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Editorial

Doncaster Naturalists' Society has a new President - Louise Hill has stepped down after more than 12 years in the post, for which she deserves huge praise and thanks. She has kept the Society active and thriving, unlike many Naturalist Societies in Yorkshire which have suffered drastic membership loss and even closure. Nora Boyle has bravely taken on the role and I am sure she will work hard to keep the Society in the healthy state it is currently in. Unfortunately Pip Seccombe has had to step back from her role as Recorder (though she did much more to represent the Society). Louise will, I am sure keep up her high standard in Pip's place.

As for the natural world, it has had to cope with some extreme weather and ground conditions over the winter, which has been the wettest on record for Yorkshire. Severe flooding at Fishlake and other villages in our region will leave its mark for many months to come. We have to hope that wildlife is resilient enough to cope with this situation - it could become more common and we will all have to get used to it. At least the winter has been relatively mild, so relieving the possible problems for our wildlife.

Again I make this appeal to all - look out for things which you can write about for the next edition of The Doncaster Naturalist.

Paul Simmons

The Doncaster Naturalist

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The Botany of Thorne Moors - an update

Ian McDonald

Since the publication of *Thorne Moors: A Botanical Survey* (McDonald *et al.*, 2014), I have continued to record plant species on the National Nature Reserve. As well as additional 1 km squares for existing species seen there are a number of species not recorded in the 2010-2013 Survey. It is these additional species which I list here (Table 1, p55).

The occurrence of Hart's-tongue fern and Common Polypody fern is interesting. In the *List of Fern-allies and Ferns of Thorne Moors* (Limbert, 1991) it reports 'Hart's Tongue, on a wall at derelict Swinefleet Moor Farm, 1989'. Common Polypody, formerly known from Madam Wood (mow removed) became extinct about 1876 though a specimen in Doncaster Museum Herbarium is labelled 'Thorne Waste 1964, William Bunting, on moor'. One plant was seen by Peter Skidmore on the canal system in 1968.

The single white-flowered plant of Marjoram was found about half way along Goole Moor Tram. Marjoram usually occurs on calcareous soils and I have seen it in Brockadale, between Kirk Smeaton and Wentbridge, on Magnesian Limestone. Some of the tracks on Thorne Moors have a calcareous base but why a single plant has appeared so long after the track's construction and so far from limestone is another of Thorne Moors' mysteries.

The occurrence of Narrow Leaved Ragwort, Lesser Swinecress, Black Nightshade, Sun Spurge, Dark Mullein and Apple-of-Peru is more easily explained. They are on a track which was raised by using material brought from elsewhere; a tip, perhaps? The Marsh Marigold was seen in 2018 but not in 2019.

I decided to see if I could find the area known as Scheuchzeria Well. This was a site of the rare Rannoch Rush, known to the Thorne Nurseryman, William Casson. The area had been covered by dense Rhododendron (introduced by Casson) and birch scrub. After this area was cleared several years ago I did find Scheuchzeria Well but he site had almost dried up and contained just a small amount of Sphagnum.

As well as the plants, I have noticed other forms of wildlife on the moors. I spotted a tiny group of fungi on one visit. I took a photo, and passed it to the YNU recorder for Mycology. He identified the fungus as *Byssonectria fusispora*. It grows on a range of substrates, including deer dung.

Figure 1. *Byssonectria fusispora*

Figure 2. Red Deer stag

While in Will Pits Wood last year a tiny fly on a bramble leaf caught my attention as it seemed to be walking sideways. I took a photo and the YNU recorder identified the fly as *Acletoxenus formosus*. Its last Yorkshire record was in 1914.

During the red deer rutting season last year I decided to see if I could find any stags. After walking around an area where one was roaring I stopped for a drink. After a short time I looked back along the track I had walked along. In the distance was a stag, trotting towards me, about 200 yards away. It stopped and looked at me then set off again. By this time it seemed to be getting quite large and was less than 100 yards away. When it was about 50 yards away I wondered what would happen. It stopped again and seemed unsure what I was. I shouted "come on then" and it suddenly turned and disappeared into the scrub at the side of the track.

On February 6th 2020, the day was sunny and warm and with no wind so I decided to look for any early emerging adders. I walked along a track until I heard lots of birds calling nearby. I left the track and saw a large mixed flock of starlings, fieldfare and redwings. Returning to the track I noticed someone standing where I had left from. It was the Senior Site Manager. He also had decided to look for early adders and pointed to two females coiled around each other. This is the earliest record of adders I have seen.

Thorne Moors is a unique place and naturalists who visit regularly are not surprised when unusual species of wildlife are seen. Peter Skidmore, who knew the site and wildlife better than most said (and I'm not sure of his exact words) "Thorne Moors contains an amazing variety of wildlife but you have to work to see it".

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Table 1. List of plants recorded on Thorne Moors since the publication of *Thorne Moors: A Botanical Survey*. The species were recorded by the author unless otherwise stated.

Scientific name	Common name	Where found	Year	Recorder
Senecio inaequidens	Narrow-leaved Ragwort	Will Pits Scrape	2014	Rob Watson
Coronopus didymus	Lesser Swinecress	near Will Pits Scrape	2014	
Solanum nigrum	Black Nightshade	near Will Pits Scrape	2014	
Euphorbia helioscopia	Sun Spurge	near Will Pits Scrape	2014	
Succisa pratensis	Devils-bit Scabious		2015	
Azolla filicoides	Water Fern		2015	
Angelica archangelica	Garden Angelica		2016	
Gymnadenia conopsea	Fragrant Orchid		2017	
Bidens cernua	Nodding Bur-marigold		2017	
Medicago sativa	Lucerne		2017	
Polypodium vulgare	Common Polypody		2017	
Caltha palustris	Marsh Marigold	ditch side	2018	
Ranunculus aquatilis	Water Crowfoot	on a track	2018	
Carex pseudocyperus	Cyperus Sedge	ditch	2018	
Ballota nigra	Black Horehound		2018	
Verbascum nigrum	Dark Mullein		2018	
Nicandra physalodes	Apple-of-Peru		2018	
Rorippa palustris	Marsh Yellow-cress		2018	Martin Warne
Spergularia sp.	Spurrey		2018	Martin Warne
Asplenium scolopendrium	Hart's-tongue Fern		2018	Martin Warne
Potentilla sterilis	Barren Strawberry	Goole Moor Tram	2019	Martin Warne
Carex binervis	Green-ribbed Sedge	Will Pits Wood	2019	
Ranunculus flammula	Lesser Spearwort	Pony Bridge Wood	2019	
Malva neglecta	Dwarf Mallow	Limestone Road	2019	
Mentha arvensis	Corn Mint	Goole Moor Tram	2019	
Origanum vulgare	Marjoram	Goole Moor Tram	2019	

Avian Botulism: A penalty of the long hot summer of 2018

Colin A. Howes

During the summer months of 2018 the Jetstream, which normally directs series of North Atlantic weather systems across the British Isles, became looped well to the north of its usual route, thus allowing climatic conditions more typical of North Africa to dominate over the United Kingdom (1 & 2). This formed part of a wider European heatwave resulting in uncontrollable and deadly forest fires from Portugal to Greece.

In the UK the Met Office declared the summer of 2018 the joint hottest on record together with those of 1976, 2003 and 2006. The UK mean temperature has been provisionally calculated at 17.3°C, some 2.2°C above the 1981-2010 long term average (2 & 3).

The extended summer heatwave, from June to August 2018, with prolonged periods of intense soar radiation (good for those who invested in Solar Panels), high temperatures and next to no precipitation led to associated water shortages in the north-west and wildfires on Pennine peat moorlands at Saddleworth and Winter Hill, these jointly burning an area in excess of 14 square miles (36 km^2) (2). Finally, and with relevance to this note, water sampling by Environment Agency biologists confirmed 'blooms' of toxic blue-green algae (not actually algae but Cyanobacteria) in water bodies across England including Ullswater, Coniston and Killington Lake in the Lake District (4), Oldham in Greater Manchester and sites in the Midlands, Lincolnshire and the Home Counties (5). Although not all Cyanobacteria produce toxins, when toxins are detected, local authorities, the water industry and other relevant proprietors of aquatic sites issue health warnings and even ban public access to recreational waters. Two forms of toxin are involved, Microcystins which lead to liver damage or failure and Anatoxins which result in neurotoxicity including muscle rigidity and paralysis.

From ponds and lakes around **Shepperton,** Berkshire, about 300 water birds suffered the paralysing toxic effects of blue-green cyanobacteria. At **Harrow Lodge Park**, Horncastle, Lincolnshire around 80 swans and geese were found dead from the same cause in early July (5). In Yorkshire, lakes exhibiting this deadly phenomenon were identified at **Angler's Country Park** Wakefield (6), **Fairburn Ings**, Castleford (7) and in the Doncaster region at **Sandall Park**, Wheatley (8) and **Lakeside**, Bessacarr (9).

At **Doncaster Lakeside**, three pairs of Mute Swans successfully nested, collectively hatching 12 cygnets (a record), 8 of which eventually fledged (10). As usual a number of non-breeding swans were attracted to Lakeside for the summertime moult of their flight feathers. Thus Lakeside was host to a significant proportion of South Yorkshire's Mute Swan herd.

Tragically, during the five weeks leading up to the August bank holiday weekend at least 32 swans (9 & 11), including 6 of the cygnets, succumbed to the Cyanobacteria toxins in a condition described as Avian Botulism. Ironically, cygnets and adults without flight feathers would have been effectively trapped here. In addition, Inspector John Gibson of the RSPCA reported that "a number of swans and other water birds had also been rescued" and were fortunately "responding well to treatment" (9 & 11).

At **Sandall Park** Lakes it was alleged that ca. 100 Mallards had died of Avian Botulism over the summer months (9, Dave Woods *pers. comm.*).

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Have we seen the last of Willow Tits at Thorpe Marsh Nature Reserve?

Michael Townsend

The Willow Tit *Poecile montanus* is in severe decline in Britain and is on the red list of birds of conservation concern. The last Breeding Bird Survey by the British Trust for Ornithology (BTO) indicated that the Willow Tit's population declined by 79% between 1995 and 2010. BTO research also concluded that the species' breeding range declined by 50% in the twenty years between the 1988-1991 breeding atlas and the 2008-2011 atlas. Most of the range contraction was in the south and east of Britain but there are also losses further north.

There has been a decline in numbers at Thorpe Marsh but until 2019 this was not on the drastic scale that afflicts Britain as a whole. Annual maximum counts from 1980 onwards indicate that Willow Tit numbers were higher in the 1980s and very early 1990s than from 1993 onwards. There seemed to be a further slight downward trend from 2013 to 2016 but 2017 and 2018 seemed more promising. The bird-ringing returns have also declined from 2012 onwards which backs up the indications from the maximum counts but at least the species was still here and breeding into 2018.

The BTO bird ringer, Ken Pearson, colour-ringed 5 birds during 2018. Judging from colour-ringed and non-colour-ringed Willow Tits that we saw, there were at least 8 individuals on the reserve during 2018.

However, events in 2019 tell a worrying story. There were nineteen reports of 1 or 2 birds up to 16th April and three reports of singles from 25th July to 1st August but there have been no nature reserve sightings since.

Willow Tits at Thorpe Marsh often have a quiet period during summer when there are no

sightings from May to June or July. This is presumably when they were nesting and rearing young. However, to see no Willow Tits from early August 2019 to February 2020 raises the likelihood that we have lost them from the reserve.

Willow Tit - note its dull black cap. Photographed at Kiveton Park on a Doncaster Naturalists excursion in 2016. *P. Simmons*

One can hope that this is only temporary and that they may re-colonise from nearby but Willow Tits are known to be sedentary and there is a strong possibility that Thorpe Marsh has become another victim of the contraction in this species' range. One cause for optimism is that in January and February 2020 Ken Pearson caught two Willow Tits at Marsh Lane, about a mile east of the reserve. One of these, incidentally, was one that he had colour-ringed at Marsh Lane in 2018.

As for what may have caused the disappearance of Willow Tits, one can only speculate. Habitat change may be a factor but Thorpe Marsh has had no discernible change in the wet scrub and woodland habitat that Willow Tits need for feeding, and the wardens leave standing dead wood needed for birds to excavate nest holes. Maxwell (2002, 2003), quoted in *Bird Atlas 2007-2011*, suggests that competition for nest sites with more dominant tit species may drive local Willow Tit declines. Blue Tits and Great Tits are certainly doing well at Thorpe Marsh but BTO states that there is only weak evidence that this may be a factor.

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Flamingo Moss in the Don Valley – a 2019 update

Steven Heathcote

The Flamingo Moss *Tortula cernua* (syn. *Desmatodon cernuus*) is one of the rarest moss species occurring in the Doncaster area. The early history of the species from it's discovery in 1909 through to efforts to save the species from a landfill proposal by DMBC are given in Howes (1992). Following this there was renewed interest when funding enabled Plantlife, through the 'Back from the Brink' project, to commission a series of monitoring and research contracts between 2000 and 2006, culminating in a 'species dossier' published in 2008 (Hodgetts 2008). Since then there appears to have been only occasional records from the Doncaster Naturalists Society (Louise Hill, pers. comm.), with little other interest.

Flamingo Moss rosettes (left) and capsules (right). The bent capsule 'stalks' give the species its common name. *S. Heathcote*

Flamingo Moss is a very rare species in the UK, currently listed as 'Endangered' on the British Red List and protected on Schedule 8 of the Wildlife and Countryside Act. The only post-1950 sites are Magnesian Limestone quarries in South Yorkshire, Nottinghamshire and Derbyshire. The species temporarily appeared in Cheshire but was quickly lost again. In the UK it only grows on the waste from lime kilns which burnt Magnesian Limestone, and specifically the powdery material left over from the crushing, drying and heating process. This material has a high pH (8-9) and contains very high levels of magnesium, and a high magnesium:calcium ratio which limits the update of potassium (Headley 2006). The material is therefore toxic to most plants, but not Flamingo Moss, which can grow without competition.

In the winter of 2018/2019, I visited all the sites in the Don Valley listed in the Species Dossier on one visit in the company of Tom Blockeel, who had visited all the populations between 2000 and 2006. We re-found the species in only three of the six locations, all in the Levitt Hagg part of the valley (Heathcote & Blockeel 2019). We failed to re-find the species around Conisborough Viaduct and in Nearcliffe Quarry. Tom also confirmed the continuing growth of Sycamore, a threat to the species highlighted in Howes (1992). Details of our findings and comparative photos between the two years were published in an article in Field Bryology (Heathcote & Blockeel 2019). Since this is only available to BBS members, but of local interest in the Doncaster region I thought it worth repeating the story here. Copies of the Field Bryology article can be provided on request.

The current situation appears to be a continuing steady decline for Flamingo Moss, and it is likely to be listed as Critically Endangered on the next British Red List for Mosses (Des Callaghan, pers. comm.). It seems that some simple, practical conservation work is once again needed to cut back scrub, and perhaps re-expose some of the substrate which has become buried under a layer of leaf litter and other organic matter. This will hopefully provide the species with an opportunity to increase populations back towards former levels and hopefully all the species to survive another 100 years in the Don Valley!

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Butterflies of the Went Valley – changes since 1991

Paul Simmons

This artilce is based on some of the information in Ted Rimington's booklet *Butterflies of the Doncaster District*, printed in 1992. He gives himself licence to go slightly beyond the political bounds of the Metropolitan District to cover, amongst other areas, the Went Valley, principally the section cutting through the Magnesian Limestone between Wentbridge and Kirk Smeaton. In a table on p14 he lists 27 species which have records in the Went Valley from 1880 to 1991. This paper concentrates on the major changes in UK distribution which have affected the butterflies which are found in the Went Valley and the Doncaster District as a whole since 1991.

Of the 27 butterflies he lists, all bar two (Grizzled Skipper and Wall) are still present, though two (Clouded Yellow and Painted Lady) are irregular immigrants from the continent. Two others, Dingy Skipper and Small Heath, probably only breed occasionally in the valley.

5 new species now occur regularly – Essex Skipper, Brown Argus, Purple Hairstreak, Dark Green Fritillary and Silver-washed Fritillary. The first two of these are new to the Doncaster District since 1991. Purple Hairstreak probably did breed before 1991, but was not reported as it is a difficult butterfly to see. The fritillaries had been reported in the past but disappeared from their more northern haunts around 1960.

Species lost from Brockadale and the Went Valley.

57.002 Grizzled Skipper. Rimington includes Grizzled Skipper because it had been seen in the Went Valley in the mid 1950s. However he describes the Doncater area status in 1991 as 'probably extinct'. Its distribution is now distinctly southern, with its most northerly site near Nottingham.

59.002 Wall. This butterfly has shown a marked range contraction over tha last 20 years, and there were no records in VC63 east of the Pennine foothills in 2018 (Relf, 2018). This compares to a good general spread of records from this vice-county in 2005 (Frost, 2006). Wall butterflies have never been common in Brockadale, and between 2007 and 2013 only 16 individual were counted in total. However, none have been seen since 2013. The reasons for its decline are not clear, though one suggestion is that as the climate has warmed, it tries to have a third brood in August only for the caterpillars to succumb to the cooler and wetter weather in the autumn.

Those species which are only occasionally seen:

57.001 Dingy Skipper. Whilst this butterfly apparently has a preference for limestone sites and its main foodplant is Bird's-foot-trefoil, it has been very scarce in this area over the last 15 years. There have been only 2 reports from Brockadale in that period. One of these was in 2019 when the species was also seen on nearby Wenthillside (Les Driffield pers. comm.). The butterfly was found in 27 tetrads in VC63 in 2018 (Relf, 2018), compared to 15 in 2005 (Frost, 2006). In both years the majority of records appear to be on the Magnesian Limestone ridge, so it is unclear why we do not regularly have this species in the Went Valley.

59.005 Small Heath. Whilst this is regarded as a widespread butterfly, its food plants are not limestone-dependent, so it tends to be a species of moors, heaths and general rough ground. It is occasionally seen not far from the Went Valley, but only on rare occasions does it actually reach it. 2019 was an a example of this as individuals were seen in Brockadale and on Wenthillside (Les Driffield pers. comm.). Rimington (1992) also reported that it was rarely seen in numbers on the limestone.

New arrivals since 1992:

57.005 Essex Skipper. This species arrived in the Doncaster area in 1996 and has gradually moved north, reaching Brockadale in 2015 and gradually increasing in numbers since then. It was at least as numerous as Small Skipper in 2019, and it will be interesting to see what the normal ratio between the two species will be once it settles into all the grassland habitats of the valley. It appears to be spreading northwards as a response to a warming climate, and individuals have been seen in County Durham.

59.017 Silver-washed Fritillary. This butterfly was declared extinct in Yorkshire in 1971 by C.I. Rutherford because it had not been seen since 1941 (Rutherford, 1971; YNU Lepidoptera Committee, 1970). Rimington (1992) noted that it was found exclusively south of a line between North Wales and the Thames Estuary. However during the 2000s there were occasional

sightings in the county and these became a steady stream by 2018. A national northward movement had been noted, again probably due to climate change. The first individuals were recorded in Brockadale in 2017 and 2018 and in 2019 singletons were seen on 3 days with 2 (a pair?) seen on 13th August.

59.019 Dark Green Fritillary. Rimington (1992) reports that this butterfly was seen quite regularly in the Went Valley in the 1940s, and reports that J.H.Seago had seen it there into the 1960s. However it then appeared to retreat southwards and was not seen here again until 2010, when 6 individuals were seen in Brockadale. Numbers increased steadily and now there are normally between 100 and 200 records per year (though 2014 was much lower than this). Brockadale is rich in its larval food plants (Violets), and has a mosaic of woodland and grassland habitats which appear to suit this butterfly.

61.004 Purple Hairstreak. This enigmatic butterfly was once reported (in 1846 by J.W.Dunning) as "The commonest of any hairstreaks – in every Oak wood" (Rimington, 1992). Rimington could only find 6 records, all between the 1830s and 1910 and after this it seems to have become extinct. He and others searched in apparently suitable places in the Doncaster area and failed to find it (Rimington, 1991). However by 2004 it was found widely in VC63 and by 2005 showed a particular concentration in the Doncaster district (Frost 2006). It was recorded on the Went Hills near Wentbridge by Mike Lockwood in 2005 (Frost, 2006) and in Brockadale in 2007, and then in most years since 2013, though in small numbers. This butterfly is one of the most difficult of all our butterflies to find. It spends most of its adult life at the tops of oak trees, and is best searched for with binoculars. The photo shows a female egg-laying on a Brockadale oak tree.

61.015 Brown Argus. Rimington makes no mention of this species which was probably heading towards Doncaster when he wrote his account. It was an early beneficiary of global warming, and arrived in the south of the county in the 1990s, and was well established in the Doncaster District by 2004 (Frost, 2004). I first recorded it in Brockadale in the same year and it has bred in each year since, though not in great numbers. It has continued to move north, and is now found throughout the county.

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The asexual generation of the gall wasp *Andricus quercuscalicis*

Nora Boyle

In September 2019, whilst I was recording the presence of galls in Sandal Park, Doncaster, I came across an oak tree bearing several different galls, including those caused by the cynipid wasp *Andricus quercuscalicis* which are known as Knopper galls. Until that time I was only focused on recording and hadn't thought very much about the gall causer. However, having removed a few specimens from the tree to photograph I wondered what I would find inside and decided to open one. The revelation of discovering that the gall causers were there inside a small egg-like inner gall prompted me to open several others over a period of about two months and record the results in quite a lot of detail, including photographs and observations through a microscope. What follows is a shortened version of my study.

The sexual female cynipid wasp, *Andricus quercuscalicis*, having left a gall on a male Turkey Oak *Quercus cerris* catkin, mates and flies to either English Oak *Quercus robur* or the hybrid between *Quercus robur* and Pedunculate Oak *Quercus petrea* where she lays her eggs in fertilised flower buds. When the eggs hatch the feeding of the larva initiates the development of Knopper galls. The fully developed gall consists of an inner gall in which the larva lives, feeds and eventually matures into an adult asexual female wasp, an air space or chamber and a woody, thick walled outer gall. In Figure 1 below, taken early in September, of a fallen Knopper gall cut into two, you can see the inner gall at the base of the air space. Figure 2 shows the groove in which the inner gall rests and a clearer view of the central chamber or air space, with the apical vent from which the adult wasp emerges, having chewed its way out of the inner gall. The position of the inner gall is always off-centre making it more difficult for parasitoids to lay their eggs in the developing larva via the vent.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 3 (above) shows an inner gall removed from the outer with its position of attachment on the left. Figure 4 shows a larva out of the gall with the only pigmentation being its tiny brown mandibles and two other tiny brown structures just outwards and above the mandibles.

Later, towards the end of September, I opened several other galls which contained wasps at varying stages of development. The first is a pupa with clearly defined eyes, legs and antennae which move slightly (are exarate) but still pale like the body of the larva (see Figure 5) In Figure 6 further differentiation has taken place, pigmentation is starting to occur, the head is hypognathous (with a vertical orientation) and the thorax has the typical hunchback appearance.

Figure 5

Figure 6

No doubt there are several stages between this and a mature wasp but the next one I observed, on October 6th 2019, was the one in Figure 7 below left, where the wasp is almost mature but still retains some pupal skin and the wings are jellylike and paddle shaped. At this stage you can see the ovipositor projecting slightly from the gaster, the ventral spine of hypopygium just above the ovipositor. Under the microscope you can see the individual segments of the antennae clearly enough to count. Being an asexual female there are 14 segments or flagellomeres. The compound eyes are developed sufficiently to see the individual ommatidia and the mandibles and palps can be seen in action. The body is covered in hair-like setae which perform different functions according to their location.The folded wings then elongate until they extend past the end of the gaster as you can see in Figure 8.

Figure 7

Figure 8

Within a day the extended jelly-like wing transformed into the mature flight wing. Unfortunately I didn't observe the stages between. Most surprisingly is the latter stage where the wings are fully formed within the gall despite being several mms longer than the wasp's body and of course the inner gall. In normal circumstances the adult (seen in Figure 9 and photographed by David Bryan on 18th October 2019) emerges from the inner gall after pupation using its strong mandibles to chew a way out of the woody shell.

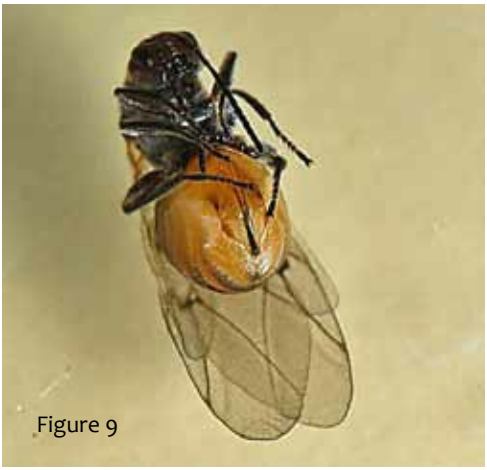

Figure 9

It then overwinters in the central chamber before wriggling out of the apical vent in the spring. The emerging wasps from these asexual galls which are all female fly off to a Turkey Oak where they lay eggs in the male catkins. This leads to the sexual generation. The wasps which emerge from the sexual galls are both male and female. Upon mating, the males expire and the females fly to Common Oaks where they inject their eggs into the developing buds to form new Knopper galls. Usually the gall becomes visible 1-6 weeks after the egg has been laid. In late August and early September many of the galls fall to the ground before the viable acorns and overwinter in the litter.

Figure 10

Figure 11

Most asexual females emerge the following February about nine months after the initiation of the gall, fly to a Turkey Oak and the cycle begins again. However some of the females remain in their Knoppers for one or two years on an extended diapause. The mature wasps only live for a few weeks and don't feed. When the Knopper gall is fully developed it is attached to the cupula or acorn by a short concealed stalk. Should the acorn develop fully in the cup with the gall attached to the side its viability isn't compromised. The photographs below show an example. Figure 10 shows an acorn with a Knopper gall attached to its side, Figure 11 shows the two separated, the attachment point on the acorn and the stalk on the gall and Figure 12 shows the acorn cut in two showing no apparent damage to the acorn itself.

Figure 12

Figure 13

However, on other occasions, the acorn is completely overgrown and aborted. This arrangement is shown in the last photograph (Figure 13) where you can just see the acorn cup at the base of the gall. Despite the high incidence of Knopper galls in some years there has always been sufficient viable acorns to guarantee survival of the oaks on which they develop.

Glossary

gaster - the functional abdomen in this group of gall wasps (Apocrita) which is composed of a series of overlapping plates called tergites. (The first segment of the abdomen called the

propodeum is fused to the thorax).
ventral spine of the hypopygium - a modified 9th abdominal segment with which the copulatory apparatus is associated, the shape and length of which is used in the identification of species of Andricus.

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Doncaster's mayoral bog-oak chair: A seat flushed with civic pride

Colin A. Howes

"The Doncaster Mayor, he sits on his chair,
His Mills they merrily go;
His nose doth shine with drinking wine,
And the gout is in his great toe."
Junius Redivivus in *The Tatler* magazine.

Doncaster Mansion House: The Mayor's Parlour
In describing the contents of Doncaster's celebrated Mansion House, C.H. Theobald, the Hon Doncaster Archivist (1946-1949) remarked that the Mayor's Parlour "*... is comfortably furnished for its purpose and contains several objects of local interest. Among these is an armchair of bog oak, made by a local craftsman from material estimated to be 2,000 years old taken from the bed of the river Don in 1848. It was presented to the corporation as a memento of the accession of Edward VII in 1901 by William Chadwick who was then living at Arksey Hall*".

These brief remarks open the door on a fascinating range of associated topics which deserve further exploration.

Figure 1: The Mayor's Bog Oak Chair on display in Doncaster Museum 6.xii.2004.
Photo: Mark Lomas

Doncaster's remarkable Bog Oaks

One of the largest oaks ever found in Britain was a colossal Bronze Age specimen located in 1701 under the peat at the southern tip of Thorne Moors. The Rev. Abraham de la Pryme, writing to the Royal Society in 1701 records that his friend Edward Canby had found within his peat moors the solid trunk of an oak which measured 120ft in length with girth measurements of 36 ft. at its basal end, 30ft. in the middle and 18ft at the top where the trunk was broken off. The complete height was estimated to have been in the region of 240ft. Mr Canby was offered the then considerable sum of £20 for the timber.

The Victorian Rustic Garden Furniture Craze

During the 19th century the masses of blackened and contorted roots of oak and pine, ploughed from beneath warpland land across the Hatfield Chase, the Torne and Idle valleys and land adjacent to the peat moors of Thorne and Hatfield, formed the basis of a local industry. This unique and ready-preserved resource became the raw material for the Victorian craze for ornate rustic fencing, garden furniture, summer houses and hunting lodges. Local examples were the pavilion in Sandall Beat, the fencing in Beechfield Park and the Summer house at Brodsworth Hall. Little did customers realise that the material of this ephemeral fashion-statement was thousands of years old and held (in the sub-fossil beetle remains within it) the secrets of what we now know to be evidence of environmental and climate change.

The hugely laborious work of searching for and excavating this wood was a wretched winter activity, the 19th century local historian John Brown noting that in the Idle Valley, this supported several families in his home village of Misson (Limbert, 1998). The Rev. Francis Orpen Morris, the prolific natural history author of the mid 19th century (the David Attenborough of his time), visited the Hatfield Chase in 1835-36 while resident in Doncaster. He wrote "I have travelled much both in England and Ireland, but never did I before behold so strange and anomalous a region." Morris (1836). Of the village of Wroot he commented that "It is probable the village was originally partly built with these roots" Morris (loc.sit.) reporting that "extensive fences are made of this material both in the open field and in the village.

Dating the Oaks

In recent years Dr Peter Skidmore of Doncaster Museum and Professor Paul Buckland and his student Dr Gretel Boswijk from Sheffield University, working on bog oaks from near Askern, Thorne Moors and Hatfield Moors have shown these ancient arboreal monsters to be much older than local tradition claimed.

The Askern oak from Norton Common Farm (SE565155) near a former meander of the river Went, was judged from its sub-fossil insect associates to be late Bronze Age in date (Skidmore, 1971). The populations of bog oaks from under the peat of Thorne Moors were dated by dendrochronology (tree ring dating) to have lived from 3,800 to 300 years BC., and a single bog oak from beneath Tyram Hall fishing lakes (SE6805) on the edge of Hatfield Moors, also dated by dendrochronology lived for at least 195 years from 3,613 BC to 3,418 years BC (Boswijk, 2003).

Location of the Arksey bog oak timbers

Of the commentators referring to the site where the timber for the bog oak chair was found, the Doncaster Gazette (1851) notes "... it was found at a considerable depth" during the engineering works "in making the new outfall drain in connection with the river Don near Doncaster in 1848". Virtue (1851) notes the timbers "... were found below the floor of

the river Dun outfall drain then being dug at Arksey, near Doncaster…" Theobald's (1940s) version had the oak tree found when excavating for the Flood Drain at Arksey, and variants in Mansion House guide books were that the bog oak had been taken from the river Don in 1848 (Dolby, 1978) or that the oak timber had been "preserved in a peat bog near the river Don" (Dolby 1990).

According to the 1854 6 inch to 1 mile scale Ordnance Survey map sheet 277 surveyed in 1849-50, the nearest ditch to Arksey which seemed to connect due south to the Don is the Fleet Drain, however it seemed very minor and was probably too insignificant to have necessitated the engineering work that unearthed such substantial bog-oak timbers.

In explaining why local [Arksey] oaks came to be submerged in waterlogged conditions, the Doncaster Gazette correspondent (11 April 1851: p.4) described "The nature of the ground was at one period an immense swamp entirely covered with water and frequently [subject] to inundation of the most fearful character". However, the drainage components of Bentley-with-Arksey Enclosure Awards of 1759 (958 acres) and 1830 (1555 acres), and the activities of the Dun Drainage Commissioners progressively rendered the naturally wetland landscape passable and suitable for agriculture.

The hinterland of Arksey consists of The Bentley and Arksey Commons and adjacent low-lying Carrs and Ings. which according to the 1864 map, were drained from west to east by three roughly parallel series of drains. The northern series included the Cockshaw Drain which flowed into the Smallholme and Tilts Drain which in turn joined the Norwood Drain.


THE INDUSTRY OF ALL NATIONS

Figure 2: Illustration of the Arksey Bog Oak Chair in the Great Exhibition Catalogue (Virtue 1851).

The central component consisted of the Bentley and Arksey Common Drain, and the southern series consisted of the Bently Mill Goit which joined the Bentley Ings and Dock Hill Drain. These three series fed into the major eastward flowing Fur [Far] Water Drain which on rounding the northern perimeter of a parcel of land called Grumble Hurst, became the Grumble Hurst Drain or Arnold Goit which finally discharged its collected waters to the river Don at the engineered tidal floodgate near the now demolished Thwaite House Farm (SE607081). It is presumably at this point, some two miles E.N.E. from Arksey Hall, where the bog oak timber was unearthed.

Description of the Bog Oak timbers

The Doncaster Gazette correspondent (1851) noted "when the tree was discovered it measured three feet six inches in diameter and had many of its branches still adhering to it". Virtue (1851) no doubt referring to documentation accompanying the chair when submitted to the Great Exhibition, records "two oak trees, measuring together two hundred feet of timber", a quotation followed by Gilbert (1988).

The Chadwick connection

William Chadwick snr, born in Leeds in 1804 and his wife Hannah Batley, born in Hipperhome in 1808, moved to Arksey in 1839 taking over the squirearchy of the parish (Vainlo, 2012). The census return of 1851 has William 47 years of age as head of the household his occupation described as Gentleman and Land Proprietor. According to Virtue (1851) it was evidently William snr. who in about 1848 acquired the bog oak timber and commissioned George Collinson to create the chair. The chair evidently remained at Arksey Hall until 1901 when his son William Chadwick jnr. presented it to the County Borough of Doncaster to commemorate Edward VII ascending the throne (Theobald 1940s). An inscribed brass plaque attached to the rear of the chair back, briefly records the donation and repeats the claim that "This chair is made out of oak trees found in 1848 when excavating for the flood drain at Arksey. The trees were supposed to have been buried upwards of 2,000 years …" Ironically it omits any mention of the all-important involvement of George Collinson, cabinetmaker, possibly too lowly a workman to be mentioned in such lofty circles as at the Mansion House.

George Collinson's Bog Oak Chair

Squire William Chadwick of Arksey Hall who in 1848 had acquired the cache of bog oak timber, evidently commissioned the newly arrived Collinson to create a chair from this remarkable blackened sub-fossil timber, a material notoriously difficult to work. The result was the creation of a unique masterpiece worthy of exhibiting at the Great Exhibition in London's Cristal Palace. In April 1851 the correspondent from the Doncaster Gazette visited the completed piece prior to its dispatch to London, reporting as follows "We have been very much gratified by the inspection of a large Hall or Library Chair carved to represent oak branches, leaves etc." …. "It is from the manufactory of Mr. Collinson, cabinet maker and upholsterer, High Street. The chief characteristic of the unique piece of workmanship is to exhibit the foliage and fruit of the oak in all their varied beauty. The leaves, the branches, and the acorns are admirably produced; and so intermingled as to form a correct representation of a tree so famous in the annals of this country. Though embedded in the earth for hundreds of years, it was still found to possess soundness and firmness in the trunk. Its sombre character combined with the design of the artist contributes to give it an inclement aspect. The Doncaster Arms are tastefully carved in the centre of the back, which is four feet eight inches high. The work is well executed and some portions of it are perfect both in taste and judgement … we can only say with the greatest confidence the work is highly creditable to the taste, the judgement, and execution of Mr. Collinson".

Gilbert (1988) considered Collinson's work to be "… an unforgettable example of extravagantly picturesque Victorian furniture … the chair is a piece of exhibition furniture par excellence being highly rated not only for the naturalistic ornament but because bog oak was notoriously hard to carve". In the two full colour guidebooks on Doncaster Mansion House, the bog oak chair is illustrated by a magnificent portrait photograph by Eddy Dixon of the local design firm Dixon, Colcutt & Weston.

Mysteries still to be unravelled

George Collinson who crafted the chair in the first place, is largely unrecognised by connoisseurs of fine furniture, apart from Gloag (1964) and Gilbert (1988). Who was he, what else did he make; did he benefit from prestigious commissions following exhibiting at the Great Exhibition; which houses of note if any purchased his work and do any of his pieces still survive?

Without the advantage of the dating methods mentioned above, the Gazette correspondent (1851) and most contemporary and subsequent commentators regarded the timbers as having been in a state of sub-fossilisation for some 2,000 years, though how this estimate was deduced is not stated. Since other local examples of bog oak have proved to be two to three times older, it would be fascinating to finalise the story by subjecting the Mayor's Bog Oak Chair to dendrochronological examination.

Not widely known

Although familiar to aficionados of Doncaster's Civic history, the chair seems to be little known outside these circles. A letter to the editor of the Country Life magazine in 1984 from a Mrs. E. Percy of London W12 enquired about an illustration of a chair found among her family papers. On the back of the illustration was written 'William Chadwick's Chair', Mrs Pearcy making the enquiry because her grandmother's maiden name was Chadwick and the family had come from Yorkshire. The editor was able to identify the illustration as the Bog Oak chair from the Great Exhibition catalogue but concluded "what became of the chair is not known" [!].

Flushed with civic pride

For almost a century the chair resided in the Mayor's parlour at the Mansion house, becoming a much cherished bauble of civic paraphernalia, well known to generations of elected members. Then during the 1990s the chair went on display as a centrepiece in the Heritage Lottery funded displays at Doncaster Museum but was briefly returned to the Mansion House through Mayoral dictate (Barton, 2004; Doncaster Star 7.xii.2004). It is currently back on public show at Doncaster Museum.

The chair's description in the Doncaster Gazette of April 1851 states that "it is not polished" thus rendering it "more in keeping with great antiquity". Today it is highly polished, the seat no doubt worshipfully burnished by successive Mayoral bottoms. Perhaps if Thomas Crapper of Thorne, celebrated inventor of the flush toilet, had used this local material for his toilet seats, the timber could indeed have been referred to as Bog Oak!

Acknowledgements

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Breeding Birds along the New Junction Canal - 12 years of records

Joyce Simmons

In 2014 edition of The Doncaster Naturalist I described the Waterways Breeding Birds Survey which Paul and I undertake each year for the British Trust for Ornithology. We have continued the research to the present, and so now have 12 years of data.

Our study area is along the length of the New Junction Canal from Braithwaite north for 4km to Sykehouse Lock. We record all birds encountered, by sight or sound, during 2 visits between April and June, starting around 6am. Over the years we have recorded 82 species, some only once. The habitat is quite stable, with occasional pruning of the high hedges beside the canal, and even less frequent clearing of the ditches. On both sides of the waterway there are grazing meadows and some arable fields surrounded by hedges and with some mature trees beyond the scrubby area beside the canal. Breeding populations of birds also seem to be mostly stable.

The 2 visits yield different species. Tits (Blue, Great, Coal and Long-tailed) are vocal and visible early in the season, but are very discreet in late spring when they their young are in the nest or fledged. Their frequencies have not changed over the study period. Summer migrants are more abundant and observable during the later visit. House Martins and Swallows are present around the few houses and farms along the route. Warblers (Willow Warbler, Chiffchaff, Blackcap, Whitethroat (below left) and Lesser Whitethroat (below right)) are common, but Garden, Sedge, Grasshopper and Cetti's Warblers are only rarely present.

Common breeding birds of the Doncaster area are common here too, and their numbers are pretty stable. Song Thrushes and Robins have increased in the last few years but Yellowhammers and Starlings seem to have declined. Raptors (Buzzard, Kestrel, Sparrowhawk) are generally around, though probably breeding in the hedges and trees around the meadows. Similarly, we hear and rarely see Curlew and Lapwing but can hear them calling in surrounding fields.

Cuckoos have always been present along our walk, and we listen anxiously for them each

year. Until now they seem to be with us in usual numbers, around 3 calling males and a female or 2 are usually heard and seen. We also have listened and sought anxiously for Turtle Doves, which peaked at 5 in 2009. In 2013 we saw 3, but not a single one since then. We will continue to look and listen, but hope is now quite thin. We are also sad to have apparently lost Meadow Pipits, which were present in small numbers, but were last seen in 2016. Maybe we have just missed them. We live in hope!

Some birds use the north-south orientation of the canal to navigate their migration northwards. For instance, an Osprey (below) headed north in April 2019, as did a Hobby (2013) and a flock of 40 Golden Plovers (2019).

New birds for 2019 were a Peacock, an escapee which seems to have settled into a wild life, and a Little Egret, which is not surprising as they are so abundant now around all water courses.

It is cheering that the bird populations here are so stable, when farmland birds are in such trouble nationally. We will continue our monitoring, and hope that the future here is bright. The full list of species we have recorded is on the Doncaster Naturalists' Society website.

From Finningley Churchyard

Tricia Haigh

The Churchyard in Spring

The wonderful thing about conserving our churchyard is that it is always changing. After the bulbs and early spring flowers are over other plants such as Honesty, Garlic Mustard and Bluebells come into flower in little colonies here and there. This is when we get the first of our butterflies visiting the churchyard, the beautiful Brimstone, its soft-yellow wings contrasting perfectly with the purple Honesty flowers as it feeds. At this time too the meadow areas become dotted with yellow as Dandelions open their bright cheerful flowers everywhere, an excellent source of nectar for bees and other insects. Another yellow flower, the Bulbous Buttercup, with its small flowers that glow a rich golden-yellow in the spring sunshine and is the first of our buttercups to flower, rapidly follows on. By now various white butterflies begin to appear flitting above the meadows, constantly on the move.
The spring meadow undertakes it greatest change now, its grasses and plants growing apace

and coming into flower. In the damper areas pale pink Lady's Smock appear dotted among the grasses, their delicate flowers visited by Orange Tip butterflies drinking their fill of nectar. In more open areas the dark brown flower heads of Plantains and rust-red spikes of Sorrel contrast well with the Buttercups against the fresh green background of grasses, in particular Sweet Vernal Grass, creating a living tapestry. Then as the meadow comes to maturity the flowers take on a darker hue and the grasses ripen to a soft gold, a sight to behold when lit by late evening sunshine on a beautiful June evening.

The Summer Meadow

As spring moves into summer the spring meadow grasses and flowers have seeded and been cut down. In the summer meadow drifts of Ox-eye Daisies stand out, bright white amongst the soft summer meadow grasses and beneath them the frothy sulphur yellow flower spikes of Lady's Bedstraw, a flower of hay meadows that was traditionally used to stuff mattresses providing a pleasant scent when dried. As these plants too begin to go to seed the summer meadow grasses are now ripening, their flower heads taking on a softer pale golden colour providing a background against which the mauve flowers of the Field Scabious and the deeper purple Knapweed flowers stand out. The grasses become supports too for the Field Bindweed that spirals its way up their stems, its candy striped flowers opening wide to receive any passing insect seeking sustenance. As July moves into August the delicate blue Harebells will be seen nodding their heads among the taller grasses alongside Yarrow with its white flower heads held on sturdy stems above its softer feathery foliage. One small clump of Rosebay Willowherb grows at the back of the summer meadow, its flower spikes standing tall and stately above the grasses.

Throughout the summer months the summer meadow attracts a variety of insects from the tiniest beetles to some of our most colourful butterflies. It is alive with the sound of grasshoppers and the movement of insects intent on finding food, none more striking than dragonflies displaying amazing agility as they dart over the meadow grasses in search of their prey.

To introduce or not to introduce?

Over the years that we have been managing our churchyard to benefit wildlife this question has from time to time been one to ponder. Should we introduce species or should we simply manage the churchyard to make the best of what we already have?

We decided at the outset that we would introduce some species, but in doing so we have always kept a record of what has been introduced and where, and generally we have tried to ensure that we only introduce plants that grow naturally in our area.

Following our first year when we allowed everything to grow in order to find out what we had in the churchyard, we decided that we would introduce some plants. These first introductions were not small ones. They were, in fact, trees and shrubs. The only trees in our churchyard at that point were 2 tall Ash trees that grew so close to each other that they could be one and a number of Hollies, most of which were introduced themselves by birds, and all of them growing in one area of the churchyard. So we decided to carefully introduce a few smaller trees such as Rowan, Silver Birch (into an uninteresting corner of the churchyard) and a native crab apple. We also introduced shrubs such as Dog Rose, Guelder Rose, Buddleia and Cotoneaster. These last two, although not native, we felt would provide a useful food source and habitat for insects, birds and small mammals. Most of these we planted close to the boundary walls so that as they grew and thickened up they would create better cover for wildlife. To help with this we leave the long grasses uncut around them when we undertake the annual autumn "cut". They also provide a suitable habitat for nest sites in the spring. One other tree that we planted on the edge of our summer meadow was Bird Cherry, *Prunus padus*. Sadly not long after it was planted someone decide to try to break it in half. However, fortunately, one of our churchwardens was in church at the time and was able to bind the tree back together. Amazingly it survived this and is now one of our prettiest trees when covered in blossom in May.

A few years later we introduced some herbaceous plants and bulbs. Many of these were introduced into areas of least botanical interest within the churchyard. In the case of bulbs and early spring flowers, we decided to plant some Wild Daffodils, Primroses and Cowslips to give early colour and interest in the spring meadow areas before the Buttercups and Sorrel, Lady's Smock and Germander Speedwell that grow naturally there took over the show.

Have we been vindicated in taking these decisions? I feel that we have. We have achieved what we set out to do in providing more interest in those areas where initially there was little, but we have also provided an early source of nectar with the spring plantings bringing in more insects which in themselves provide more food for the birds to feed on. At the opposite end of the year the trees and shrubs that we planted provide not only cover but food by means of their fruits and berries.

Not everything that we have planted has survived but some of our introductions have begun to self-propagate. Whilst the Daffodils and Primroses have increased and spread over the years the Cowslips didn't do so well, but although we appear to have lost all that were originally planted a single Cowslip will suddenly appear where there were none the year before.

In the summer meadow we introduced a single Field Scabious plant, which has flourished and attracts bees, butterflies and moths throughout the weeks that it remains in flower. However it has never provided any seedlings and any others we introduced have failed to thrive. But several seedling Meadow Cranesbills that were planted nearby did survive and can be seen

each year along with one or two new seedlings but of these plants we rarely see flowers on more than two or three of them in any one season. By contrast the Ox-eye Daisy, Common Knapweed and many others that were present when the initial survey was carried out, have since multiplied and flower throughout the summer meadow year in, year out.

In general it seems that nature will decide for itself what should or should not grow in our churchyard. However we have made one mistake in the plant introductions that we have made. After the Silver Birch trees became established we felt that the area would be further enhanced by the introduction of Bluebells and Greater Stitchwort, two plants that grow well together in the woodland setting. We asked if anyone had any Bluebells that they could offer to us, not thinking that we would receive the non-native Spanish Bluebells. Sadly these are the ones that grow and flower so well here and in some other parts of the churchyard now. I rue the day we made that request but they do look well in flower alongside the starry Stitchwort flowers beneath the Silver Birch trees each spring.

One of the early introductions that surprised us was one of the native roses that we initially purchased as a Field Rose, but which turned out to be a Sweetbriar (Shakespeare's Eglantine Rose), that gives us the scent of apples especially after a spring shower. However in 2014 John Scott of the "Nats" kindly offered us a Field Rose, which seems to be establishing well.

Sweetbriar *Rosa rubiginosa*

Fungi at Finningley churchyard

Kevin Gilfedder

Finningley churchyard has been managed for conservation for a number of years now and I have made several visits in the past for purposes of fungal recording.

Unlike a lot of cemeteries, which are mown and maintained as amenity grassland, Finningley has a range of useful habitats - both short and long grass, with a variety of wild plants, various compost heaps and piles of mowings, some trees and shrubs, and a fair amount of dead wood, all providing plenty of habitat for a variety of fungi.

2019 was a particularly good year for fungi, with a lot of long rainy periods interspersed with nice warm sunny spells, ideal from quite early in the season. A lot of species which I had hardly seen for years occurred in profusion e.g. in Longshaw in the Peak District there were so many False Chanterelles that I could barely step between them. This is a fungus which had been regarded as very common in the early 1980s but which I thought had become increasingly scarce recently, to the extent that some years I had not seen any at all. Interestingly, some others which I would have expected to see were notable by their absence.

Tricia Haigh got in touch with me in mid October to say there were many exciting waxcaps in evidence at Finningley churchyard. I made 3 visits there that month, plus one in early November, the latter in the hope of finding earthtongues (Geoglossaceae) which often occur in the same habitat as waxcaps, but fruiting several weeks later. I had not seen any at Finningley, and did not see any this visit, though they are small and indistinct and very hard to find even where they do occur.


Parrot Waxcap
Hiram Wildgust

Indistinct the waxcaps are certainly not; they glow like jewels in the short grass, which is their preferred habitat. I had seen a number of these before on this site, but extra ones appeared this year, along with other groups characteristic of grassland such as fairy clubs (*Clavulinopsis* spp.) and pinkgills (*Entolomas*). Amongst these glorious little fungi were the bright yellow *Hygrocybe ceracea* and *H. chlorophana*, bright red *H.coccinea* and *H. miniata* and the lovely Parrot Waxcap *H. psittacina* in various shades of bright green. The commoner ones included both the pure white and the much less common pale ochre form of the Snowy Waxcap *H. virginea*, and the Blackening Waxcap *H. conica*, which changes from bright red to charcoal black through the season. Entolomas, very hard to identify in the field, definitely included *E. sericeum*, the commonest one on garden lawns, and *E. serrulatum*. These are much less colourful than the *Hygrocybes*, being shades of brown and blue-black, but are equally important indicators of old grassland. Another exciting brightly coloured specimen, this time in the longer grass along with some of the waxcaps, was *Stropharia cyanea/caerulea* - this starts off a beautiful clear pale blue, then fades to shades of blue-green and fawn with a slimy, shiny texture.

Amongst a number of mycorrhizal fungi associated with trees were various Poison Pies (*Hebeloma* spp, including, I think, *H. leucosarx*), a webcap (possibly *Cortinarius anomalus*), and the striking red and white Fly Agaric *Amanita muscaria* - in this case growing with Silver Birch, its most common tree associate.

The new cemetery, which being more recent and more tidily managed, where I expected to have less mycological interest, turned out to be equally interesting this season, with *Entolomas* and waxcaps, many *Mycenas* (including *M. pura* and *M. flavoalba*) and the beautiful and uncommon little *Calocybe carnea*, which is a wonderful shade of pale pink. Various puffballs were in evidence, and a number of tree related fungi such as Red-cracking Bolete *Boletus chrysenteron*, Oak Milkcap *Lactarius quietus*, Clouded Agaric *Clitocybe nebularis* and the Amethyst Deceiver *Laccaria amethystina*. These were mostly towards the rear of the cemetery, where there is some scrubby grassland and small trees, apparently in process of being cleared. A gap in the hedge leads to a track next to Robin Hood Airport which again

supports a number of fungi, including Puffballs and *Hebelomas*. This latter area was not extensively surveyed.

As well as fungi, one slime mould was seen in the churchyard, one of the few I can readily identify; this is one regularly seen coating grass stalks in the autumn with its sticky white gunge, often given the charmingly apt common name of "Dog's Vomit" - *Mucilago crustacea*.

Some 50+ species were identified, though some only to genus, a good number to be seen in the relatively small area of the churchyard and new cemetery. There were also a few seen in previous years that I did not come across on these recent visits.

I can provide a full species list if anyone wants to get in touch - lgilfedder06@aol.com

The Mystery of the Moorends Moose

C.A. Howes

On 17 March 1986 Margaret Hall, Head Teacher of Marshlands Middle School, Thorne, brought an Elk *Alces alces* skull with one attached and one detached antler to the museum, these objects being disposed of by the school. Ms Hall recalled that the specimens had been excavated from wasteland off Grange Road, Moorends by a couple of local lads (pupils at Marshlands Middle School) who had brought them to school for the 'nature table'. After housing the specimen for several years, they were offered for disposal to Doncaster Museum.

Some years later, Mr Paul Linley of Thorne brought his young son to the museum to see if the specimens were still in the collections. Evidently Paul had been one of the lads who had found the specimens. During his visit Mr Linley was able to explain to CAH the circumstances of the specimen's discovery and to approximately indicate where they had been found.

Figure 1: Elk skull and antlers on display in the 'Old and Middle Stone age' case at Doncaster Museum 1 March 2018. (*Photo: CAH*).

Two possible find locations were marked on a street map of Thorne Moorends. These were the plot of wasteland to the rear of Haig Road and Oakmoor Grove (OS Grid ref. SE699159) and the triangular back-plot of the houses on Northgate, The Fairway and Grange Road (Grid ref. SE696 158).

The story of the discovery was that the lads had found a piece of antler projecting above ground, commandeered trowels and other implements from local garden sheds and proceeded, over a period of time, to excavate the whole object. The skull and antlers were crudely cleaned up by scrubbing brush, possibly a wire brush and household scouring powders and exhibited for a time as a trophy (evidently nailed to the wall) in a local shed before being taken to Marshlands Middle School where they remained until 1986.

In 1998 an armature to support the skull and antlers was designed and constructed by 'RS' design contractors enabling the specimen to be placed on display in Doncaster Museum in the 'Old and Middle Stone age' case where it remains today (1 March 2018), see figure 1.

As far as the museum lab records reflect and as far as anyone can remember, although the specimen was brushed clean, it did not undergo any lab conservation treatment prior to display.

The early history of the specimen remains something of a conundrum though there are various tantalising possibilities. Since holes had been drilled in each antler and either side of the base of the skull, it is likely the specimen had at some stage been prepared for display as a trophy.

Was it an 18th or 19th century import? Since the Thorne area had close ties with the whaling industry, with at least two whalebone arches having been erected locally (Howes 2002), local shipping from Thorne or Hull may have visited Scandinavian ports and acquired the specimen as a curiosity. It could also have been brought back to the UK from Scandinavia or Canada as a hunting trophy.

Is it a relic of the now extinct post-glacial fauna of the Humberhead Levels? In this case it may have been found locally by peat or drainage diggers, temporarily displayed then eventually discarded? Since the Moorends specimen had been found on disturbed land in an urban context it is unlikely that further excavation will reveal additional material and the dating of sediments is unlikely to have any contextual relevance.

There have been at least eight discoveries of Elk remains from Yorkshire and adjacent areas, see Table 1 which provide a brief review of the circumstances of each record in order of discovery.

Of the sets of dating for Elk remains found in the Yorkshire region, two (Neasham in the Tees Valley and Cove Farm Quarry, Westwoodside) relate to the late Devensian during the Windermere interstadial over 11,500 BP and one (Starr Carr) relates to the Mesolithic period around 9,500 BP. Interestingly, dates for two specimens from Ireland, where Elk were supposed not to have successfully colonised, turned out to be very recent i.e. AD1940 indicating they had been discarded imported game trophies (Kitchener 2010). No attempt has yet been made to subject the Moorends specimen to ^{14}Carbon dating. Whatever the results, ancient or modern, it will throw an interesting light on the history of the Moorends Moose.

Table 1: Records of Elk from Yorkshire and adjacent areas in order of discovery.

Site	Grid ref.	Material	Age	Source	Note
Thorpe Hall Lake	TA1067	Antlers & unspecified bones	?	Tindall 1869	1
Carnaby	TA1465	Antler & part of skull	?	Tindall 1869; Reynolds 1934	2
Barmston Cliff	TA1759	Left shed antler	?	Sheppard 1920; Reynolds 1934	3
Costa Beck, Pickering	SE78	Unspecified	Early Iron Age	Duncombe 1899	4
Neasham	NZ340100	Most of skeleton	11.011 ± 230 to 11,561 ± 250 BP	Trechman 1939; Blackburn, 1952; Lister 1984	5
Flixton Carr	TA0280	Tooth	?	Moore 1951	6
Star Carr	TA028810	>77 fragments of at least 7 specimens	Mesolithic 9,500 ^{14} C yrs. BP	Fraser & King 1954	7
Cove Farm Quarry, Westwoodside	SK737008	rib	14,115 – 13,323 cal BP (11,760 ± 150 ^{14} C yrs. BP	Bateson et al. 2001	8

Notes:

1. "In the spring of 1822, as some workmen in the employ of Messrs. G. and W. Tindall, nursery and landscape gardeners, of Beverley, were employed in digging out some drift gravel to construct a lake at Thorpe Hall, near Bridlington [Grid ref. TA1067), the seat of Lord Macdonald, they found, at the depth of about four and a half feet from the surface, some of the bones and the horns of the Elk …" Tindall (1869). In 1839 a left shed antler of an Elk *Cervus alces* was found in the cliff at Barmston [Grid ref. TA1759] by Alex Bosville, of Thorp Hall. In 1890 the specimen was presented to Thomas Boynton by Rev. C. Hudson. These details were recorded on a hand written label signed by Thomas Boynton and attached to the rear of the antler. This impressive object decorated the hall of 'Norman House', Bridlington, the home of Thomas Boynton FSA, "in which position it has long been known to the writer [Thomas Sheppard]". After Boynton's death, his collection, including the remains of local extinct mammals, principal amongst which was the Elk antler, was secured by Hull Muniscipal Museums (Sheppard 1920).

2. "In … February, 1868 a horn and the occipital portion of the skull of a female specimen of the Elk were found during the process of draining, in a peat bog, about two feet below the surface, on the property of Sir George Cholmley at Carnaby [Grid ref. TA1565], near Bridlington" Tindall (1869).

3. Elk evidence was claimed to be "possibly present" in the context of an early Iron Age Lake Dwellings on the banks of the Costa Beck near Pickering (SE78), North Yorkshire (Duncombe 1899).

4. An almost complete skeleton of elk was found in the Tees valley the at Neasham Brick and Tile quarry [NZ3111]. On 17 June 1939 a large tree blew down, causing a land-slip revealing a lens of peat sediment within the boulder clay quarry. The skeletal remains were immediately secured by Mr F. Dallimore, curator of the Darlington Public Library (Trechman 1939). The adjacent sediment deposits were radio carbon dated at from 11.011 ± 230 to 11,561 ± 250 years BP (Blackburn 1952).

5. Flixton Carr (TA0280) single tooth was excavated (Moore 1951).

6. Star Carr (TA028810) at least 77 fragments of at least 7 elk have been excavated at this internationally significant Mesolithic seasonal hunting camp on the shores of lake Pickering, dated at around 9,500 years BP (Fraser & King 1954).

7. Starr Carr Elk material (Fraser & King 1954):

   Crania: 5 posterior portions including 3 males and 2 females, one male with left unshed antler in place.
   Antlers: 7 proximal fragments consisting of 4 unshed, 2 shed and 1 partly shed.
   Lower jaw: 11 fragments.
   Scapulae: 7 right and 2 Left.
   Pelvis: 4 fragments.
   Humerous: 9 distal ends.
   Radius: 6 proximal ends.
   Metacarpal bones: 1 complete, 3 proximal ends and 8 distal ends.
   Cuniform bones: 2 right.
   Tibia: 1 proximal end and 5 distal ends.
   Metatarsus: 6 fragments including 1 immature, 3 left and 2 right.

8. At Cove Farm Quarry, Westwoodside (SK737008), examined in 2000, from pond deposits, a large Perch *Perca fluviatilis* L. bone and a rib bone of a large herbivore, possibly an Elk, were recovered from Upper lacustrine/palustrine silts at the pond margin. An AMS radiocarbon date on a twig collected in the sediment near the bones yielded an age of 14,115 – 13,323 years cal BP (11,760 ± 150 years BP; Beta 154953) (Bateson *et al.* 2001).

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Pendulous Sedge *Carex pendula*
A study at Old Moor RSPB Nature Reserve

Nora Boyle

Sedges belong to the family Cyperaceae which contains about 5,500 species. Like grasses they are wind pollinated monocotyledons with reduced flowers. Pendulous sedge , which is an evergreen perennial, is one of the most easily recognisable sedges partly because of its size and partly because, as the name suggests, the flowers (henceforth referred to as spikes), for the most part, are pendulous. It belongs to the genus Carex which are the true sedges.
The set of photographs taken in the area near to the visitor's centre at Old Moor show some of the stages in the flowering and fruiting of the species.

Figure 1

Figure 2

In the vegetative state the large tussocks and the broad strap like leaves which are folded into a w shape (keeled) are recognisable even at a distance. In Figure 1 you can see one such tuft before the spikes start to develop. Figure 2 shows a male spike held in an upright position as it develops between the bracts. The w shape of the leaves can be clearly seen. As the male spike continues to mature and the stem elongates the other spikes appear and eventually the full inflorescence can be seen. It consists of 1-2 male spikes at the tip and lower down the stem 4-5 female spikes which may be all female or very often have a male tip. They are cylindrical and, for the most part, pendulous. The spikes have long sheathing bracts which vary in length, increasing in size from top to bottom of the spike.

Figure 3 shows a stage in development where the stem has just elongated sufficiently to expose the spikes beyond the leaves. The terminal male spikes are horizontal or slightly pointing upwards and the pollen sacs are swollen with pollen ready to be shed on the female spikes below. As you can see most of the female spikes in this photograph have male tips.

Figure 3

Figure 4

Figure 5

Figure 4 shows a terminal male spike in the foreground showing the pollen sacs at different stages of maturity, the ones nearer the tip maturing first. At the very tip the pollen has been released, then there are many florets where the sacs are swollen with pollen and higher up

florets which are almost closed. In the same photograph, to the right of the male spike are several female spikes showing their white stigmas ready to catch pollen. However, as in the photograph on the right below, sometimes the pollen sacs at the very tip still hold their pollen while the next portion of spikelet has released its pollen leaving brown empty pollen sacs and there is a further part higher up where pollen sacs are not yet ready to release their pollen.

Once the pollen has been shed, by the middle of May, only the membraneous glumes remain so the remaining brown male spikes are much thinner as shown in Figure 6 below. This photograph, taken in the middle of May, also shows several female spikes which have been fertilised and have developed their bright green fruit. Figure 7 shows a plant bearing many arched stems in the same stage.

Figure 6

Figure 7

This stage continues for several weeks until the fruit starts to fall from the female spikes and the flowering stalks become more erect. The dried stalks remain on the plant over winter.

Lakeside: News from the depths

Colin A.Howes

Introduction

In 2011 I started making regular visits for exercise and to monitor the wildlife at Doncaster Lakeside. Observations quickly led to interesting discoveries about: the local spiders [1]; roosting Pied Wagtails [2]; Herring Gulls predating migrant passerines [3]; the colony of Broad leaved Helleborines *Epipactis helleborine* [4]; the presence of the aquatic Stonewort, Water Milfoil and Swedish Pondweed in a Coot nest [5], how day length controlled moult in Black-headed gulls [6] and the seasonal patterns of behaviour of Mute Swans [7]. Curious features I couldn't initially make any sense of were four circular zones of smooth water in the huge area of open, wind-ruffled water between the Keepmoat Office block and the Islands.

Distributed across the lake are four pairs of grey spherical aluminium buoys, often perched on by Lesser Black-backed or Herring Gulls or more usually by Cormorants. On looking down on this vista from the elevated lookout at the top of the artificial hill (Childers Mount) between the Lake and the Keepmoat sports stadium, the buoys mark out the locations of what appear to be four separate vigorous upwellings of water and fine bubbles, which in relatively still conditions each form enormous concentric zones of flat water. Since the lake has no feeder streams/drains, were these observations evidence of a) borehole water being pumped in from the underlying Sherwood Sandstone Aquifer; b) was it a means of countering the deoxygenation of deep water; or c) was it a means of affecting the surface layers in order to counter the development of toxic blue-green cyanobacteria?

Although the four upwellings and concentric water patterns were plain for all to see, visitors to Lakeside didn't seem to know anything about them. However, further enquiries revealed the following.

The landform engineering of Lakeside was completed in stages during the 1990s and the void (22ha in surface area and up to 11 to 12m deep) began to naturally fill with water from the underlying Sherwood Sandstone Aquifer (our water supply). Early on it was found that, hot sunny summer conditions encouraged the development of blooms of potentially toxic blue-green cyanobacteria and in 2002 and 2006 water quality was monitored which showed that in the depths, water was developing a thermal stratification and problems related to both low Dissolved Oxygen (potentially leading to fish kills) and acidification (potentially leading to the release of toxic heavy metals).

In 2006 a firm called the Aquarius Marine Group Ltd was commissioned by Doncaster Council to monitor the situation. Using a submersible device (a YSI multi-parameter 6600 sampling Sonde) which monitors depth, turbidity, dissolved oxygen, pH, chlorophyll A, conductivity and fluorescence, the water column of the lake was sampled at four locations [8].

In the winter of 2006 AMG installed an 'Aquaeration' system on the lake bed. This consisted of four 'Aquaerator' pumps. When operating, water is drawn through each device via a series of angled vanes which creates a vortex in the water flow. To this, compressed air is fed through a series of jets which by introducing fine bubbles, increases the swirl and lift of the expelled water/air mix. The water/air bubble plume is expelled at 175 litres per second but as it rises the bubbles expand and the plume gathers (entrains) more water and from a depth of 10 metres the volume of water being lifted by the swirling expanding bubble plume increases to 4.5 tonned per second [8].

Water Temperature: In summer (May 2007) the surface meter of water was reaching temperatures of almost 17˚C with the bottom waters at 8.5˚C. At the depth of about 8m an abrupt temperature stratification (a thermocline) was detected, temperatures dropping from 13˚C at 7.5m to 10.5˚C at 8.5m. The average water temperature below 10m was 8.51˚C [8].

The 'Aquaeration' system was turned on at the end of May 2007 and re-sampling a month later showed that the temperature profile in the water column was much more even with no discernible thermocline. Surface temperature was only 0.3˚C higher than in May and the bottom waters 7˚C higher. The average water temperature below 10m was 14.8˚C, only 2.6˚C below surface water temperature [8].

Dissolved Oxygen: In May 2007 the average dissolved Oxygen concentration below 10m was 1.65mg/L and near the accreting sediment zone at the bottom was down to 0.99mg/L. (8.5%). This level of deoxygenation was presumably the result of oxygen use by bacteria feeding on the accumulating rain of organic matter (leaves from the surrounding trees, dead plankton and droppings from the resident water-birds and from thousands of winter-roosting gulls). Since fish kills are likely to occur at 2mg/L it was important to remedy this situation [8]. A month after 'Aquaeration' had commenced, re-sampling showed that Dissolved Oxygen levels for the whole water column had risen to an average of 7.8mg/L (~80%) and more significantly had risen to 4.68mg/L (47.2%) near the lake bed [8].

pH (acidity/alkalinity): In May 2007 the ph value of the upper 7m of water was about pH8.5. At 6.5m the water registered pH8.3, quickly dropping to pH7.6 at 8.5m. From about 9m it remained at about pH7.5 [8]. A month after 'Aquaeration' had commenced, re-sampling showed that the lake was not as acidic and that the main pH change happened lower down with a drop from pH8.5 at 9.5m to pH8.0 at 11.5m. A slight dip in the pH in the surface meter was attributed to the absorption of atmospheric CO_2 [8].

Heavy Metal concentrations: Since high levels of acidity help to liberate heavy metals from surrounding substrates, in May 2007 concentrations of the heavy metals in an environment of pH7.5, towards the bottom of the water column, were unacceptably high with Manganese at 0.35mg/L and Iron at 0.14mg/L, both well above the permitted levels for drinking water [8]. A month after 'Aquaeration' had commenced (in June 2007), sampling showed that concentration at the lake bed in an environment of pH8.0 had decreased to 0.027mg/L and 0.005mg/L respectively, both well within accepted levels for drinking water (http://www.aeration.uk.com/lake-aration).

Algal Blooms: In May, high levels of Chlorophyll A were detected at surface and at various points through the water column [8]. Since harmful cyanobacteria blooms cannot easily develop in water flows greater than 1m/hour, the turbulence caused by the 'Aquaerator' action helped to prevent algal concentrations from occurring though without affecting the general amount of photosynthesis in the lake [8].

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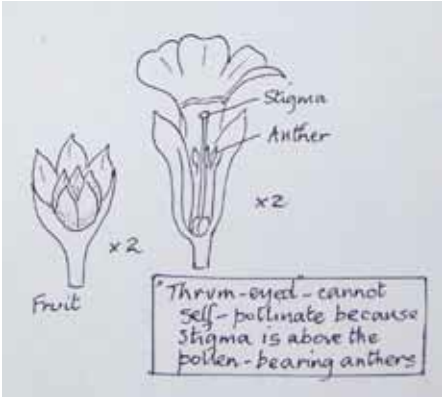
Using Doncaster Museum's timber beetle collection to monitor the decline of rain forest Insects

Colin A. Howes

After serving with the RAF during the Second World War, training aircrew in South Africa, the prodigiously vigorous and imaginative Dr Elphinstone Forrest Gilmour worked to resuscitate three scientific and cultural institutions in England during the period of post-war redevelopment. From 1946 to 1950 he worked as curator in the African Galleries at the Commonwealth Institute in London. From 1950 to 1952 he became curator of Wood End Natural History Museum in Scarborough and from 1952 became curator of the Museum and Art Gallery at Beechfield House, Waterdale, Doncaster (the site of the current Council Offices). Here he presided over the design and development of the new purpose-built Museum and Art Gallery premises in Chequer Road in 1964 where he worked as Director till 1967.

Throughout this period his indefatigable energy enabled him to maintain his lifelong research interests in timber beetles (Cerambycidae) of the world, these including some of the largest insects on earth. A review of his published output shows that from 1947 to 1968 he published at least 73 research papers on the Cerambycidae in 38 scientific journals in 22 countries, these being Belgium (6), Brazil (3), Colombia (3), Costa Rica (2), England (11), France (6), East Germany (6), West Germany (9), Holland (6), Indonesia (4), Jamaica (1), Japan (1), Kenya (1), Madagascar (1), Malaysia (1), Mexico (4), Sri Lanka (1), South Africa (1), Poland (1), USA (1) and Venezuela (3). Since Doncaster Museum and Art Gallery was Gilmour's published address, for the 58 research papers published from 1952, Doncaster and its museum received worldwide publicity.

For most scientists working in the world of biodiversity, to discover and name just one species new to science would be a lifetime achievement; however through receiving and examining material from collectors and museums around the world he described 192 new species, 51 new genera, 7 new subspecies and 42 new varieties. Examples of many of these voucher insects are retained as 'Type Specimens' within the entomological collections at Doncaster museum, one of the largest research collections of these economically important insects on earth.



An example of Dorothy Bramley's botanical art, showing the detailed structure of the 'thrum-eyed' form of Primrose flowers.

Her paintings of fungi are available for purchase by Doncaster Naturalists' Society members.

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Front cover: Painted Lady. 2019 saw a huge invasion of this migrant butterfly, something that happens every 10 years or so.

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