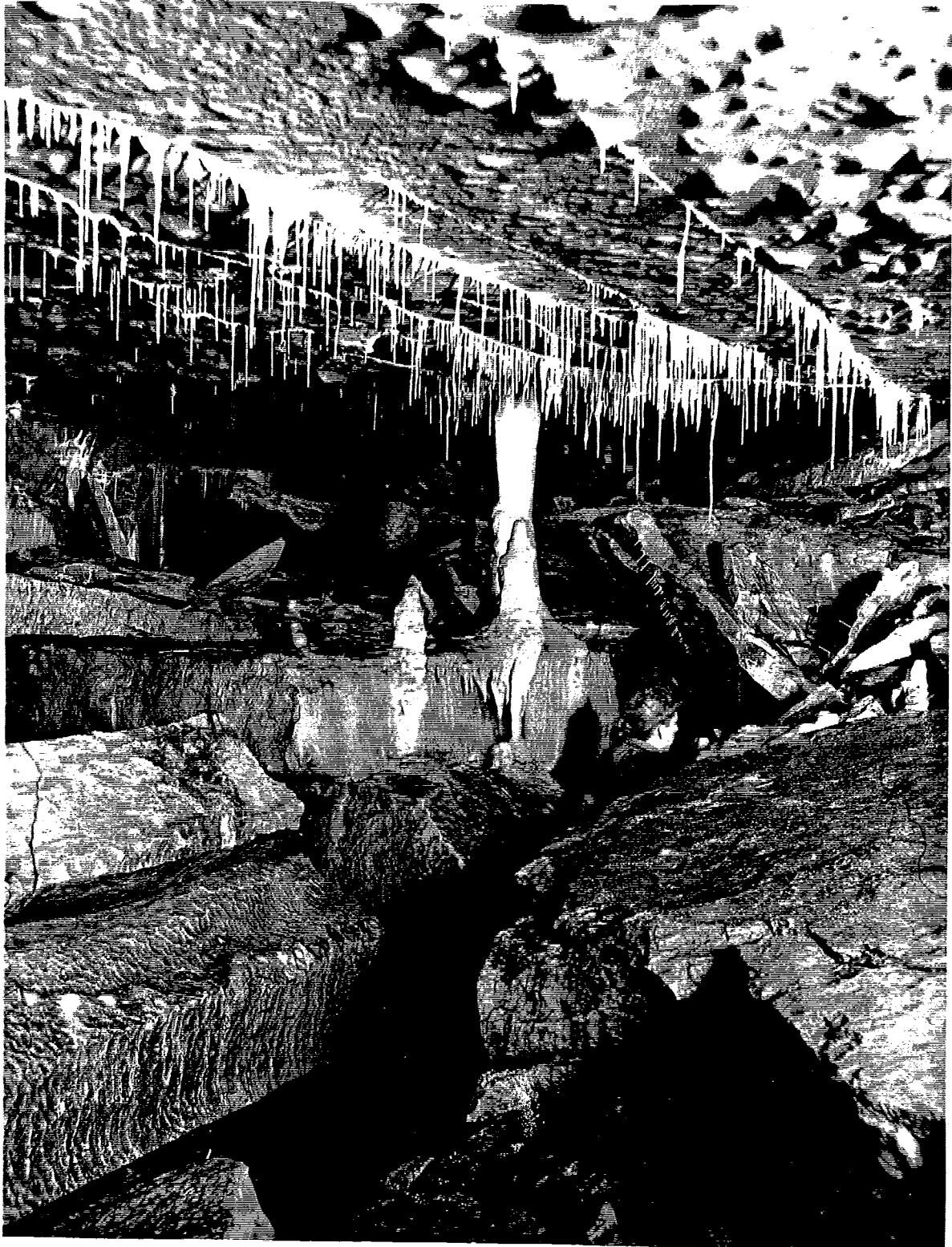


U.B.S.S.

University of Bristol Spelaeological Society



NEWSLETTER
Vol 10 No. 1

February 1994

Editorial

Happy New Year to all our readers! Welcome to this, the first of 1994, and the last one that I will be producing. As of the next issue, Rachel Privett will be taking over as editor, so I can concentrate on finishing my Phd (Pete and Malcolm take note!). I'd like to take this opportunity to thank all those who have contributed to the Newsletter over the past five years since I first took over the post. It is after all, your Newsletter, and your articles which make it, so please, don't stop sending them in. All articles and gossip can be sent to the usual address, c/o UBSS, Students Union, Queens Rd, Bristol, or to Rachel at 8 Lansdown Rd, Redland, Bristol, or via her email address. Now the disclaimer: All views expressed in this Newsletter are those of the individual authors and not necessarily those the UBSS committee.

I hope you have enjoyed reading the newsletters as much as I have enjoyed producing them, and happy caving!

Andy Farrant

Andy Farrant

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Cover Photo: The Polnagollum Main Streamway, Co Clare, Ireland.
Courtesy of the UBSS Collection.

Newsdesk

Priddy Green Sink

During the recent wet weather, recurrent flooding occurred outside the barn at Swildons Hole, due to blocking of the entrance to Priddy Green Sink. This has now been cleared, the cave reopened and a manhole installed. The bottom of the cave has a promising dig site if anyone wants to connect through Cowsh Aven in Swildons 4 - it would make a good round trip, so long as you don't mind the slurry. However, the farmer has reported to have installed a tank to prevent cowsh** running into the cave.

Tynings Great Swallet Dig

The diggers report that the wet weather in December has caused renewed slumping in the terminal chamber, so at the moment, its back to square one. Dry weather is now awaited to give the choke a chance to dry out and stabilise.

Access to Pinetree Pot

1. The key is available most weekends from the Mendip Caving Group, Nordrach Cottage, Charterhouse on Mendip, Nr. Blagdon. A deposit of £15 is required (preferably a cheque) to be returned when the key is brought back.

2. Mr. Brown (the farmer) has stipulated that there should be NO EVENING TRIPS.

3. Access is to be made only via the field gate just west of Warren Lodge cottage on the B3134. Cars may be parked in the obvious layby on the opposite side of the road, or at the M.C.G. cottage. (Please DO NOT approach the cave from the minor road to warren farm).

4. A key is also available by post from Hon. Secretary, Mendip Caving Group, 10, Enstone Road, Charlbury, Oxford OX7 3QR, but please give as much notice as possible and enclose a £15 key deposit.

Gravel

Ian 'the kid' Wheeler, one of the freshers, leads a simple life. He was quoted as saying all he needs are cheese, biscuits and assorted tarts - well, don't we all....

And then there's Hugo, a regular Russian spy lookalike, who's a little more sophisticated, (being from the south) and wouldn't dream of spending more than £700 on a suit, perhaps the new Daleswear's super deluxe Kingsdale oversuit, complete with gold braid and belt to match.

Simon Shaw's amazing ability to attract women like flies to a jam pot has been well known. Quite how successful he can be was recently demonstrated in Scotland at New Year. Every available woman, who wasn't chained to their bloke, and some who were, completely ignored the attempted advances of Tim, Andy F, Chris Bennett, Jim and Neil in favour of Simon 'Sex God' Shaw.

One woman even had to resort to sending her male friend to ask him to see her, so thick were the female hordes on the dance floor. Even Linda has succumbed, only wishing she was five years younger - ever heard of a Toy Boy, Linda??

Also in Scotland, the UBSS's answer to Eddie 'the Eagle' Edwards was unveiled. Andy 'the Ostrich' Farrant's skiing abilities were put to the test whilst descending one of Scotland's hardest, longest, most dangerous nursery slopes when he did an unintentional triple back summersault and half twist. Luckily the resident medic Dr Garrard was on hand with an instant diagnosis (which as it happens was correct!). He was later spotted on New Years Eve demonstrating a new dance, known as the Pogostick. He's now making a slow recovery hopping around Bristol being a hypochondriac. For once everyone can keep up with him!

Eve has finally found her (almost) ideal man. The contender had to have long black curly hair, leather jacket, and look good in black jeans. Unfortunately for Andy Cooke (who has black hair), along came Laurence, who used to have long curly hair, but presumably still fits the other two criteria.

Rachel has once again been up to her usual tricks, after a remarkably quiet period. This came to an abrupt end, when the residents of Castleton were rather surprised to see a strange woman eating daffodils in the local pub, and trying to snog Ian. Steve's comment at the time was 'I don't know her...'. Of course, regular UBSS readers will not be surprised by this. Was it the effect of radon, or was it perhaps just alcohol...?

Recently on a rather memorable trip down Swildons, Steve became violently ill and found it necessary to exit from the cave and use a herd of cows quietly eating their supper beneath the window of the changing barn as a puke bowl! Rachel came to the rescue (of the cows) and drove him home, only to become ill herself on the journey. Current theories are that either Hugo - the Russian spy was trying to poison them with his salami sandwiches, or that Rachel may have "accidentally" eaten some bacteria in Microbiology the day before and somehow passed them onto Steve. The mind boggles... Unfortunately, neither method worked, they are both still here!

Amazing fact No 257.

8 out of 10 UBSS members still can't find their way round OFD.

Topher found a whole new meaning to life whilst sitting on the top bunk in the TSG hut in Castleton. He was quoted as saying 'I must be gone, some blokes just fondled my goolies'. Apparently he was prepared to go through a little discomfort in order to get a bed... Perhaps the more worrying was the huge grin on his face at the time.

Neil Hawkins' superb ability at caving is only matched by his equally superb canoeing expertise. However; there are a

few lessons one can learn from such a pro.
1: Read your guidebook before setting off down a new river.
2: Never trust Simon Shaw when following him in a canoe.
The result? Neil ended up canoeing down a rapid on Langdale Beck backwards and upside down - and then lost his canoe and paddle. As for Simon, he dislocated his shoulder, and then had to rescue the canoe. Luckily, Dr. Garrard was, as usual, on hand to give immediate medical attention!

Eve's reign as armchair caver of the year came to a rather abrupt end when Eve suddenly took up caving and was promoted to the dizzy heights of Hon Sec. Thankfully, a successor has been found in the form of Steph Whitfield, whom for some apparent reason prefers making cups of tea for everyone to caving. Perhaps there is some other attraction other than caving, a certain someone perhaps...? Any guesses? All entries can be sent to the usual address, c/o the Editor.

HON SEC'S SPIEL

Firstly, a big thankyou to Alison for organising the Christmas meal this year. I know how many problems were encountered and am very glad that they weren't on my shoulders. I did start to worry at 8 pm that she'd had enough and gone home, but luckily my suspicions were unfounded. Thanks to all the drivers that ferried everyone between Swaledale and Ingleton.

Paul Harvey and Charlie Self are currently running repairs on the hut - including rebuilding the chimney - so the hut is not really available for use during February. On the same theme, recent users of the hut have been getting rather lapse about some of the rules. If you do use the hut, please don't drive cars into the front compound and take all your rubbish home. I think Rachel is organising a wood chopping weekend this term, but I am afraid we will all be fishing garbage out of the dunny as well!

On a less putrid note, there is an MRO British cave rescue council conference is to be held at Eastwater Farm on the 8-10th of July this year. the organisers would like some UBSS members to help over the weekend, and it would be good to enter a team too. There are plans to hold our own rescue practice events this term as well, both cave and SRT. these will be directed especially to those going to Slovenia this summer, but everyone is welcome and would benefit.

As I write, Rach is designing membership cards. Anyone who enters the OFD cave system must carry such a card. There is a sessional meeting on the 10th of February, so please can as many members as possible attend this evening as Dr P. Glanville is putting a lot of work into his oration.

One final moan, the tackle store seems to be losing its tackle. This is a potentially fatal condition and in the worst case scenario, demotion to a mere store may result. This would condemn our faithful hovel to becoming a receptacle for miscellaneous items such as car roofs, mouldy carpets, bicycle frames, decaying grundies, MOD signs, ripped tackle bags and unemployed manikins who are rapidly going to pieces. Sooo... could everyone have a scout... preferably not Ian (sorry, I was attacked by an unsurpressable corny joke) for any tackle. Oh yes, could you all look in the corners and under the bed to see if any krabs, ladders, slings are squatting on your land and establishing a commune. Unfortunately, tighter restrictions regarding the use of tackle are about to be imposed in an attempt to prevent further depletion of stock.

OK, no more whinging from me, I guess your alright really!!! Don't forget to pencil in the annual dinner on the 12th March into your diaries. See you

Eve

UBSS DIARY SPRING TERM 1994

- Feb 10th** **Sessional meeting:** 'Caves of Assynt' Dr Peter Glanville will be speaking on the caves in Scotland. MR4, Student Union, 8 pm. All welcome
- Feb 11-13th** **Wales Weekend**
Staying at the Croydon Hut, Ystradfellte. As usual, an excellent weekend.
- Feb 15th** **Post Wales trip tackle cleaning.** 8pm Tackle store, before Crockers!
- Feb 17th** **Quasar** (see below)
- Feb 24th** **Committee meeting!** The stables, 9pm.
- Feb 26-27th** **Mendip Weekend** - wood chopping, see below!
- Mar 4-6th** **Yorkshire Weekend, PLUS Lancaster Hole Permit.** Staying in the Ingleton caravans 23 & 24, but please don't mix up the cups between vans!
- Mar 8th** **Post Yorkshire trip tackle cleaning.** 8pm Tackle store, before Crockers!
- Mar 12th** **AGM & Annual Dinner** 4pm Room MR4, Student Union, followed by the Annual Dinner at Vintners Wine Bar.
- Mar 16th** **Caves of Thunder.** Lecture by Gavin Newman, 7.30pm, Chem. Lecture Theatre, Cantocks Close. Cost £4
- Mar 19th** **Jet Sking** (see below)
- Mar 21st** **Pub Crawl** (see below)

SOCIAL EVENTS - Spring Term 1994.

For anyone who is beginning to find that caving is taking up far too much of their time and that they would like to add a touch of spice and variation to their lives; for anyone who has tried caving and found it not their cup of tea, but who would like to continue pretending to be a caver - (Steph!); or simply for anyone who's anyone, we have some excellent social events arranged for this term.

Thurs 17 Feb. - QUASAR.

We'll be kicking off this term's social events in the traditional fashion with a trip to Bristol Superbowl to spend the evening shooting each other. Please take my word for it, this is a great deal more fun than it sounds! Meet: Tackle store, 7 p.m.

Sat 26 - Sun 27 Feb. - WOOD CHOPPING WEEKEND at the hut.

This is a chance for us to re-fill our depleted wood store, so if running around brandishing an axe appeals to you, then this is a weekend not to be missed. BUT, in case you think this all sounds a bit too much like hard work and not enough fun, there will be a barbecue, so bring some sausages and plenty of booze and you might even end up sampling the joys of "underpant caving"! Meet: Tackle store, 1 p.m.

Sat 19 March - JET SKI-ING.

For those of you who have never tried riding a motorbike on water, this is a sport not to be missed! (Details nearer the time).

Mon 21 March - PUB CRAWL!!

To end the term in true drunken style!

PLEASE NOTE: The above dates and times may be subject to slight alterations so please keep your eyes peeled to the UBSS noticeboard in the union and your ears open in Crockers! If you have any queries then please 'phone me, Rachel on 741453, or E-mail me on lv1057@.uk.ac.bristol.

TREASURER'S BIT

Graham Mullan

Despite my agonised squawkings in the last newsletter, there are still a couple of outstanding subscriptions for 1993/4, I would be really grateful if I could have them before the end of the month, and the closing of the books. If any of you are not going to renew, I would be grateful to be told that too, as it saves me writing continual follow ups.

M.G. Anderson	R.J. Barker	M.P. Bertenshaw	I Butterfield
D.B. Harries	T.C. Lyons	P.D. Moody	S.R. Perry
M. Simms	M.H. Warren		

I have been getting some enquiries as to how the Government's plans for Student Union finance will affect us. If the proposals go through as planned then we will effectively lose tackle grant and student travel grant. I am currently drawing up plans to, hopefully, deal with the tackle side of it, by rejigging our financial structure a bit, but cannot see how we can replace the travel side of it without further outside grants of income. If anyone has any ideas, the Committee will be keen to hear them.

Pausing briefly to remove the Treasuring hat and replace it with the Editing one (anyone want to buy a hat?).

Either with this N/L or soon after you should be receiving Proceedings Vol 19.3. I hope that you think it comes up to standard. I have some material either promised or in hand for the next issue, but welcome all suitable material at this stage. If anyone is working on anything that I don't know about, manuscripts by end of march, please.

As we have now reached the end of a volume, we can discuss whether the size, or format of Proceedings could be changed. Personally, I favour a slightly larger page size, the same height so as not to upset librarians, but wider to allow for better presentation of diagrams. I also favour a change in the style of the cover to make it more "attractive" to casual readers. Your committee welcomes all constructive comment in these areas.

THE ANNUAL DINNER

As has already been announced, this year's AGM and Annual Dinner will be held on March 12th. AGM details will be given elsewhere, by the secretary. The Dinner will this year be held at the Vintner Wine Bar, St Stephen's Street, just off the Centre. As last year, we have booked exclusive use of the premises, and so have the Restaurant, and the Bar and can organise music. We should also have the same bar extension as last year!

The cost will stay at £15 per head, for food. They do some good, relatively inexpensive wines and will have beer on for us as well. There is a choice of menu, detailed below, please send your choice in advance, along with your cheque (£15 per head). We need to know final numbers and menus a week in advance, so don't delay.

Annual Dinner Menu

STARTERS

Garlic Mushrooms:

Whole button mushrooms served hot in a wine and fresh herbs sauce with brown bread

Smoked Salmon Pate:

Beautifully creamy, with toast and salad garnish

MAIN COURSES

Vegetable Lasagne:

Spinach pasta with aubergines and tomato sauce, topped with cheese, served with French bread and side salad

Chilli Con Carne:

Traditional sauce with tumeric rice, with a choice of toppings - yoghurt or grated cheese

Coq au Vin:

Chicken, bacon, mushrooms, onions, garlic and herbs in a red wine sauce. Served with vegetables of the day

DESSERTS

Cheesecake:

Luxury banana yoghurt cheesecake served with fresh double cream

Chocolate Fudge Cake:

Light chocolate sponge with a rich fudge filling served with fresh double cream

THE ANNUAL DINNER AWARDS CEREMONY

Tim
Blimey, doesn't time fly? It only seems a few weeks ago Rachel was throwing up on the toilet walls, Steve was drinking 32 units of alcohol, Hilary was virtually unconscious and Trevor was wearing a neoprene bra with matching G-String - yes, its that annual dinner time again, and you all have a month or so to think up some new awards.

The idea is to think up some more awards, make something to present, and then give it to the lucky recipient at a suitable time. If, by some miracle, any of last years awards actually survived the dinner, then those can be passed on as well if you want to. Any ideas, contact Eve, Alison or Tim

THE UNIVERSITY OF BRISTOL SPELAEOLOGICAL SOCIETY CAVING

EXPEDITION TO SLOVENIA 1994

This article is written in answer to all the continual, clamorous, cross-examinations I have received regarding this pilgrimage.

The said expedition is to take place from the *3rd September to (approx) 25th September 1994*. In answer to certain accusations of snow and skiing expeditions, local sources say it is just as likely to snow in September as August. In fact they recommend late summer as there will be less of the previous winters snow on the ground. So as with any other day, we take our chances with the weather and hope it treats us kindly.

So far the numbers seem to pivot around 10-15 expedites, these probably include (in no particular order!); P. Drewery, T Martyn, D. Harries, S. Cottle, B. Miners, A. Garrard, E. Pleydell, M. Taylor, A Wiseman, H, Pyle, I Wheeler, J. Sugg, R. Privett and (hopefully) T. Parish (but I keep forgetting to ask him). Two thirds of these are very experienced expedition cavers with finds such as BS 17 (Austria) under their belts, so the expedition has every reason to be a success. However this is by no means a final list, if you are enthusiastic and interested, don't hesitate to let me know.

So, where are we going?

The Julian alps of Slovenia. These are in the top left hand corner of Slovenia, bordering Austria to the north and Italy to the west. We shall be exploring the south Triglav Plateau (2500m), which is an area of high karst just south of the summit of Mt Triglav (2864m). The valley floor lies at a mere 100m, so the potential for deep caves is good. The Triglav massif is known to contain caves, many of considerable depth and size. This particular plateau has not been previously explored due to heavy snow cover. However this snow cover has been thinning in recent years and local contacts say it should be explorable this summer. The local cavers themselves have not investigated this area as they are currently concerned with caves on the Italian border, however, we have offered an open invitation to any that may wish to join us.

We will be staying in an old hut on the plateau, but amenities are virtually nonexistent and the reality is probably nearer camping.

Due to the current upheavals in the area, the whole expedition looked uncertain at the start of the year. However, we have obtained permission from the Triglav National Park Authority and the Jamarkse Zveze Slovenije (Slovenian Spelaeological Association). Visas and permits are not required for this country.

As for the financial situation, working on a temporary total of eleven participants, the maximum sum each member will have to pay is probably £270. We have applied for grants from the Tratman fund and the Sports Council, so any monies from these should decrease the personal contributions. This sum includes ferry cost, insurance, food and hopefully petrol. The expected route is by road, travelling through Belgium, Germany and Austria. We will probably travel in cars, but tentative enquiries are being made regarding minibuses. The journey should take two days (this of course does not apply to Tophers vehicle).

There will be some rescue training sessions between now and September. These will include cave rescue practices underground and some sessions of SRT rescue and self-rescue at the St. Werburghs climbing wall (hopefully!). I will keep you informed.

The only vaccination requirements are up to date polio and tetanus injections. However you have the option of paying £40 for immunization against tick borne encephalitis.

That's about it to date. Tony and Graham have lent me various maps of the area, if you'd like to see these or wish further enlightenment on any aspect of this magical mystery tour, track me down and ask me nicely.

Eve

DATING CAVES AND THEIR CONTENTS

Andy Farrant

OK, OK, before you all go 'Yawn', and say "What's Andy wittering on about now," just stop, and consider the question - is there more to caving than just going down a cave for the sake of it? Apart from the obvious answer that they're pretty, full of lots of lovely stalactites, keeps you fit and makes for lots of good pub stories, they are also important stores of archaeological and geological material, much of which would otherwise have been destroyed by surface erosion. This is why so many cave sites have been designated SSSI's and been 'protected' (if you can call them protected, but that's another story!). This geological and archaeological information often needs to be set in a chronological framework to make use of it - hence the need to date caves. This article follows on from a letter in the last issue of Descent, and a suggestion by Graham, and is designed to enlighten those of you who perhaps may like to know a little more about how we go about estimating the age of caves.

An important thing to bear in mind is that a cave itself cannot be dated, how do you date a void? Only the deposits contained therein can actually be dated, so the cave may be considerably older than the material you are dating. Hence you obtain a minimum age for the cave. The age of the cave deposits can be estimated by a variety of methods. Each dating method usually has a restricted time range, applicability and precision/accuracy, so a single method cannot be applied to every situation, hence is often necessary to use several techniques in any one cave. Furthermore, many caves do not contain deposits suitable for dating. However, with caution, a good estimate is usually obtainable, although it must be borne in mind that many dating methods have inherent uncertainties and are often quoted with 1 or 2 sigma error bars and should never be over interpreted!

There are four basic types of dating method. Numerical age methods give actual numbers with errors, Eg. uranium series dating, while calibrated ages are those which measure systematic changes in a parameter over time, and need to be calibrated with another independent method before reliable results can be obtained. Relative age methods give an order of age and only an approximate indication of magnitude, an example being that an active cave is younger than a fossil one, but with little indication of the actual timespan involved. Correlated age methods are those which prove something is equivalent in age to something else (which may have a better time resolution), fossils provide this sort of age.

There are about eight different dating techniques commonly used for dating cave deposits (Fig. 1.). Here at Bristol, we have facilities for Uranium series dating in the Geog. Dept and potential for ESR dating in the Chemistry Dept. A host more techniques have been applied to caves, but only in unusual circumstances. The commoner one are listed below.

Fig. 1 Some of the commoner dating techniques with age ranges and type of age. (1 ka = 1000 years.)

Method	Age range (ka)	Type of age
Radiocarbon	0.3 - 45	Numerical
Uranium Series (Alpha Spec)	3.0 - 350	Numerical
(Mass Spec)	0.05 - 500	Numerical
Electron Spin Resonance	5.0 - 900	Numerical/calibrated
Palaeomagnetism	0.05 - > 2000	Correlated
Geomorphic	0 - > 2000	Relative
Palaeontological		Correlated
Stratigraphical		Correlated

Radiocarbon dating

This is the method that most people have heard of. However, it has only limited use for dating caves due to its short age range, and because it can only be applied to carbon bearing deposits such as charcoal and bone. Because of this, it is often for dating archaeological deposits within caves. Carbon - 14 isotopes are produced in the upper atmosphere by the action of cosmic rays. These ^{14}C atoms combine with oxygen to produce carbon dioxide. ^{14}C is radioactive and therefore decays at a constant rate. Assuming the rate of production is constant, the amount of ^{14}C in the biosphere and the atmosphere will be constant, and therefore, all living organisms will have the same proportion of ^{14}C in their bodies when they die. After death, the ^{14}C will continue to decay, and so the proportion of ^{14}C to other carbon isotopes will decrease. After about 50 ka, the amount of ^{14}C falls below the measurable limit, this being the age limit of the technique. The amount of ^{14}C in a sample can be measured using an Accelerator Mass Spectrometer.

However, not all living things are in equilibrium with the amount of ^{14}C in the atmosphere, some plants use 'old' carbon stored in rocks, bogs and in the deep ocean, introducing errors into the age estimate. Furthermore, the rate of production of ^{14}C has not been constant with time. To try to overcome this, a correction factor is needed, based on the ^{14}C content of fossil trees which can be dated independently by counting the tree rings. Contamination with modern carbon is also a major problem. In spite of these difficulties, it is still the only dating method applicable for many types of material found in caves. Many archeological sites in caves have been dated using the ^{14}C method.

Uranium series

The most common method for dating speleothem (stalagmites, stalactites and flowstone) is the uranium series disequilibrium ($^{230}\text{Th}/^{234}\text{U}$) method. This relies on the radioactive decay of uranium isotopes to thorium. It has an effective age range of 350 ka using alpha spectrometry, and 500 ka for mass spectrometry. In a nutshell, uranium (in its oxidised state) is soluble in water, whereas in contrast thorium is insoluble and is strongly adsorbed onto clay minerals and solid surfaces. Thus, natural groundwater will contain uranium, but no thorium. When a speleothem is formed, the uranium is incorporated into the calcite crystal lattice, without any thorium. Thus there is a deficiency of ^{230}Th compared to its parent isotope ^{234}U . Through time ^{234}U decays to ^{230}Th , causing a progressive increase in the $^{234}\text{U}/^{230}\text{Th}$ ratio in the speleothem until equilibrium is reached. As this occurs at a constant known rate, the age can be calculated. Usually, an alpha spectrometer is used to obtain the isotopic ratios, however, if a mass spectrometer is used, the increased precision can extend the age range back to 500 ka and decrease the sample size needed (0.5 - 10 g). However mass spectrometers are expensive, so if anyone has a spare half million quid....

The sample needs to be clean, to avoid contamination from detrital thorium from sediment, and unaltered so none of the uranium has had a chance to leach out of the sample.

There are numerous examples of caves dated by this method including Kingsdale Master Cave, Gough's Cave in Cheddar, which is approximately 300,000 years old and GB. Other work involving U-series dating includes estimating the growth rate of stalagmites, calculating valley incision rates from fossil resurgence caves, trying to understand climate change by looking at periods when stalagmites grew, and their trace element content, and estimating how low sea levels fell during glaciations from submerged stalagmites in the Bahamian Blue Holes

However, many caves are older than 350 - 500 ka, and so cannot be dated using uranium series methods. Two alternative methods to date older caves are ESR and Palaeomagnetism.

Electron Spin Resonance.

Electron Spin resonance is basically a means of measuring the cumulative effects of radiation on a sample and calibrating the sensitivity of the sample to radiation. The sample acts as a natural radiation dose meter, recording the amount of radiation it has received. Radiation, X rays and cosmic excite electrons within a solid and cause single electrons to separate from their pairs. Normally most of these 'loose' electrons rapidly recombine with positive charges. However, some get 'trapped' by charge deficits associated with defects in the crystal lattice. These trapped lone electrons can be detected by ESR. The intensity of the ESR signal is dependent on the average amount of radiation received at the sample site, the sample age and its sensitivity to radiation. So, by determining the sensitivity of the sample and the average radiation flux, an age can be calculated. The radiation flux is obtained by inserting radiation dosimeters for up to a year where the sample was collected. The major problem with this method is that the radiation flux at the site must have remained constant through time, which need not necessarily be the case if condition within the cave have changed. Under favourable circumstances ESR can give ages ($\pm 15\%$) up to about 900 ka.

Palaeomagnetic stratigraphy

The other method for dating older caves is palaeomagnetic stratigraphy. This involves measuring the 'natural remnant magnetism' that occurs in rocks and sediments, and which record the prevailing magnetic field at the time of deposition/formation, and correlating these with other previously dated palaeomagnetic records, usually deep sea ocean cores. This gives a correlated age, but not an absolute numerical age. At the moment, the Earths magnetic field is of Normal magnetic polarity, but before about 780 ka the Earths magnetic polarity was reversed. Seven such polarity switches have occurred over the last 2 million years. Both stalagmite and clays deposited in still water have measurable magnetic remanences. The method involves collecting orientated samples, usually about 2 cm², determining the direction of the remnant magnetisation held by the samples using a magnetometer, checking the stability of the magnetisation and correlating the data with the ocean core record. By obtaining a sequence of samples over a range of elevations a composite palaeomagnetic record can be built up. Unfortunately, the major problem with this is that it gives a very accurate, but coarse estimate of age. Palaeomagnetic studies have been conducted in Mammoth Cave, Kentucky and Clearwater Cave in Sarawak, where the higher parts of the system are over two million years old.

Other dating methods applicable to caves are geomorphic position ie. higher fossil caves are usually older than lower ones, and palaeontology, ie. the study of fossils and artifacts, which are commonly found in caves. For instance, some infilled caves near Bristol have small mammal remains in which have been identified as Triassic in age. For deposits near the entrance, pollen stratigraphy can be used, many of the archaeologically important caves on the Gower and Devon coasts have been dated this way. Other methods, such as Amino Acid racemisation, Fission track dating, Potassium - Argon and Oxygen isotope stratigraphy have only limited applications to caves; but have been used.

Perhaps the most difficult part of any dating method is finding the time and the money to do it. All methods outlined here require weeks of labwork, very expensive machines, or commonly both! On the plus side, the fieldwork is very enjoyable! If anyone is interested in finding out more than just the basics I have outlined here, than Pete Smart's book on Quaternary Dating Methods (Smart, P.L. and Frances, P.D. Quaternary Dating Methods - A Users Guide. Quaternary Research Association. Technical Guide No 4) is a useful introduction. I hope some of you are feeling suitably enlightened!!

HOGMANY IN GLENSHEE

with: Rob, Jo, Paul, Neil, Alison, Bill, Andy, Simon, Chris, Toph and Tim.

The storm over the ski slopes was getting worse; the driving snow had changed to ice particles, the wind had increased to gale-like proportions and visibility was around 30 ft.

This was my third run down the hill, and by now I had the hang of turning to the right - although turning left and stopping still eluded me. Like some drug crazed snowman from hell, I careered down the slope. Suddenly, from out of the storm ahead emerged another skier - collision was inevitable. coming to a stop in a tangle of skis, limbs and bobble hats, I spat out the snow and mumbled my apologies. "That's alright", said a soft female voice with the most gorgeous Scottish lilt, " I was about to fall over anyway". "Blimey", I thought, "Skiing ain't so bad after all".

My introduction to skiing had come on the second day of our stay in Glenshee. Thanks to Bill's efforts, we had secured the use of the Dundee Ski Club's hut, situated in the Grampian Mountains only six miles south of the ski slopes; and December 27th found most of us converging there from all over the country. A burst water pipe meant one half of the cottage was soaking wet, but the rest of it was superb.

Next morning, most people decided to go skiing, while Chris, Bill and I decided to tromp up Glen Lochsie to the top Loch. the walk up the valley was straight forward snow plodding, with large herds of deer and a pine marten keeping us company. Eventually, the valley narrowed and steepened, and as we climbed into the cloud, snow and mist merged into one. Eventually, after a particularly steep snow bank, we reached the loch - although we didn't realise this until we were walking across it.

Once back at the hut, it was food and roaring fires all round, before heading to the hotel which served as the local pub. Here Neil, Alison and Andy joined us from Bristol.

Wednesday found most of us on the ski slopes. By lunch time I had mastered turning right and by 4 o'clock, I could turn, stop and almost complete a run without running into the fence. Ski lifts continued to baffle me throughout - the chaps in charge of the drag lift got used to me falling off, leaving my poled behind and all manner of other embarrassments. Unfortunately, it was the skiing that damaged Andy's knee - effectively putting him out of action for the rest of the week. Meanwhile, all the others had been hurtling down red and black runs - a most enjoyable day.

Thursday dawned bright and clear - an ideal day for walking and skiing (but not for hobbling around the hut - Ed.). Again, most went skiing, while Bill and I decided to climb Glas Maol - a hill to the east of the ski centre. The climb to the top was reasonably easy, just one part needed crampons, and the views from the top were stunning - this was what it was all about! We wondered over to Little Glas Maol, had a brew then came back to the ridge overlooking Glenshee. One tricky traverse later, and we were on our way back down after a truly brilliant days walking. that evening, Topher turned up, with enough gear stuffed in his car to climb Everest and slight engine trouble due to water in the fuel lines.

New Years Eve - and we had to leave the hut as another party was already

booked in. We packed our bags and most people headed off for a day of cross country skiing. Having hired the skis, Bill and I were dropped off at the foot of Morone hill. Climbing up a track, the snow eventually became deep enough to ski - it was great! The snow on top wasn't perfect, but it was deep enough for our purposes. We came down around 4 o'clock, and were picked up by Jim in Braemar around 6 o'clock. Meanwhile, Rob, Jo and Neil were having a mini epic on their trip - eventually skiing back to the hut around 6.30pm. Toph and Paul were also having an epic involving ill-equipped walkers, helping a mountain rescue, calling out the RAC and wondering why they didn't have a hairdryer to unfreeze their fuel line.

Eventually, we all made it back to the hotel at Glenshee, where we were to camp in the grounds for the night. Peering in through the windows, there seemed to be an awful lot of smart evening dresses, DJ's and Kilts - however, having cooked supper in the car-park, we entered the bar. Up to midnight, they had a lot of Scottish folkdancing interspersed with a disco. At midnight there was the bagpipes, Auld Lang Syne etc. and around 2am food and coffee was dished out. Alison impressed everyone with her interpretation of 'Strip the Willow' while Paul argues heavily with some unknown woman over who should eat his food - all very amusing. The dancing was still going on when I decided to call it a night at around 3am. For some unknown reason I decided it would be a fine night to sleep in my Bivi bag - bearably warm, although waking up with ice on the sleeping bag wasn't particularly pleasant. Wandering back into the hotel around 7am to thaw my boots out, I found some old ladies still steadily downing their whiskies - rather frightening.

Eventually, everybody else emerged and after a breakfast a plan of action was decided. Simon was off to do his own skiing, Alison, Bill and I were going skiing in the Cairngorms and everybody else was off to Lochnagar for some walking and skiing.

Our slightly ambitious plan was to climb to the Hutchinson Memorial Hut up Glen Derry, and then Ski over to Ben Macdui the following day. By the time we left the Linn of Dee it was around 3pm and we reached Derry Lodge by dusk. We then lost the track up Glen Derry, only regaining it about 1 1/2 hours later. Falling into streams seemed to be my main hazard as I had stupidly forgotten my head torch - there's nothing like ice cold water down the trousers for getting you upright again. By 6.30pm we were only halfway up Glen Derry, so we decided to camp for the night down by the river. Alison cooked us a fine 4 course meal while Bill and I consumed sherry and whisky at the back of the tent - eventually we were lulled to sleep by the gentle hissing of snow falling on the tent.

Next morning we discovered about an inch of snow had fallen, and the clouds had descended over the hill tops. Leaving our kit in the tent, we skied up the valley for an hour or so before returning to pick up our kit. It was then back down the valley over the fresh snow and a further walk to the car park. Here we managed to scrounge lifts off two cars going back into Braemar - 50mph down narrow ungritted roads is quite scary, even if the car is fitted with snow tyres.

Back in Braemar we dropped off the skis before heading into a rather smart hotel for scones and beer - it was warm, the leather armchairs were luxurious and the carpet was perfect for drying socks. Neil, Andy, Chris and Jim then turned up and having said our farewells we departed in different directions. Chris, Bill and I headed back towards London, stopping off for the night in Edinburgh at Dan's house.

Tim

The saga of the Christmas Dinner Up North.

*Steph 'Tea-Lady' Whitfield
& Andy Farrant.*

This years Christmas dinner was, for a change, held in the Punchbowl Inn, in Swaledale. Steph takes up the story:

I was amazed to see just how quickly everyone managed to fall out of their various vehicles and into the pub on arrival. Forget about unpacking while still in a fit state to do so, or just finding out where we were kipping, oh no, straight to t'pub. Talk about piss-heads! Mind you we were the second lot to arrive. I was even more amazed to be greeted by four of what must be said are the maddest cavers, already sat in the pub. These sad people had actually gone up in the morning in order to do an extra day's caving. Talk about keen (or is that stupid)?!. Everyone else arrived at various times in the evening, except of course Topher's car load. Well, say no more if Topher was navigating, they could have ended up in Cornwall! In traditional Yorkshire country pub style, the landlord was quite happy to keep the pub open 'til everyone either ran out of money, was incapable of supping any more or in our case 'til someone mentioned about getting up early the next day to go caving. Caving, what's that then?! I don't know what everyone else went for, but I went for a decent pint!!

At some ungodly hour on the Saturday morning, some sadistic person's alarm went off, after which Simon and Paul leapt up and started raving about doing "a really hard cave". Other equally deranged people then started stirring and by about 10am everyone had left. At this stage though I must say how distressed I was to see Bill making cuppas during the morning for those who wanted them. Have I been sacked, or what?! I don't know what everyone else did during the day, but I had about a two hour gossip with Hilary, followed by a huge meal, a leisurely stroll and a nice hot shower! The meal itself started off fairly civilised, with the odd interruption from a group of arse-holed Bradford cavers. But, then things changed and it was all-out war between the tables. If it wasn't nailed down, it was chucked! Extra points were gained for landing something in someone's pint. Once again vast quantities of beer were drunk well past the "official" last orders as we all sat around chatting and playing pool, with the noticeable exception of Eve and Laurence who disappeared every so often. Nudge, nudge, wink, wink, say no more!


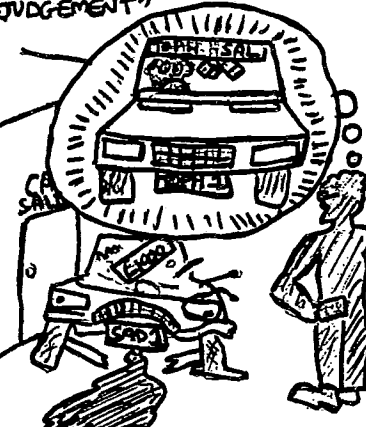

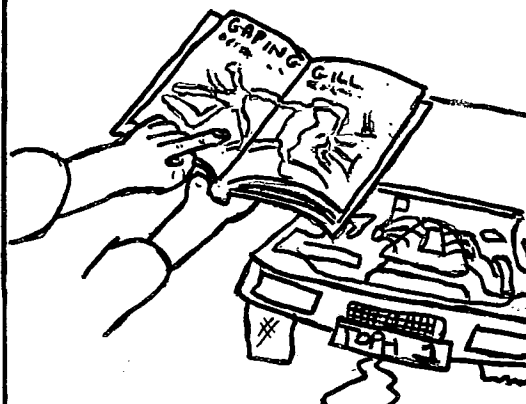

Yet again an alarm was heard the following morning, at the same ungodly hour as the "real cavers" i.e Simon, Paul and Topher had decided to do yet another cave, and a really hard one at that (they really do know how to impress a neive young first year - ed)! Oh dear! D'ya think these people had deprived childhoods?! I set off with Neil, Pippa and Kathy in search of a nice cafe and then to have a gentle walk around Asgarth Falls. Unfortunately by the time we found somewhere to eat it was 12 pm and the pubs were open! Allowing time for our meal to settle (and for a couple of drinks!) we set off on our gentle stroll before heading back down South.

Having been told on many occasions how wonderful Yorkshire caves are and how I really ought to go down one, I was quite impressed to survive the weekend without not only going down one, but not even going any where near one.! But there's always next time - NOT!

Andy's bit:

As regards the caving (Steph not doing any) - lots of excitement was had down County Pot and Wretched Rabbit on the Saturday, with two parties going in, planning to do an exchange. After meeting up in the upper high levels (Monster Cavern), one party led by Alison went back out via Wretched rabbit, with Julian showing them the way to Eureka junction before coming back to go out via County with the rest. However, in the best UBSS tradition, things did not go to plan. A caver from another club had fallen and damaged their knee near Stop Pot, so after stopping to help them we decided to go back out via Wretched Rabbit instead as Alison would probably have been back on the surface by now. So, out we went, only to find Alisons party lost. Luckily Andy knew the way out (why does no one else note where they're going?- ed). But two of our ladders were down County, so Bill went down to retrieve them to find the rescue was on the way out and using our ladders. Finally, we got our ladders back, with Bill being seconded to the CRO to help carry the stretcher, and got back to Swaledale just in time for Dinner!

On the Sunday, various people did various trips, not all involving caves, and Simon, Eve, Ian and I returned to Bristol in the usual UBSS style - on the back of an AA Relay van. Simons van had broken down yet again.

<p>THE UBSS PRESENTS: (IN ASSOCIATION WITH THE R.A.C.)</p> <h1>A Guide To Essential Car Maintenance</h1> <p>BY: TOPHER MARTIN</p> 	<p>NO 1: "THE GOLDEN RULE WHEN BUYING YOUR CAR IS NEVER TO ALLOW REALITY TO CLOUD YOUR JUDGEMENT!"</p> 	<p>NO 2: "I FIND THAT SOME PARTS OF CARS ARE USUALLY SUPERFLUOUS - ALTERNATORS, FOR EXAMPLE. HOWEVER, IF YOU DO NEED TO REPLACE ONE, MAKE SURE ITS LATE ON A FRIDAY NIGHT, SOMEWHERE ON THE M6."</p> 
<p>NO 3: "IF ANYTHING TOO SERIOUS DOES BREAK, THEN I FIND THAT "NORTHERN CAVES VOL. 1" IS AN IDEAL REFERENCE BOOK. THE GAPING GILL SURVEY BEARS AN UNCANNY RESEMBLANCE TO MY ENGINE LAYOUT!"</p> 	<p>NO 4: "FOR LONGER JOURNEYS, I FIND IT EASIEST JUST TO BORROW ANOTHER CAR. ALWAYS REMEMBER TO BRING TEN TIMES AS MUCH GEAR AS EVERYONE ELSE - CAVING GEAR IS ALWAYS USEFUL WHEN CLIMBING IN THE CAIRNGORMS. CAVES IN GRANITE ARE JUST THAT BIT SMALLER, THATS ALL!"</p>  <p>I ALSO FIND A GOOD PETROL/WATER MIX WORKS BEST IN SUB-ZERO TEMPERATURES."</p>	<p>NEXT ISSUE: "ADVANCED DRIVING TECHNIQUES" BY TIM PARISH INCLUDING: • HOW TO AVOID LARGE TREES, DITCHES & HEDGES • WHAT TO DO WHEN YOUR KEYS ARE IN YORKSHIRE & YOUR CAR IS IN SOUTH WALES • HOW TO DRIVE WHILE THE CAR IS FILLED WITH SUPER HEATED STEAM. PLUS: "TRES I HAVE KNOWN" BY ALISON GARRARD AND: "OFF-ROADING FOR PASSATS" BY JULIAN TODD</p>

WHERE A MILLION DIAMONDS SHINE

by Ian Wheeler

'Twas a cold, clear night towards the end of October in the year of our alleged Lord nineteen hundred and ninety three when my-self, Hugo, Eve and Topher set out toward Shipham to visit the legendary mine known as Singing River. Topher was our guide for the night, being the only member of the party who had previously visited the mine, and we willingly followed him up the aptly named Folly Lane as he confidently led the way. A short time later, we reached the top of the Lane, having completely failed to find the footpath entrance that Topher assured us was "around here somewhere." However, all was not lost, as the footpath was merely a shortcut; we could still reach the mine entrance via a track off the road.

So, off we trooped down to the road, from whence we followed a driveway out into the open fields that surround Shipham. A great deal of time passed, and there we were, all four of us, blundering about in these fields in the darkness, looking for something that might look like a mine shaft, caving lights stabbing hopefully through the inky blackness. One hour after leaving the car, we were still pottering around hopelessly, and, what is more astonishing, we were still attaching credibility to the things Topher kept telling us. Things like, "I seem to remember a field with a bank and a hedge, but not so dense a hedge as this one is. Oh, it's around here somewhere, I don't know "When we got a little tired of charging blithely up and down, we sat down on top of a knoll and drank in the view, while Topher sped off to investigate neighbouring fields that looked, on initial inspection, to be full of promise. For some fifteen minutes we lay still and took in the view of the countryside bathed in the light from the pale-faced moon. Looking for all the world like Tinkabel the fairy, Topher's carbide flame could be seen flitting nearer and nearer, though alas, when he arrived, he bore with him no news about the mine's whereabouts.

Wandering back onto the road, we accosted a local who was out walking his dog, arms raised up in supplication, promised him our every last penny and countless sexual favours if he would tell us where we might find Singing River Mine. Being a helpful sort of chap, he was only too willing to assist, and gave us adequate directions from where the car was parked. So, eventually, after one and a half hours of continuous searching, we finally located the entrance to the mine, a mere two minutes walk away from where we had started! Having actually found the entrance, it was but a simple matter to string a couple of ladders together and shin down them, and in seemingly no time at all we found ourselves inside the cave.

It was then that we realised our troubles had only just begun. Round and round and round we went, then round and round some more. The whole place was like some devilishly invented maze, which seemed to transmutate at will. Passages that looked quite promising and bereft of our footprints turned out to link up directly with "the passage with that bloody Police cone in it." It really was quite bizarre. After an hour or so in the depths of the cave, all we had seen was yard after

yard of muddy tunnels, each one several times over and from more directions than I had previously imagined were possible. Somewhere in this cave, Topher assured us, were some really quite lovely crystal pools and a streamway, though it should be pointed out that we had long since stopped believing a single word he said. Surprisingly, though, during a desperate last-minute bit of exploration, the sound of falling water was heard. Upon further investigation, we found ourselves gazing out over a beautiful crystal pool, ensconced within the confines of a high-vaulted cavern. Adding to the general all-round prettiness of the scene was the colour of the water, which was a delicate shade of blue, in fact, yes, azure or cobalt blue would not be an inaccurate description. At the time this was a source of some not inconsiderable bemusement to us, though I am now able to confirm, after consultation with lovely Mr. Farrant (well known authority on this sort of thing) that the water in Singing River Mine is blue because water is always blue (and they're going to give this man a Phd, are they? I ask you!). The lure of the water proved to be too much for Hugo, who insisted on wading through the lake to see if he could find anything worth looking at on the other side. As he could not, and it was getting dangerously close to closing time, we abandoned our search for the streamway and exited rapidly, heading for the local boozery, there to enjoy a pint and a pickled egg.

Some ten days later, on the Sunday of the bonfire weekend, we found ourselves sat around the fire wondering whether we could actually be bothered to go caving. Six hours of discussion, numerous cups of tea and lots of yogurt later, we decided that a return to Singing River was inevitable, and the original exploration team set off once more, this time with Pippa in tow. We discovered many more passages, none of which led to anything that even vaguely resembled a streamway, and spent an inordinate amount of time scrabbling around in circles again, managing to achieve not a great deal. When we eventually got fed up of aimlessly wandering, we settled instead on an all out mud fight, which was, by all accounts, far more productive.

Pippa, however, was not so keen on being smeared with cave mud, and scurried off into a side passage to wait until the fun was all but over. Unfortunately for Pippa, the rest of us were not so easily put off, and, though we feigned defeat, a cunning plan of ambush was forming in our devious minds. While Topher and Eve went to wash themselves in the pool, I awaited Pippa's return to six-ways chamber, while Hugo concealed himself in an alcove, his sweaty palms clutching copious amounts of stinking mud. "Have they gone yet, Ian?" cried the hapless Pippa. "Why of course they have," I replied, and for some unknown reason, Pippa believed my every word and confidently emerged into the main chamber, her entrance happily coinciding with Hugo's lunge out of his alcove, mud at the ready. A salvo of piercing shrieks rent the still air of the mine, merging and coalescing with the fiendish chuckling emanating from Hugo and myself. It was with these sound still ringing in our ears that we found, at long last, the streamway series of passages, and then forsook the mine for the comforts of more beer and pickled eggs.