

Irish Student Caving Expedition 2001

Dent De Crolles

France



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True De Glaz to Grotte Chevalier

France 2001 activities and main achievements

This report intends to describe the experience, lessons learned and aid we received in the expedition to Chartreuse in September 2001.

The Dent de Crolles is a mountain in the Massif de la Chartreuse, a huge expanse of limestone that is part of the alps in South East France.

The region was declared a French national park in 1995, in recognition of its beauty and heritage. Beneath the Parks 2000 Sq. Kilometres of Limestone lies a huge network of Cave systems. The most famous of these is the Dent de Crolles system, 603m deep and 55km long, making it the 30th longest cave in the world.

This expedition was conceived primarily to introduce young people to expedition caving and to give student cavers a chance to visit and study some of the worlds most interesting and challenging cave systems. As a joint project between students from Northern Ireland and the Republic of Ireland the project also attempted to increase co-operation between student cavers in the two areas.

The main aim of the expedition was to train for and gain experience of organising expeditions. This involved training in surveying, navigation, single rope technique, rigging, geology, and general speleological experience. The French Expedition 2001 provided the grounding necessary for an exploratory expedition in Slovenia in 2002.



The Dent de Crolles Mountain

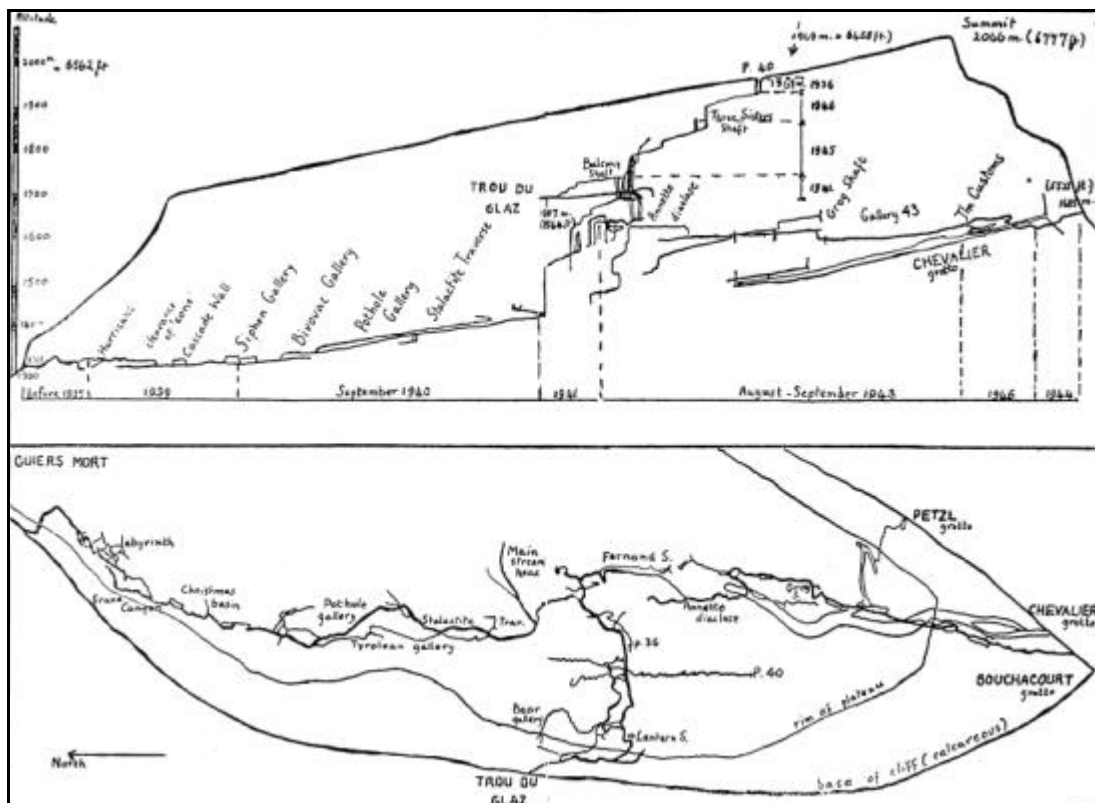


Cave entrance near the Guiers Mort Meadow.

Much was learned about the organisation required for expedition caving as well as the physical demands this type of caving places on the caver. As such the aim of introducing the rigours of expedition caving to a new generation of cavers was met.

In terms of caving the main achievements can be classed in terms of difficulty and participation. All members of the expedition had the chance to partake in the seven hour through trip from the True De Glaz entrance of the cave to the Guiers Morte exit. This allowed us to experience both a physical challenge unavailable in Ireland and one of the most interesting and challenging cave systems in the world. As well as giving everyone a taste of expedition caving this led on to even more challenging trips including the P40 through trip from the top of the Dent De Crolles to the cliff face far below.

This trip report will give greater details of all our trips and will include a geology report from Les Brown and cave conservation report as given by Seamus Breathnach at this years Hidden Earth conference.



Survey of the system from Chevalier 1951

Cave Conservation

By Seamus Breathnach

The primary objectives of the student caving expedition to the Dent de Crolles were to give the young cavers involved, the opportunity to help in the organisation of an expedition, while gaining exposure to more challenging cave systems than those locally available to them at home.

All aspects from pre-expedition logistics, participation in the expedition team, and compiling post-expedition reports were divided amongst the team members. The idea was to give as much exposure as possible to planning out and taking part in an expedition. As part of the expedition, particular attention was paid to how conservation principles differed between caves at home and the Dent de Crolles.

We come from a caving background that follows a set of principles enabling us to cave safely whilst preserving a caves natural environment as best as possible. Some like to call it the “conservation” code. Put simply: “Take nothing but photographs, leave nothing but footprints, kill nothing but time”.

While passing through some of the passages within the labyrinth honey-combing the Dent De Crolles, one couldn't but help notice the effects of human traffic throughout the cave system. Over the years many people have passed through this variety of cave passages and while some have been careful, some have not been so careful.

The Conservation Code

Clumsiness can wreck cave formations

Observe taped routes – they are there to safeguard the cave

Never leave litter or spent carbide in a cave – pollution kills cave life

Set others a good example when caving – persuade them to follow it.

Enlist the help of experts to record anything new you may find

Responsible leaders will avoid taking novices where they may accidentally cause damage

Vandalism means damage to formations, mud floors, gas pools etc. – help prevent it.

Alert your Regional Caving Council to developments that may possibly damage or destroy caves.

Take care not to disturb cave life, especially bats, or remains that may be of archaeological or historical mining interest

Initiate measures to help look after caves and mines – collect litter, clean off graffiti, etc.

Offer your support to others who initiate conservation measures

Natural caves and old mines are part of our natural heritage – help protect them.



Broken stals near the Guiers Mort

In a section of the cave not too far from the “Grotte du Guiers Mort” entrance, vandals had damaged what was once a finely decorated gallery of formations (left). Stalactites and stalagmites alike were broken into many pieces with nothing of some of the original formations remaining but short broken stubs. With the cave entrance being on the path of popular forest walks, curious individuals could not be prevented from disrespecting the natural beauty of the cave environment.



Some formations near the Guiers Mort



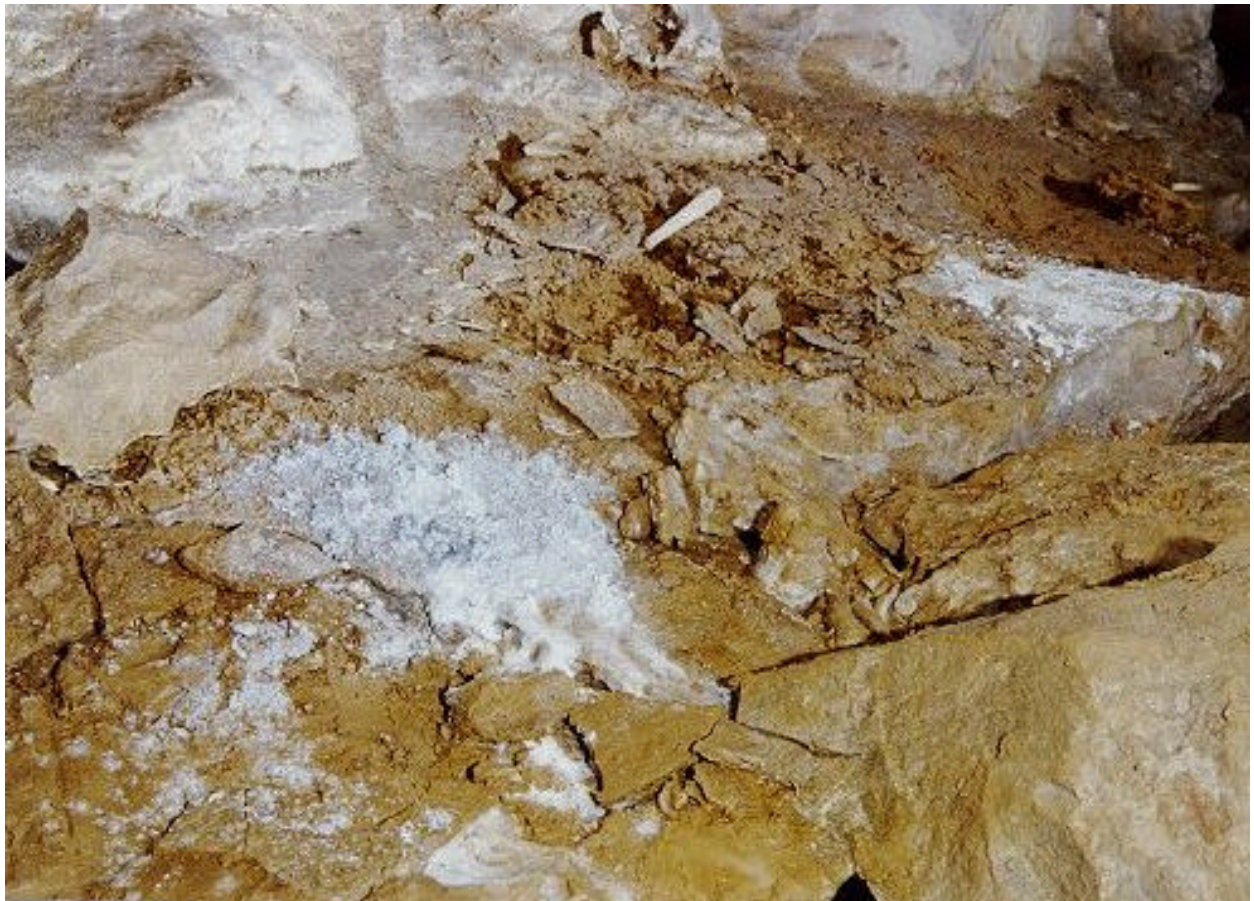
More broken stals near the Guiers Mort

Other unsightly evidence of the presence of humans in the cave was the frequent occurrence of carbide “dumps”. Spent or used carbide had been left in the cave in numerous places. We had brought plastic bags or similar containers to cleanly remove our spent carbide specifically so we wouldn’t leave a mess behind. It became clear to us that not everybody was as careful about cave conservation as we were. Used carbide can be extremely harmful to a cave’s natural environment if left behind therefore explaining our shock to find so much deposited in numerous parts of the Dent de Crolles. Carbide scorches especially in areas with low ceilings illustrate another conservation problem. The use of other types of light sources is to be recommended from our experience in the Dent De Crolles.

Because the Dent de Crolles is a multi pitched system with many levels of passages to its credit, much of the pitch heads have been set with anchors to speed up the process of rigging the pitch with ropes. As the years go by, these anchors often become worn and unsafe from frequent wear and tear. The normal process is to insert a new anchor to replace the old anchor. However, as this process is repeated over and

over again, pitch heads can become an ugly network of unused and often corroded anchors as well as those that are currently in use. We saw many instances of this, although probably unavoidable in many cases, it is a pity that such damage had been done to the walls above the pitch heads.

In conclusion, our eyes have been opened to the morals of regions outside our own when it comes to cave conservation practices. Before going to the Dent de Crolles, we knew there would be many differences in caving ethics to get used to and we have learned well from the experience. The only question on our minds now is when we get to do it again...



Photography Report

By Garrett Devitt

Introduction:

Before this trip I'd always wanted to know more about photography. I decided that since it was a training expedition, I'd try and learn as much as I could about cave photography by being the trip photographer. There's nothing like jumping in at the deep end.

Sponsorship:

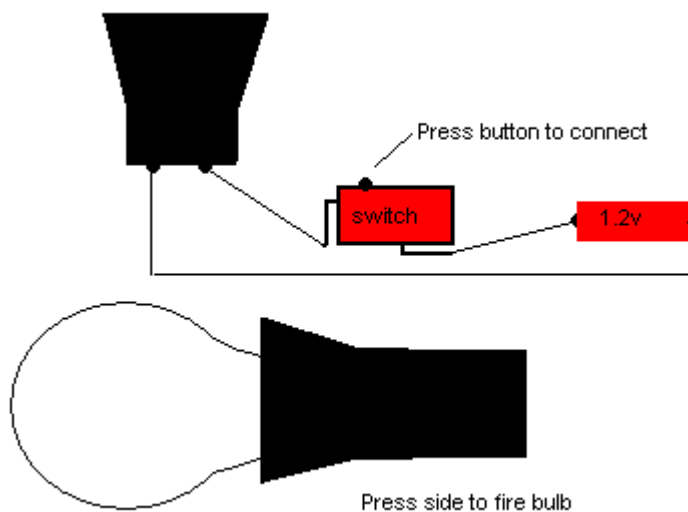
We managed to secure sponsorship from Meggaflash, a Clare company which manufactures large flashbulbs for architectural photography, and which are ideal for cave photography. They most generously gave us about 100 pf200 bulbs and couriered them up from Clare.

Fuji was good enough to kindly sponsor us in the form of 50 films. These films were very much appreciated over the course of the trip.

Gear:

Due to Foot and Mouth disease, I didn't have much chance to practice use of the new equipment I had bought before heading off.

- I bought an old Minolta SRT202, as a tried and trusted and robust camera it seemed ideal for underground use.
- I brought a 35mm and a 28mm auto-wide angle lens, the 28mm does give a little distortion but in an underground environment it's impossible to tell. The 28mm is excellent because even in a cramped environment the wide angle allows you to fit everything in the shot.
- I had no way of firing the Meggaflash bulbs. The bulbs are the same size as a standard 40-watt electrical bulb you'd find at home. I bought 3 push to screw fit light bulb converters, the flashbulbs are screw or Edison fit, and wired a switch and miniature 1.2volt camera battery to them. I stuffed the switch and battery into an empty film holder, pushed the end of the bulb converter into it and taped the whole thing shut. Hence, one very cheap, waterproof bulb firer.



- A mid-size ammo box, which I lined with an inch and a half of foam, it's very heavy but watertight.

- I got a blue lens filter on the advice of a professional film development company. Since then I discovered that they are not really necessary for caving photography, as the improvement in light quality does not compensate for the loss of light.



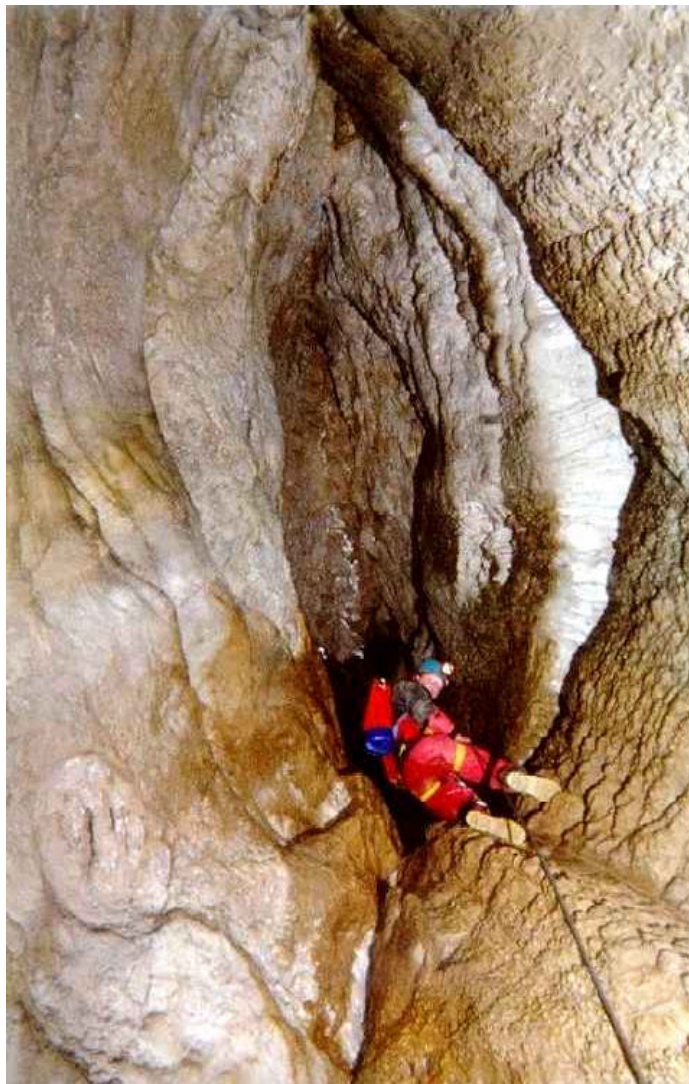
Rachael's kitchen, stove on the right, electronic flash in the foreground and firefly slave and electronic flash in the background.

Assistance

Sal Burgess lent much a tripod and gear and gave invaluable advice from her years cave photography experience. The BDH tube was invaluable for carrying the flashbulbs in and out of the cave. Eoghan Lynch was also a big help in suggesting areas of photographic interest as well as acting as a very compliant model!



Malcolm McDomhnall and Rachel Jordan at the top of Lantern one. This was taken with a disposable camera and slave flash in the background.



Rachel Jordan on Lantern Pitch 2

The picture of Lantern Pitch 2 above was taken with a disposable Kodak and a slave flash. The disposables have a wide-angle lens, greater than the 35 degrees of your normal electronic flash so a diffuser is necessary to avoid unlit 'edges' in the photo.

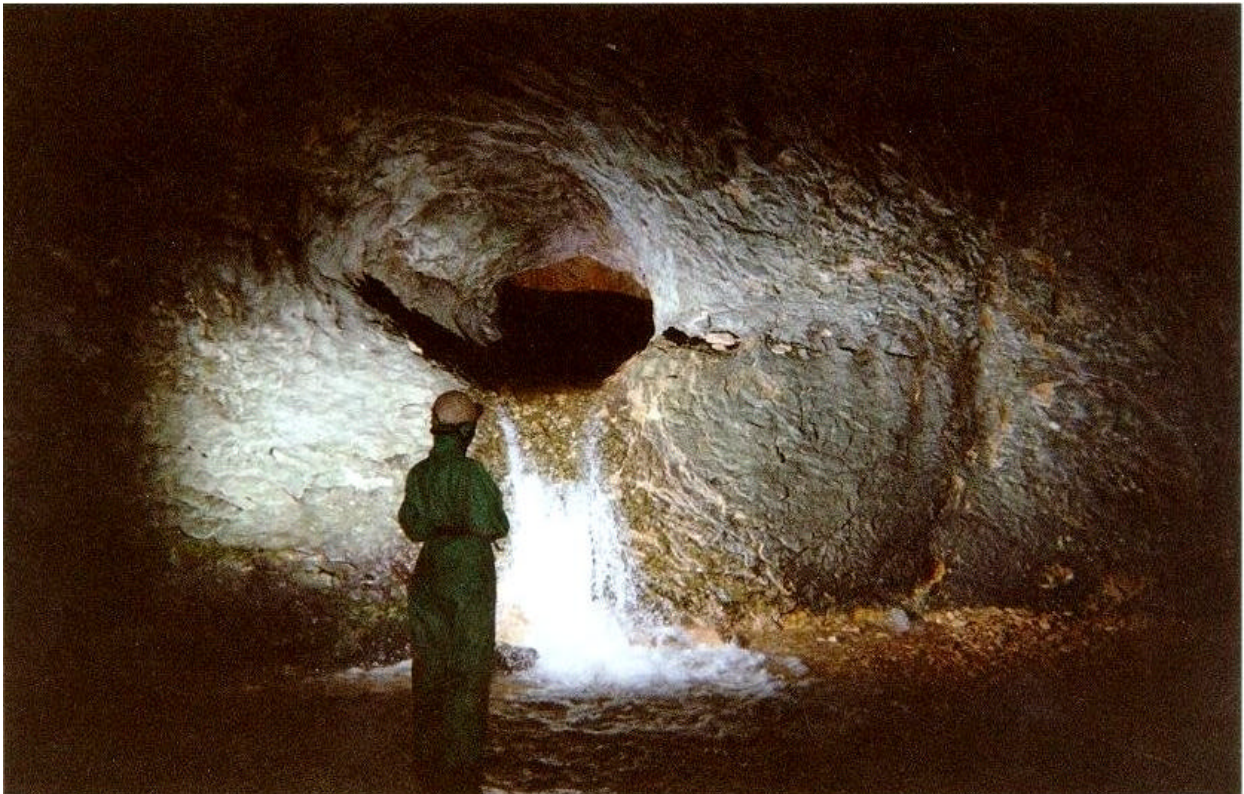
Lessons Learned:

- When estimating the light level, always add an f-stop or two.
- Cameras have no sense of balance but a tremendous sense of comedy, and the survival instincts of a lemming. After you've spent hours dragging a camera underground, and managed to set it up and worked out your light settings and angles and then set up your models, a good camera likes nothing better than to fall over and go for a swim in a handy lake or puddle or crease itself on a rock or fall off a pitch.
- Models feet increase in size in an inverse proportion to their distance from an unstable piece of expensive camera equipment.
- Add more flashbulbs, get your models to fire them and fire one yourself and fire some behind your models too. The more light the better!

- Take as many shots as you can, I took about 350 shots, maybe a 100 underground, about a dozen of the underground ones are usable.



Malcolm McDomhnall ascending P36. This was taken using 400 ASA film, b setting, an f stop of about 8 and 2 Meggaflash bulbs of guide number 100 (manually fired). A third bulb fired on the ledge above Malcolm could have improved the shot tremendously.



Fatima Touddert lighting up a waterfall with the firefly and electronic flash. The photo was taken using a Kodak 400 ASA disposable. Note how little light is reflected, even with 2 flashes.



Garrett near the entrance of Guiers Mort. This was taken using a b setting, 28mm wide-angle lens, f8, 400 ASA and a single Meggaflash bulb, and a candle. The trick is to leave a lit candle behind the camera. Open the shutter, walk up the passage with your caving light on, fire the bulb, turn your light off, and find your way back to the camera in the candlelight.



Des McNally on the walk in to the Dent de Crolles system.

Finally, I'd like to thank the models that went with me on the Photo trip (Rachel, Malcolm, Fatima and Eoghan). They put up with the tedious task of dragging lots of awkward and delicate gear up and down pitches for hours and hours in the cold without complaining.

Hydrogeological Setting of the Dent de Crolles Cave System

A brief report by Les Brown, ICC.

Regional Setting

The Dent de Crolles ridge is located in the Chartreuse Mountains, part of the French Alps. This upland area is largely composed of Jurassic limestones that have been uplifted and subsequently deeply incised into to form a typical Alpine topography.

This period of mountain building occurred as part of the Alpine Orogeny during the Early Tertiary c. 65-25Ma. As uplift occurred the rate of erosion dramatically increased incising a deeply scaped topography. The location of valleys is typically associated with weaknesses within the rock mass, particularly along fault zones. As such, the peaks and ridges that remain are typically composed of rock that is more resistant to weathering.

The Geology of the Dent de Crolles Ridge

The Dent de Crolles ridge peaks at 2062m AOD at its southern most point. Although particularly steep sided the summit ridge itself dips gently north-westwards from its highest point. The stratigraphy of the peak is particularly well exposed in the upper and steepest slopes, where it is seen to comprise of well bedded limestones. The summit dip slope shows that the bedded limestones are gently folded into a synclinal structure that plunges northwards by c. 8°.

Hydrology

There are no active streams on the Dent de Crolles ridge, all water sinks into the limestone as percolation waters and during storm events as run-off. Water sinking into the Dent de Crolles system drains in a northward direction eventual discharge at Guiers Mort (c. 1300m AOD), the main resurgence to the system.

The influence of geology on the development of cave passages

The abundance of vertical shafts in the Dent de Crolles system reflects the highly fractured nature of the limestone rock. However, the extensive horizontal passages that comprise most of the system show that bedding horizons have also played an important role in the development of conduit and cave passage.

The general trend of drainage in the active system suggests that the structural shape of the limestone beds guides groundwater flow along the synclinal plunge. This northern drainage trend is also observed in the orientation of many relict passages, and indeed the elongate shape of the system as a whole. The tiers of relict passages reflect the sequential lowering of the active streamway with time, most likely as base levels were lowered as the surrounding valleys deepened.

Considering the northwards draining underground flow pattern towards the Guiers Mort resurgence then a number of passages appear as hydrological miss-fits with regard to the existing topography, Trou de Glaz, Grotte Chevalier and Grotte Annette are the best examples of these. All three are relict north-south orientated passages located in the steep western and southern flanks of the ridge at c.1700m AOD. For these passages to have existed then they must have been part of a more extensive underground system, one that existed before the incision of the Alpine valleys.

In summary, much of the Dent de Crolles system has developed subsequent to valley incision, in particular the great vertical extent of the system. However, the underlying trends indicate that the modern system has developed by the modification of a pre-existing system, one that originally extended beyond the confines of the Dent de Crolles ridge.

Through Trip Trou De Glaz - Guiers Mort

By Steven McNamara

Cavers: Steven McNamara, Brian Cullen & Malcolm McDomhnall



View of Dent de Crolles Mountain

What happens if you get lost in a cave with over 55km of passage? We came very near to finding out. In this report I hope to shed some light on how in the hopes that it might prevent someone else getting into the situation.

Having rigged the first five lantern pitches of Dent de Crolles previously the walk to the entrance and passing these was accomplished with relative ease. After the spectacular galerie des Champignons with its popcorn calcite formations and the Cascade Rocheuse ascent we descended the Puits Banane. This pitch in a wide and open gallery reaches a muddy and slippery 10m in width 4m in height phreatic passageway. The floor slopes into a trench after the crossroads of Puits Noir and Galerie du Solitaire is passed. This trench has to be avoided (with difficulty) making this area nerve wracking.

Now seven hours into the cave this seemed like a good time to get lost. A left turn by a 15m pitch was taken where the right turn leads into the Galerie Sans Nom. The survey indicates this passage enters into a T-junction with another passageway joining from the left. In reality the passage continues and another passageway enters from the left. The next junction encountered is a T-Junction and is shown on the survey as a continuation of the passage with a passage entering from the right.



Exit at Guiers Mort

We took the second junction to be the first (and actual junction) and proceeded left bringing us back to the Galerie Sans Nom. Realising we had made a mistake we headed back to the second junction. By exploring this area we convinced ourselves we were nowhere near where we should be.

Though we didn't know where we were we at least could find our way back to where we did so we weren't completely lost. We returned to the Puits De Banane with the knowledge that it is better to be lost in the main passageway should search parties be sent. Rapidly running short of backup lights as my electrics failed we slowly worked our way back up the passageway exploring side passageways to confirm our location at each junction.

Upon reaching Puits Pierne we were again certain of our location and raced out of the cave to exit at 23:30. Half way down the mountain we met up with other cavers from the expedition who had come looking for us when we missed our call out.

Thing learned from the experience:

1. Always be able to find your way back to a point where you know where you are. If your in the main passageway it makes searching much easier.
2. How a junction looks on a map may bear little resemblance to how it looks when you're in the cave.
3. Call out times for long cave journeys cannot be what are expected in Ireland. In this case a morning call out may have been appropriate as a search/rescue operation during the night may not have been practical or safe.

P40 to Trou De Glaz

By Duncan Foster

Cavers: Duncan Foster, Fergus Boydell & Seamus Breathnach

This was to be the final big trip of our expedition to the Dent De Crolles. In preparation, I'd slogged my way up to the top of the mountain two day earlier, carrying one of the two 60+m ropes that we intended to use on the pull-through. With little difficulty we'd soon located the entrance among the limestone pavement (the shinny silver sign), & clad in my best summer caving gear (shorts, shades, SRT kit & helmet), I'd rigged the entrance pitch, and checked that the ropes was long enough to reach the ground when doubled. It was, but only just!

So, there we were, sweating buckets on the march back up the hill, this time with full caving gear and another rope. Perhaps that tardy start, and morning spent drinking tea in the sun wasn't such a good idea, as it left us cursing the midday sun. We soon reached the relative cool at the base of the entrance pitch (31m). Having identified the way on, I pulled down the rope. Committed! No retreat, we had now to push on. The second pitch (Puit de Cabri, 8m on the survey but seemed shorter) provided some challenge. It was pre-rigged with a very stiff rope, and was tight for most of it's descent. Only one of our party managed to descend it in full gear. Having tried to lock open my stop, and still finding myself unable to put enough weight on the rope (due to the friction from the walls), I decided to simply slide down. The passage continued through a fairly obvious series of crawls to a short climb (pre-rigged) upwards. A short section of passage lead to the first of the Three Sisters Pitches (Puits Des Trois Soeurs: 14m (split) & 15m, only descending the first). As this was also pre-rigged we were beginning to wonder why we were hauling two ropes through the cave?

Having received a reminder that we weren't to descend to the bottom¹, Fergus dropped the first pitch (or so he thought, and spotted a passage leading off from the shaft. He swung in, and we followed. Only when the three of us were sitting at the entrance did Fergus crawl off down and increasingly tight & muddy passage to discover we were in the wrong place. Thankfully, we managed to get back on the rope, and continue further on down to discover the real route.

From the bottom of the pitch, we traversed over some holes in the floor (over the remaining pitch) to gain access to the series of meanders that make up the bulk of the trip. It's hard to say much about these, other than that they aren't very tight, but tight enough, and long enough, that we found them very tiring. The meanders are interrupted in two places by short pitches (Puit des Orbitolines, 8m, and Puit des Pompiers, 8m), and we took full advantage of these for a short break & a bit of chocolate in both cases. It was with great relief that we ultimately reached the Puits Du Balcon (22m, 16m, 18m, 20m). The first two pitches presented neither problems nor difficulty, but I was more than a little surprised to come round a corner on the third pitch to find a rebelay with a really well placed bolt, connected to the rope with only a snap gate karabiner. I decided, despite some misgivings, to leave it rigged as it was and continued to the base. There, at the head of the final pitch, I found further curiosities. There were two bolting kits, and a well equalised rope providing an ideal hang for a pull-through. However, suspended from the maillon, was a rope, only held in place by a large knot on one side. Had

someone tried to pull-through only to be frustrated by this knot? I decided to use a maillon attached to one of the bolting kits to securely attach the hanging rope to the y hang (is it a y-hang when it has three arms?). The other two having arrived at this point lead off down the final pitch. The final pitch also held some interest, as the rope was rigged rather slackly between two rebelayes, on opposite walls! This lead to fun and games to escape the base of the loop!

Reaching the bottom, "game over", or so we thought upon consulting the surveys. However, we managed to get ourselves quite confused, and missed a junction. This lead to a twenty minutes wander around the Riviere Serpentine, visiting the Salle du Dome, and eventually finding the route out. And then the half hour walk back down the mountain. The trip took a total of about 6 hours, and was without doubt the most exhausting trip we made during the course of our two weeks in France. All of the pitches, bar the entrance pitch was pre-rigged, and we'd dragged two ropes through the meanders only to not need them, though I suppose we'd have needed them if we didn't have them!

¹Descending the final pitch drops into the Reseau Des Polonais. Named after the original explorers, who made this mistake, unwittingly pulled down their rope, and continued on. They were fortunate enough, however, to manage to force a way through the extremely tight meanders that followed, to discover a new route into the Salle du Dome, close to where the main route from P40 joins the main system.

Accounts

Ed Whelan

Conversion rates Sterling to Euro- 0.614

Euro to Sterling- 1.628

In	STG	Euro	Out	Stg	Euro
Deposits		1501.5	2444.42 Ferry		1224.6 1993.6488
GPF Grant		300	488.4 Minibus		936 1523.808
SUI Grant		234	380.9 Fuel & tolls		529.12 861.40736
Campsite		1442.2	2347.9 Food		487 792.836
			Repair to car		46.8 76.1904
			Motor Insurance		93.6 152.3808
			Camping		627.4 1021.4072
		3477.7	5661.62		3944.52 6421.67856
					466.82 760.05856

Expedition Members

Club

UCDCPC:

Rachael Jordan

Eddie Johnson

Dave Curran

Fergus Boydell

DUPC:

Duncan Foster

Brian Cullen

DCU:

Seamus Breathnach

DITCC:

Des McNally

Garrett Devitt

John Kavanagh (Jnr)

Malcolm MacDomhnall

QUCC:

Steve McCullagh

TJ Connelly

Andy Watt

Ryan Scott

Stephen MacNamara

Eoghan Lynch

Fatima Touddert

ICE:

Ed Whelan

Les Brown

Gagendor CC (UK):

Sal Burgess

Thanks and Acknowledgments

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Ghar Parau Foundation



MARS
incorporated

Kellogg's

McDonalds Soups



Meggaflash Technologies Ltd.

 **FUJIFILM**

John Gunn photography Wexford Street.

Individuals whose contribution to the expedition was invaluable:

Tim & Pam Fogg

Graham Prole

Andy Foster

Paul Mackrill

David Judson (help and advice with GPF application)

Individual Gear Needed for Expedition

By Sal Burgess

Clothing suggestions

Choose your clothing carefully taking into account the temperature (bloody hot) and the fact that we are going to be living rough in a campsite for 15 days (leave the Armani shoes at home). You'll probably get a few days wear out of some items of clothing (you can wash clothes to use them again...)

Sun hat and shades
2 pairs Long Trousers
2 pairs Shorts
1 jacket or fleece
Light rainwear – just in case!
Pair of Sandals
Pair of Walking/Hiking shoes
Flip Flops for shower/toilet
Few sets of underwear and socks
Swimsuit
Washing powder/liquid (small amount)

Caving

The caving environment in France is similar to that in Ireland except it will be slightly warmer.

Helmet
Light
Caving Belt – load bearing if possible
Wetsuit – overkill, probably not necessary
Oversuit
Undersuit
Wellies
WetSocks
Gloves
Knee Pads
Personal Caving Survival Kit:
 First aid kit in waterproof container
 Energy food (mars bars etc.)
 Survival Bag
 Woolly hat
 Spare light
 Water
 Knife
 SRT Kit

Camping suggestions

Tent
Sleeping Bag
Sleeping Mat
1 Plate, Bowl, Mug, Fork, Knife and Spoon – use metal or plastic as porcelain WILL break
Penknife
Lunch Box – useful for day trips
Drinks Bottle – climate will be very warm and you will drink quite a lot especially when hiking
Rucksack or general holdall
Daysack/small rucksack
Torch - for campsite
Sleeping Bag liner
Basic First Aid Kit

Sleeping bag liners are also handy but not essential. They keep dirt and bugs from your sleeping bag and are particularly useful for warm nights when the sleeping bag is too warm. They can be bought in any outdoor shop or made by sewing a sheet into a “cocoon” shape similar to the size of your sleeping bag.

Personal Administration

Point to note: there will be quite a lot of mosquitoes buzzing around the campsite at times and they just love to hang around sweet/foul smelling people. Get some non-scented shampoo, soap and deodorant if you don't like bugs. Insect repellent and mosquito nets (mosquito nets guarantee that you will look like a nerd) should also do the job – probably cheaper than buying non scented stuff...

2 Towels
Toilet Roll
Shampoo
Soap
Deodorant
Shaving kit
Toothbrush/paste
Sun Cream (high factor)
Brush/Comb
Scissors and Mirror
Foot Powder
Insect Repellent
Paracetamol, Lemsip etc. for common first aid complaints

Other Information

Bring a Walkman if you have one and some reading material to keep yourself amused. You might be required to stay in the campsite some days to keep an eye on the tents while others are gone caving or to town. If you were keen to pick some of the French lingo then a dictionary/thesaurus would be useful. Notebook and pens are handy for...stuff... Camera is another popular holiday item. Disposable cameras are pretty good for cave photography and are cheapest at the airport "duty free". A mending kit always comes in handy i.e. needle and thread etc. as do spare batteries for your stuff.

Carry cash, passport etc. in a money belt if possible for maximum security - also the campsite won't be 100% secure even though we will have someone constantly watching the tents while others are away.

If you wear contact lenses, ensure you bring extra saline – though I'm sure it won't be difficult to buy some if necessary. Asthmatics bring a spare inhaler. You should also have got your E111 (pronounced E one eleven) form from your local medical clinic by now (necessary for medical treatment in France if [hopefully not] required) – if not, try and get one ASAP.

Finally, if you're bringing your mobile, make sure it is set up with roaming capabilities...

Through trip Trou De Glaz to Grotte Chevalier

Notes:

Route finding fairly hard, survey essential. For a group of 4, the trip should take 7-9 hours.

Equipment:

Rope: 2x60. Only one pitch of 55m, so an additional short rope for rescue?
Bolting kit, bolts, hangers, maillons, slings & rope loops to replace any worn gear.

Route:

Start in the main gallery of the *Trou De Glaz*. Not far from the end take a descending squeeze. A little afterwards a right turn takes you to the top of the *Lantern* pitches. Descend the 3 Lantern pitches (10, 12, 13m).

At the bottom of the 3rd, slide yourself through a squeeze, and the route continues for some tens of meters in a low gallery. Arriving at a Y-junction take the more evident right passage. Continue in a large passage the 200m to the 4th Lantern pitch (10m). Come to the edge of the *P36* (actually to a not so deep pitch, the *P36* is on the RHS), and traverse it, using the in-situ handline. The passage continues to pass over the *Puit de Lac*, and then across *P60* (hand-line). The passage turns sharply right, a left leading to the *Puits Labour*, and climbs to the top of *Puits Fernand* (25m) which you descend. (Note the change in cave morphology from the top of pitch to the base!) Don't descend to the bottom but take the hand-line on the left side. It leads to a system of diaclases (*Diaclase Annette*), which are a little tight.

The last of the diaclases ends in a tight pitch which should be done in two parts (the second is freeclimbable). This leads to a semi-circular gallery, from which you take the left branch. Passing across the *Puits de la Vire* (hand-line) you soon (20m or so) come to a small meander in the floor of the passage (two entrances, take the 2nd (to the left?) about 2m high. This is the junction with the route to *Grotte Annette*.

Follow the meander in the floor to the *Puit de la Jonction* (P10, upwards, in-situ gear). From the top, a short section of traversing above a descending pitch (hand-line) leads to the top of the big *Puits Maurice* (P55, rebelay at 15m and 5m from the bottom). From the bottom follow the *Meanders Nadine* to the top of the *Puits de l'Oubliette* (30m). Descend (P20, P5), not to the bottom, but traverse with handline to the right (airy!) to gain a jointed passage which becomes a bedding plane. Follow the most evident course, and the current of air, to the top of the *Puit Toussaint* (P25), which you descend to arrive in the huge *Grotte Chevalier*. Climb the rubble(?), and keep to the right to avoid ending up in the *Invisible Gallery*.

Alternative finish to Grotte Annette

Equipment:

(2x35m ropes, plus the usual slings etc)

Route:

After the *Puits De La Vire*, continue past the hole leading to *Grotte Chevalier*, and climb up the 6m *Puits de la Varappe* (equipped). A very pretty passage follows. Three crossroads are on the journey, take the left, right & right. After a very low passage you arrive at the *Puits De La Gnole* (30m). After descending, and then crossing the *Puits Pourri* equipped with a ropes of knots (3m), follow the passage for 700m, broken rocks. The passage becomes low, and climbs up to a boulder choke. From the high point the route onward is not evident, but you thread yourself through a descending passage and follow this to the exit. The second two boulder chokes demand care! The extent of the work of the explorers is obvious. In leaving the last choke you will be surprised by a metallic structure which it is hoped will last some time.

Trou De Glaz to Guiers Mort

Access:

Leave one car (for the return) at the carpark in Perquelin, and travel by St. Hughes to the Col de Coq, where you can leave the second car. Continue on foot by the Col des Ayes, and take the path to the Dent De Crolles which crosses under the West face. The entrance to the Trou De Glaz is beside the path (marked on the IGN map).

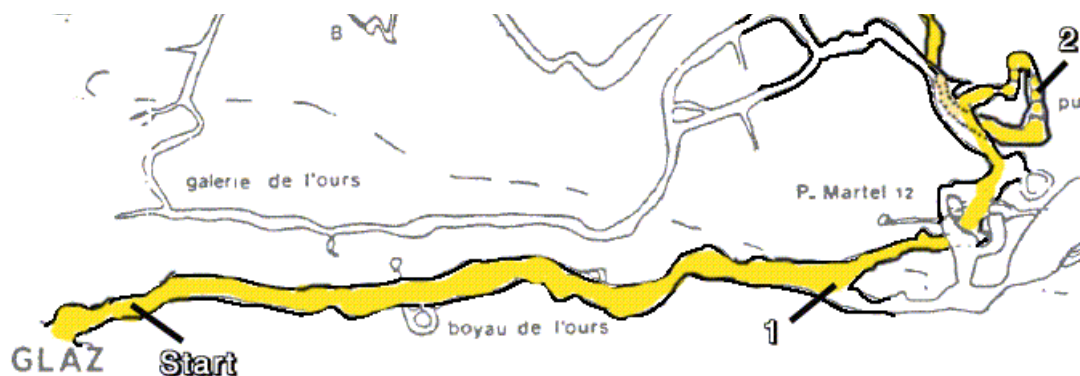
Equipment:

One rope of 80m to use in pull-through. The trip is equipped with sealed pins (fixed bolts??) with chains and/or rings of rope for the pull-throughs. The state of these rings can degrade, and it is advised to bring some to replace them where necessary.

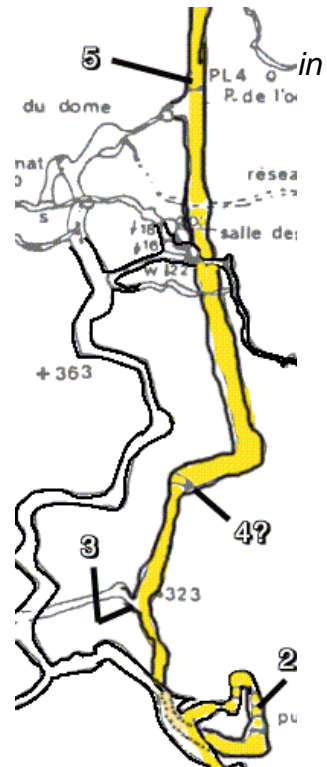
Description:

Note: Throughout this description, the normal text is the english translation of the French guide, and the description in italics are some additional commentry provided by cavers who have been in the system. Numbers in brackets refer to the surveys.

The Trou De Glaz starts in a large passage. *Entrance is large tunnel, follow this veering left. Duck under an arch to more walking passage. Pass a red sign to the "Puit Martel" (1). Not far from the start take a decending squeeze. A little further, a high diacalse (fault?)... The large passage ends, turn left, slightly uphill into a hading rift...the right takes you to the top of the first Lantern pitch. Turn right, down a slope into a small chamber. Several routes all reach this point. Continue on and look for a sign to the Puits Lanterne. Follow this route.* Iron rings are in place for the descent.

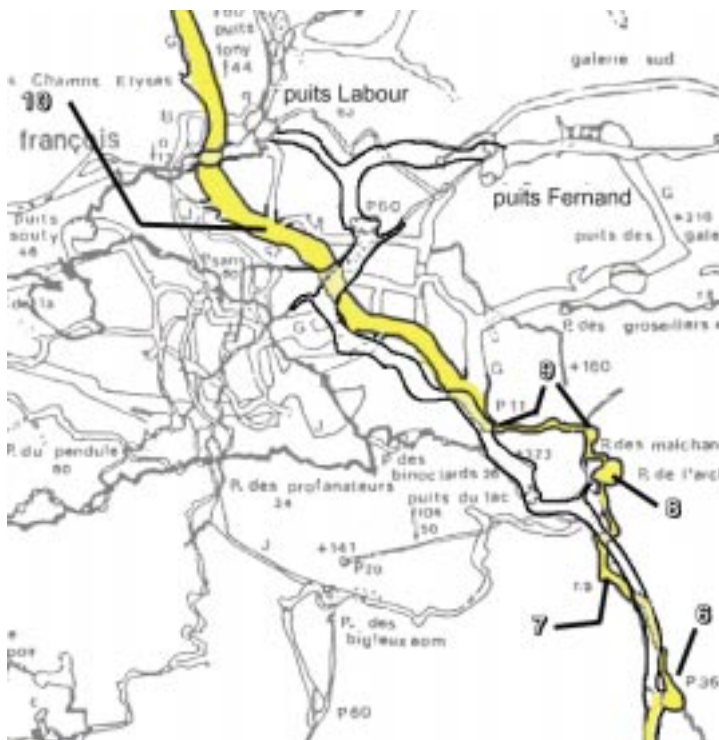


The first three Lantern pitches (P10, P12, P13) follow (2). From the bottom of the Lanterne pitches, continue large passage to a large chamber with a pit on the right, the "P36". At the bottom of the third, slide through a squeeze through boulders and the vault(?), then continue for several tens of metres in a low passage. Arriving at a Y-junction(3) take the right, the more obvious route. Accessing a vast gallery which stops suddenly (4?) at the top of a P10 (Fourth Lantern Pitch). Descend this; for placing the rappel, follow the handline on the path(vire?) to the left. A little while afterwards, the passage arrives at a not very deep pitch which one can climb using a handline (5). This emerges to the right by a window onto a vast pitch with running water, the P36 (6). Do not continue via the handline, but descend this (35m). Take care with rubbing of the rope; correct placement is not easy. Descend the P36, This has a "Y" chain for pull throughs. It is broken at -25m (approx?) by a large ledge, with a second "Y" chain.



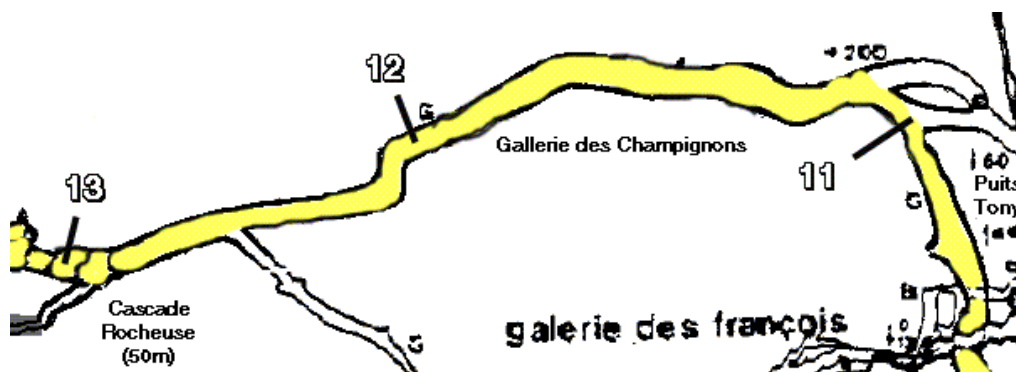
At the foot of the P36, take the meanders, Two short pitches of 10m each soon follow, the "Ressaut" and the "R9". The Ressaut had a short traverse to its head,. descend a small waterfall, the R9 (7) was in a narrow canyon, then a second, and then leave the flow of water, climbing easily (traversing, and on the benches(?)). Beyond the R9, continue down the

canyon, partly traversing until the Puits d'Arche (8) is reached. DO NOT DESCEND THIS, but traverse over. Arriving at a handline running high over the Puits De L'Arche. Do not descend. A 3m drop is then descended, followed by two pitches (9), the Puits de Malchanceux (11m) and the Puits du Bivouac (11m). These MAY be found rigged. Continue in the passage opposite, and arrive at the top of a fossil pitch P11, (Puits des Malchaneux), descend, continuing to emerge by a climb of 11m in the large gallery of the Champs Elisée (11). Turn



left and follow large, pleasant passage for 200m, passing painted signs "GO" and "G2" on the left. Eventually reach a "Y" junction (11). Turn left under a

low wall. DO NOT CONTINUE RIGHT AT THE "Y". (This would lead to Puits Tony, a 60m pitch). The left branch is easy passage to the foot of the Cascade Rocheuse. At this point (11), leave by the left (risk of error) and follow this large passage without problems. It descends gradually; the walls

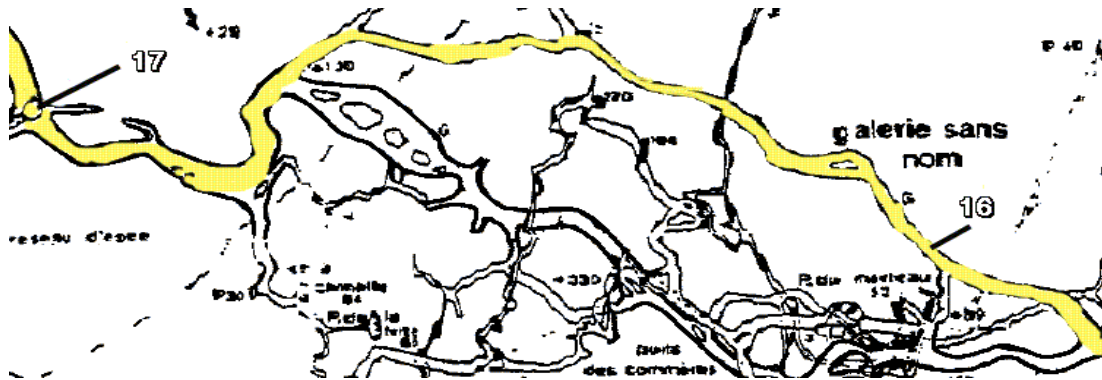


are covered in buds of moon-milk (12) (Gallery of Champignons – Mushrooms!). The stops abruptly at the base of the Cascade Rocheuse (13). At this point, climb up 10m on the right hand side, to find the bottom of a rope. Climb this 50m pitch (not vertical). **{The recce trip should aim to reach this point and ascertain if this rope is in place. If the rope is not in place, see emergency sheet!!}**

From the top of the Cascade Rocheuse, by a beautiful passage, and a short climb, gain the top of the Puits Banane (14). From the top of the Rocheuse, easy walking leads to a pit. Scramble down then up to the right to the obvious high level continuation. (Hand line in situ?). Large passage continues to the head of the Puits Banana. A traverse on the left with handline, allows access to a rope in place. This had fixed rigging. Do not descend to the bottom, you must get onto the ledge on the right (facing down) (Dodgy broken ladder to



help). Before the bottom of the pitch climb up opposite to gain the Boulevard Des Tritons (15) which you follow without encountering obstacles until you reach the Vire Rias (17) (handline). Continuing passage is large phreatic with a vadose trench in the floor. This is slippery to traverse along, and leads to a complex area. Follow the large, obvious route to the Vire Rias (17), a large shaft which is traversed round on a fixed line. (There are a number of routes to the Vire Rias, the "Passage son Nom" (16) being one. We took a different route, but I can't be certain which? We did cross a HUGE rift on a bridge made of boulders. Very spectuacular. You could look down either side of the bridge maybe 100m.) Then continue to the left by a bedding plane, to reach a handline over the Puits Isabelle (18) (an impressive 75m drop!). Past Vire



Rias, continue in more large passage, to where a trench crosses at a junction. Descend the trench and go to a huge pitch, Puits Isabelle (18)(-70, +30) and traverse round on a fixed line. The passage descends, follows this until you must leave where it is barred by some stones. Follow with air currents in low passages which lead to the top of the Puits Pierre (19) (35m). Soon, a left fork then leads to a glissade down to Puits Pierre. (Situ rope?). Do not descend directly, but traverse across to the left to get to the point of decent; fixed rope, with one deviation and one rebelay.

From the bottom of the Puits Pierre, the passage quickly transforms into bowels (20), with a violent air-current. A complex of crawls leads to the main



entrance chamber. Follow the draught! The passage is obvious, all others are much tighter. This emerges in the large entrance gallery of the Guiers Mort at the top of some boulders (21). Descend this & exit!!