long days, slaving over the thankless and relatively unexciting task of derigging the cave and dismantling camp after most others have gone home, whereas the task could be knocked off in a few painless days if manpower had been distributed evenly through the duration of the expedition. This undesirable situation is self-perpetuating: no-one wants to join the last two weeks of an expedition if it is going to be like this, but if enough people joined at the end then it wouldn’t be like this.

In an attempt to overcome the “bell curve” tendency and break this vicious cycle, I took the executive decision this year to all-but-insist that each expedition member joined the expedition either right at the start or right at the end, rather than coming to Spain for (say) two or three weeks in the middle of the expedition, joining in the fun but missing both the rig and the derig. In the latter stages of recruitment, when more of those who had already signed up had been able to come at the start than at the end, I emphasised in particular that more cavers were needed at the end, and pleaded strongly with the last ten or so joinees to join the end of the expedition. This had both positive and negative effects. The positive effect is that this year we did have a strong enough team at the end of the expedition to derig both a 900m deep cave and the surface camp, between us, in less than a week and without excessive sustained effort on the part of any single expedition member. (The value of this is not to be underestimated, and because of it I remain firmly convinced that the “start-or-end” policy is a good one for deep expeditions.) The negative effect, though, was that we were faced, two weeks before the end of the expedition, with several cavers who understandably wanted to get straight down to underground camp as soon as they arrived at Ario, but whose experience levels, in some cases, were relatively unsure of. As expedition leader, I was reluctant to hold back people who (entirely reasonably) wanted to join in the deep exploration rather than just the derig, said that they were amply experienced enough to do so, and had only put themselves in this position of having little time for acclimatisation on my express request and for the benefit of the expedition. Not knowing them all well enough, however, we were not well-placed to judge for ourselves who was and was not in fact sufficiently experienced to go straight down to underground camp, who should be on the same team as who else, and so forth. (Inexperienced cavers often overestimate their own competence levels, not with any intent to deceive but because they are simply not aware what really counts as sufficient competence.) On at least two occasions, this tension led to expedition members taking on trips that were probably too ambitious given their respective experience levels.

In the ideal world, this sort of problem would be avoided by having sufficient experienced manpower to obviate the need for relative newcomers to join the end of the expedition, and by those with less experience being able to take three or more weeks off work and also to join the start of the expedition, so that they could build up experience more gradually during the expedition and still achieve their personal goals. Such reflections on what the ideal world would be like, however, are obviously of somewhat limited use.

I am not sure what is the optimal way of dealing with the non-ideal situation that we were in fact faced with. With hindsight, the following two points are (however) evident:

(1) We should have held a pre-expedition caving weekend as close to the expedition departure date as possible, to enable as many expedition members as possible to cave together prior to the expedition. (We held such a weekend six weeks before the expedition, but many expedition members had not joined the expedition by then!)

(2) We should have set up a simple SRT course on the surface at Ario, and asked unknown cavers to negotiate it by way of “SRT test”. While potentially insulting to genuinely experienced cavers, this simple test would have enabled us very quickly to spot those who were not in fact ready to go straight down to underground camp and/or who would benefit from more passive supervision by very experienced cavers than they themselves were aware.

Summary of accounts

Rich Bayfield

Expedition income

ITEM	AMOUNT	
Members' contributions	1436.03	
Grants	400.00	
Donations	45.00	
TOTAL EXPEDITION INCOME		1881.03

Expedition expenditure

ITEM	AMOUNT	
GEAR		
Rope	0.00	
Rigging gear	50.40	
Underground camp	271.40	
Surface camp	22.00	
Surveying	0.00	
Photography	0.00	
Computers	0.00	
Miscellaneous caving	29.13	
Diving	280.88	
Dyetrace	2.25	
Lost and damaged gear	421.11	
SUBTOTAL		1077.17
TRAVEL		
Fuel	316.46	
Ferry	80.00	
Vehicle maintenance	102.98	
SUBTOTAL		499.44
MISCELLANEOUS		
Medical	143.53	
Report printing and distribution (estimated)	30.00	
Administration	35.58	
Kitty corrections	67.44	
Currency conversion corrections	27.87	
SUBTOTAL		304.42
TOTAL EXPEDITION EXPENDITURE		1881.03

Personal expenditure (estimated)

The majority of the expenditure associated with this expedition was left as individuals' responsibility, rather than coordinated at expedition level. An estimate of the costs involved is included below, so that this summary more accurately documents the true cost of the expedition.

ITEM	AMOUNT	
Kitty contributions (mostly food)	1224	
Caving equipment	2500	
Diving equipment	750	
Travel	2500	
Insurance	1000	
Visas	200	
Preunion weekend	300	
TOTAL PERSONAL EXPENDITURE (EST)		7474

Personal Stories

On fear and dissociation (before a dive)

Tony Seddon

So there you are, looking at this great blue mother of a sump pool, and you think, "Hell of a grave, boy, hell of a grave."

Call it performance pressure if you will, but when you represent, in person, the apex of a great deal of planning and effort, the impulse to sit quietly and maybe have another mug of tea is huge. Months of sorting out and arranging the gear to rig to 900m; finding the people prepared to rig, and then carry dive kit too; then actually getting all the right kit and cavers into the right place at the right time. A lot has to be done to get an equipped diver down a deep cave.

Not that I'd done any of that hard work, you understand. All along, the deal was that I'd have sedan chair treatment: wafted to the sump, fed on sumptuous sweetmeats, dressed by attentive lovelies. Got to keep the diver's edge; after all, we don't want the star of the show peaking too early, do we? This is a truly excellent deal, right up to a certain point. That point being approximately 960m below the surface, with a great clear, cold, gin blue stream passing from noisy cascade to placid silence in the space of a few metres. Movement into stillness, like life into — you get the idea.

The reports were of a reasonable flow, and the survey suggested that there was a good chance that the sump would be fairly short and shallow. An easy swim to the far reaches of Culiembro was the plan, based on the information we had. Experience, the great teacher, was showing up the flaws in due course. For a start, the passage for several hundred metres before the sump consisted of a large and ancient phreatic which rose and dipped dramatically. When the tube dipped down a few pitches and encountered water, the stream turned out to be faster and more powerful than anything suggested before, and the sump pool and chamber was large. Not inimical; just way outside the human, sometimes intimate scale of your average British sump. This did not look, or feel, like a short and shallow sump.

And that, of course, was the sort of sump that we'd brought the kit for. Minimal reserves, minimal warmth, minimal buoyancy; redundancy sacrificed for portability. The argument was, if the sump was to go long and deep then it wasn't for the team this year, so it wouldn't be fair to take the extra kit just for one. Fine, until you see a sump that has all the signs of being more than the kit can handle... but you've got to go and see, anyway. That's the deal.

The emotions are quite fascinating. Certainly it is not fear with its iron tasting, whining in the ears sounding, intense focus. No adrenaline rush here. Still, a recognition that the future, from here and now, is... provisional. The cup of tea that attentive, careful, slightly subdued mates make and press on you is sweet in all sorts of ways.

It is not foreboding, either. That's linked with animal emotion, and there's none of that. Here, now, there is only distance from people and from things. How you act now may be how you're remembered; so steady, lad, steady.

There was, of course, no reason why anything should go amiss. The kit was good, ample in its redundancy and reserves for most eventualities. With the usual pre-trip madness going on, not all the parts had been tested together, but there was nothing untried in the system. Diving alone is second nature for a British diver, so nothing unfamiliar about having no backup, either. And perfect diving conditions, too; only...

So you're here to do a job, and you kit up methodically and ask for help diligently to make everything as good as it can be. Everything is right and controlled, and there's no reason for you to cop it but you make a couple of domestic arrangements before you go, in case you do.

Still, there is nothing like stripping naked on a cold rock platform and changing into a sodden wetsuit to bring reality into sharp focus. Lots of quiet grumbling and swearing, and the usual internal debate over whether to piss outside the suit before you dive, or inside the suit before you dive, or just after you start to dive. But today even this is all a bit perfunctory, born of old habit rather than really meant. For just one moment life focusses. When the neoprene hood is tucked into the neck of the suit — no cold water flushing to increase chances of narcosis or decompression injury, everything done well for this dive — there are a few seconds of human contact, and for that time the remoteness draws back a little. Then the mask goes on and the view becomes very narrow, and clear; and there is no-one else in sight.

Time to go.

Good things come

Hilary Greaves

I sat alone, in the dark, huddled in the group shelter by the sump at Asopladeru La Texa's downstream limit, recycling my own body heat as much as possible, playing the waiting game. I found this sump three years ago with Gavin Lowe on the OUCC Asopladeru La Texa 2005 expedition; that was back in the days when I thought that finding a sump meant finding the end of the cave. Only time, now, would tell what the fruits of hard labour were to be. As much to pass this time as to maintain energy levels, I ate a Mars bar, and turned the wrapper inside out. "SORRY," it said in capital letters, "YOU HAVEN'T WON THIS TIME. KEEP TRYING!"

Some 20 minutes later Tony re-emerged from the sump, the oxygen valve in his mouth. I said nothing, and took the cylinders and various other paraphernalia that were passed to me, waiting until such time as he felt like breathing air and then talking, and telling me whether or not this was the way to Culiembro. Eventually Tony showed me his computer — "max depth 42.8m" — and told the tale of a sump that was wide open

but kept going down. We had no drysuits, little means of buoyancy adjustment and no gas except air; this sump was too deep for this year. So, we hadn't won this time; not yet, anyway.

There were, however, two other sumps to go at. And so, two days later, I was sitting in the same group shelter by another sump, waiting, alone, in the dark. This one, too, could be the short duck through to stomping stream passage all the way to Culiembro...

A loud CRASH!!! disturbed my reverie. My mind assumed that it was some lost caver, heading for camp and finding the streamway by mistake. But then it couldn't be, because we were the only two in the cave that day. I shouted. Someone shouted back. Neither of us could hear what the other was saying but, carrying on this way, I traced the source of the noise to a hole, around twenty metres upstream of the sump and five metres above the streamway, from which Tony was now looking down with a strange grin on his face. I was a bit slow to put two and two together: how did he get there?



Preparing to leave camp for a day's pushing. Photo: DP

"It's a bypass," he said matter-of-factly, "leading to more streamway and then a pitch. Want to come?"

Are you f**king kidding me!?! I would kill to come. I could hardly believe my luck; some kind of reverse gambler's fallacy seemed to have taken over. Every time I have been on a Picos expedition I have ended up on one of the expedition's best pushing trips, always by sheer jamminess in being in an unlikely-looking place at the right time, and now it seemed to be happening *again*, this time against even more ridiculous odds than usual.

The only problem was how to get there. The walls were mostly not too steep and had plenty of holds, but they were covered with moon milk, and in addition to that the rock was pretty friable, typical Picos rubbish. On the surface and with a rope and protection you wouldn't have thought twice about nipping up it, but as a free climb 700m underground, no, no way. So I legged it back to camp to get rope and bolt kit, while Tony ambled back to his end of the sump to fetch the reel of leftover dive line. Some forty minutes later we had all the necessary ingredients, I clipped them on to the dangling dive line and Tony hauled them up, and a new pitch, "Diver's Dilemma", was promptly rigged.

At this point we were approaching the last of three pre-arranged afternoon radio check times with the surface camp. It seemed worth passing on news like this to the team that was coming down the cave the next day, so this time Tony went back to camp, while I was tasked with rigging the new pitch in the downstream continuation. I followed the wet footprints through the sump bypass to the stream beyond, and soon found Tony's pitch. There were plenty of naturals, so I exploration-rigged it from a thread and a spike as backups and a thread belay at the head of the pitch, leaving an enormous loop of rope dangling from the belay to the floor and back up to the thread belay (stupidly, I didn't have a knife, having misplaced it at breakfast that day, and not worried about it too much as I was only going to hang around by a sump 30m down from camp...). I abseiled on down, leaving Tony to cut the rope in the obvious places when he reappeared from radio duty. The water cascaded deafeningly alongside me; this pitch would need deviating or re-rigging further away from the water, but it would do for now. I teetered off the rope onto a small ledge alongside a deep pool, and took in the scene before me.

Despite my best attempts not to be childish, I could not help enjoying a sweet and mischievous sense of poetic justice at this point. I had spent most of the expedition trying to take as many of the crap jobs as possible on myself, leaving the rigging, bolting, boat-making and dry leads for others and spending my own days carrying, portering and waiting at sump pools. The reason was that I was painfully aware of the potential for much of the team to get pissed off and demoralised at "bloody divers" having all the fun and a relative lack of dry leads for the support staff to enjoy – always a risk on a project whose main objectives are diving leads – and the less fun stuff I did myself, the more would be left to amuse those who maybe needed it more. The tactic wasn't really working – I could tell that some of the others were getting a bit pissed off anyway, with the expedition in general and with me in particular, already – but at this point it was all I could do. Tony had described my attitude as selfless and saintly, but of course it wasn't. This expedition was my baby; easy for *me* to identify my own success with the team's success (in fact, impossible for me not to). Nevertheless, by this point in the trip I was feeling pretty virtuous, and also a little bit underappreciated from certain quarters. So I couldn't help feeling a bit smug, regardless of my general distaste for such feelings, at happening to stumble on such a cool lead without trying, *again*. In the end the cave would decide. "Good Things Come..."

And cool it was. It was also extremely loud, and wet. Traversing round the pool, I reached the continuation of the stream passage; the water cascaded off round a corner. For a moment I considered following the usual etiquette of waiting for my caving partner, so that we could take turns leading into the new stuff. This noble sentiment lasted for a couple of seconds, and then I thought, "no, fuck that." My feet were itching with impatient energy and Tony, I knew, would hardly begrudge me a little scooping at this point.

So I stomped off down the streamway, admiring the moonmilk-covered scallops and rock-tree style formations in passing but more interested in where the cave was going until... twenty metres downstream, I reached the head of another pitch. I had no more rope, so my plan to scoop was scuppered. Bugger.

Some time later Tony reappeared from his radio duty, carrying a knife as all halfway competent cavers do, and followed me down the pitch. One slashing operation later we had a grand total of around 8m of spare rope; we placed three bolts to get the next pitch started, but could go no further. We lobbed rocks off; they seemed to rattle for a good couple of seconds. Rattle off, down into the streamway below, the streamway into the unknown that might take us past the too-deep sump of days gone by and on to Culiembro. Good things were surely to come, but for

now we must wait.

Who needs divers anyway?

Noel Snape

As a complete novice to caving outside the British Isles, I was extremely grateful to be given the opportunity to be part of an exploratory expedition to the depths of Asopladeru La Texa.

After making my way to the expedition surface campsite, I introduced myself to the cavers present, none of whom I previously knew, but all of whom were extremely friendly and accommodating. My first trip into a cave deeper than Pen-Y-Ghent Pot was at first shaping up to be a solo 'bounce' trip to a gear dump halfway down the cave, but I was lucky enough to arrive a couple of days before a large camp changeover, and wangle my way into the descending party.

I packed a small tackle bag with enough gear to be nicely comfortable for a few days at underground camp, and was rather chuffed with it until 'Mad' Phil Rowsell insisted I wouldn't be needing any of it, and promptly emptied the contents onto the floor. In the end all I was "allowed" to take was two thermals and some batteries, but I sneaked in some extra chocolate and spare socks when he wasn't looking.

We rose early in the morning and headed over to the entrance for a 9:30 start. (My usual fellow cavers would be shocked at this early time—but wait there's more... In the Picos you can't get a large Yorkshire pudding with chilli and chips for breakfast followed by the obligatory pie shop second breakfast. It's true!!)

Soon we were descending pitches at a rate of knots and we reached the camp at Sala Oston in three and a half hours. I was very impressed with the camp where I was to spend my next few days. I remember thinking to myself that the setup here put the ULSA expedition tacklestore to shame, of which notable inventory items include a crotchless furry, a load of rope that smells of cat wee and a very large bra.

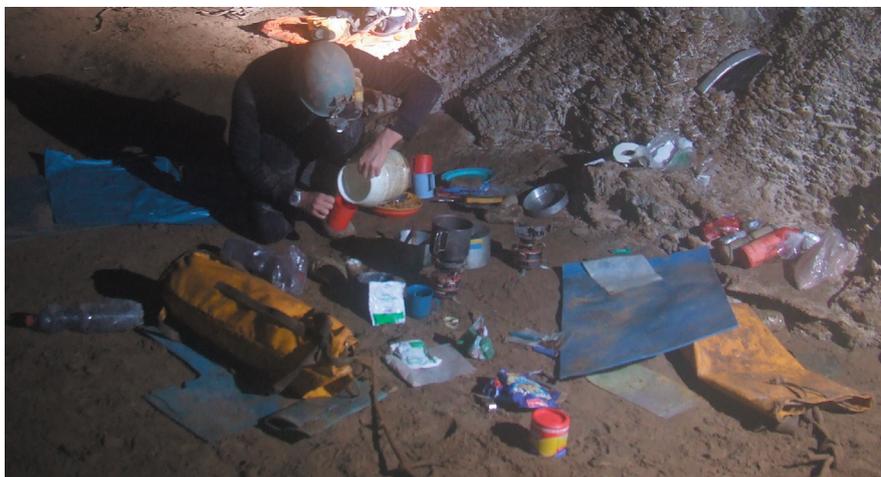
After a lunch of sandy pasta, we made our way on to the lower sections of the cave, where Mad Phil and Simon Cornhill resumed their bolting of an aven just beyond Knife Pitch, giving me and Steve McCulloch a good opportunity to explore the lower streamway. After looking around for a couple of hours I dug some cobbles out of a very tight rift to find a 3m extension (claimed in the name of ULSA). We decided that even with a discovery as momentous as this, it would be a good point to head back to the aven to see how the climb was going. It just so happened that Phil and Si reached the top of the aven just as we arrived and after a short wait, a 40m pitch was rigged to allow us to join the others at the top.

Here the passage continued openly up an incline into virgin territory. At this point Phil kindly allowed me to head on up the large climbable passage first, due to me having never entered unexplored passage before (good job I didn't tell him about my aforementioned 3m extension). This climb led up into an impressively large phreatic tube. This continued horizontally for a few metres before descending into a mud-floored chamber which, excitingly for me, had no footprints of previous human presence. We quickly trod a load of footprints through the pristine mud, and looked around the chamber to discover what looked like a boltable aven with continuing passage at the top. After a further rummage I squeezed myself under a low arch to emerge in a parallel chamber, with even more obvious looking passage continuing above. Here we decided to call it a day with plenty of decent looking passage to go at later in the trip, and headed back to camp.

We reached camp at well over midnight where we decided that since the main focus of the expedition had been to push the sumps, the aven climb should be named "Who Needs Divers Anyway?" as it had provided the largest potential lead with no diving involvement. I reflected as I ate my sandy pasta and bunked down in my one set of thermals in a sand filled sleeping bag, that caving outside Yorkshire wasn't so bad after all.

I awoke on my second day at underground camp as fresh as a daisy where I enjoyed sandy pasta for breakfast. Breakfast was accompanied by lots of tea; it was almost like having breakfast in Ingleton on a Saturday morning (except for having to bury your own poo in a sandy hole).

Today I was to join Simon in assisting Tony Seddon diving the upstream sump, with the secondary aim of pushing past the current limit of



exploration downstream in the 'upper streamway'. Wetsuits were donned by Tony and Si ready for the streamway. Unfortunately I didn't have one so I settled for a Russian 'goon suit', much to the delight of Phil who thought I looked like something out of Dr Who. He especially liked the rubber straps used to hold a tight seal around the face, though unfortunately we must have forgotten to pack the rubber ball for the mouth.

Tony quickly pushed beyond the short sump to going passage, allowing us to move on to the downstream pitches via the newly discovered downstream sump bypass (Diver's Dilemma). The connection was particularly disgusting, as we discovered that

Making dinner, the macho way, outside the tent... (Photographer unknown)

it was in fact bottom of the camp urinal [see Simon's *writeup—Ed*]. A couple of turds on a ledge and a particularly pungent pool of wee were passed to reach the refreshingly clean downstream continuation of the passage beyond the 'upper streamway' downstream sump (very confusing I know).

The limit of exploration was reached at an undescended pitch head. This was bolted and we soon found ourselves in virgin territory again, landing on a ledge overlooking further waterfalls now far below. A couple more pitches were descended before we ran out of gear above a large void, forcing us to return to camp after pushing a little further towards the eventual connection to the 'lower streamway'.

I found the camp to be once again rather comfortable if a little cold and we spent a good part of the night eating sandy pasta, and drinking lots of tea, whilst waiting for the others who were continuing to bolt the avens in the passage above Who Needs Divers. They returned late, having replaced Tony's antique dynamic climbing rope on the pitch up part of the 40m aven with real caving rope, and boasting of "the most amazing formations ever seen" at the top of the next climb, with more unexplored passage beyond. By the end of the evening my furry had finally dried out (this being after hours of walking around camp and shivering in just a furry to allow it to dry with just my body heat, as heating the inside of the tent with the stove was apparently "too gay").



...and cosying wuth the stove inside the tent (Photographer unknown)

My third day at the Sala Oston camp was mostly spent waiting for more rope for further pushing to arrive with the incoming party (as Steve and Tony were leaving the cave today). We expected our reinforcements at around lunch time, but it soon became apparent that this was vastly over-optimistic. Fairly soon after lunch, Phil got bored of waiting and decided to go back to bed whilst Simon and I decided to have a look around the passages near camp. We discovered a complex labyrinth of phreatic passage that seemed to surround the camp and connect to the 'upper streamway'. I was hoping to find a connection similar to 'Diver's Dilemma' in the upstream direction, but, alas, this link remained missing. Although the passage explored was not of great consequence, I was still rather pleased with myself as two days previously I had never before entered previously unexplored cave, and the passage found today could have been a decent length extension in Yorkshire, or a full on Mendip pothole!

Eventually, the arrival of the new team was announced by the searingly bright orange light emanating from the huge section of pipe attached to the head of Paul Windle. Fortunately, I heeded the warning from Phil and averted my eyes in time to avoid getting sunburnt retinas. As it was so late by this point, we decided to go to bed in order to continue pushing the aven passages in the morning, before returning to the surface.

We got up bright and early (well early at least) in order to fit everything in. The plan was for Phil, Simon and myself to first re-ascend the aven, photograph the formations above, then continue through and push the pitches beyond, before returning to the surface after 4 days underground.

The first thing I became aware of as I put my caving gear back on was just how smelly and sandy my furry and thermal was getting but at least everyone else was horrible too. Sandy pasta was once again enjoyed before we headed out of camp at 0730 with a fresh supply of rope.

We ascended the aven on slightly safer ropes than before, and the previous limit of exploration was soon reached. Above the chamber where I last got to, the short climb had been roped 2 days earlier by Phil and Steve and now led up into a large clean-washed phreatic tube. Continuing horizontally along this passage soon led to the formations.

The formations here were exquisite and untouched—I've never really appreciated that before. Bushes of crystals, and stal, some as thin as hair and spiny and sharp, adorned the walls. They were later named "Jack Frost" by Phil due to their resemblance to frost crystals. Unfortunately the passage here is a boulder floored rift and the whole of it is plastered with formations, so progression without any destruction is very difficult. A game of cave 'twister' ensued with each person taking about half an hour to pass the 10m or so long section of passage without touching anything other than a couple of spots sacrificed for progress.

Once past the formations, we bolted and descended a couple of short pitches into very large phreatic passage with slight stream trenching in the floor. A short walk along this huge passage led to a short pitch through a slot to a couple more short pitches. At the final pitch, the phreatic tube was almost vertical, and at the bottom passed a low arch through thick old sediment and muddy boulders. Once this arch was passed the passage inclined sharply upwards again, giving the passage the characteristics of a giant U-bend. I was sure that this almost certainly used to be a sump, even after the rest of the passage was abandoned, as old tide lines were apparent high up.

Once past the 'U-bend' the passage once again ascended up muddy boulders to a slippery hairy climb. As we were so far from the surface, and had run out of rope once again, we decided not to risk attempting the free-climb as an accident here would be very serious. Less than 10m above the climb, there appeared to be passage heading off in a similar style and size.

All this impressive passage was then surveyed back to the previous limits of surveying under rapidly dwindling levels of patience. Simon undertook some amateur photography of the formations. We then headed back to camp after what was already a long day's caving. I must admit I was feeling a little bit nervous at this point as I was already feeling quite tired and the prospect of 750m of prussiking, by far the most I've

ever done in one trip, seemed quite daunting.

However, after a tea of sandy pasta I was feeling much more enthusiastic about the exit, and in the end even the large blisters being formed by my footloop didn't stop me enjoying the long haul out. I reached the surface after 7 hours of prussicking and almost 20 hours of continual caving. At this point I couldn't help but feel incredibly lucky to have had the opportunity to a member of the party that discovered such interesting and potentially important sections of cave, the scale of which I am not accustomed to being a simple Yorkshire caver.

Piss Pour Pushing Passage

Simon Cornhill

During the first camp down Texa, we had a preliminary investigation of the alleged 'two undescended shafts near the camp'. The first was connected to a passage partway down Pozo del Guix, via some shouting and light flashing. It proved to have been already climbed on a previous expedition (due to mud being found on holds all the way up).

The second shaft was the one people staying at the camp had started to urinate down. Despite the very strong smell, I climbed over halfway down it, and it could be seen to continue. My thoughts were, 'If we are going to use it as a urinal maybe it should be fully explored first?' However I was warned off it in no uncertain terms. The expedition leader had expressly requested that we left some leads for the other cavers later on; obediently I complied.

On my second camp, after Noel Snape and I had helped Tony Seddon get into the upper-upstream sump, the three of us ascended the recently discovered 'Divers Dilemma' pitch, to continue rigging the new pitches. A short distance into the new find, lo and behold a smell of urine hit my nostrils! Turning to the others, I asked "Can you smell piss?" Tony replied, "Well, this is where Hils and I peed in our wet suits". Hmm, looking up at the passage, it seemed very familiar. "We are under the camp piss rift!" I declared.

One can only imagine the conversation between Hilary and Tony when they discovered this place... "Sniff, sniff. Have you pissed in your wet suit?" The reply, "Of course I have, haven't you?" "Yeah, lets go"... and with that they carried on exploring the new stream way. *[I confirm that this is pretty accurate, except that the wetsuit I'd pissed in was Simon's, not mine.—Ed]*

During a spare moment the next day I climbed all the way down the 'camp piss rift' and dropped into the diver's dilemma passage confirming the link.

Note: This lead had been given to some cavers to explore, who were unable successfully to make their way down it. So the 'The Piss Pour Pushing Passage' was named.

Making the connection

Paul Windle

"Change of plan. You are are going to the camp tomorrow." "OK." "With the Russians." Mind starts pondering the difficulties: how I am going to communicate, as I don't speak any Russian. However Sveta speaks English, so not to worry.

We set off across the mountain carrying lots of gear, and manage to stay on the track. Well, there are reflective markers placed every few metres, so even my usual lack of direction sense does not succeed in getting us lost.

Once at the cave, we change and descend. The snow plug has receded from previous years, and the unpleasant scabble between rock and ice has gone. On into the meanders... don't remember it being this tight. Aaah, maybe we should be at floor level. Everyone backs up, gear is shuffled round, and we continue.

At the brew stop we concoct something warm and wet at least, and then on again. The new rigging on the short rift pitches is much better: no more ankle-height Y-hangs. Dragging two bags is still slow and hard work, continually untangling them from something. Eventually the camp is reached, complete with orange tent. We grab some food and then turn in. With six people in the tent it is really warm.

Our plan is to rig Piss Pot into the sump bypass and then to explore down stream. The rock at the top is so incredibly friable, it takes us a while to find somewhere two bolts for a "Y". Further discussion, Sveta acting as interpreter, and we eventually have a rig to everyone's satisfaction. Vlad places a re-belay part for the second half of the drop. Whilst passing this there are some very fine crystals to be observed inside a pocket.

We drop into the maze below the camp. Vlad, feeling unwell, returns to camp. Sveta and I continue down, managing to keep mostly dry around the pools. A short pitch ["Good things come" --- Ed] follows in a fine sporting streamway. We locate the end of the previously explored passage, leave the rope and return to camp.



Svetlana Klimenko, one of the expedition's Russian contingent. (Photo: HG)

The following day, we all return. The rope does not reach the bottom, so a new rope is attached at a convenient re-belay, and Vlad places a further re-belay below an overlap. A little care is required on the pitch, stepping over some boulders, which look to be loose but have presumably been kicked?

Arriving on the big ledge we have a look round for the way on. Squirring through boulders does not produce a result, so we place some bolts in readiness for the day after, expecting to bolt out and drop the left hand wall. As we have now run out of rope we return to camp.

Our last day underground. We rummage round looking for more rope, and find various bits of very muddy stuff. Vlad sets off to derig the pitch up [Diver's Dilemma — Ed] into the dry bypass while Sveta and I start the survey. "Do you you know how to survey?" "A little" (but I suspect she had done more than she was admitting to). So I take the instruments and the book. The first few legs go OK. Then, "How does one measure a pitch more than 20 meters between rebelayes with a 20 metre tape?" Fortunately Sveta manages to jam the tape end in a crack, so we are able to measure that leg.

Vlad catches us up just as we finish surveying to the ledge. The way we had hoped to go proves impossible due to poor rock. In fact the only place Vlad manages to find which would take a bolt is a huge flying boulder. What is keeping it up there? Nobody can see. A heated conversation in Russian follows, but in the end we all go down off that precarious boulder. The next section is also longer than 20 meters and includes a knot-pass in a waterfall. Communication is now doubly difficult. Arriving at another huge boulder on a ledge halfway down the waterfall, I spend quite some time recovering the tape which has been swept under some rocks. Vlad has placed another bolt. Then Sveta tells me the tape had run out just above the knot, so we guess the distance back to be five metres, and continue the survey. We then descend a long calcite ramp which terminates abruptly. I shout down for a sling, but more communication problems. "Rope is free!" comes the reply.

Using a spare 'biner I tie the rope around a thread, and continue down to the others. The noise is now very loud, but on reaching the base I recognize the waterfall from my trip a couple of years ago, and tell the others we have made the connection. As the rope is in the water we derig on the new pitches on the way back to camp.

By this time it is quite late, so we decide to stop one more night at camp. The tent really is a good idea, and even without a sleeping bag it is passably warm in there with seven people providing the heat (the sleeping accommodation being overbooked). Our exit from the cave is made the next day without further incident.

The Conversion

Peter Whitaker

Journalist 'Erego Stardom writes a personal account of how she pursued the story of the rumour of a rescue in the Picos, in order to sensationalise the story in the eyes of the unwitting public, and to once again encourage them to label cavers as "bloody idiots with half their brain removed" and ask fundamental questions like "Just what on earth do they think they are doing down there?" Her report continues...

I was innocently on holiday in the beautiful Cangas de Onis. The tranquillity one day was torn apart, even more so than the surface of the river when the teenagers dive bomb off the Roman bridge to show off to their cooing girlfriends. I was researching a sensational tipoff about a historic religious event when the waters in the resurgence at the holy site of Covadonga miraculously turned blood red on the day of a religious feast. The pleasant fragrances in the internet cafe were simply assaulted by the awful smell emanating from what I can only describe as a "ragtag band of scruffy students and associated misfits". I reviled as they filled the room; they were obviously downloading child porn or up to other evil deeds by the look of them. I'm ever on alert to do my duty as a citizen, and skilfully started to overhear what they were on about. I heard the phrases: "...bloody lucky" and "...could have been a lot worse... we'd have really been in the shit if owt had happened for real". From this misty conversation, I heard but one Spanish word—Ario.

As a journalist I'm ever on the lookout for a scoop; I recognised this immediately as the makings of something gigantic, and it seemed too sensational to miss. I immediately postponed my trip to the reputed blood red waters at Covadonga Cathedral to get on the trail...

I stealthily followed them in secret to, rather disappointingly, the supermarket. However, it became apparent that their behaviour there was most unconventional. I chose to wait outside rather than get caught out following them round the aisles. When they came out I tailed their scent to a car park, and they started shuffling things round in a landrover for ages. I nipped back to the supermarket to get myself some Lucozade for this thirsty detective work. This provided me with some valuable information.

As the checkout lady recognised that I was English, she held her nose as I approached. I asked in broken Spanish about "Los Ingleses". A manager took me to an aisle. "Mire," he said, and pointed at an empty shelf where cartons of wine used to be. "Toto!" They had taken the lot. I was shown a similar void where Bimbo used to be. "They come from mountains. Did not purchase anything else." I was very alarmed at this. It appeared that these students are living in filth up the mountain, sustaining themselves on nothing but processed bread and rank vinegar wine. I had to see this lifestyle for myself. "Ario?" I chanced. "Si senorita, Ario," was the reply. I went back to the internet cafe to look up where they were.



The surface camp at Ario, on one of the nicer days. (Photographer unknown)

It turned out that Ario was a small refuge hours up in the mountains. I would have no choice but to walk there. The walk started at the end of the road, way past Covadonga and at some touristy lakes.

I took a bus up to the lakes, armed with carrier bags full of provisions for a trip to this Ario. At the end of the road I saw them all hanging about outside a cafe. I pretended to be another tourist and took a few photos at the lake, among all the Spanish, who had their jumpers tied round their shoulders. I was quite unnerved by the fierce looking cows, which tossed their fantastically long horns at the kids who tried to pet them.

As I didn't know much Spanish, I obtained a soft drink from a vending machine, and sat at a table near the scruffy bunch. They were all talking and gesturing about some rescue that had taken place hundreds of metres underground. This was obviously sensational news. Hundreds of metres is thousands of feet, and I get a bonus for reporting events in large numbers at my daily rag in England. It shocks the public with the drama of the staggering figures. The behaviour of the group took a turn into irresponsibility. I overheard:

"We've got hours to walk, we've had no food all day and we've got all this weight to take back up. It's gonna be dark soon and I didn't think to bring a head torch. I'm just gonna die on the sodding wastelands."

"Don't be so soft and have another beer. Liquid refreshment, sustenance comes from the glass. You need lots to drink in this heat. Eating is cheating."

"Twisted my arm..."

They eventually supped up, packed large rucksacks and staggered off round the lake. I decided it was too dangerous to follow these drunkards into the mountains in the encroaching darkness. The last bus had long gone. Luckily I had seen where this bunch hid a key for their trailer, so I made as comfortable a bed as I could in there from an assortment of stinking gear and hundreds of packets of noodles. The best I could do for a pillow was a diving bottle with a towel over it. I had the most awful night's sleep. The stink of unwashed filth was overpowering and gave me suffocating nightmares. Twice I woke up with a start when I dreamed that the diving bottle exploded and splattered my poor remains around this tin box.

At dawn I contemplated my predicament. Here I was, a dishevelled lady, in the middle of nowhere. I was on the trail of some filthy lunatic English who lived an irresponsible existence in the mountains on bread and wine, risking life and limb deep underground—and for what purpose, one might add? They had had some sort of incident underground and gotten away with it. It was all so terrifying, but at the same time very intriguing. I decided to bravely continue with my assignment.

Mountains are not my normal environment, but I blended in the best I could. I found a basic bag in the trailer. It was muddy, but at least the bottom was intact, which made it stand out from the rest. It had an annoying tail of rope from the top that would dangle around, but I would just have to put up with this. It was made from very thick plastic and was like a wide tube. The shoulder straps were almost impossible to adjust; there was no waistband and the top didn't close properly when I had put all my carrier bags in. It would dig into my shoulders if I had to carry it for hours, so I came up with the idea of putting a towel over my shoulders when I carried it. I had neglected to buy a sun hat, so the towel doubled up for this purpose also, when I realised my sun cream was in the bottom of the bag. I swapped my high heels for a pair of Chinese plimsols in the trailer.

The trek up to Ario on my own was very eventful. It was easygoing near the lake, but then it got steep and muddy. As I passed a remote farm (I didn't know they still existed in this day and age), the shepherd shouted at me. "Corde, mas corde? Give you my cheese." I ran on, terrified, until I noticed a bull sat in a field with a pair of rugby balls between his legs. At this point I was even more terrified. I found a spring and doused my head in it. I quickly soaked the towel and carried on. Then came hill after hill, lots of up and down and more hills. After hours I eventually got to a viewpoint stone, which was like a low solid stone table. I have to admit that the scenery was breathtaking. I was relieved to be going downhill but my good fortune was short lived. The mist descended all of a sudden and I lost the path. After wandering around for half an hour, I came across an area of bare limestone full of dangerous looking holes. Whilst stumbling on, I startled someone in the middle of some awful act. He was perched above a hole with his trousers down. When he saw me, he fell back and I thought he was going to fall down this pit. He flailed around and managed to keep out, pulled up his trousers and ran off into the mist holding a yellow tin in one hand, clutching his ribs with his other and shouting in some Slavic language.

By some stroke of luck I came across the mountain dweller's camp. I was aghast. If I had a queer impression of this group before I came here, it was reinforced at the sight of the place. Dirty gear lay all around. Heaps of washing up lay undone. Ruined huts had been poorly covered with tarpaulins and poles. An assortment of pans lay about near some large black tubs full of filthy water. Tents lay scattered around the place, one was ragged and trampled. It looked covered in cow muck. Tittering came from a tent near one of the ruins. I decided to stay among the rocks to observe them for a while. Presently, some of them unravelled some string wrapped around a soft drinks bottle, and started shouting into a little box,



Andy Wright on one of the pitches in the lower reaches of the cave. (Photographer unknown)

obviously some sort of game for occupying their time. Not only did one keep repeating something about “MORE CHEESE”, but he spoke most moronically. I thought I might be hearing things wrong, but this behaviour continued. They rolled up the string, grabbed equipment and provisions and all set off at a pace past some more ruins and up a hill into the fluctuating mist. This story was getting weirder by the minute. No wonder they needed rescuing—they were sending retards around the caves and mountains.



Four members of OUCC Canal del Montico 2008, starting the trek down from Ario at the end of their stint on expedition. (Photographer unknown)

All was quiet, so I approached the camp for a closer look. Suddenly, someone approached me from a large scout tent.

“You must be new. Which club are you from? I’m from Spartan Unitech. How much experience do you have?”

“A bit,” I improvised, “I’m from Dukinfield Uni, near Manchester.”

“I’ve been caving for over a year now.”

“Me too, They call me Erego by the way.”

“Have you done Daren Cilau entrance crawl yet?”

“Errm...”

“You’d remember if you had. It’s really hard actually. This cave over here’s harder but in a different way. It doesn’t matter if you haven’t done Daren though. You’ll probably be OK. I’ll show you the way. I came out from underground camp yesterday and I’ve been sleeping since. Have you brought bimbo from up from town?”

“Yes,” I gushed enthusiastically as I remembered the empty shelf in the supermarket.

“Cool, I’ve been looking forward to a marmite peanut butter mayonnaise jam lemon curd chorizo combo since minus 600. Want a brew?”

In order not to arouse any suspicion I agreed. He took me into one of the ruins, which was littered with dirty plates and cutlery and knives. He waved some flies away from a knife, wiped it on his T-shirt, and proceeded to use it to concoct the most disgusting sandwich I had ever seen. He set about boiling some water, which was more like the by product from making a fireball out of a petrol stove tottering in one corner.

“Where are the others?”

“They’ve all gone over to the entrance. There’s only us around now. We need to make sure that the cows don’t gorge the tents... oh and get some water.”

I smirked inwardly. All alone in the mountains with this student I could pump him for as much information as I wanted. The things I have to do for a good story.

“Why don’t you tell me about the rescue?” I pouted. “After all a girl like me needs to stay safe up here. You seem like just the hard man to look after me. Tell you what; it’s not very comfortable in here.” I cocked my head and added a finger to the corner of my mouth, “Why don’t we go back to that big tent with the... giant pole... and you can start to ... look after me? Besides, you look like you miss one or two comforts stuck up here on your own.”

This mountain dweller was so gullible, I was only going to screw the guy, but he looked like all his Christmases had come at once and the cup of tea fell out of his hand to acquire another dent on the broken stone floor.

Afterwards, as we lazed away the afternoon pouring dirty water through even dirtier tea towels and colanders. I summed up the story in my head. Even though I had got a glimpse of the lifestyle these cave goers had, no amount of pumping had revealed just why they were here. All this talk of cave systems and connections, sumps, surgances, thousands of feet below some tiny hole in the middle of nowhere, it all seemed like a made up reason to doss around all summer. They seemed to get away with it all. The drama and benignings, subsequent rescues were very close to the wire, just like the health and safety at camp. Walking barefoot to collect snow, flailing around with a rusty axe on a sugary pile of the stuff near numbing toes. Dicking about making a fireball out of some old stove in order to get a cup of tea. Doughnut mixture left for days collecting germs, only to be frazzled into a carcinogenic mass of carbon in a drunken whim, instead of throwing eggs around; washing up left for as long as possible, the list was endless. I decided that I needed much more time on this assignment.

The next two weeks became a blur; I learned all sorts of new skills but could hardly remember the names of the equipment and practices

with the ropes. I nearly needed rescuing myself; I was scared at the time but laughed about it afterwards, downing some smuttily named Spanish spirit. The life at camp was very basic but I somehow adjusted to the filth. There were some memorable moments, like sitting around under a tarpaulin in the ruins, listening to the downpour outside and singing smutty songs. My new guy's lovemaking left a lot to be desired but I got used to being roughly shagged behind some rock whilst everyone else pretended not to notice. As I walked down the mountain at the end of it all, with carrier bags full of rubbish swinging from the outside of a rucksack, I thought up a phrase to best explain what had happened:

"I had gone up the mountain normal, but came down a caver."

A novice's eye view of the expedition

Matt Bazire

As this was my first caving expedition, I really didn't know what to expect. In my mind I had likened it to the mountaineering expeditions I'd been on which generally involved early starts, very long days, uncomfy nights' sleep and crap food. So after flying to the wrong airport in Northern Spain, missing the last bus and a 10 hour walk up the mountain in the dark with the wolves baying in the background, I was pleasantly surprised at the well established base camp we found. After spending the rest of the morning recovering in the glorious sunshine we had the camp tour and settled down to wait for everybody to get back to camp. It was quite weird joining the expedition when we did: so many people were sleeping at the underground camp in Texa that it took us a 4 or 5 days to finally meet everybody on the expedition, which definitely kept us on our toes.

The caving on the expedition for me was split into 3 bits: prospecting, digging and caving in the expedition cave [Asopladeru La Texa]. All were very new to me, as I had only done a few Yorkshire trips with my university club before. I'd never been exploring or digging in caves, and had not been in a cave the sheer size and scale of Texa, so I felt I was on a very steep learning curve. But something always needed doing, whether in camp or in one of the caves, so there was never a quiet moment!

Of the three, I found digging the hardest, as in addition to having to cave down to the furthest part of the cave to begin digging/enlarging, once you're there it is generally for a long time, which when you're not making any breakthroughs feels like forever. Prospecting was a very mixed bag, as I spent a day wandering around looking down holes that had already been explored, or in one case all led to the same choked cave, which was very frustrating. But all this frustration can disappear so quickly if you find anything remotely interesting, it really showed me how much of an eye you have to have for spotting potential caves. Also how important patience is in the whole process!

Caving in Texa I found the most rewarding, despite only getting 200m down it, as it was really nice caving, a mix of really big pitches and some tight rift sections. But it once again opened my eyes to the difficulties of expedition caving in terms of the logistics and man power required.

But all in all it was a great experience for me, as I now know the areas of caving that really interest me, so I can make the most use of my next expedition. The social side of the expedition was also great fun, as there was only 1 communal area everyone ended up helping with whatever was going on, be that cooking, drinking the latest batch of cheap wine, fixing bits of kit or just chilling out.

As an expedition virgin I had a brilliant time just being able to explore caving as a sport in one of the most beautiful areas I have been to, with a group of friendly, experienced and determined people doing what they love.

'Broadsword Calling Danny Boy'

Andy Sewell

When involved in daily routine on the massif, you tend not to notice what is going on in the ordinary day to day machinations around you.

Camp was situated on one of the main long distance routes from the lakes via the Ario refugio and down to the gorge. There was always a constant stream of passers by, some of who would share the campsite.

One day late in the expedition, a Norwegian couple with a poodle appeared and set up their Scandinavian campsite in one of the depressions by our old pastor's hut. It was vaguely amusing when they asked about the 'sanitary facilities' available, and we thought no more about them.

Camp routine involved two daily comms sessions with the underground camp via the Nicola radio. This, being through 1400m of rock, was a technological marvel of cave electronics. However voice clarity was not great, and conversations took place using a combina-



Hils talking with underground camp on the 'Système Nicola' radio, from the Ario bowl. (Photographer unknown)

tion of military voice procedures as in 'over' and 'out' and either talking very loudly or very slowly. A typical exchange would go along the lines of "Say again"..... "what do you need" and a crackly distant voice would be heard replying from the depths "C H E E S E..... Charlie Hotel Echo Echo Sierra Echo". To us this was part of day to day existence, but to the uninitiated such as passing walkers and people camped next to us it must have sounded like incomprehensible gobbledygook.

One day when I was on a run down to the van, I stopped at the bar at the lakes for long anticipated steak and chips, washed down with fine local beer. In my dirty clothes and unwashed state, I was on my own amongst the well dressed Spanish holidaying crowd who had taken the long journey from their cars to the bar. I spotted our Scandinavian friends desperately trying to order using North European precision, which doesn't really work in this Gallic environment. I joined them at their table and struck up conversation. It transpired they were geologists working in the oil business, and were interested in what we were up to exploring 'caverns measureless'.

Their immediate assumption upon awakening on their first morning next to us, however, when hearing said exchange over the radio ("HELLLOOOO How are you" ... "say again"... "more chocolate, Charlie Hotel..."), and having no idea what was occurring, was that we were some sort of therapy group helping those who were mentally challenged and in need of speech therapy!

They were amused to find the team comprised some of the finest speleological minds from one of Europe's greatest universities. The team underground, when I recounted this tale on their first morning back were also highly amused, and Hils immediately decide on the nickname "Special Needs" for Mad Phil. It just goes to emphasize, things are not always what they seem!

Breakthrough in B1

Richard Overton

"Who wants to go digging?" asked Pippa [Rogers].

Silence...

After a few days of seeing the long faces on people returning from a day of "shaftbashing", and in the knowledge that generations of cavers from my own club had been digging the same hole in South Wales for around 30 years with nothing to show for it, there was only one thing to do....

So a crack team of Pippa, Andy Sewell and myself set off in search of "caverns measureless to man". The plan was simple: walk around the arid limestone landscape for hours and hours and hope to feel a gust of cool air coming from the floor, indicating miles of passage beyond... There was not a cloud in the sky, and the Spanish sun beat down on us relentlessly

After walking around for a while looking at a number of shafts, all of which had at some stage been visited by OUCC, we came to a cave entrance, B1. B1 has an entrance like the caves found in children's books about cavemen, but that's pretty much all it has (or had, I should say). The desire to crawl inside was more to do with the fact that it was wonderfully cool inside and had very little to do with wanting to do any exploration. After about 6 seconds I was at the end of the cave.

There were clear signs that some digging had been attempted to the left and to the right of the pile of rocks in front of me, but neither way looked particularly appealing. I had a little poke around, and dispiritedly pulled a few rocks out from the floor in front of me.

Then there it was, a faint draught. At first I thought I probably imagined it, but no, it was a draught, and as I pulled a few more rocks out I could feel it getting stronger. Pippa and Andy sat at either side clearing away all the rocks that I was now pulling out of the ground at some speed. Before long I could just about see a small passage emerging, and after a few more minutes of shovelling rocks out of the way I had my wellie well and truly in a hole.

Before long the hole had become big enough for me to slide into. I found myself in a very small passage, about 1.5 Richards long. The digging continued, with more and more bits of Spanish mountain being passed up to Andy and Pippa. It was at about this time that I began to become very aware of the fact that there seemed to be more rocks falling back into the hole than I was passing out, and the little gap I had been using to pass the rocks out was getting smaller. It was time to call it a day. At this point Andy and Pippa attempted to stand up and make their way out, causing an alarming number of rocks stacked behind them to come raining down onto me and threatening to block me in. A very hasty exit was made, with a small landslide behind us as we left partially blocking the hole we had just spent the previous few hours digging.



Richard Overton in B1. (Photographer unknown)

As we headed back to camp, the cloud dropped in from nowhere, and we were soon walking in very poor visibility. Somehow we managed to get split up, and within a minute we could not see each other. Andy started shout "Richard, look, I'm over here. I'm waving at you." Looking around, I could not see Andy at all. "I'm over here, look. Stay where you are and I'll walk over to you," Andy shouted. 10 seconds later: "Oh, no, that's not you, that's a cow." Andy had been frantically waving his walking poles at a cow.

The next day I started to wonder if it was worth going back to B1 again and doing some more digging. It was clear that if any further safe exploration were to be carried out, a lot of rock would need to be shifted out of the way first. For some reason Oliver [Kreitman] and Will agreed to join me, and armed with a tatty bit of rope and a large heavy duty plastic rice tub, we headed off to B1.

The plan was to set up a system in which the rice tub would be filled with rocks at the bottom of the slope, and then hauled up to the entrance using the rope. After a bit of amazing engineering from Will, our rock scoop was ready for action. Will stayed on the surface to do the hauling, Oliver was at the bottom of the slope loading the rice tub with rocks while I was at the very bottom pulling out the rocks and throwing them in Oliver's general direction. The rock scoop system worked fantastically well, and every few seconds Oliver would shout "pull" to indicate another tub of rocks was ready to be hauled out. This went on for hours and hours, and it was only when we stopped for a quick Mars bar that the scale of what we had done became apparent. Will had been stacking the rocks just outside the entrance to the cave, and in doing so had created a really rather impressive dry stone wall. By the end of the day a great deal of rock had been shifted, and the draught was still there and feeling stronger, enticing me to return another day.

A few days passed during which I occupied myself with duties around camp, doing a trip to the Landrover to pick up supplies and generally exploring the delights around "Area E". Before long my last day on camp came along. The thought of the draught in B1 would not go away. I had to go digging.

The way on seemed to be straight ahead still, so I got stuck in and started pulling rocks out again. After about an hour the breakthrough came. I could not really see much, but there seemed to be a big empty space straight ahead. Another hour went by with me carefully pulling out rocks. At this stage Andy had a look and soon realised that I had been wasting my time pulling the rocks out. The passage beyond was huge, the rocks could simply be kicked down the make the hole bigger. After about 5 minutes of kicking the hole was big enough for me to fit through. Being the non-adventurous type, I used the tatty bit of rope as a lifeline, just in case there was a huge bottomless pit beyond. Andy belayed me, and after me asking him four times if he was holding tight I squeezed through the slot. It turned out that the rope was not needed as I found myself sitting on top of a huge boulder pile in a large cavern.

I had never found any cave passage before, and it felt great. It had only taken 3 days of digging, and before us was around 200 meters of passage. I returned to camp a happy man, wishing that I did not have to pack up and leave the following morning.

From Cheesecake to Culiembro

Chris Jewell

Before Christmas, Hilary Greaves persuaded me to join her on an expedition to the Picos, along with Tony Seddon, to dive some sumps at the bottom of a 900m+ deep cave.

By the time we departed in July the team had grown to include quite a few of my friends — a team of Irish cavers, Phil Rowsell, Simon Cornhill, Rich Bayfield, Pete Whitaker, Will Stewart and various other people. I was heading out for the last two weeks of the trip, along with Rich Bayfield and Will, to pick up any diving leads left and help derig the cave. Knowing that I might be limited with my diving or not get any diving done at all, I did a lot of research on Culiembro, the resurgence for the area, incase we had any spare time.

As the team were already in Spain, I managed to get a text from Hils before I left telling me the score. The main sump had gone deep (dived to 43m by Tony), one had been bypassed and the final upstream one had been passed and a dry passage explored to a waterfall. My mission was therefore to go out, get straight down the cave and up the waterfall!!

Rich B and I drove out in my Beemer and made good time, leaving England on Friday evening and making it to the refugio at the bottom of the hill on Saturday night, in time to meet Will and have a very good dinner! The next day it was straight up the mountain, meeting Tony S, Hils and Simon on their way down. Hils was picking her diving gear up whilst the others were off home after having done their three weeks on exped. As Hils needed to pick up gear this meant we didn't have to go underground until the following day so we slogged up the hill and got settled into camp. After some frantic packing in the afternoon we retired to the bar for a beer or two before our first night under canvas in the Picos.

Up early the next day, Rich, Hils and myself headed down the cave. We had a smooth journey down, except waiting at the top of the 85m pitch for the group coming up, and then me needing to go back up half a dozen pitches to pick up a stove as one at camp was on its last legs. Camp was extremely soft, in a nice dry chamber with a sand floor, and sleeping was inside a tent with lots of karrimats. We even took the stove inside the tent which made it really warm! That night we ate lots, sat and chatted and even had cheesecake made from a packet mix. However there were seven of us in the tent, which meant Hils and I shared a sleeping bag and we were all sleeping shoulder to shoulder — side on!

The following day we donned our wetsuits and made it down to the sump with the assistance of Pete Whitaker. Tony had left two composite 6's and we had our 300 bar 3's as well. However, the composite I picked up seemed to bubble out of the tap, so I elected to keep it turned off and only use it in an emergency. I borrowed lots of Tony's gear, including a mask which leaked on me and fins which were too large and threatened to fall off. We wore far too much lead as well, and carried heavy bags, so, although it was the most beautiful sump I'd ever been in, the experience of sinking, swimming as hard as I could whilst I thought I'd lose my fins, clearing my ears and mask at the same time and trying to stay near the line made the whole thing feel like a disaster!

Once on the other side, the beautiful passage continued and we caved cautiously up the passage admiring our surroundings. We soon found Tony's waterfall and surveyed back from here to the sump. Then whilst Hils took the survey gear back to Pete and Rich who were waiting, I

began work on passing the waterfall. I decided that bolting up a sheer wet face would be hard, and chose to free climb up high some distance back from this point. By heading up and over the top I was able to get above the waterfall and drop a pitch down just beyond it. Together we then explored another 200m of incredibly beautiful cave. There were no stal or curtains, it was just the combination of cheese coloured rock, azure blue water and scalloped, sculpted streamway! This ended far too soon at another waterfall but we were both grinning from ear to ear with our discovery.

Back at camp Phil had arrived and so the plan for the following day was hatched. Whilst Hils and Rich B derigged and photographed the bottom bit of the cave, Phil and I would survey the new section and look at bolting the climb. This was actually the first dive we'd done together — what a place to do it! Phil also appreciated the streamway's beauty as we surveyed it. We tried some cowboy tactics of trying to lasso something at the top of the waterfall but with no luck and decided (perhaps wrongly now we both agree) that we didn't have time to bolt and so retreated back to camp, bringing all the cylinders, bolting gear and lead back with us, helped by Rudi [Debbaut] and Will Stewart who arrived that night.

With exploration over, it was all about derigging the cave. Will and Rudi set off early with big heavy bags whilst we packed up another 8 bags and 4 cylinders. Our plan was simply to haul all the gear up as many pitches as possible until we got to the brew point at -400m. We did this pretty successfully; it was slow, but we worked well as a team and shifted a lot of heavy gear up the cave. At the bottom of the 85m we met Rob Garrett and one of the Russians who took a few bags, leaving us with a bag and cylinder each for the final few pitches up to the brew stop. Going down took just under an hour and we had a good dinner that night!!

On the final day Rich B set off early whilst Phil, Hils and myself caved up slowly with lots of bags, hanking rope at the top of pitches until we got to the brew kit stop. Here we took a decent weight bag each and headed for the surface we'd not seen for ages. As you might expect we emerged in a misty claggy horrible evening and hurried back to camp. It was good to be back and we made the most of our time on the surface the next day by doing a carry down to the Landrover and getting dinner in Cangas. Whilst we did this another team moved more gear out of the cave so we just had one final caving trip the next day to derig the cave and carry the gear back. We sat in the sun drinking ice cold beer at Refugio camp — all pleased with ourselves!

As we'd managed to derig the cave early my plan to go to Culiembro for a recce for next year now got a chance. So once we'd washed the ropes by the bridge in Cangas Hils, Phil, Rob Garrett and myself headed off to Cain. On a sunny afternoon we wandered down the track by the gorge with our caving gear and quite a lot of lead so that we could locate the cave. The four cavers walked down the path in the gorge and met the NUCC boys before locating the cave, some 20m below the path. The path along the gorge is excellent, wide and, most importantly, flat apart from some very short sections. However the final descent down to the cave entrance from the path is steep and over very rough ground. The entrance itself is a large fossil passage out of sight of the path with a small flat area in front where we got changed.

I'd chosen to bring my wetsuit on the first trip as it meant I wouldn't need to carry 'dry' kit back to Cain and swap it for a wetsuit on day two. I also suspected that as a resurgence the cave might be pretty wet anyway. Much to my delight and the misery of the others I was proven right when we encountered a lake just round the corner from the entrance! Pushing on through this we were soon on dry land again and in some very pretty cave with lots of gour pools, calcite and stal. We followed the cave on until this section ended and we dropped down into a large chamber where the stream could be heard below, but not reached. Instead two climbs offered ways on. Phil went up the first whilst I headed up the second. With mine looking good I headed on through a wide rift section to meet a descending passage, the entire floor filled with gour and calcite. This led down to two sump pools, one of which I thought was dive base. As I finished examining these Phil arrived, his shouts echoing perfectly down the passage, making it impossible to understand him until he was six feet away! He then spotted the sump bypass and together we followed the cave to a large pool and a dive line leading through. I got in here and in my wetsuit spotted that there was in fact a duck at the far end. Once through the passage led over a fixed traverse line, and down a rift to the streamway and finally round a few more corners to the large and inviting sump. Here I got in once more to check it was in fact a true sump, and I even found the dive line, just below the surface.



Chris Jewell looking on as Phil swims off into the 'upper streamway upstream sump'. (Photo: HG)



Madphil Rowsell, preparing to dive in the 'upper streamway'. (Photo: HG)

Happy with our recce, we headed back to meet the others and talk through the plan. Although we had a survey in Survex from the 1988 expedition, we had no idea where this fitted in. So we'd come armed with survey kit and the intention of surveying from the entrance to the first sump. Hils, Rob and Martin started surveying from the duck back towards the entrance whilst myself, Phil and

Matt headed out of the cave to survey in. In pleasant conditions both teams worked quickly and we were soon back on the surface and heading towards Cain for a well earned beer and dinner before falling asleep in the open air by the Landrover.

The following day I got up early to fettle and pack my diving gear. We took down two 7 litre cylinders, the usual regs, lights, and personal dive gear, my BCD and a line reel with 220m of line. By 9.30 we had our last coffee in the restaurant next to our field and hit the path towards to cave. The NUCC pair left us en route and headed back to Ario for more packing up of top camp, so our team was reduced to four. The trip to the sump was uneventful and we left Rob (in dry gear) on the near side of the duck whilst Hilary and Phil helped me to dive base. I kitted up quickly, only slowed down by needing to explain how my camera and flash worked to Hils who was taking photos. More photos of me in the sump pool further delayed my departure but I was warm in my new wetsuit and happy that we got some usable shots. Once below the surface I followed the very thin white dive line left by the previous team. After less than 10m this ended abruptly so I tied on my own reel and headed into the large clear blue sump.

Unfortunately I soon met the remnants of the other dive line which was now in large loops and clumps festooned along the walls and floor. I made the quick decision to lay my line carefully through the sump avoiding the old line, as I knew that if I was to tidy all the old line up I'd never pass the sump this time. Line laying was easy and the cave presented plenty of belays on the walls. After 26 minutes and approximately 150m of line, I surfaced on the far side as I hit thirds on my gas supply. The environment into which I surfaced made me wish I was still underwater however — a thunderous cascade of foaming water was pouring into the sump pool, making the spot noisy, windy and intimidating! I took my fins off and stashed them before climbing up out of the pool still with my kit on; I dared not leave the gear near the water's edge. The dive had taken longer than I had hoped because of the line laying and I now wouldn't have enough air to get into any of the other sumps, so I contented myself with having a good look around here.

The active stream rises out of sump 2 which can be bypassed via a dry oxbow to reach the head of sump 3. Here I noticed a hole above the sump which requires further investigation. I then followed the other passage to the second static sump in the 'round window'. The original dive line appeared to be intact here but I wasn't convinced that it would still be in one piece further into the sump. Reluctantly here I had to turn back and collect the dive gear for the swim out. Before I left though I cut off the partially used line reel and stashed it on a ledge for next time. The dive out was uneventful and much faster. In fact it took me just 8 minutes to swim out and I used just 40 bar from one 7 litre cylinder. I put this down to the difference between line laying and just following line as the flow in the sump was not noticeable. Whilst I'd been diving the others had completed the survey, and they arrived back at the sump just as I finished packing the bags for them to carry.

We will be back next year to dive in Culiembro!!

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