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# The Naturalist

A QUARTERLY JOURNAL OF NATURAL HISTORY FOR THE NORTH OF ENGLAND

Status of Northern Brown Argus *Aricia artaxerxes* and Small  
Pearl-bordered Fritillary *Boloria selene* in the Yorkshire Dales National  
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**STATUS OF NORTHERN BROWN ARGUS *ARICIA ARTAXERXES*  
AND SMALL PEARL-BORDERED FRITILLARY *BOLORIA*  
*SELENE* IN THE YORKSHIRE DALES NATIONAL PARK 2002-2007**

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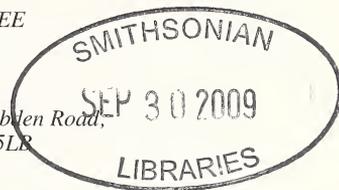
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INTRODUCTION

Two species of butterfly, the Northern Brown Argus *Aricia artaxerxes* and Small Pearl-bordered Fritillary *Boloria selene*, were categorised in 2000 as priority species for conservation in *Nature in the Dales*, the Local Biodiversity Action Plan (LBAP) for the Yorkshire Dales National Park (YDNP). Species Action Plans (SAPs) were produced detailing the conservation actions required to achieve the primary aims of each plan, namely to maintain the populations of Northern Brown Argus and Small Pearl-bordered Fritillary in the YDNP (YDNPA, 2000). A review of the trends and status of these LBAP priority species and the condition of their habitats in the YDNP is being undertaken (Court & Whitaker, 2009 in press; Court & Ellis, 2009 in press) and this paper summarises the current status of Northern Brown Argus and Small Pearl-bordered Fritillary in the YDNP.

The taxonomy of the species of lycaenid butterflies of the genus *Aricia* and their subspecies is complex and the Northern Brown Argus has variously been classified as a subspecies of other *Aricia* species (Ravenscroft & Warren, 1996). The distribution of the mainly single brooded Northern Brown Argus (Mountain Argus) *Aricia artaxerxes* (Fabricius 1793) appears restricted to Scotland and northern England being associated with calcareous grasslands where the larval food plant Common Rock-rose, *Helianthemum nummularium*, occurs. Its close relative the Brown Argus, *Aricia agestis* (Dennis & Schiffermüller, 1775), is usually double brooded and is a spreading species found in the south of England up to North Wales and eastern Yorkshire. On calcareous grasslands it feeds on Common Rock-rose but in other biotopes it uses various *Geraneum* species. In the Yorkshire Wolds, Derbyshire and North Wales single brooded populations of the *Aricia agestis-artaxerxes* complex are found, (Asher *et al.*, 2001). Analyses of allozyme and mitochondrial DNA, cluster the populations of *Aricia* in the Peak District, Derbyshire, differently. The former suggests that they are *A. artaxerxes* whilst the latter suggests they are *A. agestis* (Aagaard *et al.*, 2002). The mtDNA data show that there is little or no historical genetic differentiation between *A. artaxerxes artaxerxes* from northern Britain and several *A. artaxerxes* phenotypes from Scandinavia (*A. art. lyngensis*, *A. art. horkei* and *A. art. vandatica*) The populations of *Aricia* in the YDNP are still classified as Northern Brown Argus although genetic research suggests a degree of hybridisation with the Brown Argus occurred in the past (Aagaard *et al.*, 2002).

The Small Pearl-bordered Fritillary is still relatively widespread in Scotland and Wales but there has been severe declines across much of its range in England (Fox *et al.*, 2006) and in 2007 it was re-designated as a 'priority species' in the UK BAP (UK BAP, 1994-2007) joining the Northern Brown Argus. The species is found in damp grassland habitats such as moorland flushes, woodland clearings and mire habitat where the key food plants

Common Violet *Viola riviniana* and Marsh Violet *V. palustris* occur. The Small Pearl-bordered Fritillary sites in the YDNP and the few adjacent sites in the Craven outside the YDNP are very important as a surviving, but fragmented relict population which is at the boundary between the areas of England (further south and east) where the species has become extinct or very rare and confined to a few woodland locations, and the larger more interconnected mire and damp grassland sites of the Lake District and Western Scotland (Megson, 2008; Whitaker 2002b, 2003, 2004).

#### METHODOLOGY

Following a review of historical data, all known Northern Brown Argus sites in the Yorkshire Dales were surveyed in 2002 (Ellis, 2003). In addition, a number of sites where it was considered to be present were identified and surveyed. Any location where Northern Brown Argus was recorded was classed as a 'site', with the boundary of each site defined by the area where Common Rock-rose was present and abundant. A site was considered to be a distinct 'colony' if it was more than 0.5 km from any another site. Any sites that were less than 0.5 km apart were classed as being part of a larger colony.

Since 2002, all records of Northern Brown Argus have been collated by Butterfly Conservation and have been assigned to a site and a colony. In late 2007, the number of extant Northern Brown Argus sites and their colonies in the Yorkshire Dales were compared with the baseline data from the 2002 survey. In addition, butterfly monitoring transects have been established at three Northern Brown Argus sites using the standard methodology for monitoring butterfly populations (Pollard, 1977). This method involves walking a fixed route on a weekly basis between early April and late September and recording all butterfly species within a fixed distance (2.5 m either side and 5 m ahead) along the transect. Transect walks are only undertaken when weather conditions are suitable for optimum butterfly activity (dry conditions, wind speed less than Beaufort scale 5, and temperature 13°C or greater if there is at least 60% sunshine, or more than 17°C if overcast) (Greatorex *et al.*, 2007: 24-28; UKBMS, 2008). The transect counts have been entered into Butterfly Conservation's Transect Walker 2 computer program enabling an annual population index to be derived for each site. A relative population trend can then be determined by comparing the annual indices at each site. Where it has not been possible to calculate an annual index (e.g. when poor weather limits the number of recording visits), a weak index, the number of butterflies of each species recorded at each site during all transect visits which may include estimates for missed weeks, has been included and compared.

In 2002, all known Small Pearl-bordered Fritillary sites in the YDNP were visited to establish occupancy with a botanical survey also undertaken (Whitaker, 2002a). All known sites along with a number of potentially suitable new sites in the YDNP and adjacent areas of Craven were re-visited in 2007 to re-assess distribution and status of Small Pearl-bordered Fritillary (Whitaker, 2007). A butterfly monitoring transect has also been established at Swarth Moor SSSI in 2003 one of the largest Small Pearl-bordered Fritillary sites in the YDNP and an annual population index calculated.

#### RESULTS

In 2002, 33 Northern Brown Argus colonies were recorded comprising 64 occupied sites, and in 2007 there were 43 colonies comprising 79 occupied sites. The distribution of colonies is shown in Figure 1.

Two historical Northern Brown Argus colonies were found to have become extinct by the time of the 2002 survey although one of these has since been re-colonised. No colonies have become extinct since the 2002 survey. Only one site has definitely become extinct when compared with historical data.

The results from butterfly transect monitoring sites in the YDNP where Northern Brown Argus are recorded are shown in Table 1.

The results derived from the butterfly monitoring transect on Swarth Moor SSSI are shown in Figure 3 and Table 3.

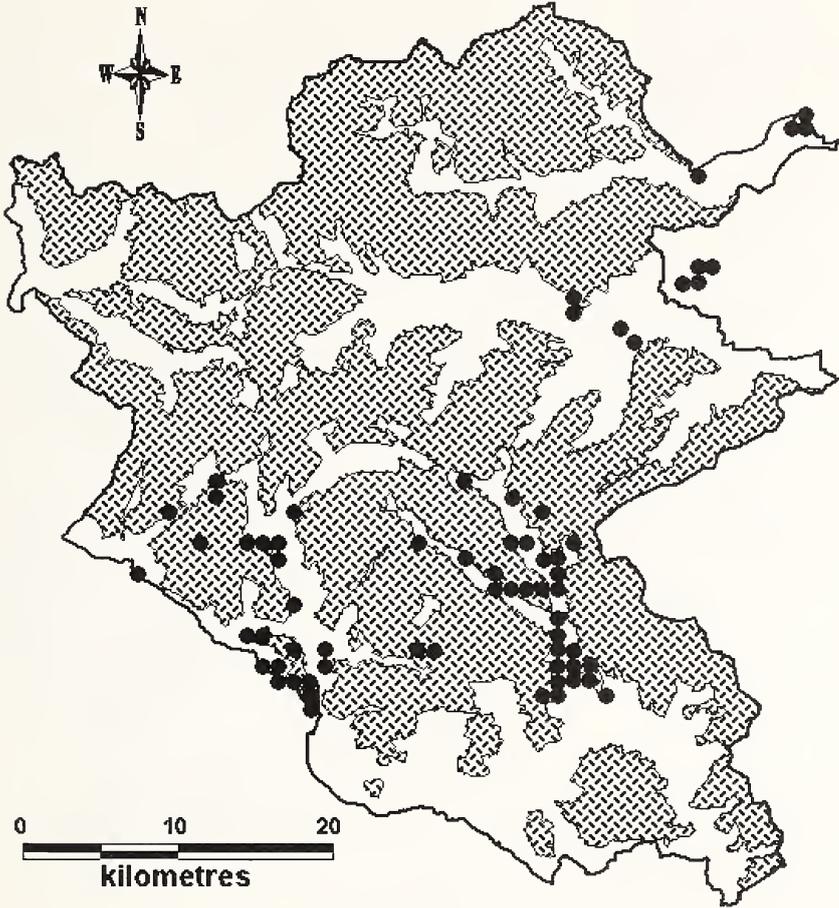


FIGURE 1. Distribution of Northern Brown Argus records, 2002-2007, in the YDNP, based on 417 records of adults (1887 butterflies), together with 39 records of ovae and three records of larvae. Stippled areas indicate altitudes < 220m.

TABLE 1

Population indices (weak index) of Northern Brown Argus butterfly populations in the YDNP.

Site/Year	2003	2004	2005	2006	2007	Trend
Scar Close NNR	2	(66)	40	(73)	–	Stable
Bastow Wood	36	(31)	78	(220)	(8)	Increase
Long Ashes	35	(11)	(26)	(20)	(34)	Stable

The distribution of Small Pearl-bordered Fritillary in the YDNP and adjacent areas is shown in Figure 2 and its status in 2002 and 2007 at the nine sites in the YDNP is shown in Table 2.

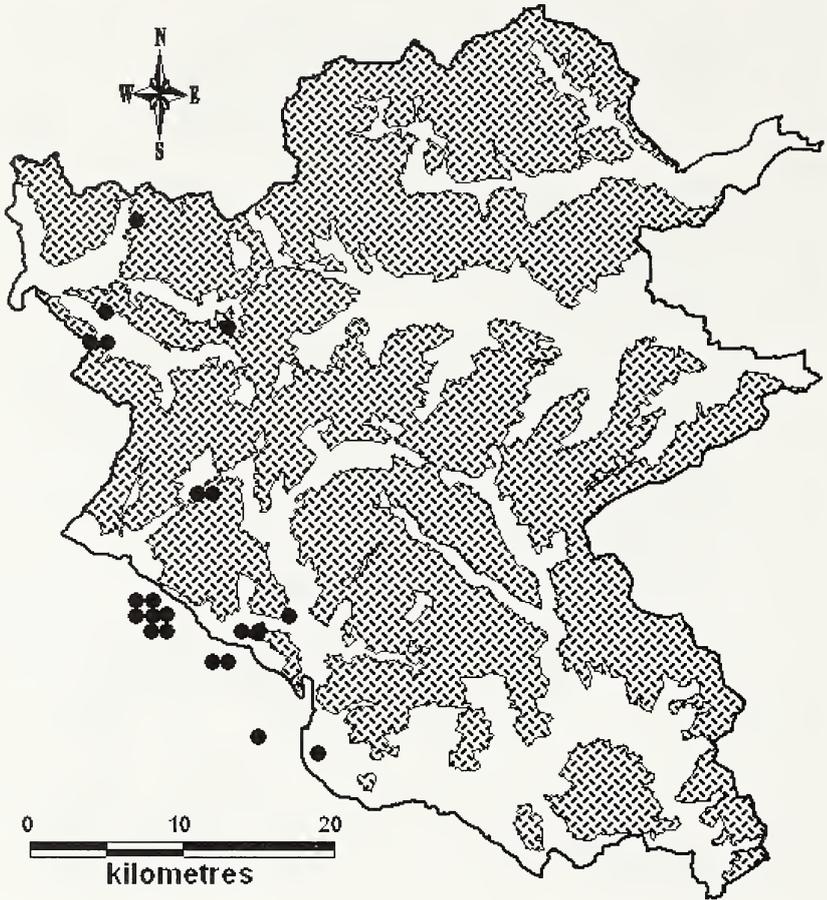


FIGURE 2. Distribution of Small Pearl-bordered Fritillary records, 2002-2007, in the YDNP and Craven Lowlands based on 197 records of adults (621 butterflies). Stippled areas indicate altitudes < 220m.

There are insufficient data from the relatively recently established butterfly transect at Scar Close NR to determine a population trend, a maximum of eight individuals having been recorded in 2006.

#### DISCUSSION

The results show that a number of new Northern Brown Argus sites and/or colonies have been recorded in the YDNP since 2002. Whilst this may relate to a genuine range expansion, the increase could also be explained by an increase observer effort resulting in the finding of previously unrecorded sites. All Northern Brown Argus sites or colonies recorded in the 2002 are still extant and include the re-colonisation of one historical site since 2002.

TABLE 2  
The status of Small Pearl-bordered Fritillary *Boloria selene* at sites in the YDNP.

SITE	Status in 2002	Status in 2007
1. Rise Hill (Near Dent station)	Extant	Extant
2. Helms Moss	Extant	Not surveyed
3. Combe Scar SSSI	Extant	Extant
4. Oxenber & Wharfe Woods SSSI	Extant	Extant
5. Swarth Moor SSSI (Swarth Moor)	Extant	Extant
6. Swarth Moor SSSI (Studfold Moss)	Extant	Extant
7. Long Preston Moor	Extant	Unknown Extant (2006)
8. Taythes, Cautley	Unknown	New Site 2007
9. Ingleborough	Unknown	New Site 2006

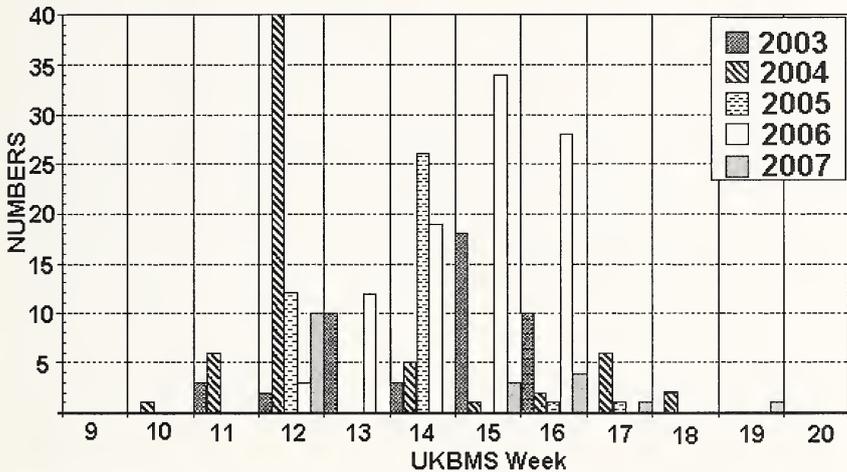


FIGURE 3. Records of Small Pearl-bordered Fritillary on the Swarth Moor SSSI transect 2004-2007.

UKBMS weeks: **9** (27 May-2 June); **10** (3-9 June); **11** (10-16 June), **12** (17-23 June), **13** (24-30 June), **14** (1-7 Jul), **15** (8-14 Jul), **16** (15-21 Jul), **17** (22-28 Jul), **18** (29 Jul-4 Aug), **19** (5-11 Aug), **20** (12-18 Aug).

TABLE 3.

Small Pearl-bordered Fritillary numbers and annual population indices at Swarth Moor SSSI.

Year	Total no counted.	Index	Weak index
2003	46	46	46
2004	63	—	101
2005	40	—	93
2006	96	96	96
2007	19	—	33

Despite the small sample size and that only weak population indices are available for some of the monitoring transects in some of the years, the data suggest that the Northern Brown Argus populations are stable at two of the monitored sites and increasing at one. It should be noted that the very low counts of butterflies in 2007 are due to the poor weather conditions prevalent in the Dales during much of the Northern Brown Argus flight period. It would be preferable to increase the number of butterfly monitoring transects in the Yorkshire Dales, particularly where Northern Brown Argus are present. Unfortunately, there are currently not enough volunteers available to reliably establish any additional transects although one is being trialed in Wensleydale using YDNPA staff and volunteers.

The increased number of new Northern Brown Argus sites located since 2002, the lack of any colony extinctions since 2002 and the results from butterfly monitoring transects shows that the Northern Brown Argus butterfly population in the YDNP is stable, possibly even slightly increasing. This compares with the information on national population trends from the United Kingdom Butterfly Monitoring Scheme that shows that although there has been a general decline since 1993 (Fox *et al.*, 2006), there has been no significantly different trend in recent years (Greatorex-Davies *et al.*, 2007).

In 2007, it was intended to undertake timed counts at all the Small Pearl-bordered Fritillary sites to enable a population estimate to be calculated but poor weather during the flight period meant that this was not possible. This particular part of the project was undertaken in 2008 and results will be presented elsewhere. The presence or absence of Small Pearl-bordered Fritillaries at each site has been used to determine whether sites are still extant but no current population estimates were possible. Although one site was not visited in 2007, the results show that at least six of the eight Small Pearl-bordered Fritillary sites in the YDNP in 2002 were still extant in 2006 (Whitaker, 2007). One site (Long Preston Moor) was visited in 2007 but no butterflies were located probably due the small size of the butterfly population associated with tiny area of habitat with suitable food plants (c. 60m<sup>2</sup>) and poor weather during the flight period. Two Small Pearl-bordered Fritillaries were recorded when this site was last visited in 2006.

Two new Small Pearl-bordered Fritillary sites have been located in the YDNP since 2002 (Table 2). Whilst this may relate to a genuine range expansion, the increase is most likely explained by an increase observer effort resulting in the finding of previously unrecorded sites. Certainly it was subsequently discovered that the butterfly had been seen on Scar Close NNR in the 1990s.

No comprehensive habitat survey work was undertaken at any of the sites in 2007 but a visual assessment suggests that there has been very little, or no degradation since 2002 (Whitaker, *pers. obs.*). This suggests that it is unlikely that there have been any major changes in the Small Pearl-bordered fritillary populations at any of the sites.

Given the small number and remoteness of Small Pearl-bordered Fritillary sites in the YDNP and the small number of butterfly surveyors it has not been feasible to establish more than one monitoring transect, although fortuitously the species was subsequently found on the Scar Close NNR butterfly transect, established to monitor Northern Brown Argus and Dark Green Fritillary *Argynnis aglaja*. At the Swarth Moor SSSI monitoring site there have been a number of missed weeks during the survey period in most years, primarily as a result of the inclement climate of this upland area. This means that only a weak population trend index can be derived. However, this index suggests that the population is stable at this site. It should be noted the poor weather throughout virtually the whole Small Pearl-bordered Fritillary and Northern Brown Argus flight periods is likely to account for the small numbers recorded in 2007.

The results from work undertaken in 2007, an assessment of habitat at known sites and the results of butterfly monitoring work at the key site suggest that there has been no further decline in the distribution and status of Small Pearl-bordered Fritillary population in the YDNP. This compares markedly with results from the United Kingdom Butterfly Monitoring Scheme (UKBMS) which shows that nationally although the Small Pearl-

bordered Fritillary population remained relatively stable from 1982 onwards (following earlier declines); there has been a subsequent decline in numbers. Asher *et al.* (2001) estimated a 39% decline in the UK distribution between 1972 and 1994. This was re-assessed by Fox *et al.* (2006) who showed a 34% decline in range between the periods 1970-82 and 1995-2004, a continued long term population decline of 70% between 1976 and 2004 with a 10% decline decade on decade. In southern and eastern England the declines were far more severe with the species now practically extinct in those areas. This subsequent continued decline documented by Fox *et al.* (2006) resulted in the species being re-assessed as a 'priority' species in the revised UK BAP habitats and species list 2007 (UK BAP 1994-2007).

#### SUMMARY

The Northern Brown Argus and Small Pearl-bordered Fritillary were identified as a priority for conservation in the LBAP for the Yorkshire Dales National Park (YDNP); *Nature in the Dales* in 2000 and SAPs were produced with the primary aim of maintaining the populations of each species in the YDNP.

Following a review of the trends and status of these two species, all Northern Brown Argus colonies located during comprehensive survey work in the YDNP in 2002 were still extant in 2007 and a number of new colonies have been located. The results from three butterfly monitoring transects in the YDNP where Northern Brown Argus are present suggest that the population is stable at two and increasing at one site. Although it is a small sample size, this information suggests that the Northern Brown Argus population in the YDNP is stable.

Six of the seven known Small Pearl-bordered Fritillary sites in the YDNP, located in a survey in 2002 were re-visited in 2007 and at least five populations found to be extant with two additional sites having been discovered in the YDNP since 2002. There does not appear to have been any significant habitat changes on any of the sites visited in 2007. The annual population indices (albeit often weak population indices) derived from a butterfly transect undertaken at one site since 2003 suggest that at this site the Small Pearl-bordered Fritillary population is stable.

#### ACKNOWLEDGEMENTS

The Small Pearl-bordered Fritillary work in 2007 was partly funded by Butterfly Conservation and the Yorkshire Dales National Park Authority. The 2002 NBA survey was funded by English Nature. We would also like to thank all the individuals who have submitted records to Butterfly Conservation and assisted with the butterfly transect monitoring.

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## ABRAHAM CLAPHAM, A YORKSHIRE NATURALIST

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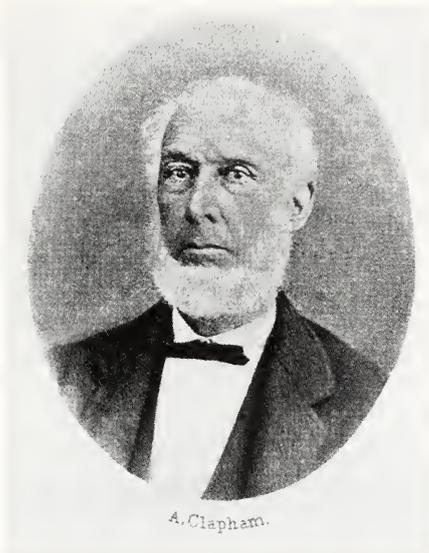


FIGURE 1. Portrait of Abraham Clapham from E.J.Lowe (1895).  
(Reproduced at [www.darwincountry.org](http://www.darwincountry.org))

### INTRODUCTION

2009 is an important anniversary year for naturalists the world over, being both the 200th anniversary of the birth of Charles Darwin and the 150th anniversary of the publication of his *On the Origin of Species by Means of Natural Selection*. A search through Darwin's correspondences at the Darwin Correspondence Project (DCP 2009a) reveals three letters to a Mr A. Clapham, initially of Bradford and then of Scarborough, all relating to plant hybridisation experiments, some apparently being carried out on Darwin's behalf. The content of the correspondence seems to suggest an unknown number of letters are missing. This, however, is not entirely surprising; Darwin was noted as a great keeper of his letters, but according to his son, Francis (Darwin 1898), he was only convinced to keep important documents after 1862; prior to this he would regularly burn letters when his folders, or 'spits' as he called them, became full, so relatively few earlier letters survive.

### BIOGRAPHICAL CONTEXT

The only modern references to Abraham Clapham are scant. His entry in Desmond (1994) describes him as 'fl.1860s-1870s. Of Scarborough, Yorks. Collected and grew ferns. E.J. Lowe *Fern Growing* 1895, 182-83 portr. *Br. Fern Gaz.* 1909, 43' and the International Plant Name Index (IPNI) is even vaguer, stating only that he flourished between 1860 and 1880 and specialized in pteridophytes.

Fortunately Abraham Clapham is not a common name, so searches through available data were made relatively simple and the following biographical information was gained. From his entries in the censuses it can be calculated that he was born in Ripon around 1810;

according to the International Genealogical Index he was born on 29 May 1810 and christened at Saint Peter's church, Leeds on 18 August 1810. An announcement of his imminent wedding in *The Times* (1853) gives his parents as Thomas and Mary Clapham of 'Stackhouse', Giggleswick near Settle in the Dales. Census records for 1841 and 1851 show Abraham had a sister Maria, three years his elder and a brother Fredrick a year his junior. Lowe (1895) believed Clapham spent his childhood near Settle, as '...[Clapham] always spoke of Ingleborough as the home of his younger days'. Abraham Clapham lived in Potternewton in Leeds during the 1830s, moving to Bradford for a year before moving to Scarborough in 1849 (LLPS reports 1847-1859). In 1853 he married Mary Ann Susan Thiselton in York. Mary was the daughter of Charles Alfred Thiselton, registrar of the Deanery of York and secretary to the Archbishop. Mary's nephew Sir Charles Alfred Payton (who was a member of her father's household with her in the 1851 census) became British Consul to Mogador and was a keen sportsman, writing in *The Field* under the pseudonym 'Scarcelle', which is French for teal (Taverner & Moore, 1935). In the late 1870s, Abraham Clapham moved to Kensington and some time later moved to East Preston in Sussex, where his death was registered in 1888. He was survived by his wife and three children, Marian, Jesse and Herbert.

#### NATURAL HISTORY ACTIVITIES

##### *Ornithology and Entomology*

Clapham's name appears several times in the reports of the Leeds Philosophical and Literary Society. The earliest mention of him is a donation to the Society's museum of 'The eggs of 71 British Birds' in April 1831 and later in June of that year the egg of an Ostrich. In April 1832 he presented them with 'Several British Insects'. It is also noted that Clapham donated '...a collection, consisting of 256 British and Foreign Insects...' in April 1833 and in 1834-1835 a collection of American birds eggs, a Barn Owl and some live bees from Pennsylvania. Over the next few years he donated several more items ranging from Golden Eagle skeletons to American quails; in the 1841-1842 report he is specifically thanked for the birds he has donated and for a collection of German Lepidoptera, by which time he had risen from Ordinary Member to Proprietary Member, meaning he owned Society shares and was a life member.

A reference to his interest in insects comes from Ormerod (1878), in which he describes finding relatively few weevil grubs, despite the large number of adults he had seen whilst digging up his primulas; this he attributes to hedgehogs.

Evidence for the breadth of Clapham's interests comes from *Monographia anoplurorum Britanniae* (Denny 1842) which deals with parasitic lice; here Clapham describes four lice including 'A Louse of the Virginian Colin' now known as the Bobwhite Quail (*Colinus virginianus*), which were '...obtained from some of these birds he imported from America, for the purpose of turning loose on a manor near Selby'. He also supplied the 'Louse of the Snowy Owl' killed in 1837 on Barlow Moor near Selby, leased by his father (Nelson 1907).

Nelson (1907) also provides some interesting information regarding Clapham's collection of birds, all of his records being birds of prey: Snowy Owl, Marsh Harrier, Montagu's Harrier, White-tailed Eagle, Goshawk (four Yorkshire specimens), Sparrowhawk (30 Yorkshire specimens!), Red Kite, Swallow-tailed Kite, Iceland Falcon (ssp. of Gyr Falcon), Red-footed Falcon and Kestrel. In 1879, he donated his bird collection (mainly birds of prey, many collected from Yorkshire) to the museum of the Leeds Philosophical and Literary Society (e.g. Fig.2). This collection, now housed in Leeds City Museum, still has 18 of his specimens, all birds of prey (Stringer *pers.comm.*). He also donated a number of birds to Scarborough Museum, including both Long- and Short-eared Owls. In 1862, as members of the Scarborough Philosophical Society (which Abraham joined in 1850), he and his brother Fredrick donated £5 towards the extension of the town's Rotunda Museum, which by the addition of two wings almost tripled its size (Buchanan *pers.comm.*). Lowe (1895) said of Clapham 'He had also a natural taste for ornithology, and had a particularly fine collection of Hawks and Owls'.



FIGURE 2. White-tailed Eagle 'Killed at Castle Howard' 1841 from the Clapham Collection.  
©Leeds Museums and Galleries

*Darwin, Experimental Horticulture and Botany*

The Darwin letters mention Clapham's experimentation on *Phlox* and *Mimulus* (DCP 2009b). Darwin studied plants a great deal whilst formulating his theory of natural selection and was fascinated by hybridization. Clapham sent Darwin a letter on 8 March 1850 stating: 'My attention has recently been called to the very singular fact that I have obtained evergreen phloxes by impregnating the annual varieties (*Drummondii*) with the perennial species or seedlings—this fact is extremely interesting when we consider that the perennial phloxes not only drop their leaves but also that their woody stems completely die down' (Darwin Correspondence Project, 2009c).

A garden plant familiar to many is *Aucuba japonica*, the Japanese or Spotted Laurel. This plant was introduced to Britain in the 1780s, but the species is dioecious and only gynoecious plants had been imported, meaning the plants had to be propagated from cuttings and the shrubs never bore fruit. This state continued until 1863 when Robert Fortune, a Scottish botanist most famous for smuggling tea into India from China, brought back male plants. Buckton (1879) states that upon reading an article in a scientific journal about the discovery, Clapham sent to London and purchased a stamiferous plant for the princely sum of three guineas. As a result: 'From this small beginning great results have come, for now there is scarcely a garden in Scarborough where *Aucubas* of both kinds may not be seen flourishing in the depth of winter' (Buckton, 1879). This applies to this day as *Aucuba japonica* can still be seen frequently around Scarborough, especially near The Crescent, the home address of Abraham's brother Frederick, where it is grown in all the public gardens.

Clapham is best remembered for his work as a fern collector, breeder and hybridizer. A search through the literature reveals his name occurring a number of times in fern books throughout the 1860s with references to his collecting around Scarborough and Settle (the home area of his parents) (Moore, 1863). Ferns were immensely popular in Victorian Britain and Clapham seems to have had an amazing knack of finding and growing new varieties. A species he particularly worked with was Harts-tongue Fern (*Phyllitis scolopendrium*) and cultivars 'Ramosum' and 'Keratooides' which he developed are still grown today (Rickard, 2005). Stansfield (1909) observes 'His *Scolopendrium Claphamii* was probably the earliest of the fringed *crispums*'. His skills were noted in Lowe (1868) who describes Clapham as '...a gentleman who has been more successful than any one else in obtaining remarkable varieties of British species from spores'. Lowe (1895) states that Clapham '...was very fond of Fern-hunting, and at one time this occupied much of his time'. He goes on to mention that 'Mr. Clapham was fond of trout-fishing, and used to combine this sport with Fern-hunting'.

Clapham, though unnamed, is mentioned in the first volume of *The Naturalist* (Inchbald, 1865): 'Oct 1st 1864 – Our first field-day was spent in the Forge Valley – a glen of the calcareous range – about five miles from Scarborough. My companions were an enthusiastic fern-grower, whose name so often appears in Moore's "Nature-printed Ferns", and a Microlepidopterist who has been so successful in rearing those minute forms of insect life, that he has attained to continental celebrity!'. This clearly refers to Clapham who is mentioned no less than 30 times in Moore (1863). The entomologist mentioned was undoubtedly Thomas Wilkinson, also of Scarborough (Theakston, 1866). This was the first of four field-days the trio undertook.

Clapham's reputation as a remarkable plant breeder is emphasized in an article on fern hybridization in Jones (1888) '...the late Mr. A. Clapham, of Scarborough, so long known as one of the most observant, painstaking, and generous of the early discoverers and propagators of the varieties of British ferns. Mr. Clapham was long known as the most successful of all hybridizers of plants in England, but through want of faith in this instance he long held aloof from experiments with ferns; but when at last (impressed by some of the results of Mr. Lowe's experiments) he did give attention to it, he approached it with all his old keenness of perception and judgment, and therefore his old success'. It was undoubtedly this reputation that led Darwin to enlist Clapham's help.

The Victorian passion for ferns is, for some, difficult to comprehend nowadays. Charles Kingsley, author of *The Water-Babies*, coined the word 'Pteridomania' to describe the phenomenon (Kingsley 1859): 'Your daughters, perhaps, have been seized with the prevailing 'Pteridomania', and are collecting and buying ferns, with Ward's cases wherein to keep them (for which you have to pay), and wrangling over unpronounceable names of species (which seem different in each new Fern-book that they buy), till the Pteridomania seems to be somewhat of a bore: and yet you cannot deny that they find enjoyment in it, and are more active, more cheerful, more self-forgetful over it, than they would have been over novels and gossip, crochet and Berlin-wool.'

Clapham provided an extensive list of ferns to be found in the Scarborough area in Theakston (1866), the popular local guide of the times, no doubt whetting the appetites of both local and visiting 'Pteridomaniacs'.

#### CONCLUSIONS

These investigations into the life and work of Abraham Clapham show that behind the great and the good of science there are many people working away behind the scenes. The contemporary references to Clapham's work in books and journals show his efforts and experiments were well known at the time, but history has forgotten him. In the past few years a vast quantity of literature has been digitized and placed in the public domain. Two sites in particular made this project viable: Internet Archives and Google Books. The ability to search obscure and rare texts for key words has opened up the possibilities for research to a degree unforeseeable even five years ago. As a result, many distinguished naturalists from the past are beginning to reveal themselves at long last. The devotion and thoroughness of

Clapham's work is in many ways typical of his time, but his contributions to Yorkshire natural history and his pioneering work on fern collecting and breeding mark him out for special attention.

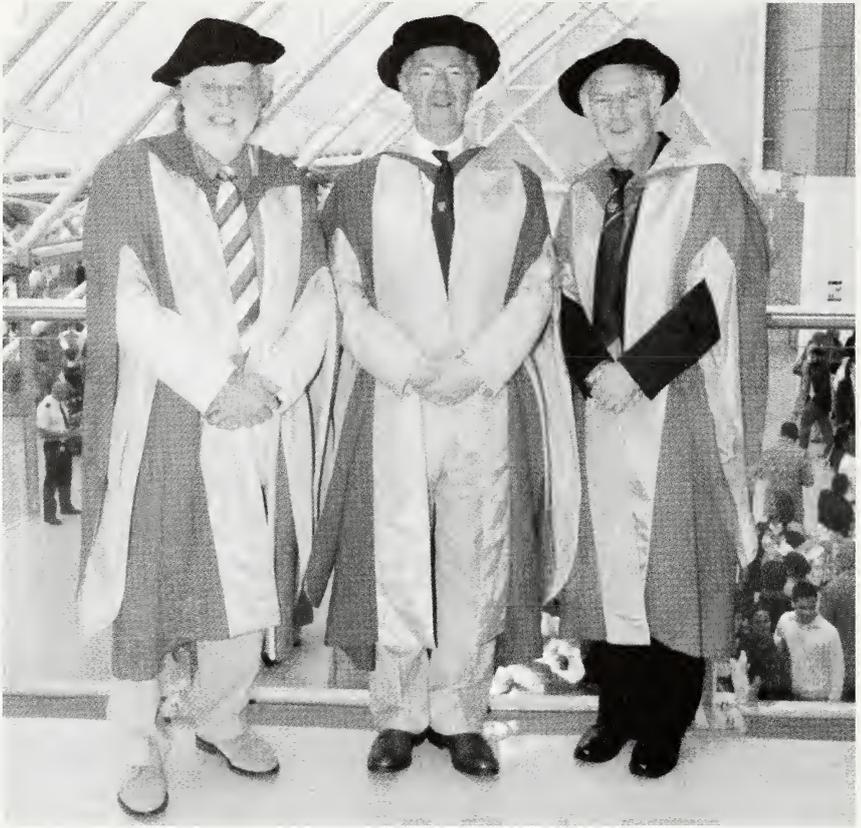
#### ACKNOWLEDGEMENTS

I would like to thank Richard Middleton for his help in searching the census data and proof-reading, David Buchanan (Assistant Curator of Museums, Scarborough Museum Trust) for investigating Clapham's links with the Scarborough Philosophical Society, Clare Stringer (Curator, Natural Science, Leeds Museum Discovery Centre) for providing help and information regarding the Clapham specimens at Leeds, Lizbeth Gale (Kew's Library and Archive) for providing a copy of Lowe's account of Clapham's life, and Peter Boyd for the copy of Clapham's portrait.

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## YORKSHIRE NATURALISTS HONOURED



Left to right: **John Mather**, **Mark Seaward** and **Colin Howes**. [Photo: Simon Stock.]

Two of Yorkshire's leading naturalists, John Mather and Colin Howes, received their doctorates at a graduation ceremony held at Bradford University on 15 July 2009. John Mather was awarded an Honorary Degree of Doctor of Science in recognition of his outstanding contribution to ornithology, more particularly of our county, and his role in promoting natural history to both amateurs and professionals. Colin Howes was awarded his doctorate for a thesis entitled 'Changes in the status and distribution of mammals of the order Carnivora in Yorkshire since 1600', the culmination of painstaking work assembled over many years. His detailed account was based on careful analyses of Fox, Wildcat, Domestic Cat, Stoat, Weasel, American Mink, Polecat, Pine Marten, Otter and Badger records derived from a very wide variety of sources, undertaken under the supervision of Professor Mark Seaward of Bradford University's Department of Archaeological, Geographical and Environmental Sciences. Fellow YNU members will, of course, be proud to know that their colleagues' work on Yorkshire's natural history has been recognized and honoured in this way.

**A NEW SPECIES OF THE GENUS *CARABODES* C.L. KOCH,  
1835 (ACARI, ORIBATIDA, CARABODIDAE)  
FROM THE BRITISH ISLES**

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**ABSTRACT**

A new species of oribatid mite, *Carabodes scaber* **sp. nov.** found at two sites in the NW of England and two sites in N. Wales is described. A previously described species, *C. rugosior* Berlese, 1916 is newly introduced to the list of oribatid fauna of the British Isles. The first published key to the known British species of *Carabodes* C.L. Koch, 1835 is provided.

**INTRODUCTION**

Members of the genus *Carabodes* C.L. Koch, 1835 are found worldwide (excluding Antarctica) and previously numbered 130 species and 2 subspecies (Subías, 2004, 2009; Mahunka & Mahunka-Papp, 2008). Members of the genus are generally well sclerotised and their distinctive body sculpture renders them readily identifiable. The majority of members of the genus reside in moss, leaf litter and, in particular, decaying wood.

The genus *Carabodes* C.L. Koch, 1835 was previously represented in the British Isles by seven species, namely *C. affinis* Berlese, 1913, *C. coriaceus* C.L. Koch, 1835, *C. femoralis* (Nicolet, 1855), *C. labyrinthicus* (Michael, 1879), *C. marginatus* (Michael, 1884), *C. minusculus* Berlese, 1923 and *C. willmanni* Bernini, 1975 (Luxton, 1996).

This work describes a new species, *C. scaber* **sp. nov.** obtained from collections made by the author as part of an on-going programme of familiarisation with the Acari. The collections were made at sites remote from each other, of varying habitat, two in the NW of England (sites 1 and 2) and two in N. Wales (Fig. 1).

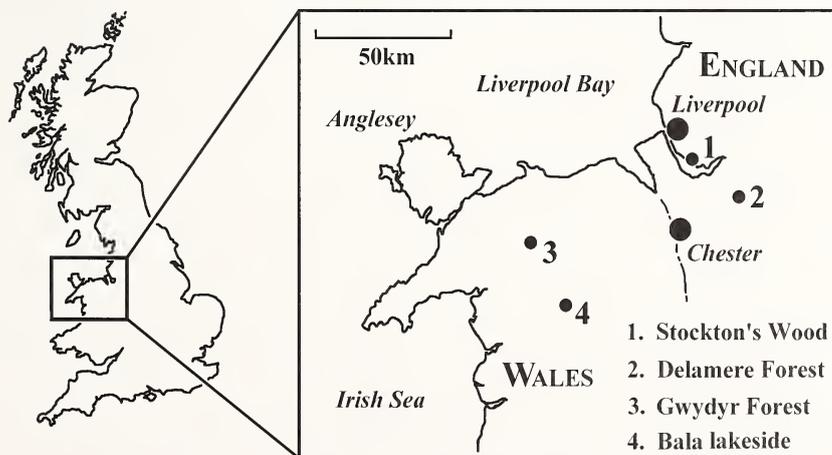


FIGURE 1.  
*Carabodes scaber* **sp. nov.** – collection sites

The known published records of oribatids previously found at Delamere Forest and its vicinity were made by Hull (1915, 1930), Kendrick and Burges (1962), and Burges (1967); Hull's discoveries were analysed in depth by Luxton (1987). The known published records for Stockton's Wood, Speke Hall NT and Gwydyr Forest, Betwys-y-coed are contained in Monson (2002). There are no known published oribatid records for Bala lakeside, N. Wales.

The type site, Delamere Forest comprises over 950 hectares of mixed deciduous and evergreen forest, grassland and wetland. It has been managed by the Forestry Commission since 1923; prior to this, Delamere Forest encompassed a much wider area. Public access to the site is encouraged.

#### MATERIALS & METHODS

Samples were sieved on site through a mesh with an aperture size of 6 mm. The sievings were transported to National Museums Liverpool in plastic bags, as was a small amount of the coarse detritus left in the sieve. Mites were extracted through Tullgren funnels, each heated by a 25W tungsten bulb, into 70% ethyl alcohol. Before loading the sieved material, a shallow 1-2 cm layer of the coarse detritus was placed over the funnel mesh in order to reduce the amount of fine debris dropping into the alcohol during the extraction process. Extraction began 12 hours after samples were collected and lasted for seven days (Baker & Monson, 2007).

Specimens were removed from the lactic acid, washed in distilled water, air dried, mounted on aluminium stubs using double-sided carbon adhesive discs, sputter-coated with gold for 2 min. at 20 milliamps (using an Emitech K550) and then examined in a Topcon ABT-55 (Japan) scanning electron microscope.

#### TAXONOMY OF NEW SPECIES

##### *Carabodes scaber* sp. nov. (Figs 2-7)

*Measurements.* Body length: 400-500  $\mu\text{m}$ , body width: 200-250  $\mu\text{m}$  (10 specimens).

*Prodorsum* (Figs 2A, 3 & 6). Surface sculpture scabrose, in raised patches, circular to elliptical in outline, closely packed and prominent in the posterior triangular medial area. The remaining surface between the lamellae is foveolate up to and over the pronotum. All surfaces, including the lamellae are generally microtuberculate. A dorsosejugal depression is present, shallow and narrow, slightly wider medially; the depression microtuberculate. Rostral (*ro*) and lamellar setae (*le*) robust, setiform, rough, the former pair pointing anteriorly, the latter pair meeting medially or just overlapping. Interlamellar setae (*ln*) 40-50  $\mu\text{m}$  long, robust, penicillate, pointing anteriorly, curving slightly laterally, held above the prodorsum and inserted anterior of the posterior edge of the lamellae. Sensilli (*ss*), long, directed laterally; pedicel and capitulum squamose; capitulum distally spoon shaped.

*Notogaster* (Figs 2A, 3 & 5). Surface sculpture scabrose, in slightly raised patches, roughly circular in outline, evenly spaced; 10 pairs of robust penicillate notochaetae: *c*<sub>2</sub> 30-35  $\mu\text{m}$  long, *h*<sub>1-3</sub>, 35-40  $\mu\text{m}$  long, *l*<sub>a-p</sub>, 40-50  $\mu\text{m}$  long, *p*<sub>1-3</sub>, 30-40  $\mu\text{m}$  long, 'feather-like'. Foveolate ridged shoulders evident at the notogaster anterior corners. A circumgastric depression is present. Notogaster generally microtuberculate between the scabrose patches.

*Gnathosoma* (Fig. 2B). Mentum, foveolate, microtuberculate posteriorly. Hypostomal setae *a*, *h* and *m* 10-15  $\mu\text{m}$  long, spiniform. Chelicera with weak, blunt teeth.

*Epimeral region* (Fig. 2B). Epimeres foveolate, setal formula 3-1-3-3; *I*<sub>a-c</sub> setae spiniform, smooth, 3-8  $\mu\text{m}$  long. Medial depressions at epimera I and III.

*Ano-genital region* (Figs 2B & 7). Anal aperture larger than genital aperture. Genital plates with random, longitudinal, shallow grooves; plates microtuberculate laterally and posteriorly, with 4 pairs of smooth, spiniform setae, 5-10  $\mu\text{m}$  long. Anal plates, foveolate, microtuberculate with 2 pairs of smooth, spiniform setae, 15-20  $\mu\text{m}$  long, situated on the

posterior half. Setae:  $ad_1$  35-40  $\mu\text{m}$  long, penicillate, 'feather-like';  $ad_2$  35-40  $\mu\text{m}$  long, penicillate, 'feather-like';  $ad_3$  5-10  $\mu\text{m}$  long, penicillate;  $ag$  5-10  $\mu\text{m}$  long, spiniform, smooth. The surface posterior to the genital plates, consisting of evenly spaced, prominently raised, scabrose patches, bridged together. The bridging, under a light microscope, is seen as forming a geometric 'mesh-like' structure linking the patches together (Figs 2B & 7). Ventral surface, generally microtuberculate.

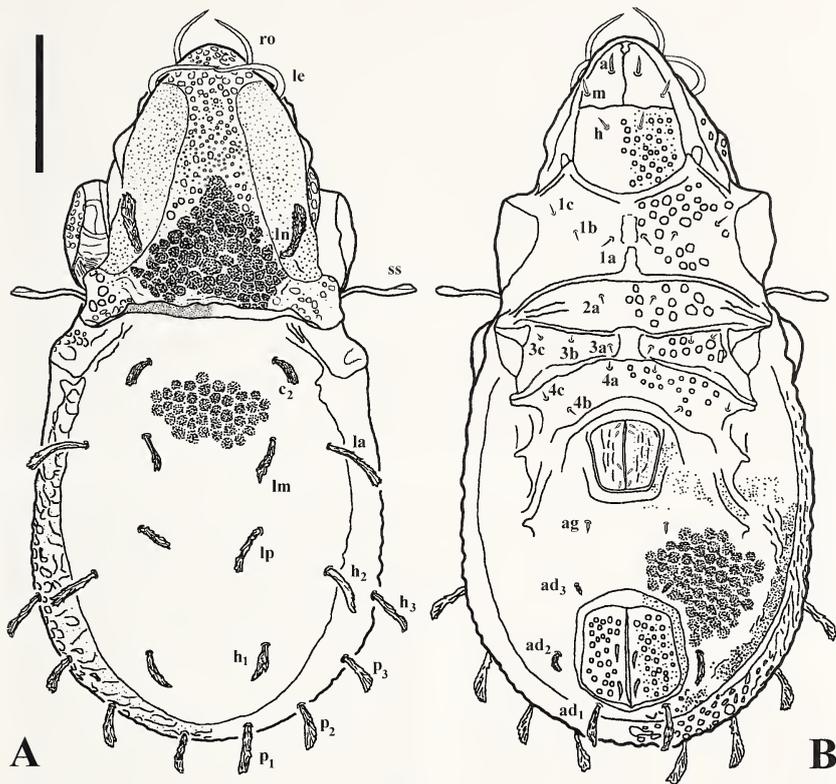


FIGURE 2.

*Carabodes scaber* sp. nov. – A, dorsal view; B, ventral view (scale bar: A, B = 100  $\mu\text{m}$ )

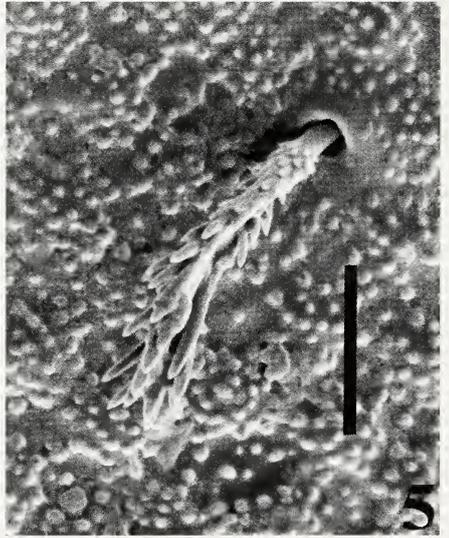
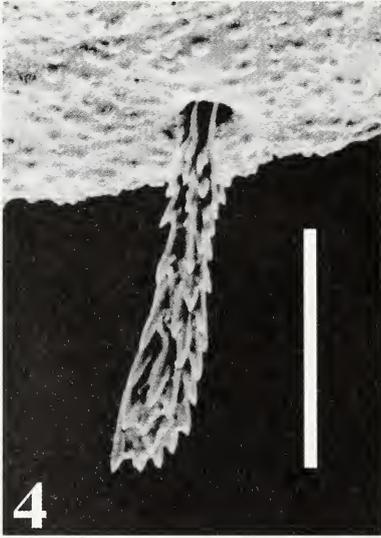
Adanal lyrifissures *iad* not observed.

*Legs*. Monodactylous.

*Colour*. Dark brown to black.

*Immatures*. Unknown.

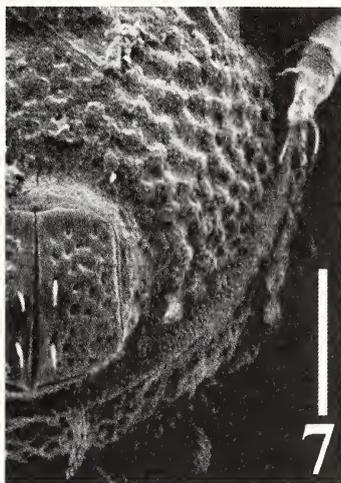
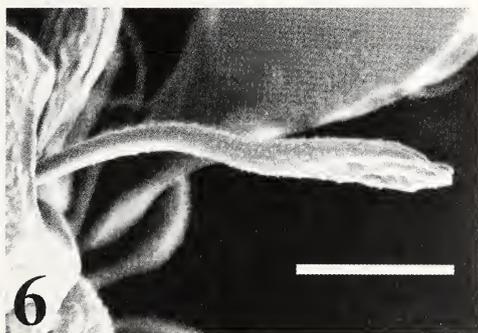
*Material examined*. Initially from bracket fungus growing on a fallen log, in a wet area adjacent to, and below Ashton Road, Delamere Forest, Cheshire, coll. F.D. Monson, 1.3.1995 (SJ545717) (53°:14':27"N, 2°:40':57"W) (4 specimens, sex unknown); from a mixture of moss, leaf litter and rotten wood from the forest floor, at a site situated on the opposite side of Ashton Road, from a banking covered with pine trees, coll. F.D. Monson,



FIGURES 3-5.

*Carabodes scaber* sp. nov. – 3, SEM of prodorsum (right ro seta missing) (scale bar = 100); 4, SEM of seta  $p_1$ , dorsal view, right side; 5, SEM of seta  $lp$ , dorsal view, right side showing the scabrose, microtuberculate surface in close-up beneath (scale bar: 3 = 100  $\mu$ m; 4, 5 = 25  $\mu$ m)

1.3.1995 (SJ545719) (53°:14':33"N, 2°:40':57"W) (10 specimens, sex unknown); from a mixture of moss, leaf litter and rotten wood from the forest floor, on a banking covered with pine trees, Delamere Forest, coll. F.D.Monson, 10.12.2007 (SJ535718) (53°:14':30"N, 2°:41':51"W) (12 specimens); from moss on the floor of Gwydyr Forest, situated to the west of Betwys-y-coed, Snowdonia, N. Wales, coll. F.D.Monson, 16.4.1994 (SH761571) (53°:05':50"N, 3°:51':04"W) (6 specimens, sex unknown); from moss on a banking, supported by a dry stone wall, adjacent to Bala lakeside, N. Wales, coll. F.D.Monson, 14.5.1994 & 8.4.1995 (SH908326) (52°:52':49"N, 3°:37':24"W) (12 specimens, sex unknown); from a mixture of moss and rotten wood from a well rotted tree trunk, the remains of which had rotted almost level with the floor of Stockton's Wood, Speke Hall NT, coll. F.D.Monson, 1.5.2004 (SJ423828) (53°:20':22"N, 2°:52':02"W) (10 specimens, sex unknown), situated in the southern suburbs of Liverpool, Merseyside.



FIGURES 6-7.

*Carabodes scaber* sp. nov. – 6, SEM of sensillus, dorsal view, right side, depicting the laterally pointing bothridium, the squamose pedicel and 'spoon-shaped' capitulum; 7, SEM part view of posterior ventral surface, highlighting the prominent, scabrose sculpture with associated 'bridging' (scale bar: 6 = 25  $\mu$ m; 7 = 50  $\mu$ m)

*Etymology.* The specific epithet '*scaber*' was chosen to highlight the scabrous prodorsum, notogaster and ventral posterior surface of *C. scaber* sp. nov. (*L. scaber* = rough, scaly).

*Type Series.* The holotype of *C. scaber* sp. nov., locality Delamere Forest, is deposited (in alcohol) with the National Museums Liverpool. The paratypes (six specimens) of *C. scaber* sp. nov., locality Stockton's Wood, Speke Hall NT, are deposited (in alcohol) in the Natural History Museum (London). The remaining specimens reside in the author's collection.

#### REMARKS

The choice of '*scabrose*' describing the sculpture on the prodorsum, notogaster and posterior ventral surface is a characteristic unique to *C. scaber* sp. nov. within the genus *Carabodes* C.L. Koch, 1835. The sculpture description was established after consulting Mahunka and Zombori (1985). The sensillus capitulum of *C. scaber* sp. nov. being 'spoon-shaped', suggested, initially, it belonged to the '*minusculus*' group (Weigmann, *pers. comm.*), but

there the similarity ceases, particularly in view of the latter group's tuberculate notogaster. Penicillate notochaetae are found on four other species of *Carabodes* C.L. Koch, 1835, namely *C. brevis* Banks, 1896, *C. granulatus* Banks, 1895, *C. radiatus* Berlese, 1916 and *C. penicillus* (Mahunka, 1998). *C. granulatus* Banks, 1895 is proportionally similar to *C. scaber* **sp. nov.**, but differs from the latter, in possessing a foveolate notogaster and is somewhat smaller at 350  $\mu\text{m}$  long (Reeves & Behan-Pelletier, 1998).

The first published key to the British species of the genus *Carabodes* C.L. Koch, 1835 provided below introduces *C. scaber* **sp. nov.** and *C. rugosior* Berlese, 1916 to the British fauna. The key is based, in part, on an earlier key by Luxton (unpublished), the recent keys by Weigmann (2006) and Murvanidze (2008) coupled with the author's personal observations of the genus within the context of the British Isles.

*Family:* Carabodidae C.L. Koch, 1837

*Genus:* *Carabodes* C.L. Koch, 1835

*Type species:* *Carabodes coriaceus* C.L. Koch, 1835

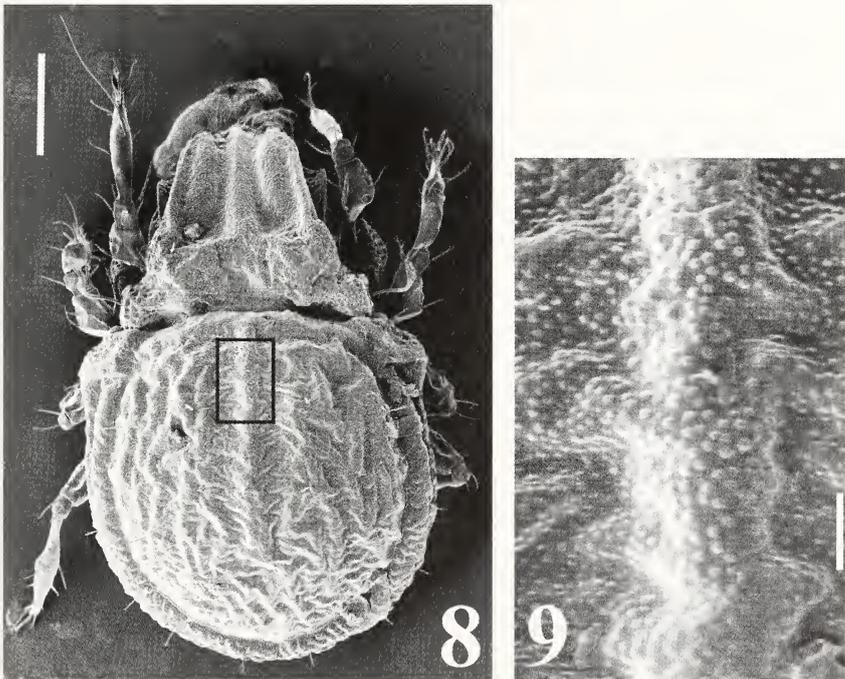
*Generic diagnosis:* Lamellae wide, situated on the sides of the prodorsum and extending to the tip of the rostrum; rostral setae inserted at the rostral tip; the posterior region of the prodorsum subject to a variety of sclerotized sculpture; notochaetae numbering 10-11 pairs; genital setae numbering 4 pairs.

1. Notogaster foveolate, microtuberculate between foveolae; notochaetae clavate, distally ciliate; sensillus clavate, ciliate distally; dorsosejugal depression wide medially; length 450-550  $\mu\text{m}$  ..... *C. affinis* Berlese, 1913  
 – Notogaster not foveolate ..... 2
2. Notogaster covered with scabrose patches, microtuberculate between; notochaetae penicilliform; sensillus long, straight, held laterally, pedicel and capitulum squamose; capitulum with spoon-shaped excavation distally; dorsosejugal depression narrow; length 400-500  $\mu\text{m}$  ..... *C. scaber* **sp. nov.**  
 – Notogaster not scabrose ..... 3
3. Notogaster with a longitudinal medial ridge (other ridges present, laterally) ..... 4  
 – Notogaster without medial ridge (and without lateral ridges) ..... 5
4. Notogaster with ridges (and troughs between) covered in microtuberculate nodules; notochaetae 10-11 pairs, short, spiniform;  $c_3$  always present at the shoulders,  $c_2$  present when 11 pairs of notochaetae; sensillus cylindrical, curved upwards and slightly forwards, flattened and squamose distally; dorsosejugal depression very narrow; length 600-750  $\mu\text{m}$  ..... *C. femoralis* (Nicolet, 1855)  
 – Notogaster with microtuberculate ridges (and troughs between); notochaetae short, bacilliform;  $c_3$  present at the shoulders,  $c_2$  not present; sensillus cylindrical, curved upwards and slightly forwards, flattened and squamose distally; dorsosejugal depression very narrow; length 550-650  $\mu\text{m}$  ..... *C. rugosior* Berlese, 1916
5. Notogaster with polygon shaped tubercles, giving the appearance of reticulation; notochaetae lanceolate, ciliate distally; sensillus cylindrical, curving upwards, ciliate distally, dorsosejugal depression wide; length 450-550  $\mu\text{m}$  ..... *C. marginatus* (Michael, 1884)  
 – Notogaster with round tubercles ..... 6
6. Notogastral tubercles, of, at least the central part, fused into irregular ridges ..... 7  
 – Notogastral tubercles distributed independently of each other ..... 8

7. Prodorsum, posteriorly, with a prominent structure resembling 'spectacles' coupled with an extensive, deep, dorsosejugal depression; notochaetae long, lanceolate, ciliate distally, sensillus cylindrical, curving upwards, ciliate distally; length 550-700  $\mu\text{m}$  ..... *C. coriaceus* C.L. Koch, 1835
- Notogastral tubercles coalesced into irregular ridges of single tubercle width; notochaetae setiform, curved, smooth; sensillus short, clavate, distally ciliate; dorsosejugal depression narrow; length 400-600  $\mu\text{m}$  ..... *C. labyrinthicus* (Michael, 1879)
8. Prodorsum tuberculate; notochaetae curved, phylliform; sensillus capitate, pedicel short with spoon-shaped excavation distally; dorsosejugal depression absent; length 340-380  $\mu\text{m}$  ..... *C. minusculus* Berlese, 1923
- Prodorsum areolate; notochaetae lanceolate, lateral setae ( $p_{1-3}$ ) short and thin; sensillus capitate, pedicel short, with a spoon-shaped excavation distally; dorsosejugal depression absent; length 330-430  $\mu\text{m}$  ..... *C. willmanni* Bernini, 1975

*Carabodes rugosior* Berlese, 1916 (Figs 8-9)

*Measurements.* Body length: 510-670  $\mu\text{m}$ , body width: 320-430  $\mu\text{m}$  (10 specimens).



FIGURES 8-9.

*Carabodes rugosior* – 8, SEM dorsal view; 9, SEM dorsal view, in close-up, showing the microtuberculate medial and lateral ridges within the designated rectangle outlined in Fig. 8 (scale bar: 8 = 100  $\mu\text{m}$ ; 9 = 10  $\mu\text{m}$ )

*Material examined.* From a mixture of moss, leaf litter and rotten wood from the forest floor, at a site situated on the opposite side of Ashton Road, from a banking covered with pine trees, coll. F.D.Monson, 1.3.1995 (SJ545719) (53°:14':33"N, 2°:40':57"W) (6 specimens, sex unknown); from a mixture of moss, leaf litter and rotten wood from the forest floor, on a banking covered with pine trees, coll. F.D.Monson, 10.12.2007 (SJ535718) (53°:14':30"N, 2°:41':51"W) (8 specimens, sex unknown); from moss on the floor of Gwydyr Forest, situated to the west of Betwys-y-coed, Snowdonia, N. Wales, coll. F.D.Monson, 16.4.1994 (SH761571) (53°:05':50"N, 3°:51':04"W) (6 specimens, sex unknown); from moss on a banking, supported by a dry stone wall, adjacent to Bala lakeside, N. Wales, coll. F.D.Monson, 14.5.1994 & 8.4.1995 (SH908326) (52°:52':49"N, 3°:37':24"W) (8 specimens, sex unknown).

*Distribution:* Palaearctic and the northern Nearctic (Subías, 2004, 2009).

#### ACKNOWLEDGEMENTS

I am most grateful to Dr Malcolm Luxton for his advice on reading an earlier draft of the manuscript and for providing access to his unpublished *Monograph of the Oribatids of the British Isles*. The recent acquisition by National Museums Liverpool of the Luxton Archive (on his retirement) provided the majority of the much needed literature required for researching the genus. Thanks are due to Prof. Gerd Weigmann (Freie Universität, Berlin) for reviewing the manuscript; his 2006 publication contains an in-depth chapter on the genus *Carabodes* which provided the catalyst for this paper. Thanks are due to Dr Maka Murvanidze (Institute of Zoology, Tbilisi, Georgia) and Dr Heinrich Schatz (Institute of Zoology and Limnology, University of Innsbruck, Austria) for their advice, to Mr Oliver Thompson (Forestry Commission Warden) for permission to collect at Delamere Forest and for his advice on the history of the site and Dr Siobhan Watts (Conservation Centre, National Museums Liverpool) for kindly producing the scanning electron micrographs. I am also grateful to Dr Jerry Bird (Liverpool John Moores University) and Mrs Jacqueline Chaplow (Centre for Ecology & Hydrology, Lancaster) for their help in obtaining additional literature. Specimens were extracted by Tullgren funnels at the National Museums Liverpool thanks to the hospitality of the past and present Curators of Entomology, Dr Stephen Judd and Mr Guy Knight respectively.

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## BOOK REVIEWS

**Peat and Peat Cutting** by **Ian D. Rotherham**. Pp.64, including numerous photographs and other illustrations. Shire Library no. 483. Shire Publications, Oxford. 2009. £5.99 softback.

It is decades since the appearance of a general and popular account of peat, peat cutting and peat usage in the British Isles. There have been site, regional, even subject-based studies, as well as Feehan and O'Donovan's *The Bogs of Ireland: An Introduction to the Natural, Cultural and Industrial Heritage of Irish Peatlands*, but in Britain there has been no recent overview of such culture and industry. Interest in these latter may grow as mechanised peat extraction fades and the survival of entire peatlands becomes less of a consuming issue. Perhaps Ian Rotherham's volume will not be a one-off, but a modern – if slim – first, produced in an elegant pocket-sized book containing a wealth of nicely produced illustrations.

Following an introductory explanation of peat, peatlands, their location and loss in the British Isles, Ian Rotherham divides the bulk of his text under four headings: 'Uses of peat and peatlands', 'How peat was worked', 'The Enclosures and fuel allotments' and 'Other uses of peat'. He closes with a 44-strong 'References and bibliography'. As an unrefined fuel, peat was once of great significance in certain areas. The author notes that not only was it available for the rural poor to exploit, but there was an extensive trade to cities such as York and Norwich. Additionally, there were many attempts to unlock peat's chemical and calorific riches, though it became more valuable as marketable bedding for working animals. These and a variety of other usages, now virtually extinct, are explained by the author. He also emphasises the disciplined methodologies, adapted to local climate and circumstances, once necessary to harvest peat by hand. It was labour intensive, socially cohesive and hard graft, often undertaken on defined allotments or common land. In favoured locations, worked by companies or entrepreneurial landowners, machines and rolling stock were labour-saving possibilities.

Much of Ian Rotherham's narrative, and many of his images, embrace subsistence activity in Ireland and Scotland, but other locations such as the Fens are included too, where manual commercial working was also important. However, the technological endgame for peat profit, mechanisation by Bord na Móna in Ireland, or Fisons and others in

Britain, is only marginal to the book's remit. To be fair, these recent decades would need a book to themselves. The author concentrates on earlier human communities with all their evolved variety and strategies, and not on industrial workforces and automation. However, he does not shy away from an opinion of the declining modern industry. This he characterises as "unsustainable and unacceptable", briefly outlining the consequences – on the landscape, biodiversity and the atmosphere – of removing huge tonnages of peat for horticulture and refined fuel. However, the overall intent is expressed by the author himself: "this book rekindles memories of traditions and times now past", and, within the parameters set, he has provided much in his 64 pages.

ML

**Primates of the World: the amazing diversity of our closest relatives** by **Ian Redmond**. New Holland Publishers (UK). Pp. 176, incl. 160 full colour plates and numerous drawings, tables and maps. 2008. £24.99 hardback.

*Primates of the World* is a beautifully illustrated, authoritative and fully comprehensive guide to the world's primates, covering nearly 300 species. The principal sections focus on the four main primate groups: prosimians, New World monkeys, Old World monkeys, and apes. Drawing on the latest research, the author explores the evolution of these fascinating creatures and provides an intimate view of what makes each primate group unique. Chapters explore aspects of their behaviour such as feeding, playing, courting and defending territory; also explored are the origins of primates, their social structures, world distribution, relationships with humans and the threats to their existence.

More than 160 full-colour photographs show members of every branch of the primate family tree in their natural habitats. Regional maps present the distribution of all the primate groups, data panels indicate their conservation status and listings give details of the best primate-watching locations. It seems too pedestrian to refer to this work as a book. It's an event, a glamorous trip abroad to visit our colourful relatives in all the tropical, and some temperate, parts of the globe. In dealing with our taxonomically closest relatives it fascinatingly and sometimes disturbingly holds a mirror up to ourselves and confronts us with uncomfortably familiar physical and behavioural characteristics.

Its success in my view lies in its visual and journalistic attractiveness. It combines bold magazine-style presentation with Redmond's vast knowledge and infectious enthusiasm for his subject. It places the best in reprographic technology, imaginative layouts, graphics and artwork at the service of these fascinating creatures and the issues facing them. Through Redmond's very readable prose style it seems they are given a voice, bringing the world of primates alive for a very broad public.

Ian Redmond has had a lifelong interest in apes, having worked with Dian Fossey in Rwanda, studying gorillas and their parasites and subsequently working on 60 wildlife documentary films; he introduced David Attenborough to the gorillas in his landmark BBC TV 'Life on Earth' series and advised Sigourney Weaver on her role as Dian Fossey in the film 'Gorillas in the Mist' (1988). Doncaster residents will remember Ian from when he hitch-hiked from Bristol in freezing fog, weather conditions having closed down all commercial transport, to deliver a public lecture at Doncaster Museum to commemorate the Centenary of the Doncaster Naturalists' Society in 1980. His choice of subject was 'Gorillas' and his descriptions of gorillas 'taking the pith' out of the jungle vegetation are still remembered!

I congratulate the author and his editorial and design team for producing what promises to be a popular and influential work. This attractive and compelling publication will appeal to travellers and wildlife enthusiasts, as well as students of mammalogy.

CAH

## Y.N.U. BRYOLOGICAL SECTION REPORT 2007-2008

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### EXCURSIONS

The following sectional meetings were held in 2007 and 2008.

#### Combe Scar, Dentdale (VC 65), 12 May 2007

Combe Scar is an outlying locality for several montane and oceanic ('Atlantic') bryophytes that occur more widely in N. Wales, the Lake District and Scotland. The Y.N.U. visited the site in 1979 (Blockeel, 1980) and made some noteworthy records, including the liverwort *Bazzania tricrenata*, here at the south-eastern limit of its distribution in England (and Britain). The purpose of our visit in 2007 was to do further recording at this interesting site, and attempt to assess the status of some of the rarer species. Unfortunately, after the unusually dry spring of 2007, our recording was made more difficult by the very dry condition of the crags, and we did not re-find the *Bazzania*.

Ledges and crevices on the crags produced, among others, *Lophozia incisa*, *Tritomaria quinquedentata*, *Scapania gracilis*, *Preissia quadrata*, *Diphyscium foliosum*, *Seligeria recurvata*, *Blindia acuta*, *Campylopus atrovirens*, *Amphidium mougeotii*, *Bartramia pomiformis*, *Breutelia chrysocoma* and *Isopterygiopsis pulchella*. Particularly noteworthy was a patch of *Bartramia halleriana*, a very rare species in Yorkshire, and *Schistidium strictum*. There has been a revival of interest in *Schistidium* recently, following the work of the Norwegian bryologist Hans Blom, and the species are now much better understood than formerly. *S. strictum* is an Atlantic species that has been over-recorded in the past, and the record at Combe Scar is confirmation of its occurrence in VC 65. It was noted on wet inclined rocks in the westerly of the two main gullies on the crags.

Below the crags, *Mylia taylorii* was plentiful in places on the heathy slopes and a large boulder had *Racomitrium sudeticum*. Two important records were *Riccardia palmata* on rotting wood (a new vice-county record), and *Tortella bambergeri*. The latter species is similar to the widespread *T. tortuosa*, which also occurs at Combe Scar. It was noted on a small sheltered boulder in the block scree below the main eastern crag.

The gravely flushes and mire communities below the Scar are an equally important habitat for bryophytes. The flushes are calcareous and support fine populations of *Scorpidium scorpioides*, as well as *S. cossonii*, *S. revolvens*, *Breutelia chrysocoma* and a several patches of *Campylopus atrovirens*. The leafy liverwort *Jungermannia exsertifolia* ssp. *cordifolia* occurred in swelling masses in runnels. *Sarmentypnum sarmentosum* (*Warnstorfia sarmentosa*) was a new record for the site, occurring sparsely in a hollow in the wet mire. It is a species of mineral-rich and base-rich mires primarily in montane habitats, and is here near the south-eastern limit of its geographical range in Britain. In more acidic niches and on hummocks we noted *Polytrichum strictum*, *Racomitrium lanuginosum* and several species of *Sphagnum*.

The total list for the day was 102 species.

#### Abbey Brook, Upper Derwent Valley (VC 63), 13 October 2007

Abbey Brook, in the Upper Derwent Valley of the Peak District National Park, is one of the most important sites for bryophytes in the Sheffield region, and indeed in S.W. Yorkshire. The Abbey Brook runs eastwards from the northern end of Derwent Reservoir into the Howden Moors. The diversity of the site is due in part to base enrichment of the low crags along the stream banks, unusual on the gritstone moors.

After the long walk in to the head of Derwent Reservoir, we began recording at the eastern end of the plantation that occupies the lowest part of the clough. Early finds included *Frullania tamarisci*, in its only known vice-county site, and *Barbilophozia barbata*, growing on a low boulder with *Scapania nemorea*, the first recent record for this

species in the vice-county. *Saccogyna viticulosa* is known from the clough – an isolated site for the species in this part of the Peak District – and it was refound in a recess at the base of a gritstone outcrop. The low crags along and above the stream bank were very productive, with *Amphidium mougeotii*, *Blindia acuta*, *Barramia pomiformis*, *Heterocladium heteropterum*, *Fissidens adianthoides*, *Pohlia cruda*, *Seligeria recurvata*, *Jungermannia pumila*, *Solenostoma sphaerocarpum* and *Marsupella emarginata*. The most base-rich niches had *Gymnostomum aeruginosum*, *Orthothecium intricatum*, *Ctenidium molluscum*, *Palustriella commutata* and *Jungermannia atrovirens*. The *Orthothecium* is particularly noteworthy, as it is usually found in limestone rock crevices. A tuft of *Ptychomitrium polyphyllum* on a natural outcrop of gritstone rock was an interesting find. Although present in several places in the Upper Derwent valley, it is normally found only on gritstone walls there. Also of note was another record *Tortella bambergerei*, which we had already seen on the spring meeting in Dentdale, new for the vice-county on a small, low and slightly base-rich boulder.

*Fontinalis squamosa* and *Hygrohypnum ochraceum* were aquatic in the stream. Species found in the springs and flushes along the stream banks included *Straminergon stramineum* and *Sphagnum teres*. *Metzgeria violacea* (*M. fruticulosa*) was found on an ash tree, and on our return *Orthotrichum pulchellum* was on *Salix* in the plantation at the foot of the clough.

Abbey Brook is a long valley, and we did not have time to explore the upper part. Nevertheless the total of 108 species was a high one for a site in the southern Pennine moors.

#### **Crag Wood and Yew Grain Scar, Eskdale (VC 62), 10 May 2008**

The morning was spent in Crag Wood, south of Houlisye. The wood is acidic, with alder in the damp bottom areas and mainly birch in the upper wood. The low ground was not particularly rich in species, but wet ground among the alders produced the undulate form of *Plagiothecium denticulatum*, a moss at one time regarded as a distinct species *P. ruthi*. There were two species of *Sphagnum*, *S. denticulatum* and *S. palustre*. The most notable feature of the wood is the bouldery ground below the upper crag, some of the rocks being of massive proportions. This ground looked extremely promising, with luxuriant bryophytes, including patches of *Dicranum majus*, *Plagiothecium undulatum*, *Rhytidiadelphus loreus* and *Plagiochila asplenioides*. The sandstone rocks also produced *Dicranum fuscescens*, *Cephalozia lunulifolia*, *Scapania umbrosa* and *S. gracilis*, with small amounts of *Tetradontium brownianum* and *Tritomaria exsectiformis*. A small patch of *Nowellia curvifolia* was seen on an old log. A total of 54 species was recorded in and around the wood. In spite of its attractive nature, the site did not quite live up to expectations, and we left with a feeling that it should have been richer and more diverse than it appeared to be.

After lunch we drove to the head of Great Fryup Dale in order to examine the slopes and waterfalls of Yew Grain Scar, with mostly acid grit and shales. The stream-sides and rocky slopes brought welcome additions to the day's list with five *Sphagnum* species, including *S. russowii*. Both *Nardia compressa* and *N. scalaris* were seen. *Aneura pinguis* and *Pellia neesiana* grew on wet banks with patches of *Philonotis fontana*. Other records included *Pogonatum urnigerum*, *Aulacomnium palustre*, *Rhytidiadelphus loreus* and *Marsupella emarginata*. A wet, slightly base-rich stretch on the higher parts of the crag produced some nice patches of *Amphidium mougeotii* and *Palustriella commutata*. The *Conocephalum* growing here proved to be *C. salebrosum*, the recent segregate from the familiar *C. conicum*. *Lophozia incisa* was seen in small quantity. In total 50 species were recorded in this area.

#### **Kirkham Park (VC 61), 29 September 2008**

Kirkham Park is located in the 'gorge' of the R. Derwent south of Malton. The gorge is a glacial overflow channel, and there are riverside communities of woodland, grassland, fen and marsh. Our visit took in parts of the Kirkham Park and Riverside SSSI on the eastern side of the river. We recorded in the dry deciduous woodland of Kirkham Park Wood and

adjacent areas of alder swamp to the north by the R. Derwent, but we did not have time to visit the northern part of the SSSI.

The ground flora in Kirkham Park Wood supported, in places, fine patches of large woodland bryophytes, notably *Thuidium tamariscinum*, *Thamnobryum alopecurum*, *Eurhynchium striatum*, *Cirriophyllum piliferum* and the leafy liverwort *Plagiochila asplenioides*. Stones at the southern end of the wood had *Mnium stellare*, *Oxyrrhynchium pumilum* (*Eurhynchium pumilum*), *Fissidens pusillus* and *Cephalozia bicuspidata*. The calcareous springs in the woodland were notable for an abundance of *Palustriella commutata*, with *Cratoneuron filicinum* and (on hard calcareous deposits) *Eucladium verticillatum* and *Pellia endiviifolia*. The epiphytic flora of tree trunks and branches was not especially rich, but included small quantities of *Orthotrichum striatum*, *Uloa phyllantha*, *Frullania dilatata*, *Metzgeria furcata*, *M. violacea* (*M. fruticulosa*) and, unexpectedly, the tiny liverwort *Cololejeunea minutissima* on an ash tree. Riverside trees had few of the riparian species that are characteristic of rivers with a defined flood zone. Only *Leskea polycarpa* was noted.

Swampy ground in alder/willow woodland had *Oxyrrhynchium speciosum* (*Eurhynchium speciosum*) on roots and twigs in wet ground, and *Calliergonella cuspidata*. Increased humidity in this habitat was evident from the abundance of *Metzgeria violacea* on some willows. Other epiphytes here were *Dicranum tauricum*, *Radula complanata*, *Uloa bruchii*, and further small amounts of *Uloa phyllantha* and *Frullania dilatata*.

Several of the epiphytic species that we recorded had not been recorded in the East Riding of Yorkshire for many years, notably *Orthotrichum striatum*, *Radula complanata* and *Frullania dilatata*. This reflects the general trend during recent decades for the recovery of epiphytic species in areas previously affected by atmospheric pollution. However the record of *Cololejeunea minutissima* was remarkable. Only two decades ago this was primarily a plant of coastal counties in the south and west of Britain, but it is now spreading rapidly north-eastwards. The Kirkham record is most north-easterly yet known in Britain, though the species extends to the Hebrides in the oceanic west. The spread may be attributed to recent mild winters and wet summers, as much as to cleaner air.

46 species were recorded in the SSSI, and a further 11 species at Manor Farm and in the gateway at the southern entrance to the wood. Species present on bare soil by the gateway included *Bryum subapiculatum*, *B. klingraeffii* and *Dicranella schreberiana*.

## RECORDS

Recent bryological publications for Yorkshire have included Colin Wall's survey of churchyards in the Doncaster district (Wall, 2006), and Joan Egan and Harry Lake's account of the recovery of epiphytes in the Sheffield region (Egan & Lake, 2007). Matthew Adamson has reported on his detailed survey of Studfold Farm in Nidderdale (Adamson, 2009), including a notable record of *Hedwigia stellata* on a gritstone wall.

The list below includes new vice-county records and other records of note. Nomenclature follows the new *British Checklist and Census Catalogue* (Hill *et al.*, 2008). An asterisk indicates a new or updated vice-county record. Recorders' initials: JMB = J.M. Blackburn; TLB = T.L. Blockeel; HL = H. Lake; CW = C. Wall.

***Barbilophozia barbata***: (63\*) SK176921, thin soil on surface of grit boulder under tree, Abbey Brook, Upper Derwent Valley, TLB & YNU, 13.10.2007.

***Blasia pusilla***: (63) SE65-07-, Hatfield Carr-side Quarry, CW, 29.10.2008; SE689021, Blaxton Common, CW, 2.10.2007.

***Cololejeunea minutissima***: (61\*) SE737665, on bark of small ash tree, Kirkham Park Wood, TLB & YNU, 27.9.2008. (63\*) SK304833, on sycamore, Limb Valley, Whirlow, TLB, 15.3.2008; SK518822, on spindle-tree by railway, E of Kiveton Park Station, CW, 17.5.2008. See the Kirkham Park report (above) for comments on this species.

***Fossombronina incurva***: (63) SE689021, Blaxton Common, CW, 2.10.2007.

***Kurzia trichoclados***: (63) SK19-97-, Midhope Moors, HL, 14.7.2008.

- Lophocolea semiteres*: (63) SE68-02-, Blaxton Common, CW, 2.10.2007.
- Lophozia excisa*: (63) SE68-02-, Blaxton Common, CW, 2.10.2007.
- Metzgeria consanguinea* (*M. temperata*): (63\*) SK304833, on birch and sycamore, Limb Valley, Whirlow, TLB, 15.3.2008.
- Nowellia curvifolia*: (61\*) SE948308, on rotting log, Brantingham Dale, CW, 5.4.2007.
- Porella platyphylla*: (63) SK549941, Marshall's Quarry, Stainton, CW, 22.9.2007. Though common in the limestone dales, this species is very rare in S.W. Yorkshire.
- Radula complanata*: (61\*) SE73-66-, on ash, Kirkham Hall Park, S.W. of Malton, CW, 27.9.2008.
- Ptilidium ciliare*: (63) SK65-94-, Austerfield Sand Quarry, CW, 31.8.2008.
- Riccardia palmata*: (62) SE5-8-, Hawby Estate, JMB, 9.8.2008; (65\*) SD67-87-, Combe Scar, CW & YNU, 12.5.2007.
- Scapania irrigua*: (63) SE36-05-, Kendray, HL, 30.1.2007.
- Scapania nemorea*: (61\*) TA07-60-, north wall of church, Lowthorpe Church, N.E. of Driffeld, CW, 7.8.2007.
- Aloina brevirostris*: (63) SK54-94-, Marshall's Quarry, Stainton, CW, 24.11.2007.
- Brachythecium glareosum*: (63) SE52-07-, grassy track, Brodsworth Community Woodland, CW, 21.4.2007.
- Campyliadelphus chrysophyllus*: (63) SE52-00-, Pot Ridings Wood, Sprotbrough, CW, 6.3.2007.
- Dicranum polysetum*: (63) SE40-00-, Cortonwood, HL, 5 Feb 2007; SE715081, Hatfield Moor, CW, 13.3.2007; SE694045, Packard's Heath, Hatfield Moor, CW, 28.2.2008.
- Hedwigia ciliata* var. *ciliata*: (61\*) SE897327, stone capping of east churchyard wall, North Cave, CW, 28.6.2007.
- Henediella heimii*: (63\*) SE525077, flush on colliery spoil bank, Brodsworth, CW, 21.4.2007. This is a very interesting record of a species that is halophytic and normally found only in coastal regions.
- Microbryum floerkeanum*: (63) SK522882, arable corn field, Laughton en le Morthen, HL, 21.8.2008.
- Microbryum rectum*: (63) SK51-84-, North Anston, HL, 19.9.2008; SK53-88-, Slade Hills, HL, 21.8.2008; SE508172, Brockdale Nature Reserve, Wentbridge, CW, 29.1.2007.
- Orthotrichum consimile*: (61\*) SE937639, on elder, Sledmere Park, CW, 1.5.2008. Second recent record in Britain for this interesting epiphyte, which had not been recorded in the country since 1846 until it was discovered in Derbyshire in 2007 (Blockeel, 2008).
- Orthotrichum lyellii*: (61\*) TA003424, on ash tree, disused railway cutting, NW of Beverley, CW, 12.9.2007; (63) SE596001, on *Salix*, Potteric Carr NR, Doncaster, CW, 1.5.2007; (64) SE37-42-, on elder, Hetchell Wood NR, CW, 15.8.2008; SE27-54-, on *Salix*, Birk Crag, Harrogate, CW, 10.10.2007.
- Orthotrichum striatum*: (61\*) SE73-66-, on ash, Kirkham Park Wood, CW & YNU, 27.9.2008; (63) SE21-02-, Ecklands, HL, 27.4.2007.
- Oxyrrhynchium speciosum* (*Eurhynchium speciosum*): (61\*) SE73-66-, wet twigs and roots by woodland pool, Kirkham Park Wood, TLB & YNU, 27.9.2008.
- Plagiomnium cuspidatum*: (63) SE27-08-, Cannon Hall, HL, 17.3.2008.
- Pohlia campotrachela*: (63) SE65-07-, Hatfield Carr-side Quarry, CW, 31.5.2008.
- Pylaisia polyantha*: (61\*) SE86-36-, on elder, North Cliffe Wood Nature Reserve, CW, 28.1.2008.
- Rhytidiadelphus loreus*: (63) SE23-03-, Thurlstone, HL, 23.4.2007.
- Rhytidiadelphus triquetrus*: (63) SE40-00-, Cortonwood, HL, 5.2.2007.
- Sanionia uncinata*: (63) SE29-09-, Cawthorne Park, HL, 19.7.2007.
- Schistidium strictum*: (65\*) SD677874, on wet sloping rocks on side of gully, Combe Scar, TLB & YNU, 12.5.2007.
- Scorpidium revolvens* s.str. (*Drepanocladus revolvens*): (63\*) SE12-03-, Ruddle Clough, HL, 20.10.2007.

- Syntrichia laevipila*: (63) SE753171, epiphyte, Goole Moor edge, Thorne Moors, CW, 22.4.2008.
- Syntrichia virescens*: (63) SE712166, on *Salix*, Green Belt, Northern Canals, Thorne Moors, CW, 22.11.2007.
- Taxiphyllum wissgrillii*: (63) SK52-81-, Hawks Wood, west of Worksop, CW, 17.5.2008; SK54-94-, Marshall's Quarry, Stainton, CW, 22.9.2007.
- Tortella bambergeri*: (63\*) SK18-92-, low grit boulder in open woodland, Abbey Brook, Upper Derwent Valley, TLB & YNU, 13.10.2007 (65\*) SD67-87-, on small boulder below crag, Combe Scar, TLB & YNU, 12.5.2007.

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## THE LEEDS CITY MUSEUM COLLECTION OF BIRDS, NOTABLY FROM NEW ZEALAND, AND THE ROLE OF THE YORKSHIRE NATURALIST JOHN HENRY HIRST (1888-1963)

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#### INTRODUCTION

The Leeds City Museum bird collection is a very good one, being worldwide in coverage and containing many currently endangered and several extinct species. In all, these collections comprise some 4500 birds (Norris, 1989). There is an impressive collection from New Zealand which has been assembled from a variety of sources, often unrecorded and lacking site details. However, in the case of the John Henry Hirst collection, we know a little more about them.

The birds of New Zealand are interesting. The country, consisting of two main islands, has been separated for some 65 million years from other land mass and the birds include a large number of endemic species. However, European settlement has led to the decline and extinction of many birds, so conservation issues are of great importance. More than 50 species of birds from New Zealand were classified as critically endangered, endangered or vulnerable in 2004 (Mackay, 2005). In an earlier paper, Baker (2003) described the important collections of Moa bones from New Zealand held in the Leeds City Museum. The present paper describes the Leeds collection from New Zealand and, in particular, the part played by John Henry Hirst and his family.

#### JOHN HENRY HIRST

The obituary of J. H. Hirst in the *Spenborough Guardian* (24 May 1963) tells us that he died on 18 May 1963 at Tarn House, Whitehall Road, Wyke aged 75 years. On the front page of the same issue is a photograph captioned "The Editor dies". What it doesn't tell us,

in any detail, is the extraordinary and fascinating life of this Yorkshire eccentric, his interest in wildlife, the countryside and fish and birds in particular. John Henry Hirst was born in Vine Street, Cleckheaton in 1888, the eldest son of Agnes and Eli Hirst. There were two brothers John (himself) and Alfred Edison, who died in France during WW1, and two sisters, Florence and Dorothy. His father Eli owned the *Cleckheaton Guardian*. John went to Heckmondwike Grammar School and was destined for higher education, having won a scholarship to Oxford, but his parents refused to allow him to go.

When WW1 broke out, John joined the army and went to France and Belgium, serving on the Somme and at Ypres. He was also a war correspondent. In a book of newspaper cuttings written by Pte J. H. Hirst from the trenches (Bradford Libraries, cat.no. Y 940.4144 HIR; Record of the 1st / 4th West Riding Regiment, Cleckheaton Territorials), there are many articles, one of which is headed "Realities of Warfare", describes his bird observations: "Wild birds are scarce in France. There is no Wild Birds' Protection Act here, and in times of peace wild birds are shot for sport. The war may also have driven some of them away...There is no long line of rooks across the sky at sunrise and sunset. One or two skylarks and a few sparrows are the only wild birds I have seen except a very large hawk (probably a goshawk) which I noticed hovering in the distance". He later became a Second Lieutenant in the army and then a pilot in the Royal Flying Corps. After a period as an observer, he became a pilot seeing service in Egypt, Palestine and Arabia, shooting birds in some of his postings. Following WW1, he planned to stay in the army but his father promised him that if he came back he would give him half of the business.

He returned home and finally took over from his father, becoming Editor and Principal Director of the *Guardian and Herald* series. In 1949 he was President of the Yorkshire Newspaper Society and the *Cleckheaton Guardian* changed its name to the *Spenborough Guardian* in 1955. He married twice, first to Jane Bell Leiper and secondly to Winifred Leiper, they were sisters and his second wife survived him. After his marriage to Jane Bell, he went to live in Threshfield, near Grassington to be near to the River Wharfe for fishing. He also owned and kept a farm at Starbotton and fishing rights at Buckden in the Dales. However, he found the daily travel to Cleckheaton difficult and after three years had a house built in Wyke, near Bradford where he lived for the rest of his life. Three sites were selected, two were former mills with mill dams and the third an old quarry and all three were capable of keeping fish. He told the Irish builder "to build it as cheaply as possible because as long as it lasted his life, then it would do". The house stands in Whitehall Road, Wyke and is still owned and occupied by a member of the family. Hirst wasn't keen on the Cleckheaton area. He wrote every week to his sister Dorothy, who had moved to be a permanent resident and missionary in Africa. In one letter he said, "My family are unwilling to leave Cleckheaton – would you believe it? – I hate it – thank you for the monkey skins" (Letter from J. H. Hirst to Dorothy Hirst, 5 September 1957 held by the family).

His interest in fishing started as a six-year old; his major interest in life was fishing around the Spen Valley and Low Moor, Bradford. He fished at home and abroad while in the army and became one of the most prominent English anglers. He also designed and patented a fishing rod which created wide interest, the so called "Spider web fishing rod", which was known for its lightness, strength and length in order to reach mid-stream. He was a member of the Bradford No. 1 and the Bradford City Anglers' Association, wrote articles under the penname "Baitman No. 1" for angling magazines such as the *Angler's News* and won many trophies and cups. He also bred giant-sized carp, golden orfe and tench, some of which he kept in the pond at his home. He was a meticulous recorder of nature, a keen observer and lover of the countryside, and kept a detailed diary (held by the family) with notes of all the fish he had caught. Details are given of the date, weight and type of fish, as well as of every bird he shot, some of which were prepared by him as he was an expert taxidermist. He also employed a professional taxidermist from London to prepare other animals and amongst his collection were badgers and foxes. Other interests included landscape drawing, fungi and mimicking the songs of most birds. He had a large

and fine collection of birds; although some he had shot, the main collection was purchased from the Day family who lived in Mirfield, Yorkshire who were moving house to Kirk Hammerton, North Yorkshire and wanted to dispose of them.

John Hirst had a strong personality and an “unchallenging integrity and honesty” (*Spenborough Guardian* 24 May 1963). In a tribute, Mr G. Glynne-Walton wrote, “By his impartiality and broadmindedness he had built up his local papers; especially “The Spenborough Guardian”, into the front rank of local provincial newspapers. An achievement, indeed, which his successors will do well to emulate” (*Spenborough Guardian* 24 May 1963).

#### THE ‘HIRST’ COLLECTION OF NEW ZEALAND BIRDS IN LEEDS CITY MUSEUM

A year after his death, the family decided to dispose of John’s collection of birds, “several cases of which filled the corridors of the business in Cleckheaton” and partly because “the corridors were regarded as a fire hazard in the offices”. The family retained some of them, including a snowy owl and a case of foreign birds. The collection was sold to the Leeds City Museum in 1964, its records noting the purchase as: Birds worldwide – late nineteenth century – seven large cases containing 216 birds purchased for £70 – the collection includes many rare and extinct birds, including three pairs of Huia’s, two Saddlebacks and two Kokakos from New Zealand; the accession register entry is: “C/4/64 Bought from Mr J.C. Hirst, Spenborough Guardian, Cleckheaton 4.8.64. 7 cases of exotic birds” (Hirst File, Leeds Museum Discovery Centre). The records also contain photographs of the cases before the birds were removed from them – an impressive collection. The entries relating to the 13 specimens (7 species) of New Zealand birds purchased from the Hirst family (accession numbers in parentheses) are as follows:

- Callaeas cinerea*, Wattled Crow. Mount. (1964.4.10056)
- Callaeus cinerea*. Wattled Crow. Mount. (1964.4.10057)
- \* *Creadion carunculatus*. Saddleback. Mount. (1964.4.10058)
- \* *Creadion carunculatus*. Saddleback. Mount. (1964.4.10061)
- Heteralocha acutirostris*. Huia. North Island. Mount. (1964.4.10059)
- Heteralocha acutirostris*. Huia. North Island. (1964.4.10060)
- Apteryx haastii*. Great Spotted Kiwi. Mount. (1964.4.2.28.2190)
- Tadorna variegata*. Paradise duck. Mount. (1964.4.6.36.2459)
- Tadorna variegata*. Paradise duck. Mount. (1964.4.6.34.2460)
- Prothemadera novaeseelandiae*. Tui or Parson bird. Mount. (1964.4.6.45.4132)
- Prothemadera novaeseelandiae*. Tui or Parson bird. Mount. (1964.4.6.44.4133)
- † *Hemiphaga novaeseelandiae*. New Zealand pigeon. Mount. (1964.4.6756)
- † *Hemiphaga novaeseelandiae*. New Zealand pigeon. Mount. (1964.4.6757)

\* now *Philesturnus carunculatus*;

† on display from 2008 in Leeds City Museum along with various other of Hirst’s non-New Zealand birds including: Regent Bowerbird (LEEDM.C.1964.4.1.8.2119); Tawny Frogmouth (LEEDM.C.1964.4.1.16.7210); Blue-and-Yellow Macaw (LEEDM.C.1964.4.2.14.6979); Ringed Kingfisher (LEEDM.C.1964.4.2.24.6603); Agami Heron (LEEDM.C.1964.4.3.13.2423); Golden-collared Toucanet (LEEDM.C.1964.4.10272); African Pygmy Kingfisher (LEEDM.C.1964.4.6631); Fruit Dove (LEEDM.C.1964.4.6741); Ground Parrot (LEEDM.C.1964.4.6946); White-tailed Trogon (LEEDM.C.1964.4.7260); Blue-crowned Motmot (LEEDM.C.1964.4.7274 & LEEDM.C.1964.4.7275); Eastern Bluebird (LEEDM.C.1964.4.8026).

It should be noted that a number of other New Zealand birds, mostly from unknown sources, are also present in the collections, as are birds in the Hirst collection from other parts of the world. The former, with the exception of the Moa bones (see Baker 2003), are (with accession numbers in parentheses) as follows:

- Apteryx australis*. Brown Kiwi. Mount. (1975.15.2188† & 1975.15.2189)  
*Apteryx haasti*. Great Spotted Kiwi. Mount. (M.C.1975.15.2191 & 1975.15.2192)  
*Nestor meridionalis*. Kaka. Mount. (1960.66.2254)  
*Nestor meridionalis*. Kaka. Skin. (1961.113.6837)  
† *Strigops habroptilus*. Kakapo. Mount. (1950.25.1.2255 & 1950.25.2.2256). Listed as part of the Bernard Stephenson collection. Gift of Mrs S.G. Thompson.  
*Malacorhynchus membranaceus*. Pink-eared duck. Mount. (1976.73.2493)  
*Charadrius bicinctus*. Banded Dotterel. Mount. (1962.378.3155)  
*Prothemadera novaeseelandiae*. Tui or Parson bird. Mount and skin. (1962.1468.4134, 1962.152.4135 & 1962.153.4136)  
*Callaetus cinerea*. Wattled Crow. Skin. (1962.1405.10055). Associated person: Joan Armatrading  
*Petroica macrocephala*. North Island Tomtit. Skin. (1963.140.8423). Collector: Mr. John Chisholm

† on display from 2008 in Leeds City Museum.

Other New Zealand bird material listed, but not fully catalogued, includes 26 bird skins from New Zealand sent from Mr G. H. Moore, Canterbury, New Zealand (see Baker, 2003); “fine specimens of the Kakapo or Metcalfe Ground Parrot, Owen’s Apteryx from Preservation Islet, New Zealand” (attributed to Mr John Smith); skins of the Rifle bird, Regent bird, Swainson’s Lorikeet, Green crane, Blue kingfisher, Diceum and Silky Bower bird from New Zealand (attributed to Mrs W. B. Smith of Wakefield); “two glazed cases, containing Australian Wattle-birds and New Zealand Ground Parrot” (attributed to Mr J. W. Gaunt of Bramley); six cases of New Zealand birds forming the Bernard Stephenson collection (from Mrs S. G. Thompson of Crouch Field, Seaford, Sussex).

#### BRIEF NOTES ON THE ABOVE BIRDS IN THE COLLECTION

Huias belong to the New Zealand Wattle bird family (Callaeidae) which has three species in three genera. They are the Huia, Saddleback (= Tieke) and the Kokako (= Wattled Crow). All are endemic to North Island, New Zealand and “to a dozen or so islands off North Island and Stewart Island” (Perrins, 2004). The Huia is believed to be extinct, being last recorded in 1907. The Kokako is endangered, being a forest bird with a very restricted distribution and decimated by invasive mammalian species. The Saddleback is confined to offshore and mainland islands, and is at lower risk (or Near Threatened). Two subspecies of the Kokako are recognized, but “the South Island subspecies...has not been seen since 1967” (Perrins, 2004).

Three species of Kiwi are recognized. The Great spotted Kiwi (Order Apterygiformes) still exists, but according to Fuller (2000) numbers are “free falling to extinction”. The Paradise duck or Paradise Sheld duck (Family Anatidae) is a prized game bird; changes in habitat have led to a large increase in numbers. The Tui or Passion bird (Family Meliphagidae), another endemic, has thrived and is common throughout New Zealand, but is scarce east of the Alps in South Island. Finally the New Zealand pigeon (Family Columbidae), also called the Kereru, Kuku, and Kukupa, is widespread but not common and, like the Kokako, is a lowland forest bird.

In conclusion, the Leeds City Museum has an important collection of birds, several of which are critically endangered or extinct in the wild. Hirst’s private collection purchased in 1964 makes an important contribution and the New Zealand collection is of particular note.

#### ACKNOWLEDGEMENTS

The author wishes to acknowledge the generous help of members of the Hirst family, Margaret Cordingley, Sylvia Haddon and John C. Hirst, as well as Catherine Morris of the

Huddersfield Library and Adrian Norris formerly of the Leeds City Museum. Clare Stringer, of the Leeds City Museum, read a draft of the paper and made some useful suggestions for its improvement.

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See also webpages including: [http://en.wikipedia.org/wiki/Birds\\_of\\_New\\_Zealand](http://en.wikipedia.org/wiki/Birds_of_New_Zealand)

## NEW AND IMPORTANT RECORDS OF FUNGI FROM COUNTY DURHAM (VC66), 2006-2008

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A brief account of historic fungal recording in County Durham (VC66) since the late 18th century was provided by Legg (2006); to this was added a summary of such recording carried out between 1990 and 2005 and published in *The Vasculum*, a journal formerly produced by the now defunct Northern Naturalists' Union. The 2006 article also contained a list of 55 taxa considered newly-recorded for VC66 in 2004 and 2005, together with five others of particular significance, bringing the raw total of non-lichenized fungi recorded for the vice-county to slightly more than 3000.

Since the publication of the above article, detailed recording work has continued and many hundreds of records have been added to the national BMS datadase. There has been a drop in the annual number of newly-recorded taxa as, for fairly obvious reasons, beyond a certain point, the accumulation rate of such records naturally tends to be slow. Although the number of recorders has increased during the period 2006-2008, most of them have not yet attained the confidence and experience necessary to seek out and identify new vice-county records. At the same time, the ageing population of more competent recorders has no longer been able to gather and identify as many records of previously unrecorded taxa as hitherto. Although many new aids to identification have been produced during the period concerned, certain groups remain beyond the scope even of the most dedicated amateur and such techniques as DNA sequencing are outside their competence. At the same time, professional experts in systematics, taxonomy and determination of species are even fewer than used to be the case. Such people are as willing as ever to assist the serious amateur, but there are severe limitations on their time and there is a natural reluctance amongst amateurs to pester them with requests for help.

The list which follows adds 38 new county records to the previous total and also includes second county records of four especially notable species. A breakdown of records under the headings of organizations and individuals responsible for collections follows: North Eastern Fungus Study Group 16, A.W.Legg 15, Darlington and Teesdale Naturalists' Field Club 4, Gordon Simpson 4, Mrs R.M.Legg 1, D.E.McCutcheon 1 and Mrs B.Walton 1.

The list generally follows the systematic arrangement adopted by Kirk *et al.* (2001). More specifically, although the Myxomycetes are now considered to be Protozoa, the

single slime mould given here appears at the beginning rather than the end of the list. Then follow the Oomycota, now considered to be part of the kingdom Chromista. Ascomycetes are dealt with alphabetically in genera according to Cannon *et al.* (1985). Lichenized ascomycetes are excluded as these have been dealt with separately by (McCutcheon (2001). Treatment of basidiomycetes follows Legon and Henrici (2005). Anamorphic fungi are treated under the traditional sub-headings of Hyphomycetes and Coelomycetes for ease of reference (cf. Ellis & Ellis 1997).

#### NEW AND IMPORTANT RECORDS

##### MYXOMYCOTA

*Comatrica tenerrima* (M.A.Curtis) G.Lister. On a dead stem of *Angelica* by the serpentine lake, Hardwick Hall Country Park, Sedgely (NZ3429), 25.5.2006, coll. and det. A.W.Legg. Not uncommon in Britain; no doubt previously overlooked in Co. Durham.

##### OOMYCOTA: PERONOSPORALES

*Peronospora trifoliorum* de Bary. On living leaves of *Trifolium pratense*. In grassland near Coatham Stob (NZ3916), 16.5.2006. Collected on a DTNFC outing.

##### ASCOMYCOTA

*Calospora arausiaca* (Fabre) Sacc. On a dead branch of *Quercus*, Tees Banks, Barnard Castle, (NZ039177), 16.2.2008, coll. A.W. Legg, det. B.M.Spooner **K(M)**156217. Only four earlier British records on the national database.

*Cordyceps ophioglossoides* (Ehrenreb. Ex Pers.) Link. On *Elaphomyces granulatus* with conifers, Chopwell Wood (NZ141584), 2.10.2008, coll. G. Simpson.

*Daldinia loculata* (Lev.) Sacc. On trunk of moribund *Betula*, near Annfield Plain (NZ1750) 21.7.2007. Previously collected in Durham Great High Wood by A.J.S.Whalley in 1976 (Rogers *et al.*, 1999). Only 15 British records, but probably often misidentified as the common *Daldinia concentrica* most often found on *Fraxinus*.

*Didymosphaeria conoidea* Niessl. Parasitic on *Leptosphaeria doliohum* on indet. herbaceous stems, Gainford (NZ168166), 16.9.2007. Only 16 earlier British records.

*Geopora tenuis* (Fuckel) T.Schumach. On spoil heaps colonised by *Betula*, near Annfield Plain (NZ1750), 21.7.2007, conf. B.M.Spooner **K(M)**153783. 39 previous British records.

*Lachnellula resinaria* (Cooke & W.Phillips) Rehm. On old exuded resin of *Picea stichensis*, Burnhope Reservoir, Weardale (NY8338), 25.4.2007. Since found at other sites in Co. Durham. A spring species found less often than *Sarea resiniae* but probably not uncommon nevertheless. The age of the exuded resin is critical for successful colonization.

*Leptosphaeria arundinacea* (Sowerby) Fr. On dead culm of *Phragmites*, Low Barns, Witton-le-Wear, (NZ165315), 3.5.2007. Probably not uncommon on this substrate.

*Lewia infectoria* (Fuckel) M.E.Barr & G.G.Simmons. On a dead leaf of *Typha*, Low Barns, Witton-le-Wear (NZ165315), 4.4.2008.

*Lophiostoma nucula* (Fr.) Ces. & de Not. On a fallen twig of *Populus nigra* var. *betulifolia*, Baydale, Darlington, (NZ2615), 9.5.2006. Very few British records.

*Microglossum viride* (Pers.) Gillet. With *Fagus*, Chopwell Wood (NZ141584), 2.10.2008, coll. and det. G. Simpson.

*Monilinia laxa*. (Aderh. & Ruhl) Harvey & Whetzel. *Monilia* state only on attached fruit of *Prunus spinosa*, Baydale, Darlington (NZ2615), 7.8.2007.

*Paraphaeosphaeria glaucopunctata* (Grev.) Shoemaker & C.E.Babe. On dead attached cladodes of *Ruscus aculeatus*, opposite entrance to Ceddesfield Hall and in nearby grounds, Sedgely (NZ354289), 8.2.2006. Found by this author to be present on the same part of this host whenever encountered.

*Podosphaera euphorbiae* (Castagne) U.Braun & S.Takm. On living leaves of *Euphorbia* sp. Stodhoe Farm, Middleton St. George (NZ 336133), 3.2.2004, coll. G. Simpson.

*Trematosphaeria pertusa* (Pers.) Fuckel. On dead attached twig of *Fagus* hedge, (ironically, since destroyed for car-parking), Low Barns Nature Reserve, Witton-le-Wear, (NZ161315), 16.2.2008. Only 33 earlier British records.

### **BASIDIOMYCOTA: BASIDIOMYCETES**

*Agaricus porphyrocephalus* F.H.Moller. On rough sheep pasture, Crawleyside, Stanhope, (NY993406), 28.10.2006, coll. P.Holmes, det. A.W.Legg.

*Boletus decliviatum* (C.Martin) R.Watling. With *Quercus*, Riding Chase, Winlaton, (NZ1661), 1.10.2006, coll. and det. D.E.McCutcheon, conf. R. Watling E. Of unknown frequency and distribution because only recently segregated from similar species.

*Clavaria argillacea* Pers. On rough sheep pasture, Crawleyside, Stanhope (NZ993406), 28.10.2006, coll. and det. A.W. Legg.

*Clitocybe brumalis* (Fr.) Gillet. With *Betula* near Annfield Plain (NZ1750), 21.7.2007.

*Cortinarius cinnabarinus* Fr. With *Fagus*. Pontburn Woods (NZ1456), 30.9.2006, coll. and det. G.Simpson.

*Entoloma caesiointinctum* (Kuhner) Noordel. On rough pasture, Crawleyside, Stanhope (NY993406), 28.10.2006, coll. and det. A.W.Legg.

*Gomphidius roseus* (Fr.) Fr. With *Pinus* near *Suillus bovinus* near Redford, Hamsterley Forest (NZ0931), 11.9.2006, coll. and det. G. Simpson. Second VC66 record. The double association with *Pinus* and *Suillus bovinus* seems to be essential for successful colonization by this species.

*Hemimycena lactea* (Pers.) Singer. On needles of *Pinus*, Hamsterley Forest, (NZ0629), 15.10.1988, coll. and det. A.W.Legg. A record which somehow escaped earlier listing.

*Hygrocybe fornicata* var. *fornicata*. (Fr.) Singer. On rough pasture, Crawleyside, Stanhope (NZ9940), 28.10.2006, det. A. Mclay, conf. A.W.Legg.

*Hygrocybe glutinipes* var. *glutinipes* (J.E.Lange) R.Haller Aar. Auckland Castle grounds, Bishop Auckland (NZ2130), 16.9.2006, det. G. Simpson/A. Mclay.

*Hygrocybe* cf. *subpapillata* Kuhner. On closely-mown turf, Darlington West Cemetery (NZ269138), 30.10.2006, coll. A.W.Legg. Rarely recorded.

*Lepista panaeola* (Fr.) P.Karst. On rough pasture, Crawleyside, Stanhope (NZ2130), 28.10.2006, coll. D.E.McCutcheon, det. A.W.Legg, conf. A.Henrici. Uncommon.

*Lepiota felina* (Pers.) P.Karst. Mixed woodland, Pontburn Woods, Derwentside (NZ1455), 30.9.2006, coll. NEFSG. Uncommon in northern Britain.

*Leucoagaricus badhamii* (Berk. & Br.) Singer. In a hedgeback, Nunnery Lane, Darlington (NZ268148), 15.10.2006, coll. R.M.Legg, det. A.W.Legg, conf. A.Henrici. Uncommon, especially in northern Britain.

*Omphalina pyxidata* (Pers.) Quel. Heathland, Crawleyside, Stanhope (NZ2130), 28.10.2006, coll. NEFSG, det. AWL, conf. A.Henrici. K.

*Peniophora nuda* (Fr.) Bres. On thin fallen branch of *Corylus*, Pontburn Wood, Derwentside (NZ1455), 30.9.2006, coll. and det. A.W.Legg. Uncommon in northern England.

*Phaeoagaricus erinaceus* (Fr.) Kuhner. On *Salix*, Morton Valley Farm, Middleton St. George (NZ3313), 4.5.2004, coll. B.Walton, det. G.Simpson. Also collected from Auckland Castle grounds, Bishop Auckland (NZ2130), 16.9.2006, coll. G.Simpson, NEFSG.

*Russula anthracina* Romagn. With *Acer*, in north-eastern perimeter border, Darlington West Cemetery, (NZ2714), 30.9.2006. Not often recorded but apparently not really uncommon, simply not recognised as a genuine species until recently.

*Russula exalbicans* (Pers.) Melzer & Zvara. With young *Betula*, colonizing spoil heaps, The Whinnies Nature Reserve, Middleton St. George (NZ349138), 10.7.2007. Also found with *Betula* on spoil heaps near Annfield Plain (NZ1750), 21.7.2007, NEFSG.

*Scleroderma areolatum* Ehrenb. Auckland Castle grounds, Bishop Auckland (NZ2130), 16.9.2006, coll. V.Jones, det. G.Simpson.

*Tylophilus felleus* (Bull.) P.Karst. With *Fagus*, Pontburn Woods, Derwentside (NZ1455), 30.9.2006, coll. M.Sly. Second VC66 record.

### **BASIDIOMYCOTA: UREDINOMYCETES**

*Gymnosporangium sabinae* (Dickson) C.Winter. On living leaves of *Pyrus salicifolia*, Darlington West Cemetery (NZ2714), 23.7.2006 *et seq.*, conf. G.Brand **K**. First known British collection from *P. salicifolia*.

*Uromyces trifolii-repentis* Liro. On living leaves of *Trifolium hybridus*, Maidendale Nature Reserve, Darlington (NZ312135), 4.7.2006, coll. G.Simpson, conf. B.M.Spooner **K(M)**140494. Rarely collected in Britain.

### **ANAMORPHIC FUNGI: HYPHOMYCETES**

*Ramularia schulzeri* Bauml. On living leaves of *Lotus uliginosus*, Tees riverbank near Broken Scar, Darlington (NZ258129), 4.9.2007. Very rarely collected.

*Tuberulina sbrozii* Cav. & Sacc. Infecting aecia of *Puccinia vincae* on leaves of *Vinca major*, Whorlton riverbank (NZ110146), 15.5.2007. Said to be always present on the fungal host in the south but not recorded here until a few years after this rust species was first recorded at this site.

### **ANAMORPHIC FUNGI: COELOMYCETES**

*Ascochyta equiseti* (Desm.) Grove. On dead stems of *Equisetum fluviatile*, in a flush by a boardwalk on the Tees river bank near Winston (NZ150172), 29.10.2006 *et seq.*, conf. B.M.Spooner **K(M)**143211. Not often recorded but apparently frequent on this host.

### **ACKNOWLEDGEMENTS**

The author is especially grateful to Dr G. Brand, Mr A. Henrici, Dr B.M. Spooner and Prof. R. Watling who have determined or confirmed a number of taxa. Where specimens are known to have been lodged in national herbaria, these have been accorded the conventional symbols **E** (Edinburgh) or **K** (Kew).

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## LOST AND FOUND BUMBLEBEES (HYMENOPTERA: APIDAE, *BOMBUS*) OF WATSONIAN YORKSHIRE, WITH THE INTRODUCTION OF A NEW YORKSHIRE SPECIES

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While beginning to prepare a history of the study of the wasps, ants and bees of Yorkshire, it became apparent that 19th and early 20th century entomologists had difficulty in distinguishing between *Bombus* species. This paper deals with the following species because most of them are now extinct or rare in Yorkshire:

- B. soroensis* (Fab.)
- B. hypnorum* (Linn.)
- B. distinguendus* Morawitz
- B. subterraneus* (Linn.)
- B. ruderatus* (Fab.) with its subspecies *perniger* (Harris)
- B. humilis* Illiger
- B. muscorum* (Linn.) with its subspecies *agricolae* Baker
- B. ruderarius* (Müller)
- B. sylvarum* (Linn.)
- B. rupestris* (Fab.)

The study of these species is often complicated as other names or synonyms are used for many of them. To follow the recording history of these species, evidence will be taken from the literature, particularly *The Naturalist*, and specimens found in museums and private collections.

### EARLY LITERATURE

Smith (1852) records three species that are being considered: *B. muscorum*, *B. senilis* (Fab.) and *B. fragans* (Pallas). Smith (1891) found that *B. senilis* was a synonym of *B. muscorum* and replaced it with *B. venustus* Smith. *B. venustus* is now considered a synonym of *B. humilis* (Else, 2005). However, from the description that Smith (1891) gives of *B. muscorum*, it could include *B. pascuorum* (Scopoli). *B. fragans* is a synonym of *B. distinguendus*. As such, only *B. distinguendus* from Smith (1852) can be accepted currently. *B. distinguendus* is a distinctive large ginger-yellow species with a transverse black band of hairs between the wings on the thorax.

Both Smith (1866) and Yarrow (1968) looked at the bumblebees collected by Kirby (1802) and named them. Using Yarrow (1968) as the current understanding of bumblebee species, the species concepts of Smith (1866) can be understood. From Yarrow, Smith's *B. senilis* includes *B. humilis*, *B. muscorum* and *B. pascuorum* and Smith's *B. muscorum* proved to be *B. pascuorum*. Thus, these carder bumblebees could not be separated by Smith. Smith's *B. fragans* was *B. distinguendus*, so this species, as already indicated, can be accepted. Smith's *B. rupestris* also corresponds with the current concept of *B. rupestris*. Smith's *B. lucorum* (Linn.) included *B. soroensis* besides *B. lucorum* while his *B. terrestris* (Linn.) included *B. lucorum* besides *B. terrestris*.

Smith's *B. latreillellus* (Kirby) is *B. subterraneus*, but his *B. subterraneus* is *B. ruderatus*. Further, Smith's concept of *B. hortorum* included *B. ruderatus*, *B. jonellus* (Kirby) besides *B. hortorum*. Smith did not realize the difference between *B. ruderatus* and *B. hortorum*, and *B. subterraneus* being associated with two species has also given rise to problems of identification.

Saunders (1895) would have been the main text for the identification of bumblebees for, at least, the first part of the 20th century. Seven species listed can be considered for the current study: *B. soroensis*, *B. latreillellus*, *B. hortorum* (Linn.) with vars *subterraneus* (Auct. nec Thomson) and *harrisellus* (Kirby), *B. venustus*, *B. smithianus* White, *B.*

*sylvarum* and *B. rupestris*. *B. soroensis* is clearly defined “as currently understood (Yarrow, 1968)”. *B. hortorum* var. *subterraneus* is described as an intermediate colour form between *B. hortorum* s.s. and *B. hortorum* black var. *harrisellus*. The black var. *harrisellus* is currently regarded as the subspecies *perniger* (Harris) of *B. ruderatus* (Else, 2005). As such, the var. *subterraneus* could be the light coloured form of *B. ruderatus*. *B. latreillellus* is clearly described, so as to separate it from *B. hortorum*, with two vars. *subterraneus* (Thomson) and *distinguendus*. Associating *distinguendus* with *B. latreillellus* introduces confusion, although the description given of *distinguendus* indicates that is the same as *B. fragans* and *B. elegans*. Otherwise, the description of var. *subterraneus* (Thomson) certainly seems to be similar to *B. subterraneus* (Linn.). Saunders also gives a description of *B. agrorum* Fab. (synonym of *B. pascuorum*) which could also include some specimens of *B. muscorum*. Therefore, *B. pascuorum* and *B. muscorum* are not clearly distinguished as currently understood. The description of *B. venustus*, particularly of the male, indicates the current concept of *B. humilis*. The dark species *B. smithianus*, now called *agricolae* Baker (Else, 2005), is currently regarded as a subspecies of *B. muscorum* (Else, 2005). *B. soroensis*, *B. subterraneus*, *B. distinguendus*, *B. ruderatus* via *perniger*, probably *B. humilis*, *B. muscorum* via *agricolae*, *B. sylvarum* and *B. rupestris* can be regarded as clearly understood as in current times.

Roebuck (1877, 1882, 1907) listed the following Yorkshire species that can be considered for the current study: *B. soroensis*, *B. elegans* Smith, *B. subterraneus*, *Bombus hortorum* var. *harrisellus* (Kirby), *B. venustus*, *B. muscorum*, *B. derhamellus* (Kirby), *B. sylvarum* and *B. rupestris*. *B. elegans* is a synonym of *B. distinguendus*. Roebuck (1907) treats *B. elegans* as a var. of *B. latreillellus*. *B. subterraneus* is transferred to *B. hortorum* as var. *subterraneus* by Roebuck (1907). The var. *harrisellus* is a synonym of subspecies *perniger* of *B. ruderatus*. *B. derhamellus* is a synonym of *B. ruderarius* (Else, 2005). *B. sylvarum* and *B. rupestris* are “ms. species” of Smith and are not based on actual specimens (Archer, 2002). Only *B. distinguendus*, *B. ruderatus* as subspecies *perniger*, *B. ruderarius* and recent records of *B. soroensis* can be accepted in current times.

Keys by Yarrow (in Free & Butler, 1959) seem to be the first keys that clearly separate all colour variations of *B. hortorum* from *B. distinguendus* and *B. subterraneus* and all colour variations of *B. pascuorum*, *B. humilis* and *B. muscorum*. Thus, nine of the ten species being considered are, at last, clearly differentiated. The tenth species, *B. hypnorum*, was only first recorded in England during 2001.

#### EARLY PUBLICATIONS, MAINLY IN *THE NATURALIST*

Some interpretation is now possible of the species named in early papers published in *The Naturalist*. Hey (1908) gives an account of the bumblebees of West Ayton, including the following species relevant to this study: *B. soroensis*, *B. latreillellus* var. *distinguendus*, *B. hortorum* with vars. *subterraneus* and *harrisellus*, *B. smithianus*, *B. sylvarum* and *B. rupestris*. The varieties of *B. hortorum* belong to *B. ruderatus*, and *B. smithianus* is a dark-coloured variety of *B. muscorum*. Thus, the records of six species can be accepted. The variety *smithianus* (now called subspecies *agricolae*) is now restricted to the Hebrides and Shetland Islands (Benton, 2006).

Heslop-Harrison (1917) gives an account of the bumblebees of Cleveland, including the following species: *B. latreillellus* var. *distinguendus*, *B. smithianus*, *B. sylvarum* and *B. derhamellus*. *B. smithianus* is the subspecies *agricolae* of *B. muscorum* and *B. derhamellus* is a synonym of *B. ruderarius*. Thus, all four species can be correctly interpreted.

Bradley (1923b) mentions three species from Roundhay, Leeds: *B. soroensis*, *B. latreillellus* and *B. ruderatus*. Bradley (1922a) also refers to black males of *B. hortorum* at Scarcroft, Leeds and *B. distinguendus* at Roundhay and Scarcroft. Furthermore, Bradley (1923a) records *B. soroensis*, *B. ruderatus* and *B. derhamellus* at Roundhay. The black males at Scarcroft (Bradley, 1922a) are *B. ruderatus*, and *B. derhamellus* is a synonym of *B. ruderarius*. A problem is the identification of *B. latreillellus* (Bradley, 1923a) as to whether it is *B. distinguendus* or *B. subterraneus*. Since Bradley (1922a) records

*B. distinguendus*, his *B. latreillelus* is probably *B. distinguendus*.

The problem of the identity of *B. latreillellus* also arises with Butterfield's records from Bingley and Grassington (Butterfield, 1909a), near Middleton (Butterfield, 1909b), Crimsworth Dene (Butterfield, 1915b), Grass Wood (Butterfield, 1927a), Skipton (Butterfield, 1932), at Goole (Butterfield, 1934) and Hovingham (Butterfield, 1935). *B. latreillellus* is interpreted as *B. distinguendus* by Hey (1908), Heslop-Harrison (1917) and Corbett (1919b) at Ryhill Reservoir. *B. distinguendus* is recorded from Littondale (Bradley, 1920), Roundhay and Scarcroft (Bradley, 1922a), Sunnysdale (Rhodes, 1922), Allerthorpe Common (Fordham, 1924), Sedbergh (Butterfield, 1927b) and Spurn (Hincks, 1952). The last literature record for *B. latreillellus* as *B. distinguendus* is 1951. Except for Butterfield and Fordham (1932), to be considered later, no reference has been found to *B. subterraneus*, so it tempting to consider *B. latreillellus* to be *B. distinguendus* or possibly the subspecies *perniger* of *B. ruderatus*.

Concerning the separation of *B. humilis* and *B. muscorum*, the former (as *B. venustus*) is recorded from Halifax (Silverlock, 1910), Deffer Wood, near Skelmanthorpe (Morley, 1917), Ravenscar (Grimshaw, 1924), Grass Wood (Butterfield, 1927a), Sedbergh (Butterfield, 1927b), Skipton (Butterfield, 1932), Hovingham (Butterfield, 1935) and Spurn (Shaw, 1953), and last recorded during 1949. *B. muscorum*, as *B. smithianus*, is recorded by Hey (1908) and Heslop-Harrison (1927), and as a non-melanic variety at Littondale (Bradley, 1920) and at Spurn (Shaw, 1953), and last recorded during 1951.

The other considered species have been recorded in the early publications of *The Naturalist* as follows with the last record in square brackets: *B. soroensis*: at Grassington (Butterfield, 1909a), near Ilkey (Butterfield, 1909b), Settle (Butterfield, 1915a), Grassington (Butterfield, 1919), Littondale (Bradley, 1920), Roundhay, Scarcroft and Collingham (Bradley, 1923a, 1923b), Ravenscar (Grimshaw, 1924) and Grass wood (Butterfield, 1927a, 1933) [1933]; *B. ruderatus*: at Hemingborough (Musham, 1919), Spurn (Cheetham, 1920), Roundhay (Bradley, 1923b) and Spurn (Hincks, 1952) [1951]; *B. ruderarius*: at Halifax (Silverlock, 1910), Bessacar (Corbett, 1919a), Skipton (Butterfield, 1932), Hovingham (Butterfield, 1935) and Reeth (Norris, 1976) [1976]; *B. sylvorum*: at Spurn (Shaw, 1953) [1951]; *B. rupestris*: at Martin Beck Wood (Corbett, 1920), Roundhay (Bradley, 1922b) and Spurn (Shaw, 1953) [1949].

#### MUSEUM COLLECTIONS

The following numbers of each considered species were found in those museums investigated (Table 1):

- B. soroensis* – 15 specimens, latest label date 1920.
- B. distinguendus* – 20 specimens, latest label date 1951.
- B. subterraneus* – no specimens
- B. ruderatus* – 9 specimens, latest label date 1951
- B. humilis* – 14 specimens, latest label date 1966.
- B. muscorum* – 20 specimens, latest label date 1973.
- B. ruderarius* – 11 specimens, latest label date 1981
- B. sylvorum* – 4 specimens, latest label date 1949.
- B. rupestris* – 16 specimens, latest label date 1949.

#### THE PAPER OF BUTTERFIELD AND FORDHAM (1932)

Butterfield and Fordham (1932) give a summary account of the bumblebees of Watsonian Yorkshire. The considered species and sites are given in Table 2. The species *B. latreillellus* is used for records from the following sites: Scarborough, West Ayton, Upper Airedale, Blackhills, Crimsworth Dene, Ryhill, Roundhay, Middleton and Upper Wharfedale. The record from Scarborough is similar in date and locality to a specimen of *B. ruderatus* at Scarborough Museum. The record from West Ayton is also *B. ruderatus* as already established, and that from Roundhay is probably *B. ruderatus* (Bradley, 1922, 1923b). Since no Yorkshire specimens of *B. subterraneus* have been found in the Museums,

TABLE 1. Sites and numbers (in brackets) of *Bombus* specimens found in museums

Species	Museum	Sites
<i>B. soroeensis</i>	Keighley (14)	Grassington
	Manchester University (1)	Grassington
<i>B. distinguendus</i>	Keighley (15)	Bingley Wood, Bolton Abbey, Bradford, Flamborough, Gormire, Keighley, Lister Park, Shipley Glen, Spurn Point, Sunnydale
	Manchester U. (2)	Kilnsea Warren, Spurn
	Scarborough (3)	Scarborough, Silpho
<i>B. ruderatus</i>	Keighley (4)	Spurn Point
	Manchester U. (4)	Spurn
	Scarborough (1)	Scarborough
<i>B. humilis</i>	Doncaster (1)	Goole Moors
	Keighley (6)	Allerthorpe Common, Austwick, Bradford, Masham, Whitby
	Manchester U. (3)	Kilnsea Warren, Spurn
	Scarborough (2)	Allerthorpe Common, Scarborough
	York (2)	Clifton Ings, Acomb
<i>B. muscorum</i>	Keighley (17)	Allerthorpe Common, Austwick, Barden, Bingley Wood, Blackhills, East Morton, Harden Moor, Keighley, Lister Park, Malham, Ponden, Whitby
	Manchester U. (2)	Spurn
	Sheffield (1)	Filey
<i>B. ruderarius</i>	Keighley (7)	Grassington, Nab Wood, Whitby
	Sheffield (3)	Beighton, Filey, Holbrook
	York (1)	Clifton Ings
<i>B. sylvarum</i>	Keighley (1)	Blackhills
	Manchester U. (2)	Spurn
	Scarborough (1)	Scarborough
<i>B. rupestris</i>	Keighley (11)	Bradford, Gormire, Grassington, Keighley
	Leeds (1)	Allerthorpe Common
	Manchester U. (2)	Kilnsea Warren
	Scarborough (2)	Allerthorpe Common, Sandsend

although specimens of *B. subterraneus* from outside Yorkshire are present in the Keighley Museum, it is unlikely that the other records are of *B. subterraneus* and for the moment their identity must be regarded as unknown. Very possibly the other records are var. *subterraneus* of *B. hortorum*, which would then be *B. ruderatus*.

Butterfield and Fordham (1932) indicate that the confusion between *B. humilis* (as *B. solstitialis* Panzer or *B. venustus*) and *B. muscorum* has been realized so the listed sites, except for the very early ones, can be accepted.

TABLE 2. List of reliable sites for each *Bombus* species recorded by Butterfield and Fordham (1932)

Species	Sites
<i>B. soroeensis</i>	Woodlesford, Roundhay, Scarcroft, Collingham, Grassington, West Ayton
<i>B. distinguendus</i>	Bubwith, Spurn, Allertorpe Common, West Ayton, Easton Moor, Woolley Edge, Halifax, Bingley, Huddersfield, Ackworth, Blackhills, Beckfoot, Bradford, Keighley, Grassington, Roundhay, Littondale, Leeds district, Sedbergh, Masham
<i>B. ruderatus</i>	Roundhay, West Ayton, Allertorpe Common
<i>B. humilis</i>	Sutton Hull, Allertorpe Common, Sandsend, Bradford district, Upper Airedale, Halifax, Leeds district, Roundhay, Upper Wharfedale, Sedbergh
<i>B. muscorum</i>	Easton Moor, West Ayton, Skipwith Common, Allertorpe Common, Harden Moor, Roundhay, Littondale
<i>B. ruderarius</i>	Dunswell Beverley, Northallerton, Goathland, Cleveland, Bingley, Halifax, Keighley, Bessacar, Collingham, Leeds, Roundhay, Grassington
<i>B. sylvarum</i>	West Ayton, Great Ayton, Scarborough
<i>B. rpestris</i>	Sutton Hull, Reight Cliffs, Allertorpe Common, Ravenscar, East Ayton, Seamer Moor, Fyling Hall, Blackhills, Bingley, Keighley, Hebden Bridge, Martin Beck Wood, Linton Common, Grassington, Leeds, near Leeds

Site names recorded by Butterfield and Fordham (1932) for particular species can also be found among specimens found in museums.

#### OTHER SOURCES OF RECORDS

Records have also been obtained from Roebuck (1907) and Walsh (1956), and from some record cards of Fordham which have records only of aculeate Hymenoptera from Yorkshire. Unfortunately, the latter were misfiled at Keighley Museum; they have now been re-ordered, but are probably incomplete. The sources produced the following new records:

*B. soroeensis*: Upper Airedale, Scarborough, 1922, Fordham cards.

*B. ruderatus*: Bradfield district, early 1880, Fordham cards; Holgate, 1881, Roebuck; Kelsey Hill and Filey, Fordham cards; Barmby Moor, 1927, Fordham cards; Malton and near Thirsk, Roebuck.

*B. ruderarius*: Adel, 1920, Fordham cards; Goathland, 1924, Walsh.

*B. rpestris*: Leeds, 1816, Roebuck; Ripon, 1907, Scarborough, 1922, Fordham cards.

#### PRIVATE COLLECTIONS

Besides his own records (MEA), the author has seen specimens in the collections of T. Broadhead (TB), W.A. Ely (WAE), J. Flannagan (JF), A. Grayson (AG), A. Smith (AS) and D.H. Smith (DHS), but has not seen specimens for records from M. Crawley (MC), A. Gomez (AGZ) and G.M. Spooner (GMS) as follows:

*B. soroeensis*: Ellerburn Bank, 1975, DHS.

*B. hypnorum*: Hull, Marborough Ave., 2005, 2006, 2007, 2008, AGZ; Hull University, 2007, AGZ; Langsett Reservoir, 2007, JF; Hull, Anlaby Rd., 2008, MC.

*B. distinguendus*: Ellerburn Bank, 1974, DHS.

*B. subterraneus*: No records.

*B. ruderatus*: King George Dock, Hull, 1931, DHS; Arras, Market Weight, 1952, DHS; Clifton, York, 1954 AS.

*B. humilis*: Thorne Moors, 1837, GMS; Hessle, 1944, DHS; York, 1968, MEA.

*B. muscorum*: Castle Howard, 1955, DHS; AG; Filey, 1959, MEA; Spurn, 1968, TB; Allerthorpe Common, 1976, MEA; Strensall Common, 1976, MEA; Spurn, 1992, AG; Welwick saltmarsh, 1998, MEA; Branston Sands, MEA, 2003..

*B. ruderarius*: North Anston, 1977, WAE; Thrybergh C.P., 1980, WAE.

*B. sylvarum*: No records.

*B. rupestris*: Allerthorpe Common, 1948, DHS; Brayton Barff, 1997, 2000, 2001, MEA; Allerthorpe Common, 2007, MEA; Hatfield Moor, 2007, MEA.

#### SUMMARY

A summary is given of the latest dates known for ten taxa from publication (P), museums (M) and private collections (PC) as follows:

*B. soroeensis*: 1933 (P), 1920 (M) and 1975 (PC), now extinct.

*B. hypnorum*: A new species known from 2005-2008 (PC).

*B. distinguendus*: 1951 (P), 1951 (M) and 1974 (PC), now extinct.

*B. subterraneus*: Probably never recorded.

*B. ruderatus*: 1951 (P), 1951 (M) and 1954 (PC), now extinct.

*B. humilis*: 1949 (P), 1966 (M) and 1968 (PC), now extinct.

*B. muscorum*: 1951 (P), 1973 (M) and 2003 (PC).

*B. ruderarius*: 1976 (P), 1981 (M) and 1980 (PC), probably now extinct.

*B. sylvarum*: Extinct probably soon after 1951 (P) and 1949 (M).

*B. rupestris*: 1949 (P) and 1949 (M), so probably extinct soon after 1950, but has reappeared since 2001 (PC).

#### ACKNOWLEDGEMENTS

I am grateful to Colin Howes for a list of vice-county field meetings of the YNU, Dr Gerard McGowan for photocopies of papers from *The Bradford Scientific Journal*, Tony Harman for access to specimens from the collection of D.H. Smith, and Val McAtear, Librarian of the Royal Entomological Society, for help with 19th century references.

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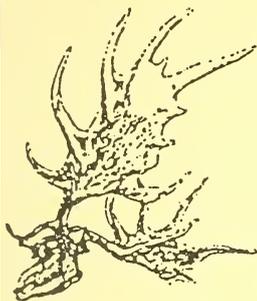
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## APPENDIX – List of sites with grid references (which may be very approximate).

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Ackworth – SE4417	Keighley – SE04
Acomb – SE5751	Kelsey Hill – TA2326
Adel – SE2741	Kilnsea Warren – TA4112
Allerthorpe Common – SE7645	King George dock, Hull – TA1428
Arras – TA0344	Langsett Reservoir – SK2099
Austwick – SD7666	Leeds district – SE23
Barden – SE0256	Linton Common – SD9962
Barmby Moor – SE7748	Lister Park – SE1435
Beckfoot – SE1038	Littondale – SD97
Beighton, Sheffield – SK4484	Malham – SD8967
Bessacar – SE6001	Malton – SE77
Bingley Wood – SE1039	Martin Beck Wood – SK6294
Blackhills, Wilsden – SE0936	Masham – SE2280
Bolton Abbey – SE0556	Middleton nr. Ilkley – SE1249
Bradford – SE13	Nab Wood – SE1239
Branston Sands – TA1759	Northallerton – SE39
Brayton Barff – SE5830	North Anston – SK5185
Bubwith – SE7136	Ponden – SD9937
Castle Howard – SE7270	Ravenscar – NZ9801
Clifton Ings, York – SE5954	Reeth – SE09
Collingham – SE3946	Reighton Cliffs – TA1476
Crimsworth Dene – SD9830	Ripon – SE37
Dunswell, nr. Beverley – TA0736	Roundhay, Leeds – SE3337
Ellerburn Bank – SE8484	Ryhill – SE3814
East Ayton – SE9985	Sandsend – NZ8513
East Morton – SE1043	Scarborough – TA0488
Easton Moor – NZ5418	Scarcroft – SE3641
Famborough – TA2171	Seamer Moor – TA0181
Filey – TA18	Sedbergh – SD69
Fylinghall – NZ9404	Settle – SD86
Goathland – NZ8301	Shipleigh Glen – SE1239
Goole Moor – SE7317	Silpho Moor – SE9092
Gormire – SE5083	Skelmanthorpe – SE21
Grassington – SE0367	Skipton – SD95
Grass Wood – SD9865	Skipwith Common – SE6537
Great Ayton – NZ5510	Spurn – TA4112
Halifax – SE02	Strensall Common – SE6561
Harden Moor – SE0738	Sunnydale – SE1043
Hatfield Moor – SE7006	Sutton, Hull – TA1231
Hebden Bridge – SD9927	Thirsk, nr. – SE48
Hemingborough – SE6730	Thorne Moor – SE7115
Hessle – TA0326	Thrybergh C.P. – SK4796
Holbrook, Sheffield – SK4481	Upper Airedale – SE04
Holgate – SE5851	Upper Wharfedale – SD9178
Hovingham – SE6474	Welwick saltmarsh – TA3319
Huddersfield – SE11	West Ayton – SE9884
Hull, Anlaby – TA0428	Whitby – NZ8911
Hull, Marlborough Ave. – TA0729	Woodlesford – SE3629
Hull University – TA0731	Woolley Edge – SE3013
Ilkley – SE14	



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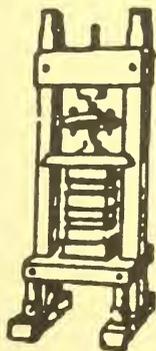
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