

Imperial College Caving Club



Newsletter No.15



IMPERIAL COLLEGE CAVING CLUB

IMPERIAL COLLEGE UNION
PRINCE CONSORT ROAD
LONDON SW7 2BB

NEWSLETTER No. 15 SUMMER 1991

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The Exec (1990/1991):

President	Rob Knell
Vice President	Bron Ley
Secretary	Pam Murphy
Treasurer	Dave Vickers
Tackle Officer	Alva Gossan

Weekly meetings are held on Tuesday evenings at about 7:00 pm in Southside Upper Lounge. Messages can be left with the Students Union (tel 071-589-5111).

EDITORIAL

It's me again. Sorry this newsletter is a bit late but life has been kind of hectic with exams an' stuff. But it's all over and I'm a lady of leisure again, so here's a newsletter.

I will, actually, be quite sorry to leave I.C. (shock, horror etc.) and the main reason is the caving club - but since I won't be leaving the club, that's okay. Being a third year has been harder than I expected, and I haven't done anything like as much caving as I'd have liked this year. But, I've just planned a trip to Yorkshire for this weekend so I'm in a DEAD GOOD MOOD, and now I'm going to drink some more of Bron's champagne. (hic!)

Enjoy the newsletter.
Enjoy the summer.
Safe caving.
See you all next year as an old lag.

Love Pam

ROB'S BIT

Chairman's chatter : exalted leader's epistle :
President's potterings : main-man's meanderings:

This will be the last newsletter of the academic year, and so I shall start with the traditional resume of the year's activities. As you all know, last summer saw the club spreading itself wide across the world: from the Vercors to the Dominican Republic. Both of these have been discussed in previous issues, so I will not dwell on them here. This was followed by the usual fun and games in the first term and with a number of new faces appearing, some of whom are actually still with the club, much to my surprise. This is good news as it means that next year there will be a stronger group at college than at the start of this year. The Christmas tour was a week in Co. Fermanagh which was definitely the highlight of the year for me, despite a number of near disasters. I hope that we will return soon as there is some damn fine caving there and a lot of potential for new discoveries, not to mention the Guinness in Maguires.

The following term saw more weekend caving going on, with slightly less of an emphasis on Yorkshire than previous years: I think this worked fairly well. The Easter tour was in Yorkshire, and although only a small number of people went, I think a good time was had by all.

The Dinner Meet, once again at the Brass Cat, was excellent with vast numbers of old lags crawling out of the woodwork to put us student types to shame in the Cock-a-leekie etc. The actual number of students there was very low, however, and it may be a good move to hold the Dinner slightly earlier, in the future, to avoid clashes with exams.

This brings us up to date, and the next major event is the summer tour to Monte Canin, in the Julian Alps, on the Yugoslav/Italian border. This will take place between August 5 and September 2. The Mt. Canin region is an area of world-class caves, and we hope to run "tourist" trips into some of these as well as a possibility of doing some exploration with a local Italian club. I must ask anyone who wants to go out in the van to get a £50 deposit to me or Dave Vickers A.S.A.P. as we will have to book the ferry soon. Total cost will probably be around £350. If anyone wants to go for less than the full time, there will be a number of cars going over at various times, and there might be some spaces in these.

The "elections" for the next year's exec. were held at the Dinner Meet, and the results were as follows:

President:	Bronwen Ley
Vice President:	Alva Gossan
Secretary:	Caroline Fletcher
Treasurer:	Dave Vickers
Tackle Officer:	Dominic Walker

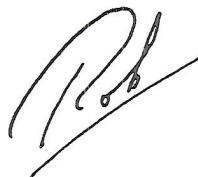
Bron will hold the distinction of being the first ever woman President of the club - gosh aren't we a liberated lot now.

A few concluding remarks now: I think that I've enjoyed my term as President, although sometimes it was jolly horrid. The club's been undergoing some changes recently with a lot of familiar faces going off into the big wide world, leaving the college side of the club in the hands of some less experienced people such as myself. This has led to a bit of a decrease in the standard of caving. But this is inevitable given the circumstances and we should come out of this in a stronger position than before, eventually. One of the things that didn't work this year was recruiting from St. Mary's, but with a bit of perseverance we should be able to persuade some people to come across Hyde Park.

I would like to thank everyone on the exec. this year for their help: without the support from these bods I would probably be in the loony-bin right now. Those old lags who have helped out also deserve a special mention: I won't name anyone, but the advice and assistance I got from a number of people has played a similar role in keeping me out of the padded cell (although Silwood does bear a certain resemblance).

Finally I would like to say how sorry we all are that Dave Bormann is leaving us for America. If he ever comes back there will be a warm welcome in Southside bar. Dave Wilson is moving up to Bath, and I hope he finds what he's looking for there. Lastly, I wish Bron the best of luck with the Presidency.

Cheers !



LETTERS

In response to Harry's letter in the last n/l: I feel that distribution of newsletters has always been a rather hit and miss affair, largely dependent on various individuals' personal contacts and goodwill. This probably stems from the lack of an effective address database in the club. Individual members know of old lags addresses, and it is by this means that info, meets lists and newsletters get distributed, but I suspect many people get missed. The secretary regularly revamps the club's card index, but this requires everyone to keep the club informed of changes of address etc. Nevertheless, judging by the Dinner Meet we seem to have maintained contact with the majority of main characters from the last 10 years.

As regards newsletter exchanges: the NPC definitely have been given copies of every newsletter and copies of most (especially the most recent ones) have been sent to MNRC, BEC and MCG but again this has been on a rather erratic, personal contact basis. However I have recovered the masters of all past issues and have run off new copies. Since this is issue #15 (a nice round number) I will bind No.s 1-15 together as a set and send these to NPC, MCG, BEC, MNRC, BCRA (and any others?) to ensure they have complete runs.

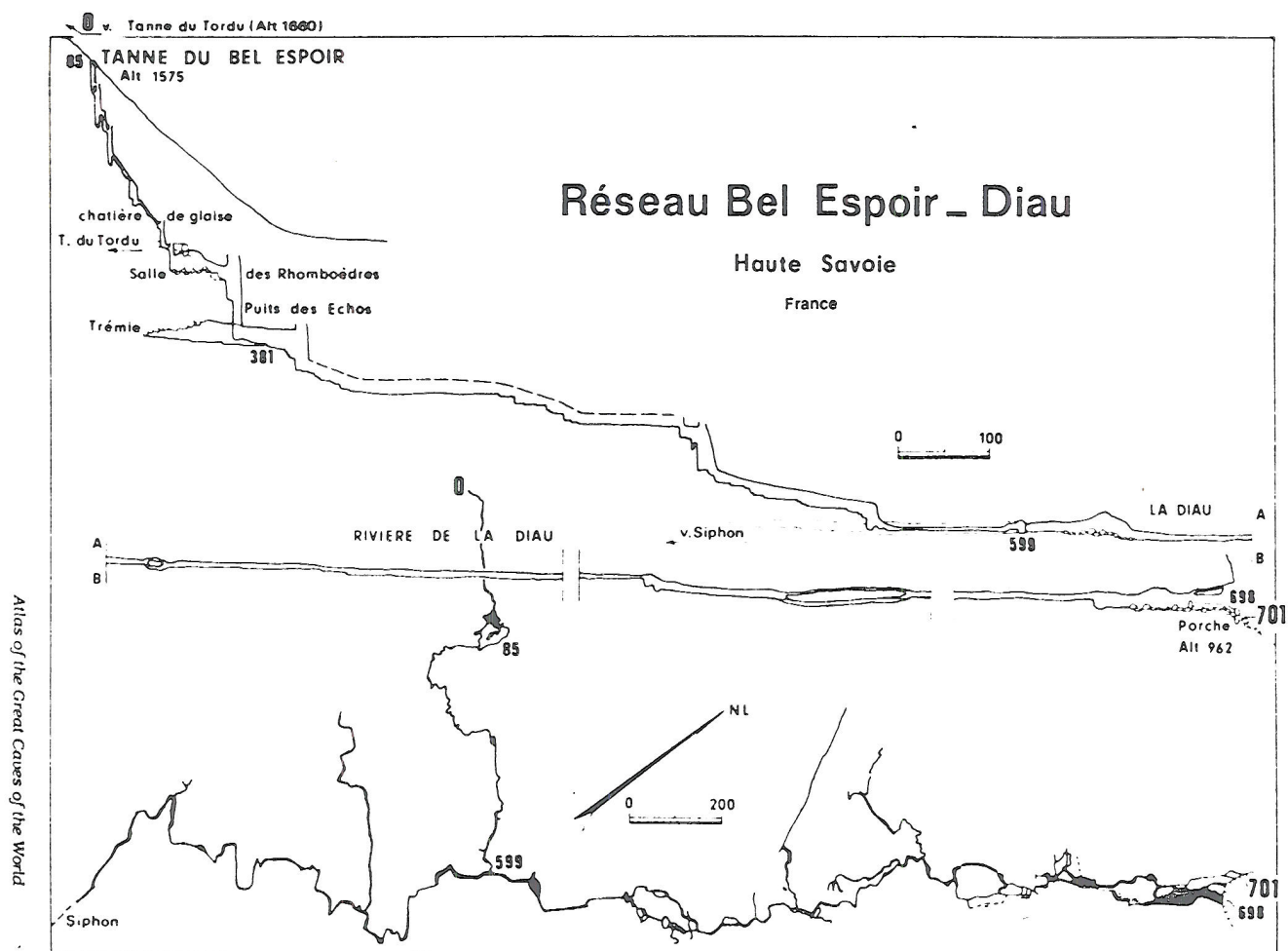
I thoroughly agree with H. the newsletter should be given as wide a circulation as possible as it's in the club's interest in the long run.

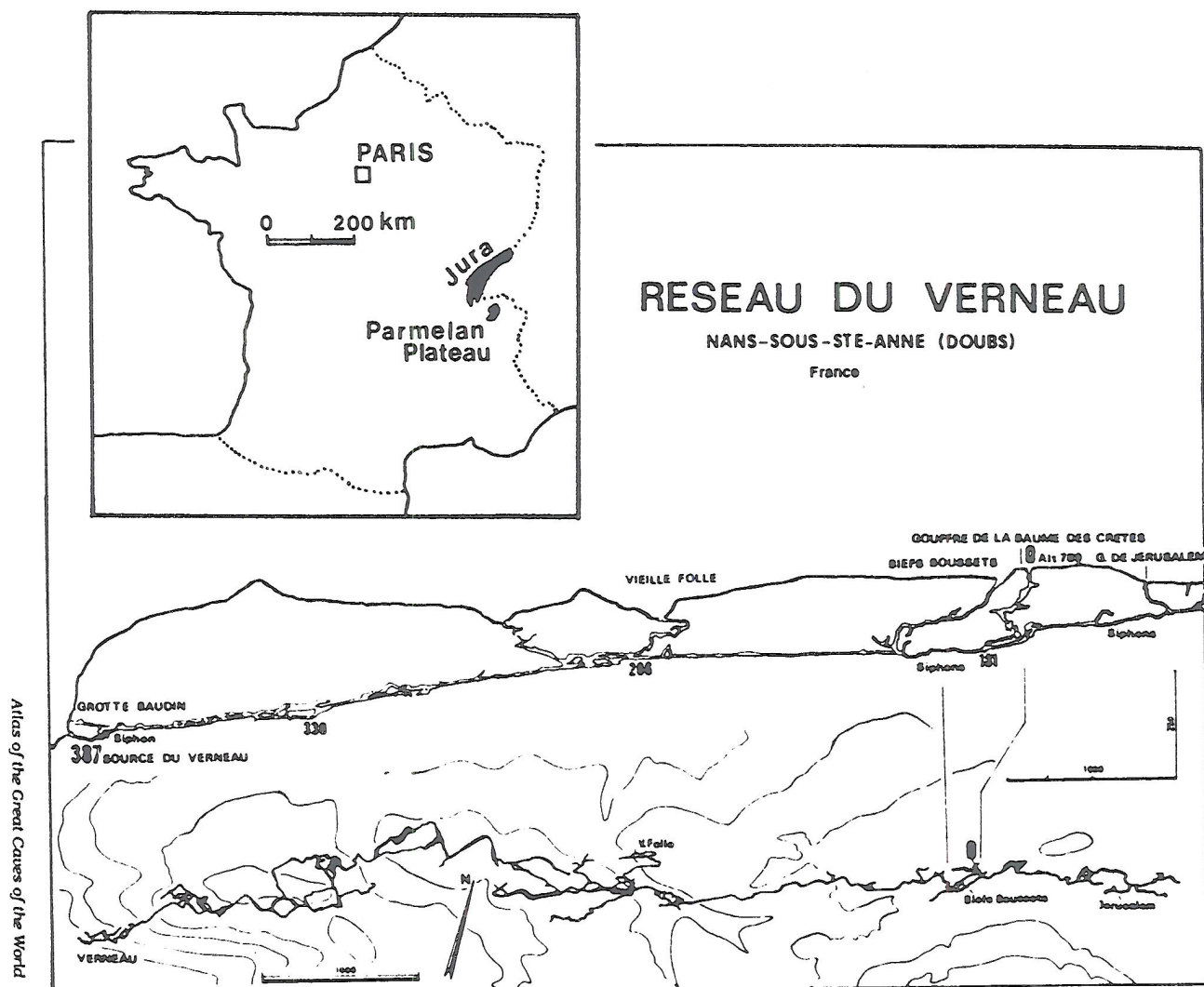
Clive Orrock

EASTER VISIT TO FRANCE

Rob Chaddock, Chris Birkhead, Harry Lock

The first area that we visited was the Parmelan Plateau to the immediate NE of the large town of Annecy. We camped at the head of the road from Thorens-Glières, close to the entrance of the Grotte de la Diau. One of the intentions of the visit was to attempt the through trip from the Tanne de Bel Espoir to the Grotte de la Diau (-615m, 4km long). Having arrived on the Sunday afternoon, we spent Monday morning preparing the kit for a through trip. In the afternoon we drove up to the highest point accessible by car (Chalet d'Anglettaz). Unfortunately, there was still a large amount of snow on the plateau and it proved impossible to find the cave in the time available. Additionally it seemed highly likely that the doline would be blocked with snow. On Tuesday we had a 9½ hour trip into the Diau system from the bottom entrance: 2½ km of magnificent streamway negotiated by fixed wires and ladders, and much traversing and wading. Our recently purchased pontonniers certainly proved their worth - we were all still warm and dry after continued immersion in chest deep meltwater. The return from the far point in the system was made sporting by a significant rise in water levels. This was a really enjoyable trip which made the week worthwhile.





On Wednesday we drove across to the Jura, again staying at the gite d'etape in Nans sous Ste Anne. We wanted to have another go at the Verneau system (see Newsletter No. 13), so on Thursday we went into the Grotte Baudin. We had intended to drop into the "collecteur" and explore upstream as far as the "jonction", but, unfortunately the collecteur had backed up behind the siphon and had again flooded the last pitch of the Baudin, just as in December 1989. Clearly the water conditions must be quite exceptionally low for access via the Grotte Baudin to be possible, and surface water levels are no form of indication at all.

Harry Lock

FERMANAGH - N. IRELAND

Christmas Tour 1990

As Rob has already mentioned, last year's Christmas tour saw ten club members spending a week near Enniskillen in County Fermanagh, Northern Ireland. This area hadn't been visited by the club before, and provided some interesting and varied caving.

We stayed at Agnahoo Cottage, which is run by a small group of local cavers. The facilities were not quite so flash as the nice warm showers and drying room at the NPC: there's one outside tap and a chemical toilet, the emptying of which required far more bravery than any of the caving! The cottage is heated by incredibly smoky fires and has an oven with a tendency to explode. It could be described as 'cosy' for ten people, but would start to get uncomfortable for any more than that. It's well positioned, with a number of caves within easy walking distance (although the pubs are further away).

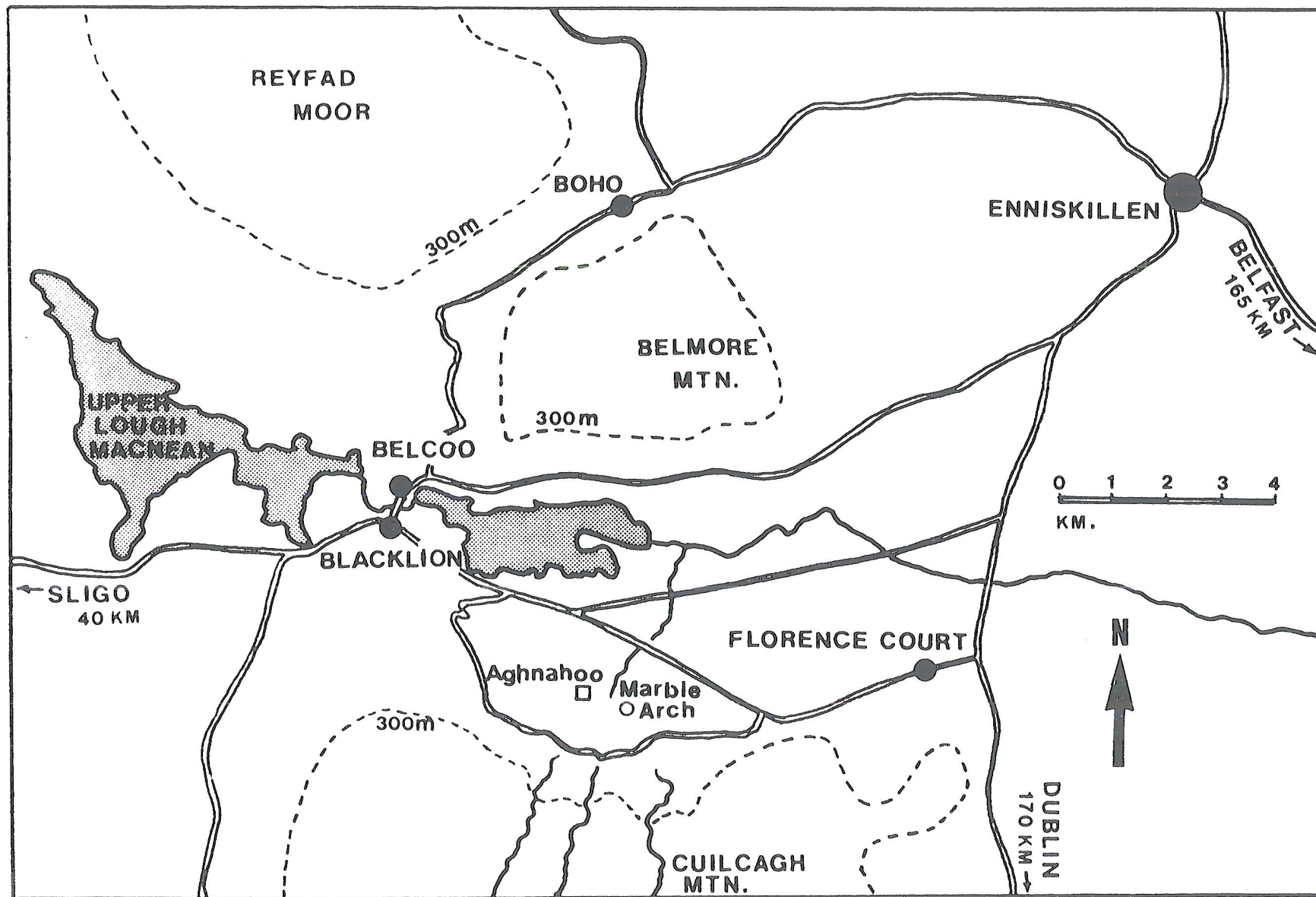
The Marble Arch showcave is just behind the cottage - a matter of crossing a couple of fields. Although the showcave was closed to tourists for the winter, and locked gates were on the main entrances, it's easy to get in by other entrances, and once inside you can wander at will along the concrete paths. It's a helluva lot more impressive than White Scar - the last cave I visited.

Like most of the caves in the area, Marble Arch is very wet (although obviously not if you stick to the paths). In some places the tourists get ferried around in boats: mean-hard-tough cavers can swim. Upper and Lower Cradle Caves form part of the same system and again consist mainly of streamways with some beautiful gour pools.

Pollnagollum of the Boats is within a short walk of the cottage. Once beyond the dodgy entrance boulder choke (with warning signs that are very off-putting, which means they do their job of making you a lot more careful) it is again an active streamway: no vertical shafts, some swimming required, and some gorgeous formations.

Fermanagh caves don't all consist of just wandering along admiring the flowstone. Prod's Pot is in the same area as Pollnagollum and is my least favourite cave ever. I tried three times to do the damn thing and never got beyond about 10m. First I couldn't find it, then I wasn't sure it was the right one, then I got stuck 'cos I'm useless. But I'm told that if you do get beyond the entrance, it's a really good cave: several short pitches, then an impressive streamway and formations, and some memorable names: 'Papist's Passage' and 'Atheist's Arsehole'!!

While these are all mainly horizontal caves, with little vertical extent, a short drive away are Reyfad Pot and Noon's Hole. I know little about Noon's, but Reyfad contains a 92m entrance shaft which is very impressive and goes into a massive



passageway with a still active stream. There are quite ridiculous amounts of mud, and some huge chambers. There's also some beautiful clean white stal', still sparkling despite all the mud and the fact that you have to climb right past all the formations. These were probably the best formations I have ever seen - helectites, gour pools and cave pearls - all perfectly preserved because there are so few active cavers in the area.

We had a few problems with Reyfad and Noon's: aside from Tim having to do a bit of self-rescue practice when Jan had some rather bizarre problems with entangled jammers. The main pitches were left rigged since other groups were planning on visiting the caves the next day. Unfortunately it rained heavily, and the run-off is very rapid due to local farming activity, and the result was that the entrance pitches reached flood conditions. Despite valient efforts about 100m of brand new rope had to be left behind. I hope someone makes good use of it.

Although we visited most of the main caves in the area there is still a lot of potential for new discoveries. The area is peppered with promising looking shakeholes that have not been fully investigated simply because there are so few locally active cavers.

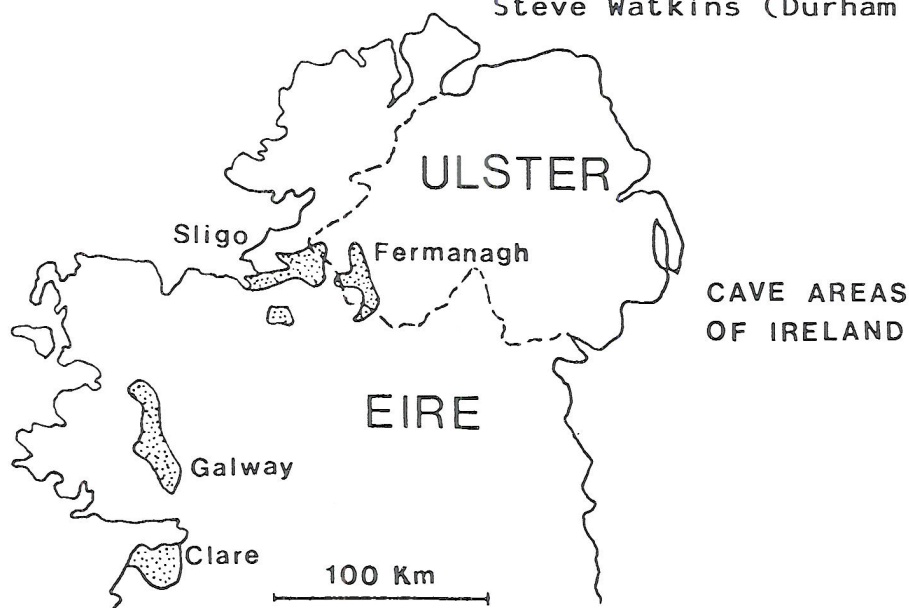
Despite the near misses - such as collisions with coal trucks and exploding ovens - it was a great week and I for one would love to return. I hope Ireland crops up again as a Christmas or Easter tour destination sometime soon.

If anyone is interested in caving in Fermanagh, Rob Knell has contact addresses and info etc.

On the tour were:

Me!
Rob Knell
Rob Cuddley Chaddock
Chris Birkhead
Janet Cotter-Howells
Timmy Trot-Pots Palmer
Alva Gossan
Herman Herz
Bobby Kynaston (North Wales CC)
Steve Watkins (Durham University SA)

Pam Murphy



RADON IN BRITISH CAVES

It is now common knowledge among the caving community that elevated levels of radon exist in caves. In the wake of recent paranoia epidemics on listeria, salmonella etc. it is important that understanding of this subject is increased. I recently attended a conference on radioactivity in the environment which included lectures by John Gunn (Limestone Research group, Manchester Polytechnic) and Simon Bottrell (Earth Sciences Department, Leeds University) on the subject of radon in caves. Presented here are some of the main points made in these lectures (with their permission). Whilst every effort was made to ensure that my notes were correct, I cannot guarantee that every detail is exact.

Radon [$^{222}_{86}\text{Rn}$] is a naturally occurring radionuclide from the uranium-238 decay series. It is an α (alpha)-emitter having a half life of 3.8 days. α particles cannot penetrate the skin and cause very little damage as an external source of radiation. However, as an internal (i.e. inside the body) source of radiation the hazards are quite high as the ionizing radiation causes damage to living cells. Radon is a colourless, odourless gas so the problem arises when it is inhaled, causing damage to cells in the lung.

Uranium, the ultimate source of radon occurs in all rocks in trace amounts. It is generally present in limestone in concentrations of 1-4 ppm (0.0001-0.0004 wt.%) but can be as high as 25 ppm. As uranium decays, radon gas is released to the atmosphere. In the surface environment, radon is dissipated in air and becomes harmless. However, in environments such as caves where air circulation is limited, radon can build up to relatively high concentrations becoming a radiation hazard.

The first recorded radioactivity measurement in British caves was in Derbyshire in the 1970's. Some equipment from the Christie Hospital in Manchester had been stored in a cave during the Second World War and was re-discovered. Thinking the equipment may be radioactive as the Christie Hospital specialises in radiotherapy of cancers, the cave was tested. The equipment was found to be safe, but the cave contained high levels of radioactivity. Correspondence between the National Radiological Protection Board (NRPB) and show caves companies ensued recommending that guides worked a maximum of two years and recorded the hours they worked. No further action was taken until the 1980's when new draft Ionising Radiation Regulations (IRR) were sent out to relevant parties including show cave companies. Understandably enough, no-one had a clue what these regulations meant and called in John Gunn (a hydrologist and caver) to help. Measurements of radioactivity were taken in show caves and found to be very high. The results were reported and the problem realised.

The radioactivity levels measured were 37,000 Bqm⁻³. For comparison, homes in Devon and Cornwall which are "affected areas"

as they are underlain by U-rich granites contain as much as 2,000 Bqm⁻³; the official "action level" is 200-400 Bqm⁻³. Regulations state that the maximum annual dose for an employee is 50 mSv. At the level of radiation encountered, show cave guides would be receiving an annual dose of 287.5 mSv. This raises an interesting issue as show cave guides are employed and therefore are covered by these regulations. In the States the hazards of radon in caves have long been recognised and show cave guides have been wearing radioactivity dose indicators since the 1970's, but the idea was never transported over here. It should be emphasised that show cave guides represent the group most at risk from radiation, the hazards are very much reduced for recreational cavers (unless you spend eight hours a day, five or six days a week down a cave).

Research is now being carried out on radon levels in the caving areas of England and Wales. Scotland hasn't been tackled yet but there are plans to start work in Co. Fermanagh, N. Ireland soon. The majority of work has so far been mostly on show caves (due to ease of accessibility) and only limited research on to wild caves.

Caves in the Mendips, Wales and Yorkshire show similar ranges and patterns of radioactivity. Radioactivity is highest in places where air circulation is minimal e.g. dead end passages and lowest where there is a substantial air-flow e.g. streamway. Caves also show a seasonal variation in radon levels due to the change in direction of airflow. In winter, radon levels are fairly low as air is flowing into caves producing a diluting effect. In summer however, radon levels are much higher as air flows out from caves. In South Wales, a summer high of 10,545 Bqm⁻³ was recorded giving a mean excess over winter levels of 4,144 Bqm⁻³.

Derbyshire caves contain radon levels above those of other caving areas. This is due to the presence of U-rich (5-10 ppm) black shales lying above the limestone. As these shales weather the sediment is carried into limestone caves and deposited. Uranium shows a strong affinity for the surfaces of clay particles and is concentrated in clay-rich mud (up to 24 ppm). Being fine grained, these deposits have a large surface area allowing radon to escape more easily than from solid rock e.g. limestone. These sediments constitute a significant local source of environmental radon, raising the radioactivity levels of Derbyshire caves. In one popular Derbyshire cave a monthly average of 15,540 Bqm⁻³ was recorded with a high on one day of ten times this amount.

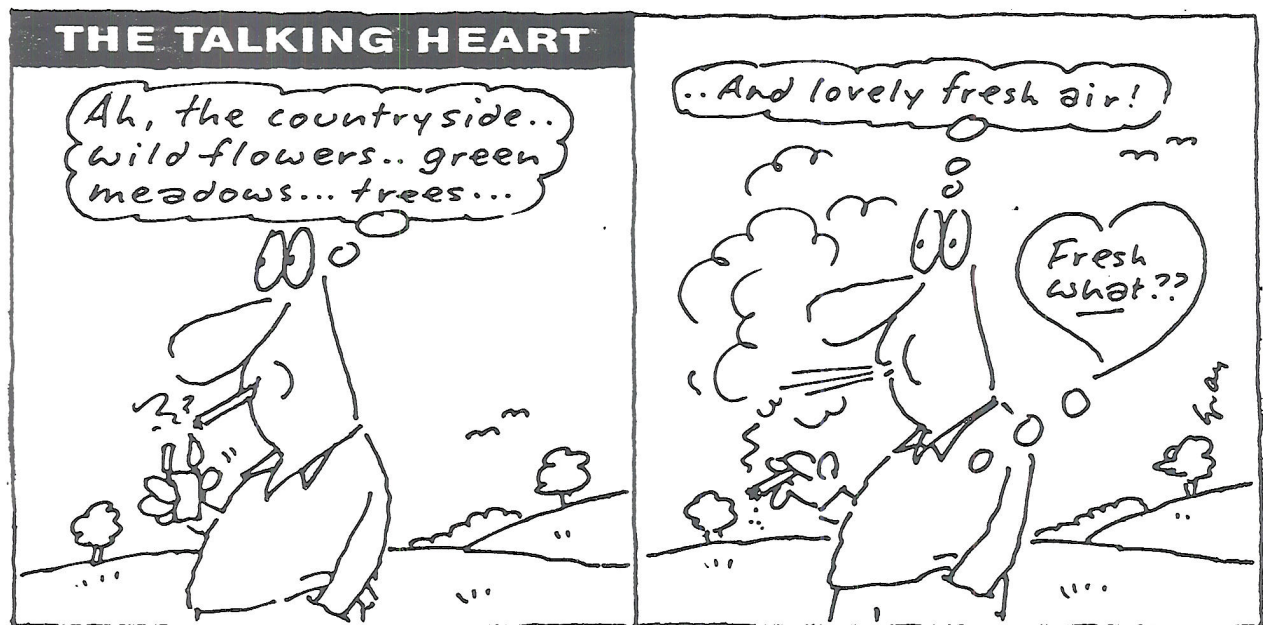
The problem in show caves is not without solution. Ventilation dramatically decreases radon levels. This has already been installed in one show cave with positive results and I suspect the rest will follow suite.

Radon is not considered a hazard for the recreational caver because of the limited amount of time spent underground. Also, most cavers are only active for two or three years. Working on the assumption that the average dose per trip is 1 mSv, you would have

to do 100 trips per year over a period of 10 years to receive a lifetime dose of 1000 mSv, the level at which lung cancer would occur. Recreational cavers involved in digs do spend long periods of time underground. Potentially, this could lead to harmful effects if continued over a number of years.

On a lighter note, small doses of α radiation are twenty times more likely to kill rather than mutate cells. If you're a smoker the mutated cells on the surface of your lung may well be killed off by α emissions from radon gas in caves; a sort of natural radiotherapy. So, take heart, if you smoke 20 a day and cave once a month you're bound to be perfectly healthy!

Janet Cotter-Howells



Dangling on a Silken Web of Steel

Caving and climbing ropes could soon be made with spider silk. On 17 April an American scientist announced that he had cloned the main gene that spiders use to make their drag-line silk. Drag-line silk is one of six different types of silk that spiders produce, and is twice as strong as steel. It is used to form the outer framework of a spider's web, and it is the silk that spiders use to dangle on.

Randolph Lewis of the University of Wyoming conducted his research with a large common American spider. To obtain silk for his work he anaesthetised the spiders and drew the silk out of the spinneret onto a spool turned on a variable speed electric drill.

Silk rope has been made in the past using the silk of the silk moth grub. This is strong, though not as strong as spider silk, and very light, but is expensive despite mass production. Lewis traces efforts to mass-produce spider silk to the 1860's when British merchants tried to raise spiders in barns. "They planned to harvest and spin the webs", Lewis said, "but spiders are not dumb. They tolerate people stealing a few webs, but then realise that it is all futile. They simply stop spinning".

News from "The Independent"

A NAME - WHAT'S IN A NAME ? Part 4.

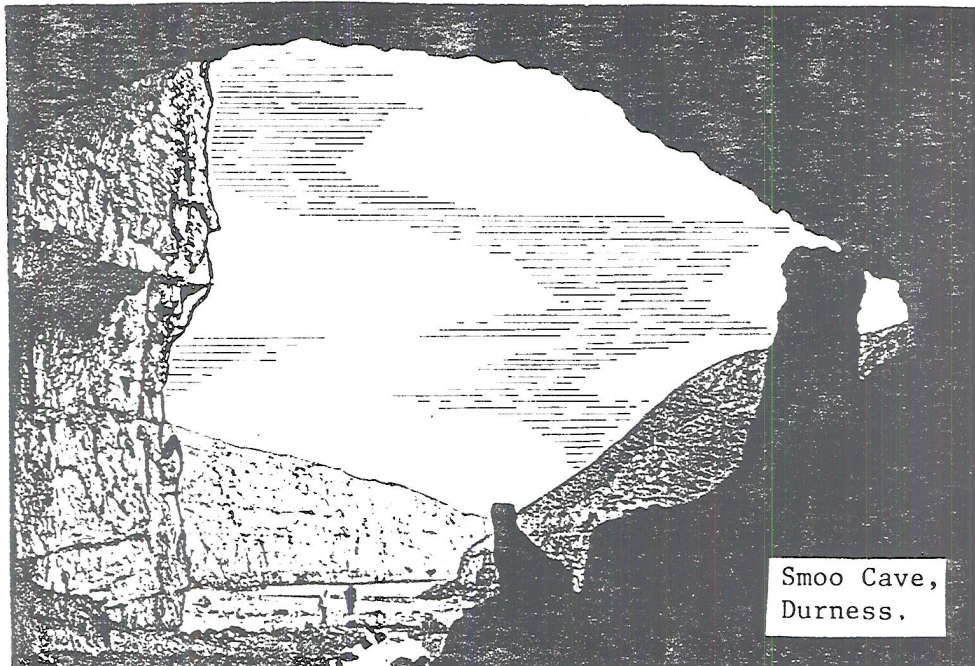
Scotland is rarely considered to be prime cave country although it is perhaps the only area of Britain where it is still possible to stumble upon open, unexplored cave entrances. There are many outcrops of limestones of various ages scattered throughout the country, but none of these are of any great thickness. Nevertheless caves feature frequently in the legends and troubled history of Scotland. Remember it was a cave-dwelling spider who in 1304 encouraged Robert the Bruce to re-enter the battle and so changed Scottish (and British) history, and 450 years later Rob Roy was continuing the partisan fight against the english - traditionally from the same cave near Inversnaid. Early Scottish cave explorers gave vivid descriptions — if sometimes a little exaggerated. In 1792 Sir John Sinclair described a minor Highland cave which was little more than a rock shelter as:

"..... so wide at the entrance as to admit four men abreast, it then expands furnishing an apartment where fifty men-in-arms may stand without any inconveniency."

Scotlands caves have as usual been seen as mysterious places of legend and myth: the abode of ogres or the scenes of nefarious deeds. Others have been used simply as places of refuge or shelter - indeed as a consequence of the brutal highland clearances some where still being lived in at the end of the nineteenth century. The caves' names often contain echoes of earlier usage, perhaps from a millenia or more ago. This then continues an exploration of the etymology of British cave names by looking at the caves of Scotland as seen through the eyes of Norse raiders, fleeing refugees and dilettante gentlemen explorers.

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The most northerly cave on the British mainland is Smoo cave near Durness. The name Smoo is not Celtic but derives from the Old Norse, Smuga - a hidden cleft or a hiding place, which incidentally relates to the modern english word, smuggle. The cave's name thus might be descriptive of an activity real or potential once carried out there in the dark ages. Although situated at the base of sea cliffs, Smoo is a true limestone cavern, with the stream dropping down a 25m shaft inland and then flowing out of the main cave onto the beach.



Smoo Cave,
Durness.

The beach entrance at least has always been readily accessible - Black's Guide to Scotland, 1920, describes it as:

"A gigantic arched cavern in some places 100' wide, and about 50 or 60 in height. A natural arch reminds one of the vaulted roof of a beautiful crypt. Through a second opening, the noise of the falling water coming down from the stream above can be heard, but the second cavern cannot be seen without a boat, and thus has never been properly explored owing to the the danger of foul air, though it is said to extend 120' farther in."

Regardless of what Blach's Guide says the inner chanber was explored in 1833 and found to contain, not foul air, but many stalactites. Smoo is occasionally known as MacAllister's Cave and legend has it that in the seventeenth century a local hitman disposed of 18 people by throwing them down the stream shaft. An image of his face is still said to appear on the cave's wall at certain times of the year.

The longest cave in Scotland is Uamh an Claonaite in the Cambrian limestones of Assynt (Assynt itself is probably from the Norse, denoting a bare, rocky place, ie. typical karst). The numerous small caves along the glen of Allt nan Uamh (Gaelic: Burn of the Caves) have clearly been known for a long time. (Uamh - pronounced "oo-arv" or "oorv" is Gaelic for cave). At the top end of the usually dry Allt nan Uamh stream lies a small lake, Loch an Claonaite (Loch of the Sloping Rock) named from the sloping beds running down to the loch. While many streams flow into this loch, none flows out: all the water sinks into the bed and resurges further down the glen at Fuarain Allt nan Uamh (Great Spring of the Burn of the Caves). Several small caves associated with this active system have been known for centuries, and excavations in 1917 and 1926 revealed animal and human bones dating from about 6000 BC. The main stream cave, Uamh an Claonaite (Cave of the Sloping Rock - named from the adjacent loch) was however only dug into in 1966 and since extended to about 1½ km in length.

Also resurging at Fuarain nan Uamh is Allt nan Uamh Stream Cave - now popularly known from its initial letters as Anus Cave. Occupying only a very limited area on the map A.N.U.S. is a complex little system on several levels and is probably linked to an Claonaite. I wonder if the modern name will stick, to puzzle later generations.

Leaving the mainland: caves are to be found throughout the Hebridean archipeligo. The Hebrides were for a time part of an independent Viking kingdom only later becoming a refuge for gaelic culture, so alongside gaelic names are many with Scandinavian origins. The name Hebrides itself derives from the Norse, Havbredey (Isles at the Edge of the Sea). One of the largest isles, and one with many well known caves, is Skye, again deriving its name from the Norse, Skuy (a cloud) - in Gaelic it is Eilean à Cheo (Isle of Mist).

Probably the most famous cave on Skye is Spar Cave, whose name was self-explanatory in the days when its delicate calcite formations were still undamaged. The entrance is situated behind a broken wall which, once complete with locked door, was built by a nineteenth century proprietor to prevent visitors from robbing the cave. Unfortunately it did not serve its purpose and the door was eventually demolished by a boisterous shot from a RN gunboat. Sir Walter Scott (who climbed over the locked door in 1814) described it in the "Lord of the Isles" as:

".... deep in Strathaird's enchanted cell dazzling spars gleam like a firmament of stars".

In gaelic Spar Cave is known as Slochd Altrimen (Nursing Cave) after a tale of the ninth century. The son of the chief of Colonsay was shipwrecked on the Strathaird coast and found by Princess Douhuila of nearby Dun Glas, whose father was the sworn enemy of the Chief of Colonsay. Young Colonsay was imprisoned in Dun Glas castle, but Douhuila fell in love with him and eventually bore him a child (presumably he was allowed a certain amount of freedom within the castle confines!). To ensure the child's survival Douhuila had a trusted servant keep it in Spar Cave. Douhuila visited the cave to nurse the child, hence the cave's name. The story has a happy ending for the chiefs patched up their feud and the lovers married.

Also well decorated, at least formerly, is Piper's Cave in the coastal cliffs at Harlosh point on Skye. Near here the Macrimmons, the hereditary pipers to the MacLeod chiefs are said to have established a pipers' school. Far less plausibly, legend tells of one piper who having been thwarted in love entered the cave in search of Hell, his loyal dog following at his heels. For a while his playing could be heard beneath the earth but finally it ceased (have you ever managed to play the bagpipes while caving?!?). He was never seen again but his dog came out of another cave on the far side of the island with its coat singed off by the fires of Hell - the traditional fate of caving animals.

Piper's Caves (many with a similar story) abound over the western highlands and islands. One suggestion for the popularity of the piper stories is a miss-spelling of the Scottish, pipar (a priest). This probably dates from the times when caves were commonly used by hermit preachers. However Paper Cave, in Argyll, means just what it says.

In 1685 the ninth Earl of Argyll backed the wrong side in the Monmouth rebellion against James II. After Monmouth's defeat (at Sedgemoor to the SW of the Mendips) orders were given to the loyal Murrays of Atholl to "... destroy all houses, goods and persons of any who join with Argyll". The inhabitants of Argyll fled to avoid the vicious rout and "... concealed themselves in caverns or in the clefts of the rocks". The Earl was captured and beheaded but the estate of Argyll survived for the title deeds, legal documents and records of the family had been concealed in a small cave on the slopes of Beinn Mhor near Inverary, ever since known as Paper Cave. Even today the cave is remarkably dry - an obvious consideration when hiding a wooden chest of valuable papers in an area with an annual rainfall in excess of 2m!!

Exploration of caves in these wild highlands and islands had their own peculiar dangers. About Arran, the Swiss Geologist Necker de Saussure in 1821 wrote:

"In a small cavern, the entrance into which was covered with briars, were ranged 30 or 40 casks of whiskey, destined to be transported during the night on board a vessel anchored at a little distance. Some very ancient iron spears were lying in the mouth of the grotto which were the arms used by the smugglers in case of attack".

Fearful lest the smugglers returned he hurriedly sidled away leaving the cave unexplored.

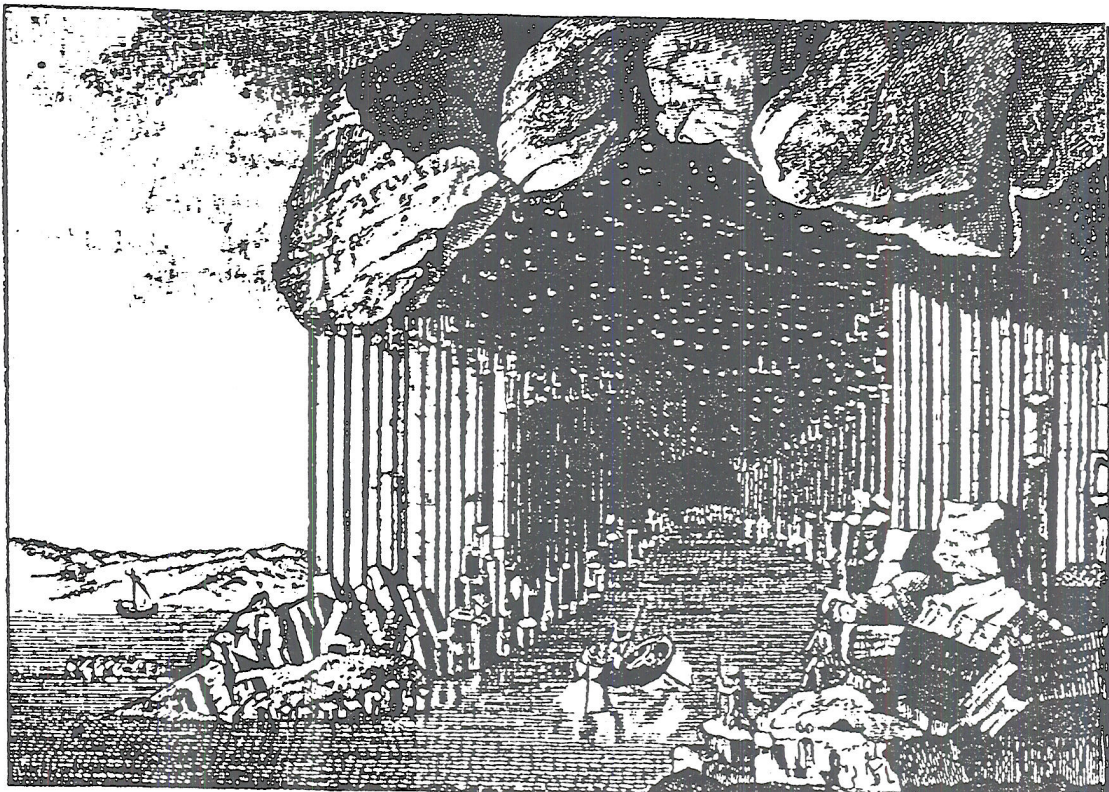
The island of Staffa, with its distinctive basalt columns, also derives its name from the Norse Stafr-ey (pillar- or rod-island, cf english staff). Famed mainly for Fingal's Cave, which Horace Walpole said, "... proves that nature loves Gothic architecture", Staffa also contains several other caves in its spectacular cliffs (all are of course non-karstic). In the

bay of Port an Fhasgaidh (Shelter Bay - a strangely named cove since it is exposed to the full force of the Atlantic) is MacKinnon's Cave. Nearly as grand as Fingal's and much longer, MacKinnon's is connected to Cormorants Cave by a narrow 100m tunnel. Traditionally MacKinnon's Cave is named after Abbot MacKinnon of Iona (died circa 1500) although his connection with the cave is uncertain.

For so large and obvious a cavern it is surprising that Fingal's Cave was only brought to the notice of the world in 1772 when a timely storm forced Sir Joseph Banks, then President of the Royal Society, to stop here while journeying to Iceland to study volcanos:

"We arrived at the mouth of a cave the most magnificent I suppose has ever been described by travellers. The mind can hardly form an idea more magnificent than such a space, supported on each side by ranges of columns and roofed by the bottoms of those which have been broke off in order to form it; between the angles of which a yellow stalagmitic matter has exuded, which serves to define the angles precisely; and at the same time vary the colour with a great deal of elegance".

When he asked of a crofter (the island's only inhabitant) the name of the cave his interpreter told him it was the Cave of Fhinn, that is Fhinn MacCoul, the Ulster warrior giant who in Scottish Gaelic is usually called Fingal (strictly Fion na Ghal: Chief of Valour).



Fingal's Cave, Staffa according to Sir Joseph Banks (1772) probably the oldest print of a British cave.

However 12 years after Banks' visit the French explorer Faujas St Fond visited Staffa and its famed cave. Concerning the cave's name, he later consulted several scholars of Celtic languages and from them deduced that:

"The true name of the cave is An Ua Vine. An, the - Ua, grotto, cave, cavern - Vine, melodious. The name Fingal in the same language is spelled and pronounced Fion, and the Cave of Fingal (in the genetive) would be: An Ua Fine."

Thus between the gaelic, Vine, that is melodious, and the genetive of Fingal (ie. Fingal's) in gaelic, Fine, there is no other difference than a change of letter v into f. Consequently Faujas concluded that someone not well versed in gaelic had translated An Ua Vine (in modern gaelic: An Uamh Bhinn) by Fingal's Cave, while the true and literal translation should have been The Melodious Cave.

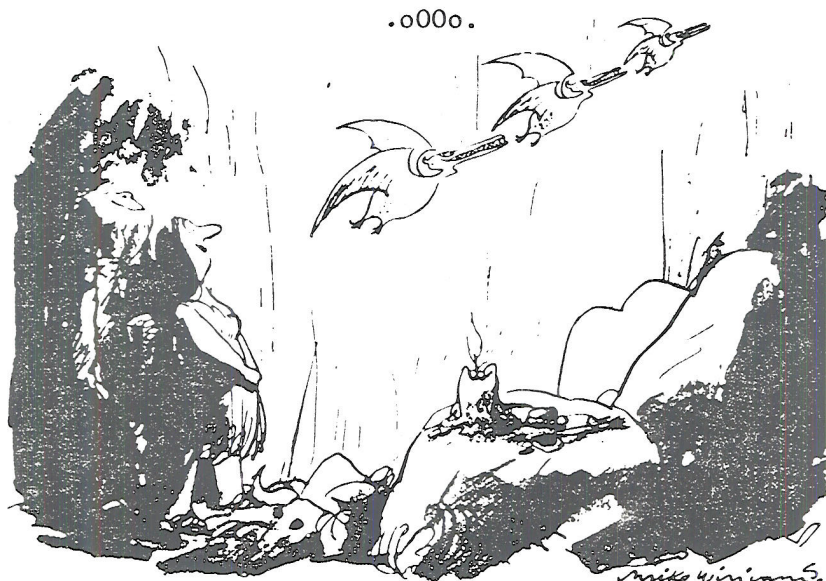
Fingal's Cave has indeed often been described as emitting agreeable sounds caused by the rushing in and out of the sea and it was this that inspired Mendelssohn to compose his Hebrides Overture (or Die Fingalshöhle as the piece was originally known) after a visit in 1829. However Banks' name Fingal's Cave seems to have stuck, probably reinforced by the similarity with the Giant's Causeway in Ireland.

For a cave of such difficult and dangerous access Fingal's has attracted vast numbers of visitors. The Victorians in particular seem to have considered a visit de rigeur, even the Queen and Albert struggled ashore there in 1847 (accompanied by sailors singing "Rule Britannia" !). So crowded did Fingal's get that it often lost all its grandeur. After William Wordsworth's unhappy experience in 1833 he wrote:

"We saw, but surely in the motley crowd
Not one of us has felt, the far famed sight.
How could we feel it? Each the others' blight,
Hurried and hurrying, volatile and loud."

Today, similar words might perhaps be said about many of the more popular sporting cave systems throughout Britain. However, for the time being at least, the majority of caves in the Scottish highlands remain as wild as ever.

Clive Orrock

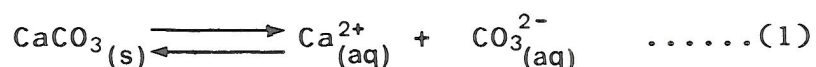


CAVE FORMATIONS

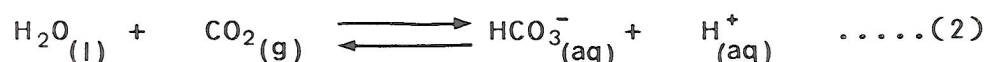
All cavers have different reasons for wanting to venture underground. Explanations for the motivating force behind this admittedly strange pastime range from a desire to return to the womb, to a more worrying; 'I only do it for the danger!'. Whatever your reason however, there can be few people who are not greatly moved by the plethora of beauties to be found in these subterranean art galleries. From the vast and awe inspiring, to the intricate and delicate, cave decorations are mostly all formed by the same simple processes. Understanding hows the various forms are created is to further appreciate the wonder of the underground.

Unfortunately there is very little opportunity for the weekend caver to appreciate cave decorations in an unspoilt state. Generations of cavers have marred their beauty simply by being in the cave. The caver who deliberately breaks or tarnishes a decoration is thankfully a rare and endangered creature. However, the caver who carelessly puts a muddy hand on a stalagmite to leave his handprint encapsulated for all time, or who accidentally knocks past delicate straws and hears them tinkling to the ground behind him is all too common. We are all, to an extent, guilty of contributing to the degradation of the cave's beauty.

Many minerals are deposited in caves as chemical precipitates, although, at least in British caves, formations of calcite are the most important. These can take many forms for which the generic term, speleothem, has now largely replaced earlier ambiguous terms. The principle of formation of calcite speleothems is basically very simple and is essentially the reverse of the reaction that first created the cave. The rock in which caves form, limestone, is basically composed of calcium carbonate (CaCO_3) which dissolves in water as:



In pure water, the solubility of CaCO_3 is quite low. However water that has passed through the atmosphere (rain) and more especially has percolated through rotting organic material on the surface, dissolves CO_2 from the air:



The free hydrogen ion (H^{+}) left by this process makes the solution acidic; in this case carbonic acid. When carbonic acid comes into contact with limestone equations (1) and (2) combine to form a secondary hydrogen-carbonate ion (HCO_3^{-}). A shortage of carbonate ions in equation (1) is created and so (1) is driven to the right ie extra limestone dissolves. The net result is that limestone is more soluble in carbonic acid, up to about 25 times more, than in pure water.

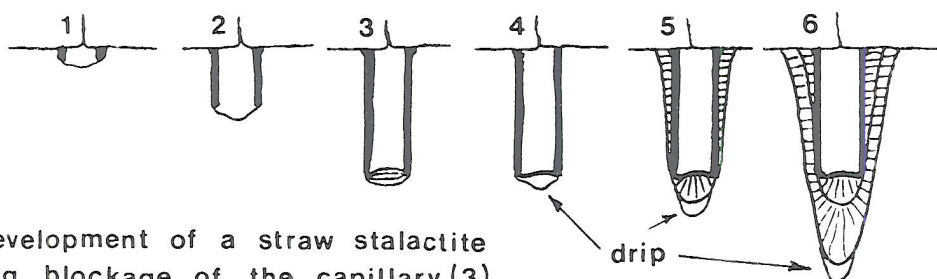
When this calcium laden water percolates through rock the solution remains saturated and no change occurs. However, when the water begins dripping through into the open space of a cavern and so meets free air again, the chemical reactions are reversed. If (usually) the cave atmosphere has a lower than equilibrium content of carbon dioxide then CO_2 diffuses from the water to the air. The droplet becomes saturated with Ca^{2+} ions, equation (1) is then reversed and solid calcium carbonate precipitates from the solution. Conversely, if the flowing water should at any time become more acidic (from industrial pollution, or from organic debris following deforestation etc.) the water drop may be still undersaturated and so it will change from depositing to dissolving calcite.

The basic chemistry of calcium carbonate solution and precipitation, although easily understood, does not go far in explaining why such a variety of speleothems can form from the same reaction. To understand this it is necessary to examine the formation of each different form of decoration.

Stalagmites and Stalactites

While a water drop hangs from a cave ceiling it will leave a small ring of calcite at the water/roof/air interface. When other drops fall from the same spot (fed from say a joint in the rock) they build up calcite on the deposits that have been left before. Thus are straws created: hollow, and always of the same diameter (that of a water drop).

Typically growing at about 0.2mm per year, straws can eventually reach great lengths (up to more than 5m in some caves) until they fall down under their own weight. However they usually block internally before any great length is achieved, and then films of water are forced to flow down the outside depositing radial crystals around the central tube. This leads to a conical form, circular in section with a tree-ring type of structure. These have no standard dimensions and can be enormous - one in the Aven Armand, France, being 30m long.



The development of a straw stalactite showing blockage of the capillary (3) & layered growth of the conical form.

The drops falling to the floor from the straw or stalactite deposit more calcite there as a result of splash. A minimum diameter for a stalagmite so formed is about 3mm. If the drip rate, water hardness and cave atmosphere remain uniform, then uniform-diameter stalagmites are formed; a conical form results from a decreasing rate of deposition; and a tiered-cake shape implies a varying rate. If left undisturbed for long enough, stalactite and stalagmite grow towards each other and may eventually join to become a column.

Curtains and Draperies

If the cave ceiling is tilted at an angle that will let a drop of water slowly roll down it, a line of calcite may be deposited. Over the years curtains of calcite form, often following irregularities in the ceiling so that they undulate gracefully. Among the most beautiful of cave formations, curtains can be stained many colours from minerals in the rock and often appear banded like streaky bacon. Iron gives rise to reds and oranges, manganese black, and copper green, but organic impurities also give rise to many colours from yellow through brown to black.

Helectites

A source of confusion to scientists for years, these small calcite formations defy gravity by growing in all directions. Although rare in popular caves because of their fragility, they are not uncommon off the beaten track. It is now fairly certain that they grow by capillary action depositing calcite in a randomly at the end of tiny tubes. Past theories have included fungal growth depositing calcite and subterranean draughts blowing water off the ends of stalagmites. They have been known to grow to lengths of 400mm although they are tightly coiled or twisted and the length is difficult to estimate.

Flowstone

This is the generic term given to calcite deposits of no true form. Water trickling over rocks and boulders or even the floor, deposits calcite over large areas. Sometimes covering whole chambers or passages, sometimes merely coming from a small inlet in an otherwise mundane passage, calcite can be very delicate and beautiful.

Rimstone Pools

When water laps over the rim of puddles CO_2 is lost at the faster flowing cascade line and it along here that calcite is deposited. This can eventually create rimstone dams or gour pools. These pools can be less than an inch deep or may need climbing protection to scale!

I have not yet covered the full range of attractions to be seen in caves: there are many different and esoteric formations yet to be studied and hopefully some that are yet to be seen by man. I hope I have given some of the reasons why speleothems exist and some of the reasons why we should all be careful to leave them untouched. Any formation takes many human lifetimes to grow, and most are still growing. But they take only seconds to destroy.

Simon Lawes

CHASMS, CAVERNS, HOLLOWES AND HOLES

Once again, can you identify the following fictional, troglodytic characters? In what books do they appear, and who are the authors?

1. In a world supported on the back of a giant turtle (sex unknown) was a mountain, "... huge, grey and upside down..... curving gracefully outward like an upturned trumpet until it was truncated by a plateau fully a quarter of a mile across. There were also a number of cave mouths, a few yards below the plateau, they had a crudely carved, regular look about them, so that on this crisp autumn morning the Wyrnberg hung over the clouds like a giant dove-cote. This would mean that the "doves" had a wing span slightly in excess of forty yards."

The mountain was in fact hollow containing a vast cavern in which roosted numerous dragons (if you believed in them) until who arrived?

2. Who, by saying the magic words "Open Sesame!" was able to gain entry to the cavern of the forty thieves and all their stolen treasure?

3. Whose door, pictured right?
"Now they all pushed together, and slowly a part of the rock-wall gave way. Long straight cracks appeared and widened. A door five feet high and three feet broad was outlined, and slowly without a sound swung inwards. It seemed as if darkness flowed out like a vapour from the hole in the mountain-side, and deep darkness in which nothing could be seen lay before their eyes, a yawning mouth leading in and down."



4. Who voyaged so deep underground that they came to the very gates of Hell which bore the sign:

LASCIATE OGNI SPERANZA VOI CH'ENTRATE
(Abandon all hope, you who enter here)

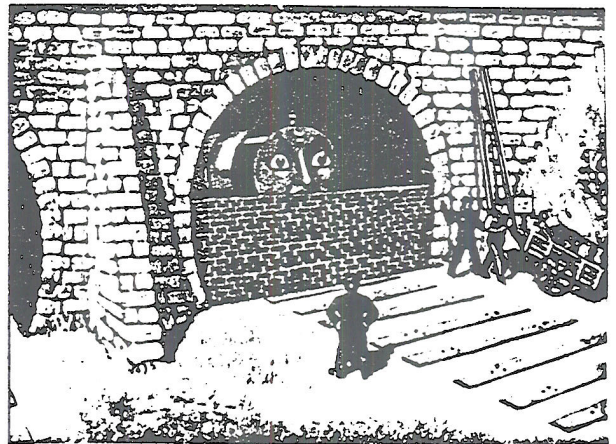
.... they entered and carried on down.

5. Who, thought Constantine Bay in Cornwall to be the very best place in the world for a holiday. There was always something new and exciting to discover, scrambling about the rocks and caves. Then one day, "she heard a noise like a loud sneeze, and a little puff of green smoke came out of the cave." It was dragon! He had impeccable manners, was far too polite to eat people, was very partial to sugared buns, and he told the most wonderful stories. (See left).



6. Who, along with Peterkin Gay and Jack ("a fine strapping lad who stood fully six feet two inches in his stockings"!!!) was shipwrecked on a south-sea island where they found a submarine coral cave in which they hid to avoid the cannibals?
7. Enchanted by her voice, he lured a young soprano, Christine Daae, into his lair in the labyrinth of caverns, crypts and catacombs beneath the Paris Opera where he lived to hide his disfigurement. Who was he?
8. Who, when he wasn't paid for some successful pest control work, kidnapped the town's children and led them into a cavern, to emerge miles away (according to local tradition from the Almasch Cave in Romania's Carpathian mountains)?
9. Who's telling who about the famed Caverns of Aglarond?
 "Here they have one of the marvels of the Northern World, and what do they say of it? Caves, they say! Caves! Holes to fly to in time of war, to store fodder in! My friend, do you know that the caverns of Helm's Deep are vast and beautiful?.... And, when when the torches are kindled and men walk on the sandy floor under the echoing domes, ah! then ... gems and crystals and veins of precious ore glint in the polished walls; and the light glows through folded marbles, shell-like translucent....."

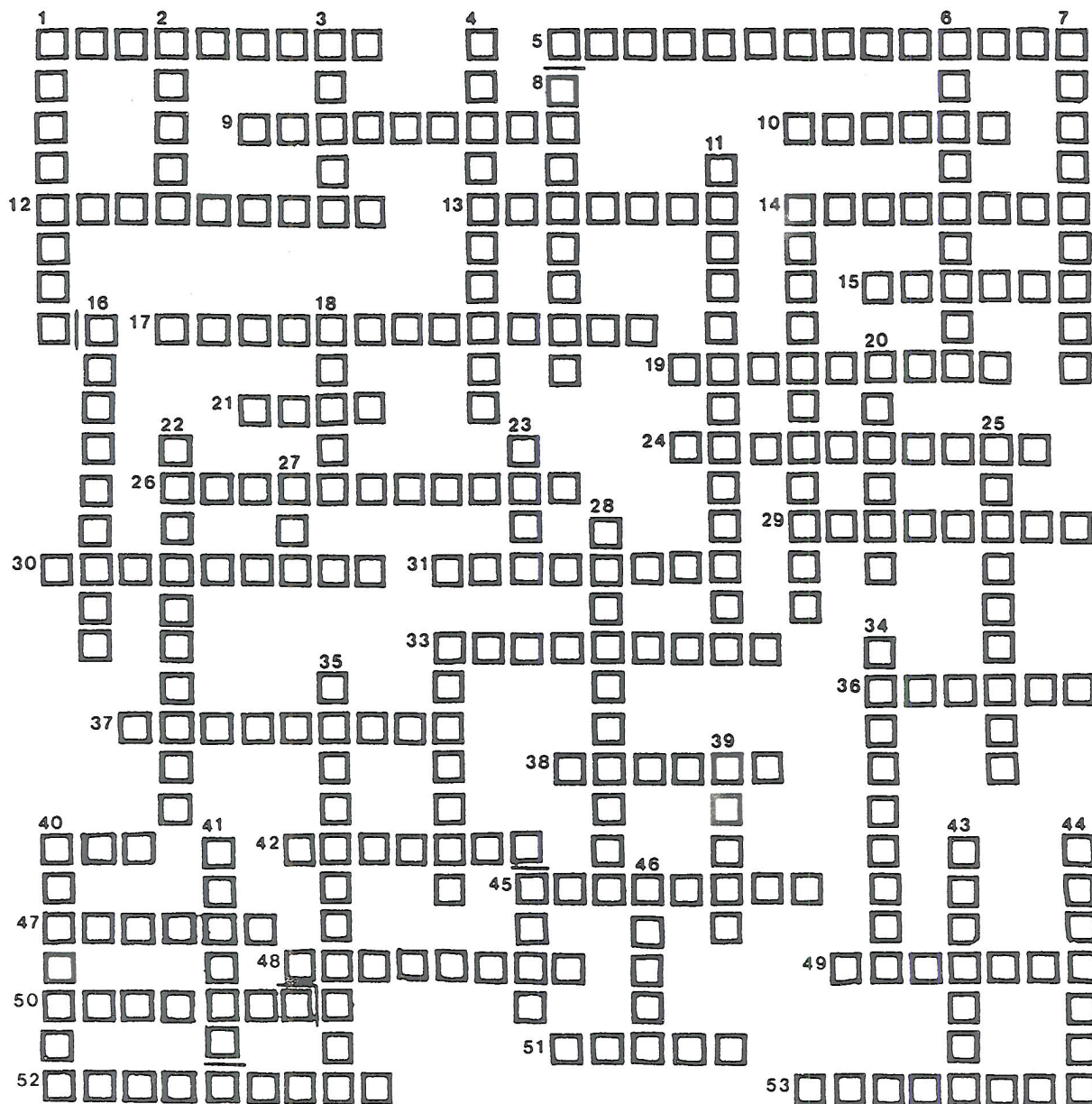
10. Who? (See right).
 "Once an engine attached to a train
 Was afraid of a few drops of rain.
 It went into a tunnel,
 And squeaked through its funnel,
 And never came out again."



11. Forged credit cards and stolen sapphires led this pair of boy sleuths to a cave on Blackfoot Path, in the Rockies. Intruders were found unconscious with red welts on their necks and a dead vampire bat lay on the track. But such bats only lived in Central America.
12. Who, after escaping from prison in French Guiana, was held in an underground cell which half flooded with every tide?
 "... they took me to a staircase that led underground. After we had gone down more than twenty-five steps we reached a very dimly lit corridor with cages to the right and to the left. One of the cells was opened and I was shoved in. When the door on to the passage closed, a smell of decay rose from the slimey earth floor." This was the Black Hole of Santa Marta.
13. Having tracked an international crime syndicate to a voodoo-ridden island off Jamaica, this secret agent is attacked by a shark while fixing a mine to the criminals yacht 'Secateur'. He seeks shelter in a submarine cave - Bloody Morgan's Cave - which he discovers to lead to the centre of the island and the underground HQ of Mr Big and the mysterious Baron Samedi. Who is he?
14. Who found a cave somewhere in darkest Africa?
 "It is the cave", said Umbopa.
 We made the best of our way to the spot, and found sure enough that the hole was the mouth of a cavern, no doubt the same as that of which da Silvestra wrote. We were not too soon, for just as we reached shelter the sun went down with startling rapidity, leaving the world nearly dark, for in these latitudes there is but little twilight."

CAVING CROSSWORD/WORD FIT

Back by popular request!! Again, either fit all the listed cave names into the grid (ignoring the numbers) or for a challenge treat it as a cryptic crossword. The grid and answers are the same whichever way you do it. Having been accused of regional bias in the last one, this should redress the balance. All are names of caves in Wales (North & South), Mendips, Devon and Peak districts - none are in the Yorkshire Dales.



3
BOX
TOP

6
AUGUST
GIANTS
GOUGHS
KITLEY
MITNOR
NETTLE
WOOKEY

8
AVELINES
BLUE JOHN
HESP ALUN
LAMB LEER
LLYN PARC
LONGWOOD
PANT MAWR
SWILDONS

MANOR FARM
PERRYFOOT
PORTH GOGO
SPEEDWELL
STOKE LANE
TOWN DRAIN
WHITE LADY

11
AGEN ALLWEDD
LITTLE NEATH
PORTH YR OGOF

4
BONE
COXS
PEAK

7
BAGSHAW
BANWELL
HUNTERS
JACK POT
MASKILL
PEN ERYR
SHATTER
SLOCKER

9
BAKERS PIT
CARLSWARK
CATHEDRAL
DAN YR OGOF
EASTWATER

10
DAREN CILAU
FFYNNON DDU
OGOF FECHAN
THRUPE LANE
UPPER FLOOD

13
CRAIG A FFYNNON
TYNINGS BARROW

14
SAINT CUTHBERTS

Across:

1. A measure of pear cider.(9)
5. Can St. Hubert sit in a mess? (5,9)
9. Bishop's seat in a Welsh tunnel. (9)
10. Cesar lost us in Longwood. (6)
12. Swop man for ram to find a smelly cave.(5,4)
13. We'll get you out of penury but drop East in it, right? (3,4)
14. An extensive forest conceals a deep system. (4,4)
15. Stinging plant pot. (6)
17. Bundle of tiny brown rags. (7,6)
19. Cardinal points between Carl and a big lifeboat.(9)
21. Derbyshire's top - the devil's arse it is! (4)
24. "Fin on do!" What? (7,3)
26. Gate of a cave which has no gate. (5,2,4)
29. Backward couple: senile Victoria and Albert (8)
30. Sounds like saliva found in dough or Devon. (6,3)
31. Messy anus. Help! (4,4)
33. Disturbed lake in middle of stone swallet. (5,4)
36. Too touristy! Makes you want to go "ugh" sometimes (6)
37. (Old name for 26)Pour forth losing 4. Go on, go! (5,4)
38. Devon joint lost in neither summit nor valley. (6)
40. Spar mine, on trunk route to Bath. (3)
42. (With 45 down) Prohibit spring fossil cave. (7,4)
45. Miner's spar and apostle look cold. (4,4)
47. O great Derbyshire cave.(6)
48. Wild sons of Mendip are floundering here. (8)
49. This pot wins top prize.(7)
50. Well known hole lodged in Priddy. (7)
51. Bit of Devon claimed by SE county. (5)
52. Senora blanca. In Wales!(9)
53. Young sheep was lost and empty is now refound and staring. (4,4)

Down:

1. Knicker sounds as if needs something more, or moor? (4,4)
2. Horny animal has rift. (5)
3. Playful animal in pot terminating under Chepstow. (5)
4. Rupeth Lane is cobbled. (5,4)
6. EH20. (9)
7. Rushing spring, dug out by miners. (9)
8. Initially go left, then left again, yes, then go North. Then park. (4,4)
11. Sounds like a Welsh language magazine for garden pond enthusiasts. (5,1,7)
14. Ellen Arsey, I hear, has first name(s) written in full. (6,5)
16. Metropolitan sewer. (4,5)
18. It's a little river cave, says young Nedd. (5)
20. Witches, Luke Skywalker, Tussauds - it's seen 'em all. (6)
22. Two peas in a ewer we hear left in food. (5,5)
23. Apples in Cheddar. (4)
25. Now showing: "Daniel and The Cave", in Welsh.(3,2,4)
27. A pit I came out of backwards leaving nothing. (3)
28. Blend l'eau rancid. (5,5)
33. Lock in South-East, right of Mendips. (7)
34. I chafe no fog and am still confused. (4,6)
35. Keyhole which might unlock secrets to LLangattwk.(4,7)
39. Bovine bellow. (6)
40. Now we're lost in here!! Nothing personal but the tacklebag Shaw took down the pitch with him. (7)
41. Left it in key. (6)
43. Ski in the Mall. (7)
44. The star is broken. (7)
45. See 42 across.
46. The Spaniard in the hills near Buxton. (5)



Now and Then

“The Balaeric Isles in the Mediterranean are amongst the least visited by travellers. Did you ever meet anyone who has been to Majorca or Ibiza? Yet these islands are deeply interesting. They have magnificent mountains, fine towns, splendid gardens and active, intelligent people and the far-famed Cave of Arta, which is reputed to be the most splendid specimen of a crystal grotto in the world.”

The Pictorial Tour of the World. (1884)



Cueva del Arta 1884

“Mention Majorca to most cavers and immediately they think of beaches (bikinis), foreign food (pizza, hamburgers) and exotic drinks (like lager). But in addition to these holiday perks the Balaeric Islands, of which Majorca is the largest, also have many interesting and well-decorated caves.”

Dave Elliot. Caves & Caving No. 25. (1984)



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There seem to be a lot missing.....