North Eastern Fungus Study Group

Newsletter No 88 - Spring 2018

David L. Smith 1935- 2018

David had been a longstanding member of NEFSG and over the years contributed greatly to our efforts at group-education. In 2017, aged 82, he gave us a scholarly tutorial on lichens illuminated by his stunning photography of his subject. In a previous year as part of a microscopy workshop I remember him explaining the intricacies of microscope slide preparation by using the thinly sliced pith of an elder twig-perhaps an old-fashioned method only he still used?

David spent his early years near Keighley, West Yorkshire before moving to Derby where he studied successfully.He moved on to agricultural college as part of which he commenced a practical year on a farm. Unfortunately he could not complete this due to dermatitis caused by chemicals used on the farm.

Glasgow University was his last place of study where he obtained a first class honours degree in botany, followed by a doctorate in palaeobotany there in the 1960's. An assistant lecturership at Glasgow was followed some years later by a lecturership in palaeobotany at Queens University, Belfast.

On his occasional returns to Keighley during holiday breaks he met his future wife, Shirley, and in due course three sons were born. Later in life David bought and converted a barn at Crackpot, Swaledale into their home whilst undertaking his last few years of work-and then retired there. Due to Shirley's failing health they decided to move to Stokesley, North Yorkshire where they had an active social life before her health worsened and David became a full time carer until Shirley passed away.

David was a polymath. As well as his palaeobotanical work he had equivalent [and prior] botanical qualifications and almost up to his death was involved in international research on aspects of botany, most recently on legumes.

In naturalist groups in the Teesside area he was much in demand to lead walks and talks on lichens, fungi and photography. He was an expert microscopist, an essential skill for the above studies, and had superb photographic skills as well-his micro-photographs of lichens and fungi wowed his audiences across the north east. A member of the Stokesley Photographic Society since 1994 and a Fellow of the Royal Photographic Society he exhibited nationally and internationally with great success.

At the North Eastern Fungus Study Group we hope to curate a collection of his wonderful photographs of lichens and fungi.

He will be missed.

Paul Forster
Alan Simkins

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NEXT ISSUE: End August 2018 - Contributions will be gratefully received up to 19th.

Forthcoming Events

Saturday 19th May - Bedburn Foray, Nr Hamsterley, County Durham - Leader Catherine Gillie (Post Code DL133PF)

Directions From the A68 travelling North turn left for Hamsterley village just after the entrance to Witton Castle on your right.

From the A68 Travelling South turn right for Hamsterley village after the turn off for Witton Le Wear on your left.

then take the next right turn onto a road which becomes a track after Lane House and winds its way though a farm (Edge Knoll Farm) and onto Park house following signs for NESFG Foray. Please meet and park cars at the aptly named Park House which is a farmhouse at the end of a long private track. (please note the track is rough in places so you will need to drive slowly to avoid the potholes)

The route from Park House will be decided nearer the time depending on weather, but I expect that it will be around route of between 2-4 miles following the path of Bedburn beck across grass land into oak woods

Summer Programme

June 23rd	LICHENS at Bowlees	Jo Scott
July 14th	LUNCH at The Kings Lodge, Durham, DH14BG.	
September 2nd	Wingate Woods	Alan Simpkins
September 9th	Stocksfield	Mike Cruse
September 15th	Deerness Woods	Val Standen
September 22nd	Bellister Woods	Gordon Beakes
September 29th	Clay Bank Bilsdale	Jo Scott

All forays meet at 10.30am for 11am start. Details will be e-mailed nearer the time and will be posted on the web site at http://nefsg.co.uk/

DNA? It's not going to go away…

The Trust is about to introduce a DNA profiling service for fungi collected in the field. Why is it doing this, and does DNA profiling matter?
DNA is short for deoxyribose nucleic acid. This substance makes up sub-cellular elements called nucleotides which become formed into the doubled-stranded helix made famous by Watson and Crick, and which carries the genetic instructions used in the formation and development of all living organisms. In short, DNA is what makes you and me different from a dog, an oak tree, or a fungus. But it can also make one look-alike fungus different from another.
Two hundred years ago most fungi that we collected were lumped into one genus *Agaricus*. Then microscopy came into more general use, and we discovered that there were far more fungus genera and species than we had previously imagined. Microscopy paved the way for the binomial system that we know today to I and evolve. But microscopy still only allows us to examine species down to cellular level. It does not mark the end of species diversification. We now know that distinctions between species can exist at sub-cellular, genetic level. These distinctions cannot be detected using the naked eye or the microscope.
Does it matter? It matters because genetic distinctions may possess all manner of implications. Think of their ramifications in human health and welfare! So just because we can't detect them in fungi by familiar means doesn't mean that we can afford to ignore them. There is no suggestion that we should genetically determine every *Sterum hirsutum* bracket to establish if it is actually a DNA variant. But we should responsibly know if that variant exists, and ideally what conditions it requires to exist, and in cases of rarities, where it exists.
Who cares? Our knowledge of the role of fungi in the world is still it its comparative infancy. We are only just starting to get to grips with *mycorrhiza*. Suppose we discover through the study of the genetics of what we call *Russula emetica* that it exists as two or more variant species. One turns out to be vital to the well-being of a species of conifer, but another variant species is found to be immaterial. If we are going to take a responsible approach, information is needed about the distribution and well-being of those two newly-discovered species, not always by you and me on our Saturday morning foray, but by scientists and arboriculturalists who have a responsibility to conserve the conifer species.
And what if one of the genetic variants of a fungus, at some time in the future, is found to possess a cure for cancer? As field mycologists, we carry a responsibility to do our bit. We are not proposing that you flood the Trust with material for DNA profiling. But if you suspect that a collection is one of those wherein genetic variants are now known to exist, or believed to exist, then we need to put it through the DNA profiling process and record it.

Thanks to **Michael Jordan** for this interesting piece.

Giant Bolete

(Phlebopus marginatus, Boletaceae One found in South Australia prior to 1934 had a cap (pilea) 61 cm (24 in) wide by 46 cm (18 in) broad. Same one (?) weighed 32.34 kg (71.3 lb)[19]another, at Hall's Gap, Victoria in 1939 weighed 28.6 kg (63 lb) but was 77.5 cm (30.5 in) across the cap.[20]
Native to humid regions of Australia, New Zealand, Sri Lanka, Sumatra and Java) Quote from Wikipedia

I took this photo at Hall's Gap in Victoria Australia last Autumn (Spring in Australia) It was growing with Eucalypus and my hat is 30cm wide so it must have been over 60cm on the longest side but I don't know how much it weighed. Just one of the delights that I encountered whilst down there. **Doug. McCutcheon**.

'Rowan tree and red thread,
Haud the witches a' in dread'
(Grigson 1955)

Keith Tulip


Figure 2

A rowan stood at our front door, as a protection against witches and evil spirits. So when we returned home from holiday in 2017, not long after Witchwood Day, May 2nd, when traditionally boughs were stripped from churchyard rowans, kept to prevent the dead from rising (Grigson 1955), and carried home as protective charms (Jeffrey 1923), we were perturbed to find it dead.


Figure 1

Upon close examination, the rowan was afflicted with red threads oozing through the bark. Not the protective red threads that ensnare spirits (Pennick 1989), but of fungal origin. Did the 'red threads' of the title turn against their ally, the rowan tree?

The red threads were reminiscent of the anamorphic form of *Quaternaria quaternata*, not uncommonly found, and restricted to beech (Thompson 2013 as *Eutypella quaternata*). Are there similar species growing on rowan?

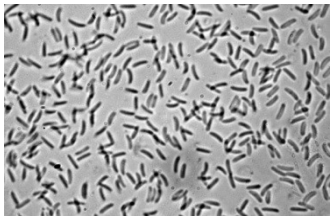
Figure 3: allantoid conidia
mean = 5.0 x 1.3 µ ; n = 51

Searching Ellis & Ellis (1997) found *Eutypella sorbi* and *Leucostoma persoonii*. The very useful online database *BioInfo (UK)* (Storey 2010) lists organisms with relationships to another species, and for rowan, *Sorbus aucuparia*, includes *Valsaria cincta* (as *Cytospora rubescens*) and *Cytospora microspora*. The *Fungal Records Database of Britain and Ireland* (Kirk & Cooper 2018) also allows searches for associated organisms and gives another three associated with rowan: *Cytospora populina*, *Leucostoma massarianum* and *Valsa ceratosperma*.

Under microscopical examination, the red threads were found to be an extruded mass of sausage-shaped conidia (asexual spores) in a gelatinous matrix, with mean dimensions of 5.0 x 1.3 µ (fig. 2). On this basis of conidial size, we can eliminate four of the above:

E. sorbi with 3.5 - 4 x 1 µ (Grove 1935)
C. microspora with 6 - 8 x 1 µ and white tendrils (Grove)
C. populina with 8 µ (Grove)
L. massarianum with 6 - 7 x 1 µ (Saccardo 1882)

this leaves:

Valsa ceratosperma with 4 - 7 x 1 - 1.5 µ (Adams *et al* 2005, as *V. ceratophora*)
Valsaria cincta with 3.5 - 6.7 x 0.9 x 1.2 µ (Mehrabi *et al* 2011)
L. persoonii with 3.5 - 5.5 x 0.9 - 1.2 µ (Mehrabi)

By cutting across the conidiomata, it is possible to see cavities or chambers (locules) which join to the ostiole, which is the pore out of which the conidia are extruded. Adams (2005) tells us that *Valsa ceratosperma* has only 4 to 8 globose chambers, whereas Mehrabi (2011) describes *Valsaria cincta* and *L. perssoonii* both having multiple labyrinthine chambers, as in our specimen (fig. 5). Therefore, we can eliminate *Valsa ceratosperma*.

Figure 6: erumpent conidioma

Figure 5: labyrinthine radiating locules

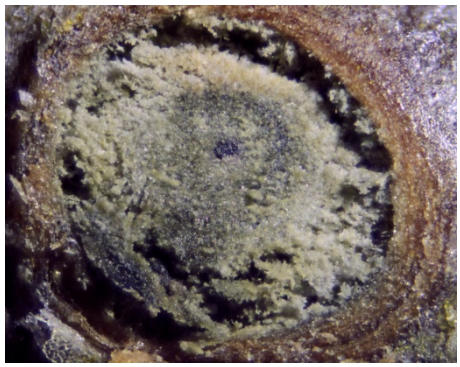

Figure 4: single ostiole, disc not snow-white

The key difference between the remaining two species seems to be the colour of the ostiolar disc. Mehrabi says that *L. persoonii* 'is separated from closely related or similar species by the presence of one ostiole per snow-white disc'. The disc in our case is not snow-white, but a shade of grey (fig. 4), so it seems that what we have is ***Valsaria cincta***.

With the help of Gordon Simpson, a report and photographs were sent to the Forestry Commission Research Agency. They responded in agreement that *V. cincta* was the most likely species.

So did the fungus kill the tree? Is it a pathogen, or just, as some suggest, an opportunistic saprophyte following the death of the tree, perhaps by drought? If it didn't kill it, then who or what did? Did the witches finally win a battle in the eternal war?

It could be witches! Some evil witches! ...
Which is ridiculous 'cause witches they were persecuted,
Wicca good, and love the earth, and woman power ...
(Whedon 2001)

Nevertheless, a new rowan, offspring of one of its predecessor's berries, now proudly stands guard in its place.

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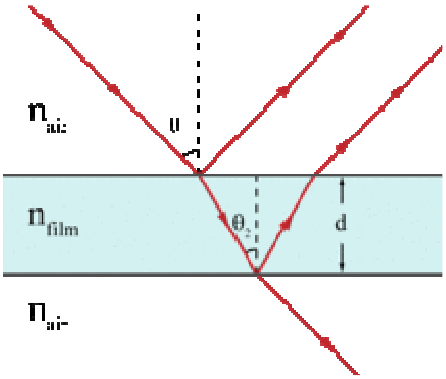
I am *Keirn*, *Cuirn*: I can charm your pain away
I am Mountain Ash: set me on high
I am *Witch Wiggin tree*: wish me near
for no cream curdles beneath my touch
. . .
my sinews are supple dousing wands,
my roots dance widdershins to the underworld,
I touch and sing of secret springs,
those below and those beyond.
(from *Rowan*, by Kaye Kossick, November 2016)

John Robinson

Iridescence is a phenomenon of certain surfaces that appear to gradually change colour as the angle of view or the angle of illumination changes. Common examples of iridescence include soap bubbles, thin layers of hydrocarbons on water, feathers, insect wings and anti-reflective coatings of optics.

A diagram illustrating the physics of thin-film interference on a soap bubble is shown below.



Lamproderma cf. muscorum (above)

The two different wavelengths of reflected light can create constructive interference depending on the thickness of the film. This leads to different regions of the film appearing as different colours depending on the local film thickness and angle of light.

In animals and plants, iridescence is often created by micro-structures that interfere with - but also diffract and scatter light - to produce a range of colours and metallic effects (structural colouration).

Female Golden Stag Beetle Fir0002/Flagstaffotos

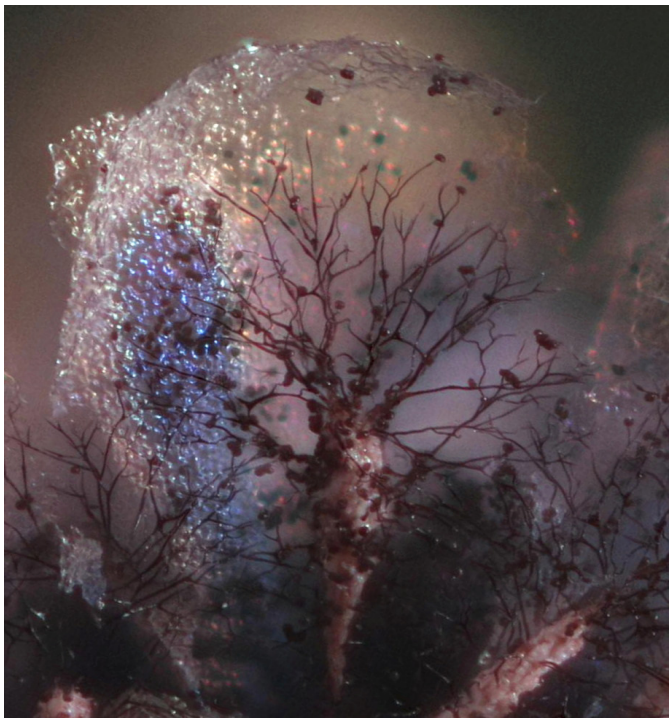
In beetles, a number of hypotheses have been put forward for its behavioural function including communication, thermoregulation, camouflage and predator deterrence.

The leaves of some shade-loving plants ,such as *Begonia pavonina*, exhibit a blue irridescence due to thinly layered photosynthetic structures called iridioplasts which have evolved to maximise the energy obtained from the limited light available.

Fungi are one biological group where iridescence has not been found. However, it is widespread in myxomycetes and conspicuous in some genera (e.g. *Lamproderma* and *Diachea*) due to the presence of the peridium – the thin transparent layer that covers the sporangium. In many species the peridium is fugacious making iridescence less obvious. Whether the iridescence has any biological function or is just a structural artefact is uncertain.

Lamproderma echinulatum sporangium (right).

Sometimes, banding of colours can be seen, such as in *Elaeomyxa cerifera* (below). This may be due to increasing thickness of the peridial membrane towards the base affecting the wavelength of light observed.



A close up of the inside of an almost empty *Paradiachea caespitosa* sporangium (left) showing the central columella, dark capillitium and the transparent peridium.

Externally, *Paradiachea caespitosa* exhibits a beautiful range of bronze, blues and purples (below).

References

Thin-film iridescence https://en.wikipedia.org/wiki/Thin-film_interference

Gold bugs and beyond: a review of iridescence and structural colour mechanisms in beetles (Coleoptera) https://archive.is/20150215180401/http://171.66.127.193/content/6/Suppl_2/S165.full#selection-279.0-279.102

Structural color in Myxomycetes https://www.researchgate.net/publication/45708979_Structural_color_in_Myxomycetes

Thank you to Sarah Lloyd for specimens and comments.

I don't know what it proves…but what fun…

Below is the "analysis" of the survey on our ability to identify fungi from photographs, carried out at our Indoor Meeting in January 2018.
50 slides were shown to nine participating members, a small sample admittedly, but enough to draw but one conclusion…identification from photographs is of variable validity at best. At worst, it is dire!

Slide Number	Number of different Entries	Number of SAME entries	Total Entries	No guesses	Same split			
1	7	2	9	0				
2	6	3	9	0				
3	5	2	7	2	3 and 2			
4	6	0	6	3				
5	6	3	9	0				
6	4	5	9	0	3 and 2			
7	5	4	9	0	4			
8	2	6	8	1	4 and 2			
9	5	2	7	2				
10	7	0	7	2				
11	4	5	9	0	5			
12	6	3	9	0				
13	4	4	8	1	4			
14	4	4	8	1	2 and 2			
15	4	4	8	1	4			
16	6	2	8	1				
17	6	2	8	1				
18	4	0	4	5				
19	2	5	7	2	5			
20	3	6	9	0	4 and 2			
21	5	2	7	2				
22	6	0	6	3				
23	3	4	7	2	4			
24	6	2	8	1				
25	5	3	8	1				
26	4	0	4	5				
27	5	0	5	4				
28	3	3	6	3				
29	6	3	9	0				
30	1	3	4	5				
31	2	2	4	5				
32	0	9	9	0	9	Jelly Babies		
33	3	6	9	0	3 and 2			
34	2	3	5	4				
35	4	4	8	1	4			
36	3	4	7	2	4			
37	3	5	8	1	3 and 2			
38	5	0	5	4				
39	3	0	3	6				
40	3	5	8	1	3 and 2			
41	2	4	6	3	4			
42	4	5	9	0	2 and 3			
43	4	4	8	1	4			
44	3	5	8	1	3 and 2			
45	3	5	8	1	5			
46	6	2	8	1				
47	0	9	9	0	9	Fistulina hepatica		
48	0	5	5	4	5	Psilocybe semilanceata		
49	0	5	5	4		Pleurocybella porrigens		
50	2	4	6	3	2 and 2			
	Full house correct	Average number of attempts		7.2	Which is	80	%	
	Every entry correct	Average number of same answers		3.36				
	Every entry incorrect							

As not ALL of the slides were of identified species it would be churlish (and impossible) to give a result for the percentage of correct answers, but for the ONE member who got *Trichia decipiens*, slide 2, correct…well done. You know who you are and it beats the *Tomato sauce* answer for Slide 1. Interestingly, *Fistulina hepatica* was an outright winner by a short head over *Psilocybe semilanceata*…which only goes to show that we all look at pictures and remember what interests us….ahem…

Tom Kirby

Lichen Lookout

Two common lichens seen on tree trunks, branches and small twigs and one uncommon one that you may find. You may need a hand lense to see the small details.

Evernia prunastri

Thallus lobes are flat, soft and are grey/green on top and white below. Growing on tree trunks, twigs and fences.

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Ramalina farinacea

Thallus lobes are flat, and narrower than in the E. prunastri above. They are grey/green above and below. Can have disc like patches of soralia along the edges of the lobes. On tree trunks, twigs and fences.

Ramalina fastigiata

Not unlike R. farinacea (above) but often has smooth apothecia on the lobe ends. Found on tree trunks and branches but not common.

- Soralia - are powdery asexual reproductive structures made up of fungal hyphae wrapped around a cyanobacteria or green algae.
- Apothecia are the fruiting bodies.