

HYPHOLOMA FASCICULARE — SULPHUR TUFT. Painted on 12/9/84

Found in the Lounsdale Forest on September 10th 1984



Contents

Directions to Bowlees Foray	Page 4	
Directions to Minsteracres foray	Page 4	
Trouble Brewing	Page 5	Tom Kirby
Elmore foray report	Page 7	Alan Legg
Annual Social Event	Page 8	Gordon Simpson
Looking at Veils	Page 9	Alan Legg
The things you hear about fungi	Page 10	Tom Kirby
More About Those Names	Page 17	Chris Lowe

Front Cover: *Hypholoma fasciculare*, Sulphur Tuft

Painted by Dorothy Wolfe.



Xylaria longipes Elmore Woods

Photo: Tom Kirby

For further information or if you would like to submit an article or questions for the next newsletter, please contact Alan Legg at 36, Carleton Drive, Darlington, Co Durham, DL3 9QP. Tel : 01325 - 350834. Membership Sec, Babs Walton, Stodhoe Farm, Middleton-St-George, Darlington, Co Durham, DL2 1DS. Tel: 01325 332789. Chairman: Gordon Simpson, 2 Coniston Avenue, West Auckland, Co Durham, DL14 9LL Treasurer, Tom Kirby, 4, Bishopton Crossings, Stillington, Stockton -on-Tees, Cleveland. Newsletter Secretary: Keith Cunningham, 1 Grove Cottages, Baybridge, Blanchland, Consett, Co Durham DH8 9UB email keith.cunningham@ntlworld.com Tel: 01434 675339



Affiliated with The Association of
British Fungus Groups



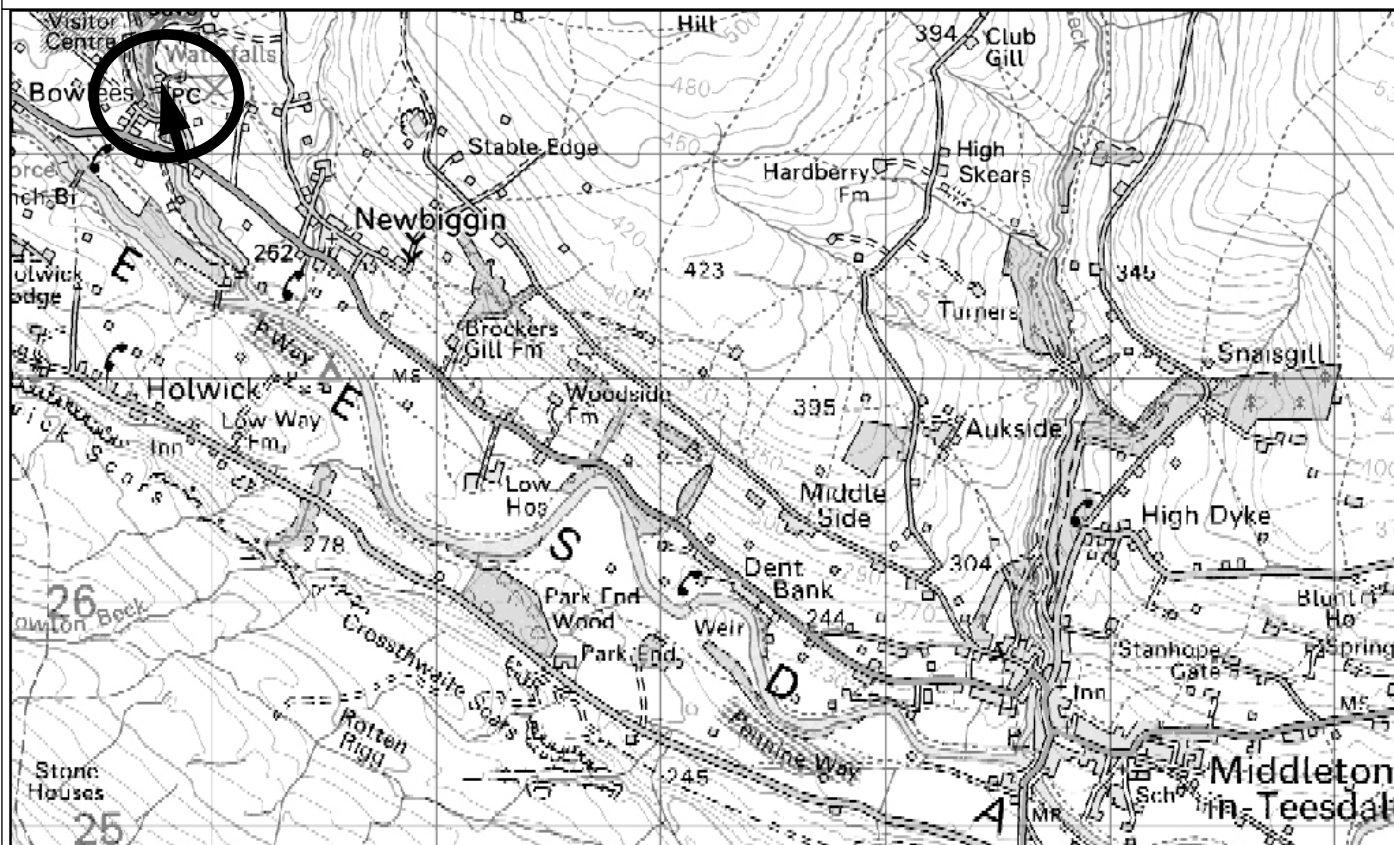
Affiliated to the British Mycological Society



This Newsletter is produced with the
assistance of Durham Wildlife Trust

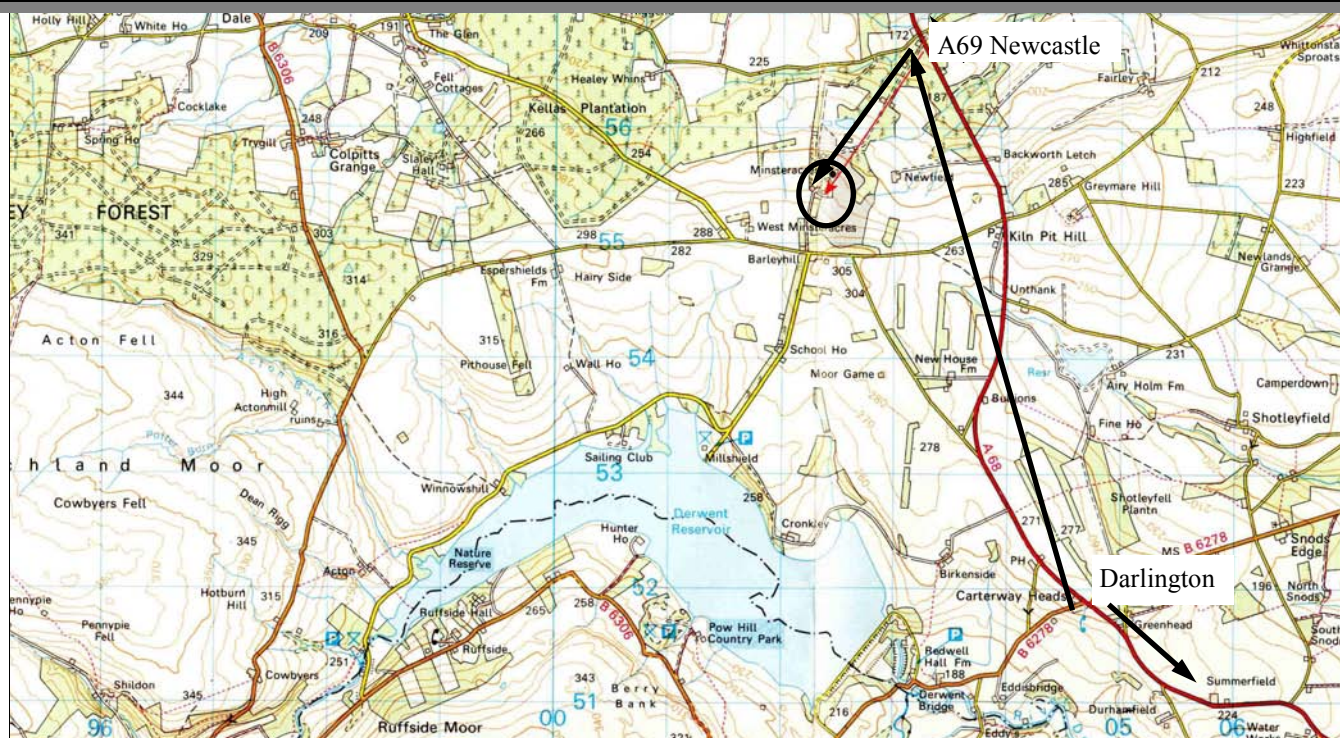
Bowlees Foray Saturday July 19th 2003 11am

Meet at Bowlees Car park which is 2 1/2 mls west of Middleton –in-Teesdale on the B6277 Grid ref NY907283



Minsteracres Foray Saturday September 13th 11am NZ024554

A revisit to Minsteracres following a fruitful foray last July (see Newsletter 26) Minsteracres Monastery is a Passionist Monastery and retreat. The grounds contain many exotic trees as you will soon see when you enter from the A68. Enter the Monastery from the A68 at Scales Cross driving through the gate and up the long drive of enormous Conifers. After you pass the Church turn left towards the main buildings and park in the cobbled area on the left.



Trouble Brewing?

I don't think so!

Tom Kirby

For those of you who missed the March 8th. “foray” into Sunderland University’s excellent facilities, for whatever good reason, this is a taste of what you missed. It will not be a long article as I am feeling a little drowsy. The fresh air, I suppose. I know it is unusual for me to write-up foray reports but Alan pointed out to me during a quiet moment that it was unlikely he would be able to remember ANYTHING by the end of the day! So, being aware of my reporting precision, for which I am famous, he suggested that perhaps I could deliver a short tome.

You will forgive me if I begin at the end, which being cronollolo cronollol the most recent memory it is the easiest to recall! There we were, having been stimulated, surprised and amazed... being forced to drink free beer in order, I imagine, to render our recollective abilities minimal. The sort of day we had just enjoyed should not be blabbed about. In fact, the closing words of thanks from our Chairman said it all. It was something along the lines of “.....like to thank Keith Thomas for the strangest foray I’ve ever been on!” And so it was.

Ah, my memory is clearing..... I think I can remember all the way back to 11 a.m.!

Now, there are many mansions in the labyrinthine citadel of Sunderland University, and so you can imagine my surprise to discover that Babs had arrived on time and within a ten-minute walk of our ultimate destination. Twenty yards as the crow flies. (Good map, Keith.) Gordon was a little late as he had forgotten his. Map not crow. Although he *did* engage me in a surreal conversation on Scarborough Crows (*Larus canus*) and the edibility of same. This was to set the pattern of the day.

Not being certain of our own whereabouts (a personal observation) we set off from the car-park with unusually high confidence and in three different directions. Having circumnavigated the facility a couple of times, split up, re-grouped, checked the position of the sun, we were getting warmer for sure. Then without warning we were “captured” by friendly forces and ushered in to the inner sanctum of Brewlab.

The gathered NEFSG members were in high spirits as there was obviously something in the air,

and we were slow to settle around the seminar room table where Keith delivered unto us a fascinating insight into the range of activities carried out in the good name of research. We were in the kind of environment that conjures up emotive thoughts of schooldays in the “Chemi-lab”. Formica, lab-taps, smell of public-baths crossed with operating theatre, overhead projector, wall-charts, beer bottles..... beer bottles? (*Name that school. Ed.*). Well, yes, beer bottles *were* prominently on display, but for good reason. The Brewlab facility is a major University research resource, invaluable to students embarking on the British Brewing Technology course.

So where is the fungi connection? Well, you may be forgiven for thinking it is a little tenuous, but you would be wrong, dear reader. A significant part of the work carried out here is research-based and includes the study and use of yeasts. Not just for brewing in the widely understood sense, but in foodstuffs. (Quoted examples being yoghurts and sauerkraut, would you believe..... I must just take a break for water, excuse me). Back again. Where was I? Oh, yes, and in staples such as bread. The visible processes involved in brewing and fermentation were, I believe, well known to most, if not all of us, in a limited way. Here, though, we were talking micro-biology.

Of course, we were all curious from the outset, as to where this was taking us. As the information unfolded all became clear. Micro-biology has its roots in technology, and in particular that field of endeavour much beloved of mycologists..microscopy. So it was that after a whirlwind tour of the laboratory facilities, in which we were able to witness poor and impoverished research students giving up their Saturday in order to peer down microscopes, we were off hot-footed on a ten-minute half-hour walk to the hidden jewel in the University’s crown. The Area 51 of brewing in Sunderland ...The Darwin Brewery. I myself would not have gone if it was for the fact that I may have missed an opportunity to visit the Electron microscope on the way back. But that’s the kind of guy I am.(*Creep.Ed.*)

And it was a walk. Not being a city person I felt like the lead rabbit in Watership Down as we leaped and hurtled our way over busy crossings in our lemming-like (if you’re going to mix metaphors, mix’em good, I always say) desire to get to our destination. We were all quite strung out by the time we got to the substantial vault, within which is the brewery. An imposing building, in the immediate post-war style of re-enforced con-

crete, it is designed to look like your average protected housing development. Complete with multiple burglar alarms, satellite-dish and seven-element super-yagi UHF TV antenna, all mounted at high level, this was a near perfectly disguised temple to Baccus. Entrance was via a cunningly positioned but almost straddle-able (try saying that in my condition, or try straddling it in Alan's!) section of LNER railway line, welded to seriously solid uprights. It was apparent that advice had been sought from the local CPO! Not without good reason, for within lay a beer-drinkers paradise.

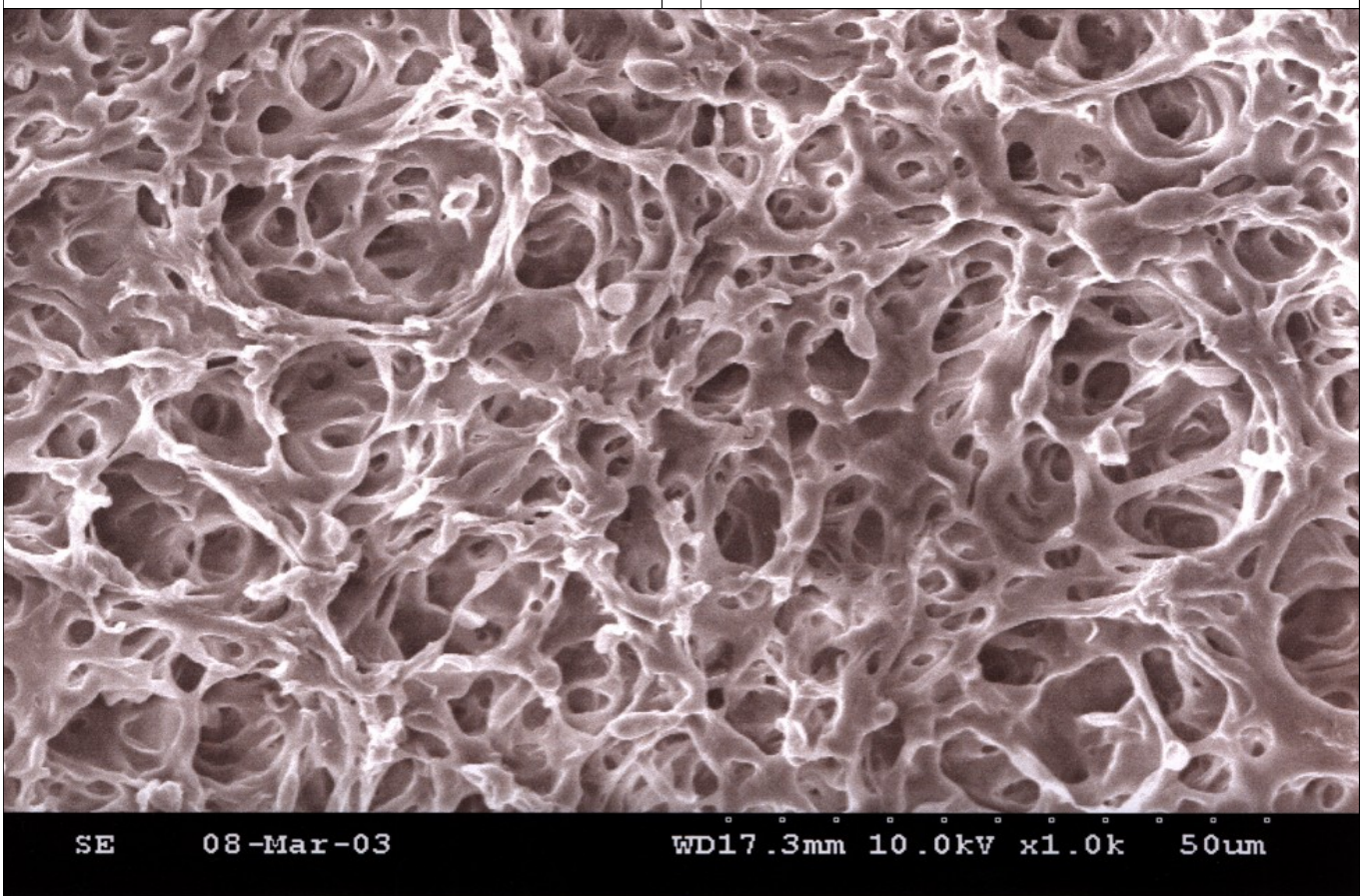
The Darwin Brewery is an essential part of the University Brewlab facility, and although independently run as a small business, it allows the research to run its course, as all good research should, terminating in a professionally finished and viable product. We began a tour of the facility. First, the pre-fermentation room where the alchemical work of the brewer is to the fore, mixing ingredients to produce the required colour, bitterness and strength, controlling temperature to let the various enzymes do their work, and generally exercising his/ her skill and judgement in the process. Steamy vapours heavy with the scent of hops and malt emerge into the Sunderland air where hopefully they will be lost in the greater concentration of vented air from

the Indian, Chinese and Italian restaurants all around, thus preserving the anonymity of the brewery's location.(*Fat chance. Ed.*)

Now so far, we have been rabbits and lemmings, but after moving into the actual fermentation room I was quite looking forward to becoming a guinea-pig.... and I don't like beer! There is something mouth wateringly irresistible about the smell of fermentation by yeast. Bread, marmite, soy-sauce and, yes, I admit it, beer, all possess this attribute. The journey back to the University was going to be faster than the walk here... for we had been primed by the fermentation process, captivated by the names of the brews (Killer Bee and Cauldron Snout had my vote and I hadn't tasted them yet) and promised SAMPLES!!!

Back to base then, more surreal events on the way, wandering saxophonists emerging from Mowbray Park, a quick foray in the grounds (nothing), then sandwiches purchased on the hoof. During these excursions Babs made up for her earlier orienteering success in arriving on time and intact, by getting lost. Or did we get lost and Babs not? No worries, but time was pressing, and we had much to see.

The Electron microscope was operated by Malcolm. Once the buzzing euphoria of being able to USE the microscope had subsided and Alan had been told to put out his sandwich we got down to business. A



sample had been set up for us as we were not really expected to find much on our dash back. We viewed a beach-scene on the connected monitor. Tidal zone, sand, bands of deposited sea-weed...er, no. It was the upper surface of *Coriolus versicolor*. Fascinating stuff and a rare treat. Alan takes the controls, he has the mouse, he is using a computer...an even rarer treat! (But where is the sandwich?)

Times have changed and progress in the design and manufacture of Electron Microscopes has advanced significantly since my first encounter with the towering, humming, life threatening beast at Leeds university, back in 1966 or thereabouts. Peering at a four inch across green porthole-like screen has been replaced by the luxury of a comfortable viewing distance and a high resolution computer monitor. This modern kit looks almost portable, standing only a couple of metres high and with a "footprint" of only a square-metre or so. Malcolm kindly put it through its paces and we were all quite noticeably impressed. I think Alan wants one so we should start saving up now.

As was obvious from the pre-emptive and savage attacks which had been made upon certain persons' sandwiches by this point, we were all (dare I speak for all?) ready for lunch but to give some measure of the high interest level in events pertaining, even I displayed restraint previously unknown as we passed into yet another domain. Here, as a pre-prandial treat, we were witness to the microscopic nano-slicing of a substrate from God-knows-what part of an unknown student's anatomy infected with the Herpes virus. All good stuff!

I should say at this point that as we were on a tight schedule I am afraid we may well have left the good administrations of Malcolm without expressing our gratitude sufficiently. So thank you, Malcolm, if this was the case.

And so to bed. No, sorry, no. Error. Back to the seminar room. Did I say SEMINAR? Back to the bar would be the *mot just*, I think. Beer all round, then!

Now I know NOTHING about beer but I am assured by the assembled NEFSG members that we were drinking something special. Indeed, I tried a sample or three myself and was pleasantly rubicund within seconds. I purloined a bottle for research purposes, you understand, as I am trying to perfect Car-bonnade de Boeuf.

As I wended my way straight back to my vehicle, guided by the sound of Bab's car alarm, triggered no doubt by the attempted ingress of a Scarborough Crow through her wide open passenger window, a warm glow came over me. The fresh air was doing

its work. My most vivid recollection was of great glee and mirth as we were regaled by Gordon's tales of his imminent interface with his Turkish aupair. Fatima, I think, was her name. There's trouble brewing, there, I thought.

With thanks to Keith Thomas for all his efforts in organising an excellent and different day out. Thanks, too, to Malcolm, for answering our questions with tolerance and patience. We must do it again sometime, as soon as I'm awake.

For more information go to www.brewlab.co.uk

Special thanks to P.C. Wainright (3467) of Durham Traffic Police. Forever in your debt less a tenner.

Spring Foray in Elemore Woods 26th April 2003

Alan Legg

Tom Kirby kindly arranged permission for our Group to foray in the private part of these woods. Our thanks go to Tom and to the Headmaster of Elemore Hall School. We also strayed briefly on to Woodland Trust land which is open access.

The weather was fine and dry - as it had been for too much of the preceding period. Our hopes of finding many large fleshy fungi were not high but in the event, the outing, our first of 2003 - proved highly enjoyable to the 20+ members who turned up.

Seven kinds of toadstool were eventually found but two of these - both species of *Conocybe* - were too far gone to identify to species. The five identified toadstools were all common species. Other fungi of note were the red-brown polypore, *Hapalopilus nidulans*, here growing not on the rowan that it prefers but on a sycamore log, and, surprisingly, a single specimen of the large bleach-smelling discomycete, *Disciotis venosa*, managing to fruit in only minimal shade and dampness.

Of most interest, in terms of relative scarcity, were two microfungi. One area of the woodland floor had large numbers of strangely erect but slightly curled celandine leaves. With a hand-lens these were seen to be covered underneath with the greyish infection of the downy mildew,

Peronospora ficariae, previously known in VC66 from a single leaf in Darlington West Cemetery a few years ago.

The other interesting species was found only on our return journey on dead attached stems of the rather rare Mountain Currant. This is thought to be possibly native in some of the magnesian limestone coastal dunes. It has been previously recorded in Elemore Woods but is more likely to have been planted there. The fungus found on the dead stems was a little over-mature but seems to key to *Dothiora ribesia*, an uncommon pyrenomycete. Because there do not seem to be any British records of this fungus on Mountain Currant, material has been sent to Kew for further examination.

Our grand total of identified species was 58, not high for a spring foray but very respectable given the weather conditions, and evidence of the gradually-improving retrieving skills of our members.

Annual Social Event 31st May at Pinchinthorpe Hall, Guisborough

Gordon Simpson

All our meetings arranged for members are social events but this 'great reunion', according to Tom, is to assist fungi etc in our stomachs. Tom and Ann put a great deal of effort into organising the meal. I have been informed by a reliable source that they tried all the menus, at considerable expense, before selecting one suitable to fungus forayers. After a fairly long spell of average weather it is also remarkable that Tom and Ann arranged the warmest, sunniest day so far this year. I, on behalf of the members and their spouses who attended the function, must thank Tom and Ann for praying for such weather, damaging their knees in the process, and draining their bank balance in order to provide delectable sustenance for our variable palates. I also thank all the members who brought their spouses to see what we fungus addicts get up to on our outings. Two members paid a fleeting visit as they were attending a wedding reception at the Hall. As is usual at all NEFSG meetings I am sure everybody thoroughly enjoyed themselves judging by the jovial atmosphere.

On arrival we were presented with a card enti-

ling the holder to a complimentary drink. This probably introduced most participants to the first fungus of the day in the drink brewed on site. Did anybody record the species? Most participants retreated to the shade of the canopy erected in the court yard. Eventually, on time, a nubile, young waitress called us into the Bistro. It appeared dark due to the strong sunlight outside. After a scratching of heads everybody remembered their choice of menu. Victor the Malteser had moved from the Mediterranean to take over the hotel. His wife cooked the food using herbs from the Hall's herb garden. My first course was Homemade Soup of the Day but I noticed some had selected Homemade Chicken Liver Pate whilst others tried Mixed Herb Leaf Salad with Shaved Parmesan and Truffle Oil. My soup was not coloured liquid with a few floating mysteries. It was thick, creamy and orange in colour. I imagined it was *Lactarius deliciosus*. Nevertheless it was very tasty. For my second course I chose Lord Lees Steak and Ale Pie (a speciality). The other selections were Pasta Provencale, Flaked Salmon with beans, Tomatoes, Olives, Capers and Potatoes or Chicken Breast with Sweet Red Peppers and Onion Glaze Fumet. The fungus in my Ale Pie certainly added a kick to the flavour and it was so filling I wondered whether I could cope with the third course. My third course was Sticky Toffee Pudding. I saw some members had selected either Bread and Butter Pudding with Crème Anglaise or a Selection of Ice Creams. My pudding was unusual in that it had a base of dark sponge floating in syrup. Fungi had not had time to ferment the sucrose. Yes there were leftovers but those who I spoke to later were highly satisfied with the meal and service. Thank you Tom and Ann. Can you save up for next year's trial? I reluctantly had to return home to my bread, butter and clear soup (in order to lose weight).

Alan tells me that the sober few who examined part of the garden for fungi afterwards were rewarded with 18 species. These included 4 toadstools and a rust on planted Alexanders. New to Alan was a minute fungus on Butcher's Broom *Ruscus aculeatus* called *Paraphaeosphaeria glaucopunctata* (*rusci*), evidence that small fungi have to have long names to prevent feelings of inferiority. Finally, on leaves of Gean *Prunus avium* was *Taphrina wiesneri*, apparently a new record for Yorkshire!

Looking at Veils

Alan Legg

Archie and Helen McAdam, our postal members from Skipton, have responded to our request for questions with a letter containing the following:

“How do you answer the couplet “veil present; veil absent”? I think I know in theory how to look for other microscopic features like clamps or pigment incrustation (Lucky you! ed.) but what about a veil?

Is it completely separate and different from a ring? Where do you look and how? Is it different in different genera? I know we all have hang-ups. To you and others this might be a very easy thing but I almost never have confidence in saying I have found a veil, so I usually go down both sides of the key I am using and choose the better of the two “last fits” when I can go no further. Please can you give us all a tip or two on this? It doesn’t need to be the last word on the matter, just any word would help”

I had almost given up hope that someone would do what Archie and Helen have done, i.e. respond to our quarterly invitation to submit questions. As an ex-teacher I know how hard it can be to get people to do this. A question is a big clue to what you find difficult and you may not want other people to know this. Actually, most of the time, they will be relieved to know that someone else has been having the same problem as they have. So they will be grateful to you for bringing the subject up and may be encouraged to bring up other problems of their own in future.

Archie is referring to the use of dichotomous keys, that is those that work by presenting a series of choices between each of a pair of alternative statements. For instance, the first couplet of a simple hypothetical key might read as follows:

1a Cap red 2

b Cap some other colour 4

This choice implies that if your toadstool has a red cap there may be more than one to choose from, dealt with under 2 and 3 concerned with different characters. If, however your toadstool’s cap is sky-blue pink you will go straight to 4, not even bothering to read 2 and 3. Most choices are

much more difficult than this but it will do as an example.

Keys make you think systematically and force you to look closely at your specimens. Flicking hopefully through the pictures in your field guide will never do this and either you will soon give up or you will end by merely fooling yourself - which doesn’t matter or trying to fool others - which does.

All technical terms in science have their roots in everyday speech - in whatever language. They are all based on the process of analogy or comparison. The word “atom” in Greek, for example, means literally “not cut”. Since the 1940s this meaning has become redundant so we now use the word “atom” in a new sense. The meaning of “veil” in ordinary parlance is, roughly, “something which hides, covers and/or protects something else” When people started trying to describe fungi they had to use available language and, whereas the original meaning of “veil” is still current, in mycology it has an adapted, basically metaphorical, narrower sense with reference to structures in toadstools (and some *gasteromycetes*). I shall restrict this discussion to agarics because I know that Archie and Helen have been working on these.

With “veil” it helps to remember the original meaning and think of the veil as something that covers, hides or protects a toadstool or, more often, the important parts of a toadstool, whilst it is growing. Thus, in *Amanita*, for example, the whole fruiting body is covered by a “universal veil” when young but the fragments on the cap surface and/or on the stem are still referred to as “the veil” even when reduced by age to a few cap-scales or bits of tissue round the base of the stem. The colour and structure of such fragments can be very important in identification. In *Coprinus* (now seen to be more than one genus) the veil sometimes persists for a time as a membranous ring (or annulus) or as traces of tissue at the cap centre or on the stem. Some other members of *Coprinus* either have no veil at all or just a few microscopic hairs on the cap to which the term “veil” cannot normally apply because they cover and protect nothing.

The term “partial veil” is rather ambiguous but usually refers to a temporary covering either of the gills alone or of less than the whole toadstool, usually cap and gills. In the former case, this covering may be membranous or consist of a cobweb-like structure of hairs known as the cortina. In the latter case, traces may be found on either or

both the cap and stem at maturity. You are all familiar with the rings of *Agaricus* species but may not have realised that some or them are remnants or a structure originally protecting the top part of the stem as well as the gills (a hanging ring). See Courtecuisse and Duhem p.22 fig. 20a. Others are what is left of one originally seeming to cover the whole lower part of the stem as well as the gills (a sheathing ring). See Courtecuisse and Duhem p.22 fig. 20f. The recognition of such a difference can be crucial so, if your *Agaricus* has lost its ring, it may be better simply to jettison it than attempt an identification process probably doomed to failure. Figs. 20b,c,d, and e on the same page show more complex kinds of ring in *Agaricus*, *Lepiota* etc.

So, a ring may be defined as the remains of a kind of partial veil. Members of an important section of *Conocybe*, sometimes regarded as a separate genus called *Pholiotina*, have rings but these are very easily lost, as you might expect in such small, fragile organisms. If you have something you've identified as a *Conocybe* from other characters, it is essential to check the cap-edge and stem with a field-lens for any tell-tale fibres of a partial veil. If you're not sure, I'm afraid you will have to resort to the McAdams' strategy of following both strands of the key to see which one leads to an identification. In any big genus, such a strategy can often (not always!) leave you with nagging doubts and you may prefer simply to discard your specimen and forget you ever collected it. I admit this is not easy to do when you've already spent an hour getting that far, but it does become easier when you're older with a memory as faulty and selective as mine!

In many toadstools the veil-structures are very rudimentary and soon disappear. These are often described as "fugacious", an unnecessary Latinate word for "fleeting". In such groups it is essential to have youngish material which retains at least some of the veil material either on the upper stem or at the cap-edge. This rule applies to large and small toadstools in *Cortinarius* but you will also need to apply it to deal confidently with sections of *Galerina*, *Hebeloma*, *Inocybe* and *Psathyrella*, to name just a few of the larger relevant genera.

The things you hear about Fungi..... Tom Kirby

For some time now I have enjoyed giving short and frivolous talks to captive audiences of Rotarians, Baptist Tabernacles (?), Lions, Lifers and Women's Groups. The subject matter has always been Fungi. I have a collection of photographic slides which keep getting mixed up and so I never know exactly what I am going to say until the show is underway which suits me because it is hard to make a mistake if you have nothing to adhere to in the first place. This happily disorganised state extends into the content of the talk as I try to recall the anecdotes which relate to each slide. It is always stimulating (for me...) to try to make the whole show appear as the zenith of organisational skill whilst having no idea of what comes next! The difficulties were compounded when I gave a truncated talk of about forty minutes, instead of the usual hour and a half or so, to an enthusiastic and knowledgeable group of nature lovers in Darlington. In the audience was our esteemed Group Leader. As you can imagine, I was particularly keen to give this talk.

All went well, apparently, and I disappeared into the night with that warm glow which comes from the adulation associated with celebrity status.

I arrived home with five organic eggs in a six-pack and a bottle of reduced price wine from Babs and John (surely, thanks indeed?), applause still ringing in my ears and the honeyed words from Alan "I blame it on the pills" Legg, in his effusive thank-you speech, still bringing tears of emotion.

Getting quickly to the point, for a point there is, I was shocked and stunned to hear, during our lunch in the woods of Ellemore Hall School, from the very mouth of our leader, a comment to the effect that there was some doubt in his mind as to the veracity of my anecdotes and statistics quoted during the aforementioned talk. This cannot be allowed to pass without comment and so I have below attempted to give credence to at least some of the interesting rabbits which I regularly pull out of my metaphorical hat, in order to amaze and entertain my public. The sources of these rabbits are in brackets. Which makes them true er, rabbits.

On the record

Which is the largest fungus?

Well, in the UK we would *expect* it to be the Giant Puff-ball, *Calvatia* (= *Langermannia*) *gigantea*, variously laying claim to records of girths of up to 3 metres (Source, I Funghi, translated from the original Italian by Ian Tribe) and weights of over 100 pounds. There may be new records for the Giant Puff-ball out there!

If what we mean by the “biggest” is the largest fruit-body, then the perennial polypores are likely to be in the lead. *Bridgeoporus nobilissimus* managed a fruit-body of over 300 pounds (Source, Guinness Book of World Records) but is now beaten by a specimen of *Rigidoporus ulmarius* growing in Kew Botanical Gardens! If, on the other hand, we mean the largest organism *in its entirety* then there is a reported find of *Armillaria gallica*, quoted in the magazine Nature as being of the same DNA over a 37 acre site in Michigan (Smith, M.J. Bruhn 1992). This was beaten by a find of a colony of *A.bulbosa* (Nature 356:428-431) reported in the New York Times. (Source Tom Volk. Proff. of Biology, Univ. of Wisconsin.) The weight of the mycelium was estimated to be in excess of 75 tonnes but another “find” of *A.ostoyae* in Washington would probably top this as it reputedly covers 1500 acres! (Source, Tom Volk’s Fungus World)

On seeing the light

Do some fungi glow?

Yes. The Honey or Bootlace fungus, *Armillaria mellea*. There are others. The “glow” is bioluminescent and is principally emitted by the microscopic tips of the mycelia (The rhizomorphs, or “bootlaces”, are ropes of mycelium) as they invade and permeate the wood of infected trees. The glow is called “foxfire” and the wood which glows due to the fungal presence is known as “touchwood”.

Soldiers in trenches during world war one reportedly put pieces of glowing wood on their helmets to avoid bumping into each other. (Source, Moselio Schaechter. 7th Dec 1998. Bio-net News)

On the most ubiquitous fungus

Which is the most widespread fungus?

Well, in order to achieve this distinction you have got to have something special! *Schizophyllum commune*, the Split Gill fungus, was known to have 2000 distinct “sexes” (Source, John

Raper and co. Harvard University 1950-1970) , which must have been an aid to reproduction, but this figure has been creeping up and now stands at a staggering (well wouldn’t you be?) 28,000!! In other words, this fungus can “mate” with members of its own species all over the world.

Of course, its not as lucky as it sounds as it doesn’t have “differentiated” sex organs, it just mates where it touches! (Hmm, is that so bad?) So keen is it to reproduce that an account has been recorded of this fungus managing to grow through the soft palate of a child’s mouth and forming fruiting bodies in her sinuses! (Source, Proff. Tom Volk). It is not found in Antarctica where there is no wood, so watch out children of Antarctica!

On volume, speed and the nature of the beast

Which fungus is the fastest growing?

By volume, the good old Giant Puffball takes some beating. *Langermannia* (= *Calvatia*) *gigantea* can reach its full size in less than a week but for speed of growth in terms of dimensional increase, I have the record. No, not me personally, you understand. I decided to photograph the erupting egg of *Phallus impudicus* in 1991, with an hourly time-lapse set-up using an old Minolta Dynax 35mm camera, a self-contrived timer, a flash set to auto and a car battery. I had spotted a group of three “eggs” about a mile from my home in a heavily wooded area one Sunday evening in early September. I carried everything to the location on Monday evening but too late!!! Two of the three were already up and running, so to speak, but undaunted I set up the rig and returned the following evening. When I developed the film I got only TWO shots of the growth phase. The other twenty-two shots were of three rigid specimens, just standing to attention! (Source, me. 1991)

On those names

Do you have a favourite name for a fungus?

I like this one. We all quite glibly trot out the name of *Lycoperdon pyriforme*. Correct identification is usually given with confidence because it is a small puff-ball which grows on wood. The “pyriforme” bit is generally easy to recall as it means “pear-shaped”, and it is.... but what about *Lycoperdon*? Greek for Wolf is LYCO, and PERDON is Greek for “to break wind”. I leave the rest to you.

(Source, me 2003)

On the Chicken and the Egg

Just where do mushrooms come from?

Spores. Spores are everywhere. They are in your lungs, in your hair, on your skin, in the upper atmosphere, in the soil. They float through your lives, are inhaled, eaten, and sucked up by your Dyson. Your neighbour has them in his house, too. They are almost ethereal and all pervading. Sir Fred Hoyle, the irascible slayer of the sacred cows of “establishment” science, has even postulated that biological spores make up a measurable portion of the “dark matter” in outer space, as the “filtration” which is caused by the presence of extremely small particulate matter *en masse* is typical of particles of spore size. Hoyle explains that “...the particles in the atmosphere of Venus have the same refractive index (light bending properties) as biological spores, ...” (Source, *The Intelligent Universe* by Sir Fred Hoyle, published by Michael Joseph, 1983). He makes further circumstantial claims by pointing out that spores have been irradiated past the point of expected sterilisation and still been viable. So what? I hear you ask. Well, there very few “living organisms” which have such a remarkable ability to either avoid, or repair, damage by radiation overdoses except bacteria and viruses. (Note. There is a significant amount of contradictory evidence to the claim of viability. Fungal spores are not known for their longevity as they are mechanically fragile having very thin “walls” not suited to long distance travel. This is not a complete contradiction of Sir Fred’s claim, as “viability” may be taken to mean nothing more than intact DNA. It is the destruction of the DNA molecule by radiation which renders most organisms unviable. (Source, *The Macdonald Encyclopedia (sic)*, 1985)

Evolution is a process involving the delicate trimming away of all the bits and pieces which are burdensome or energy-consuming within a given environment, and the almost quantum-step enhancement of those features (or abilities) which are advantageous. As an organism, you do not evolve to withstand huge doses of radiation unless it is of significant advantage to you.... So in answer to the question, where do mushrooms come from, the answer might just be “Anywhere”!

On the survival of the species

How many spores do fungi release?

I’m afraid this is a Lynus question but here goes.

Let’s start with a field mushroom, *Agaricus campestris*. How many spores per hour? Can you believe it....100,000,000! In total something in the region of 16,000,000,000 per fruiting body. You don’t believe me? Then you will not believe this. A giant puff-ball, average size of say a foot in diameter, can produce 7,000,000,000,000! (Source, Sir David Attenborough, *The Living Planet*, published by William Collins 1994).

It is very hard to exaggerate figures like these as an error of a million here or there is still within the limits of plausibility. It is worth noting that the spore figure quoted by Sir David regarding the giant puff-ball is credited, by him, to some un-named botanist. This I like. If it’s good enough for Sir David Attenborough it’s good enough for me!

An un-named botanist once said to me that if all fungal spores were to produce fruiting bodies we would be knee deep (thigh deep, up to our necks, buried, a mile deep, up to the tip of Everest....) in fungus over the whole planet’s surface. I kid you not.

On the similarities with plants

Are spores like seeds?

Yes and no but mostly no. Seeds and spores both contain DNA. This long molecule organises the reproduction of a new construction capable of producing yet more spores or seeds. Seeds carry within themselves a certain amount of nutrient to feed energy into the first growth stages of the new plant which itself is within the “embryo” of the seed, but significantly the seed is the product of the *germinated* host plant. Spores, on the other hand, carry no energy reserves and are more often than not uni-cellular. Spores are *part* of the germination process. In this sense spores are more correctly the “pollen” of the fungus. There the similarity ends. Generally two viable spores of the SAME species are necessary to produce a fungus. They must be located VERY close to each other. (Less than 1mm, Source, Giovanni Pacioni and others.) Is this very close? A spore can be as small as 2 millionths of a metre in diameter (Even less for the asexual “conidia” of the Deuteromycetes, but these don’t count in the following analogy, for obvious reasons!) and so if we scale everything up to human proportions this equates to an attempted mating between partners lying about kilometre apart! Quite a trick as long as you don’t get cramp.

On Statistics...

Or how to poison your daughter/ wife/ Bank Manager etc.

I quite often tell the tale of Roger Sleath, my Mycologically challenged mate, and his lovely surviving daughter, Victoria. We still entertain and alternate dinner parties with Roger and his wife, Carol. Which is surprising, really. Now I realise that I have touched on this story before but if you tell it twice it must be true.

Roger and family came to dinner. This is what, oh, ten years ago. Roger was still ninety-two and Victoria was about twelve. Roger and I had that very day spotted, with a pair of binoculars, a huge *Laetiporus sulphureus* on a fallen Willow about a mile away from my house. Knowing Roger's propensity for eating dangerously I decided to collect and thence prepare a stunning "starter" with a portion of the said fungus. I must say, right now, that I knew full well of a report in The Mycologist which stated definitively that research showed a one in twenty-five chance of a serious allergic reaction to this delicious polychromatic fungus. I even mentioned this before we sat down to eat. Of course, as there were only five of us the statistic didn't apply. I had prepared little parcels made from gently hammered out chicken supremes, and had carefully wrapped the delicate meat around a cooked mixture of the fungus, pine nuts, coriander leaf and star-anise infused double cream. The parcels were dipped in seasoned flour, beaten egg and then rolled in bread crumbs before being subjected to a quick roasting. Served with a wild Rocket leaf salad, shavings of Parmesan and an orange zest and walnut oil dressing we were happy to partake of this simple repast. But you know kids. "What's in it?" mewled Victoria, poking the parcel until it disgorged its contents. Roger used to be a Headmaster. "Shut up!" he explained. "Just eat it, it won't kill you." Nor did it. But it did produce projectile vomiting within ten minutes of ingestion. I am happy to report that Victoria survived to be poisoned by her father on several other occasions.

We did not immediately associate the effect with the cause as the years between 6 and 56 are often difficult for girls, and they can be pernickety in their diets even after this early phase. I did, however, take a large specimen to my favourite chef, Didier Deville, who was rapturous over the gift and produced a beautiful main course that very evening in his excellent restaurant. I was there and can confirm two violent bouts of vomiting amongst 48 covers which ties in with the pub-

lished statistics very well. Didier is, of course, French, and had little difficulty in explaining to his green-gilled clients that it was perfectly Aukay to throw up and not to worry and how bien joué to get outside in time. Don't you just love their attitude to Fungi?

On distant shores...

Or stories which should be true

Simon was my best man. I used to get him jobs by filling in his application forms. He never entirely forgave me. He worked abroad on civil engineering contracts in places like Basra, Venezuela and Papua New Guinea and never quite new what the jobs entailed until he got there. When he was away we would keep up correspondence by snail-mail (Is this what used to be called a Letter? *Ed.*) Some of the stories were worthy of publishing but would now be considered very non P.C. if not downright racist. When he got married he took his family with him to Papua where he was overall "Big-boss lickum-lickum bootey-wear" in charge of a Palm Oil plantation. Most of his workers were Papuan with relatives up in the mountains and the jungles, still eating the odd tribesman who didn't put up a fight (Adrenalin taints the meat, apparently) and still engaging in unfathomable rituals involving much drink and drugs. Simon tells the story of a fungus not known to him but well known to the natives. When I say that he knew not what this fungus was, he first told me the story after spotting its look-alike during a walk in Hamsterley forest. I was there and very animated he became. It was the *Amanita muscaria*, the Fly Agaric, which excited him so.

Lapsing into Pidgin English he squawked, "Looky-looky, him No Stoppy Lie-down"! A reference, apparently, to the awesome ability of this fungus to induce a trance-like state during which the Papuans danced for protracted periods without stopping until they collapsed in communal heaps. I am no longer given to this sort of behaviour although I believe a similar situation prevails at the Tall Trees just outside Yarm of a Saturday night. What separates the two societies is one astonishing fact. According to my friend Simon, Papuan society has a strict the hierarchical structure which gives preferential treatment to the Hunter-gatherers rather than to the Hooray-Henrys. It is the Hunters who first drink from a great vat of liquor in which soak a thousands caps of the local variation of *Amanita Muscaria*, gathered especially for the yearly seasonal binge. Apparently

they drink the stuff by the gallon and get into a rare old state. They dance a lot and get thirsty and so they drink a lot. This means that, well, not to dwell on it, they pee a lot, too. So far, just like the Tall Trees. But, gentile reader, avert your literal eyes, for now the difference is more clearly manifest. The Hunters pee into great wooden vats, presumably with something more akin to luck than accuracy, as they are still dancing, from which the Young Men in their turn then drink! How this all started is a mystery to most Europeans but there it is. The toxin in the fungus is not readily assimilated by the body, possibly because of the speed of transition due to the required exertions, and the urine is still quite potent if somewhat watered down. Nonetheless, the Young Men exhibit the same behavioural traits as their fathers and much fun is had by all. It does not end here, though. Oh no. The Young Men drink copious amounts of water “with it”, so to speak, and so produce urine in commercially viable quantities which by some miracle not understood by our cluttered, blinkered 21st century minds, they manage to express into yet another array of cisterns. This process, according to my best man and witness, Simon, is then repeated twice more, first by the Mothers of the tribe and finally by the Young Girls. I did not ask and do not wish to know what size, shape or clever design the final two depositories of all this urine is, but the liquor itself must have some intrinsic value as I am assured that at the end of the fourth day of the festivities a huge tanker arrives from Australia and fills up its cavernous tanks with the amber fluid. It is thence shipped off, for what purpose I know not, to an Ozzy company by the name of Castlemain. Alright, I made the last bit up. But the rest is TRUE. (Source, My Best Man, Simon. 1995)

On the establishment of the truth Or not.

For the pedants among us, I must point out that the last tale lays itself open to the charge of being apocryphal. Just in case you should, for some personal reason, choose not to believe my source, then I have to say that a similar story exists from Mexico. Here, the so called “hallucinogenic” toadstools are known collectively as *teonanacatl*, and include species of *Psilocybe*, *Stropharia*, *Inocbe* and probably *Mycena* and *Panoeolus*. (Source, The World of Mushrooms by Uberto Tosca. Orbis Publishing 1973) The effect of partaking of a cocktail of these fungi is dire and can quite easily cause death. Most of the stories of the

ceremonial eating of poisonous fungi which I have uncovered over the years DO involve drinking a great deal of water and DO involve vigorous dancing as part of the proceedings but even my credulity is stretched by such tales. Nonetheless, there is little doubt that some ceremonies involving the use of what we consider highly suspect fungi have existed for thousands of years. It may well be that ridding oneself of the various toxins by dilution with water and quick elimination may limit their immediate effects. I can recall one story for which the source escapes me but it goes like this.

In mediaeval times, always a safe period for story tellers, there existed several accepted methods for the extraction of “truth” from hapless individuals. It has always surprised me that this desire for the facts led the authorities of the times to some pretty circumstantial conclusions, which we cannot accept today. The difference is in the way of thinking. A “belief” culture is one in which almost any crackpot theory can be held to be true if you “believe” what the consequences are for NOT “believing”. In other words, if you do not have enough factual knowledge, any knowledge will do.

So, we need to know if Hapless Citizen, a self-confessed necromancer, is telling the truth over the small matter of who cast the spell on the Cardinal causing him to turn purple after his dinner of grog, roast Lamprey and Dog’s Mercury salad before dying a painful death.

Bring in the prisoner, the Inquisitor is waiting.

“ Was it you, Hapless?” Good, penetrating opening question from the Inquisitor.

“No.” Succinct reply, with the conviction normally associated with plausible denial, from Hapless.

O.K. so far but the plot is unfolding. Now here’s the thing. The Cardinal was actually poisoned by his brother, who was next in line for his job, and Hapless saw him pouring something into the Cardinals’s grog.

“Then who was it, Hapless? You must tell the truth.”

“ It was the Cardinal’s brother, most merciful one.”

Vigorous denials from the Cardinal’s brother lead the Inquisitor into stage two of his painstaking search for the truth. The Inquisitor calls for the Alchemist. The Alchemist produces two large pewter mugs in each of which is a strong-smelling liquor made from the reduction of a gallon of lightly salted water and a stone of *Agaricus*

xanthodermus.

Now what comes next is quite remarkable. The Inquisitor advises both suspects that the liquor in the mugs is a truth serum. Each will be ordered to drink the mug dry.

"If innocent, you will live. If guilty, you will surely die." So says the inquisitor.

"Oh. And I forgot to mention that if you don't drink the drink, your eyes will be removed by the blind butcher with a rusty meat-hook."

Both suspects live in a "belief" culture. They believe in God, the Devil, Witches and Warlocks. It is reasonable to assume that they "believe" in this methodology. They also know the butcher.

Hapless Citizen is content as he is innocent. The Cardinal's brother is a little rattled as he is guilty. Each is given a mug and told to drink.

Hapless sees this as his route to freedom and so he confidently glugs back the black goo in one. He immediately throws up and lives.

The Cardinal's brother is more circumspect, slowly and hesitantly sipping away, sure that each sip will be his last. At last it is all drunk. He does not feel well. He has just been poisoned. Within a few hours he will die. See, it works.

The poison in *A.xanthodermus* is slow to be absorbed, and in large quantities is a powerful emetic. It does not help to know this as the results are often just the same!

One ring to bind them all....

You cannot open any book on fungi without finding a reference to the so-called Fairy Ring. This is not surprising, as quite apart from the ease with which human-kind can and does deceive itself with mysticism and wholly irrational beliefs, we are as a species programmed to look for the unusual and to explain it away with whatever theories the science (=knowledge) of the time can offer. The thought that these common "rings" of fungi, particularly of *Marasmius oreades*, on which species the name is hung, were considered to be of magical consequence may seem to be comical with the benefit of our current knowledge, but the "scientific" explanations of the past are even more entertaining! The much respected 18th century observer of all things natural, one Bradley, spent exciting evenings watching slugs tear around in circles when on heat (The slugs, that is. An ill chosen term, but you know what I mean). He then made a leap of monumental deduction and decreed that the mushrooms which grew in rings arose from putrefying slug-slime. (Source various but recently revived in the Chan-

nel 4 program, Mushroom Magic with Michael Jordan and the book of the series.) The real reason for these rings is perfectly simple and plausible enough to have that clear ring of truth, and we are all happy with the explanation. Mycelium spreads out from central point in all directions, grass deprived of nutrients as mycelium mat spreads, grass grows strongly at outer edge of mycelium as minerals are released by enzyme action at growing hyphae tips, fungus "fruits", withers and dies, releasing more nutrients, grass flourishes, mycelium continues and cycle repeats. Result, ring of green grass surrounding recovering circle, ring moving outwards yearly. Outwards and outwards. If undisturbed and in good pasture land, these rings can be huge..... but I am not going to insult you with the plethora of statistics available, as each one can no doubt be topped by another, *ad infinitum*, like fairy rings. I will tell you this, though. Not a twenty minute walk from my house grows intermittently a "ring" of *Agaricus campestris*. The field has never seen chemicals in all its long history and I am assured by the owner has that it has been a sheep-grazing pasture for hundreds of years. The land is not suitable for cultivation being a scoured out sloping "valley", created by a now much diminished "beck". The soil is poor but that alone would not stop the owner trying to grow some profitable crop. No. The reason it is grazing pasture is because of the stream which runs the full length of the land strip. As any farmer knows sheep love killing themselves and water provides opportunities to good to miss. You can drown yourself or get stuck in mud and starve to death. You can get washed away when the stream floods or find yourself stuck six feet up a tree when the waters retreat. I have seen all of this and more when I go mushrooming. Not foraging. Mushrooming...and what mushrooms they were.

In 1999, the last good year, I was entertaining myself with flying lessons. It was O.K. Nothing to get excited about. Until, that is, we had the opportunity to fly over my house at low level. Approaching from the north-east at 350 feet, I identified the stream some two miles from home and followed its course. As we flew over the field, the whole ring was visible. It was over 500 yards across, which is nearly a mile in circumference! What a ring! What a fairy!

There were gaps, but not great enough to break the pattern. Admittedly, the circle was lost as the railway line embankment cut through it. In fact, I decided to investigate the land at the other side of

the line, and sure enough I found MORE mushrooms just where I expected them to be! The “ring” has been there for a very long time and MUST have existed at a size which carried its perimeter past the railway cut *before the line was laid*, as the propagational *modus operandii* for such phenomena prohibits the leaping of fifty feet of clinker! The line was laid in the eighteen-nineties.(Source, me and Old Man Thompson, sheep farmer)

On estimates and claims

How many fungi are there?

I am reminded of a Peanut’s cartoon when Lynus (?) asks Charlie Brown how many grains of sand there are on all of the beaches in all of the world. After a suitable delay during which Charlie’s eyes-heavenward expression indicated infinite concentration, he arrived at the definitive answer. “There are four hundred and seventy five million, trillion, gillian, billion, zillion.” Lynus was impressed but not overly so. After consideration he felled Charlie with devastating disdain with the simple repost, “I bet there isn’t!”

There are, however, one million specimens in the U.S. National Fungus COLLECTION. This is the world’s largest repository. 600,000 are in the database. (Source, Systematic Botany and Mycology Laboratory, US Dept. of Agriculture). This is a statistic of Texan proportions. Leaving the world of big hats, I would like to quote some statistics of a more local nature. Michael Jordan is cautious in his statistics regarding the British Isles. “...there are about 3500 species of mushrooms.....big enough to pick...” (Source, Mushroom Magic. Michael Jordan 1989) This is probably wisely conservative, as is the view that there are “...a quarter of a million species of fungi *known (sic)* worldwide...”. Tell that to the Marines!

Similarly, one Ronald Rayner who is published by Hamlyn, agrees with the 3500 figure but describes them as “...larger fungi.” (Source, Mushrooms and Toadstools, Hamlyn Publishing group 1979).

For the most **conservative** world estimate of species I can’t beat Giovanni Pacioni, writing for The Macdonald Encyclopedia (*sic*) of Mushrooms and Toadstools, who estimates that the world species count “...runs into tens of thousands.” (Source as stated 1985, so if he was correct at the time, you can see the problem!)

More seriously, and from more serious sources, there is a tendency to avoid putting figures to world or national species counts. This is not necessarily deliberate avoidance, but just cautious wisdom, which I do not possess. I like Stephan Buczacki’s world estimate of “...upwards of 5000 genera and 100,000 species” (Source, Collins Guide, Mushrooms and Toadstools of Britain and Europe. 1992) Upwards to where? Well, the highest figure I have come across is a world species *estimate*, that is to say not yet all found, of 1,500,000 to 2,000,000 (Source, ABC News, abcnews.go.com 1997) Since being so informed I began to air this interesting nugget at every opportunity. For three or four years immunity from any detractors was total as I had begun to believe the statistic, allowing me to give plausible confirmation by quoting my source as a last resort. In the autumn of 2002, however, I decided to update my information base and referred again to the ABC News archives. I could no longer find the figure which I had been quoting! As I saw it, I had two choices. I could come clean and go with Stephan, as I still had the book...or, I could brass it out and hope that no one would bother to check up! Being the sort of guy I am... I decided to brass it out. I did not like myself, you understand, but the Vicar said it didn’t make me a bad person. Nonetheless, the strain got too much and I was at cracking point when my tortured soul was rescued by THE MYCOLOGIST, of all things!

I happened to open Volume 16, Part 4, November 2002 whilst sitting in my library. The first two pages were stuck together due to water splashing over the rim of the sink and so the opening left-facing page was the first I saw. There, in boxed-banner header, was an article intro called “I’VE GOT YOU UNDER MY SKIN-THE MOULDS OF MAN” by Professor Ann Wakefield, now sadly deceased. The opening gambit of the intro reads “ There are thought to be over 1.5 million species of fungi...” (I bet there isn’t.*Ed.*).

I can only assume that the good Professor must have attended one of my talks.

There are other stories in my repertoire, but I’m not sure you would believe them. Some of them I do not believe myself. One day, I will have the time to investigate further, but if you know any fascinating facts about fungi, let me know.(Don’t make me laugh! *Ed.*)

More About Those Names

Chris Lowe

This is a (very brief) follow-up to Alan's interesting piece about names. Scientific nomenclature has fascinated me since early days. Perhaps this is in part because I studied Latin (to 'O'-level), at the same time that my interest in natural history developed. I recall being the first to answer the classics master's question: "What does 'Columba' mean?" I had no need to refer to dictionaries or other aids in class for this word, having imbibed thoroughly the details from 'The Observer's Book of British Birds'. "***"

Recognizing, though, that the subject may prove arduous or arcane to others, I compiled some years ago a guide to 'Biological Latin'. I have this document available for walks and lectures. I must stress that it does not explicitly cover fungi, being devised chiefly for botanists. Also, as Alan points out, mycological terminology borrows often from Greek, not Latin.

Much of what I deal with in 'Biological Latin', however, is generally applicable. The main message is that scientific naming has 'patterns and relationships', rather than being merely gibberish, and that strides can be made towards understanding, and, thereby, more easily remembering, the names of objects in natural history.

'Biological Latin' comprises six sides of well-spaced items to do with meanings, recurrent terms, gender agreement and so on. It is easily printed off from the computer, and I will happily supply copies if any NEFSG members feel that it could be helpful in any context.

** 'Columba' = dove or pigeon

