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**Plate 1.** Part of the large population of Imperforate St John's-wort (*Hypericum maculatum*) growing just south-east of the parish boundary on the track from Lucy Wood to Woodditton (photograph by David J. Barden). (See article on page 3).



**Plate 2** *Trentepohlia abietina*, erect filaments, x 400 (Photograph by Chris Carter). (See article on page 23).

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Cover illustration: Wood Mouse (*Apodemus sylvaticus*). Photograph by Vince Lea.

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## EDITORIAL

First, an apology is due. I have unaccountably left Jane Bulleid's name off the last two lists of Editorial Board members. Though she is no longer our Membership Secretary, she is still a valued member of the board.

I mentioned in my last editorial that we are extending our coverage to include Huntingdonshire (v.c.31) when we receive suitable articles. With that in mind I would draw readers attention to the Huntingdonshire Fauna and Flora Society. Each year it organises field and indoor meetings. Their annual report details the records made by the Society, and covers a wide variety of taxa. Their website is [www.hffs.co.uk](http://www.hffs.co.uk).

This year Nature in Cambridgeshire covers flowering plants (St John's-worts and Water Dropworts), small mammals in Hayley Wood, lichens at Wicken Fen, bog-oaks near Haddenham, tardigrades in Cambridge and the flora of a flat roof. Once again one of Lucy Hulmes' drawings graces our pages. We are extremely grateful to her for creating these beautiful illustrations. Toby Carter has updated his bibliography, begun in 2006, of natural history articles relating to Cambridgeshire. If any reader knows of articles that could be added, please let us know.

Regular articles include the fifth part of Hilary Belcher and Erica Swale's Algal Flora of Cambridgeshire, a report of the 2009 survey by members of Cambridge Natural Society, the regular sections on vascular plants, bryophytes and invertebrates, book reviews and obituaries. John Kapor has again contributed weather notes from the Botanic Garden.

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# The *Hypericum maculatum*–*Hypericum perforatum* complex in Cambridgeshire (v.c. 29)

David J. Barden

## Introduction

Perforate St John's-wort (*Hypericum perforatum*) and Imperforate St John's-wort (*Hypericum maculatum*) are two closely related rhizomatous perennials native to Britain. The former is a fairly common and familiar component of grasslands throughout the old county of Cambridgeshire (v.c. 29), but the latter has always been rare. The two readily hybridise, and have given rise to a continuum of intermediates, known as Des Etangs' St John's-wort (*H. × desetangsii*). Although many specimens of the *H. maculatum*–*H. perforatum* group from v.c. 29 have been critically examined, an account of plants from the vice-county has not been compiled. The first aim of this article is to provide such an account, by describing the morphological variety that the group displays in the vice-county. Secondly, following the discovery of a significant number of new populations of *H. maculatum* and *H. × desetangsii* in v.c. 29 in recent years, a listing of all records will be provided, and reasons for the apparent spread will be explored.

## The relationship between *H. perforatum* and *H. maculatum*

The *H. perforatum* we find in Britain shows a set of rather odd reproductive behaviours that indicate it arose as a hybrid (Robson, 2002). The parents are proposed to be *H. maculatum* ssp. *immaculatum* (now found in the central Balkans, but formerly more widespread) and *H. attenuatum* (west Siberia to China). One of the products of this match, *H. perforatum* ssp. *perforatum*, spread westwards throughout north and north-west Europe, and this is our plant.

The subspecies of *H. maculatum* that we find in Cambridgeshire, ssp. *obtusiusculum*, also has an unusual history, having arisen from chromosome doubling of *H. maculatum* ssp. *immaculatum*. This common ancestry of *H. perforatum* ssp. *perforatum* and *H. maculatum* ssp. *obtusiusculum* explains why they hybridise so easily, and also why the hybrid (*H. × desetangsii* nothosp. *desetangsii*) is able to backcross to its parents and produce viable seed, features that are readily apparent in any investigation of British populations.

## Background to the three taxa in v.c. 29

### *Hypericum perforatum*

This taxon is widespread and common over much of Britain, and is described in the *Flora of Cambridgeshire* (Perring *et al.*, 1964) as being “common in open woods, hedgebanks and grasslands on the chalk and boulder clay; apparently absent from the open Fenland in the extreme north of the county”. Records for the vice-county stretch back to the time of Ray, and since 1987 *H. perforatum* has been found in 33 out of the 42 10-km squares that make up v.c. 29 (N.P. Millar,

*in litt.*). It is often associated with waste ground and dry well-drained sites such as old railway lines.

### *Hypericum maculatum*

This species is divided into two subspecies, although in many areas of Britain recorders have not distinguished between them. Ssp. *maculatum* is apparently rare, only occurring in a few 10-km squares in Scotland, and being very scattered (and probably introduced) in England (Preston *et al.*, 2002). There has only been one record of this subspecies from v.c. 29 – the orchard of Christ’s College, where it was first seen by Charles Raven in 1948. However, the orchard seems to have been destroyed by the construction of the Lasdun Building in about 1970, and this subspecies will not concern us further in this article.<sup>1</sup> Ssp. *obtusiusculum*, in contrast, is widely distributed throughout Britain. Being a ‘good’ native species, it is therefore surprising that the first record for v.c. 29 was not made until 1873, near Kirtling in the east of the county (Pryor, 1873). Sightings were then very occasional until the current recording effort began in 2007.

### *Hypericum* × *desetangsii*

According to the account in Preston *et al.* (2002), this is a widespread but overlooked taxon in Britain, a picture that is reflected in local records. The first records from the vice-county were from Swansley Wood (*c.* 1930), and near Leys Wood (1931), two sites that have since been lost. The next was from Longstowe in 1975 (Crompton, 1978), and following that it was found on just a few occasions until 2005, when the number of records started to increase substantially.

## **The morphology of the *H. maculatum*–*H. perforatum* complex**

### *Identification*

Identifying members of the *H. maculatum*–*H. perforatum* group is not straightforward, firstly because the hybrid can backcross with its parents, and secondly because *H. perforatum* and *H.* × *desetangsii* can produce viable seeds without fertilisation (*apomixis*). Thus, a hybrid at any point along the spectrum can in effect act as a ‘species’ in its own right. Plants on railways in Yorkshire were so variable that Crackles (1990) developed a scoring index to gauge the degree of hybridity. Here, I have chosen simply to record all the key characters (summarised in Robson, 1990 and Rich & Jermy, 1998) and then decide where in the spectrum the population lies. The following summary, and the data in Table 1, are a distillation of what I have found by examining *Hypericum* populations in v.c. 29 over the past few years.

When one finds a *Hypericum* specimen in v.c. 29, it is straightforward to confirm that it belongs to the *H. maculatum*–*H. perforatum* complex by excluding the only other two common *Hypericum* species found locally – *H. hirsutum* (plant densely hairy all over) and *H. tetrapterum* (plant with square stems, *finely* ‘perforate’ leaves, and acute sepals). Although there is a great deal of variability

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<sup>1</sup> It is worth, however, being aware of the key characteristics of ssp. *maculatum*. The most striking feature of the Christ’s College plant in CGE are its very broad, rounded and untoothed sepals; the leaves are like *H. maculatum* ssp. *obtusiusculum*, being densely net-veined.

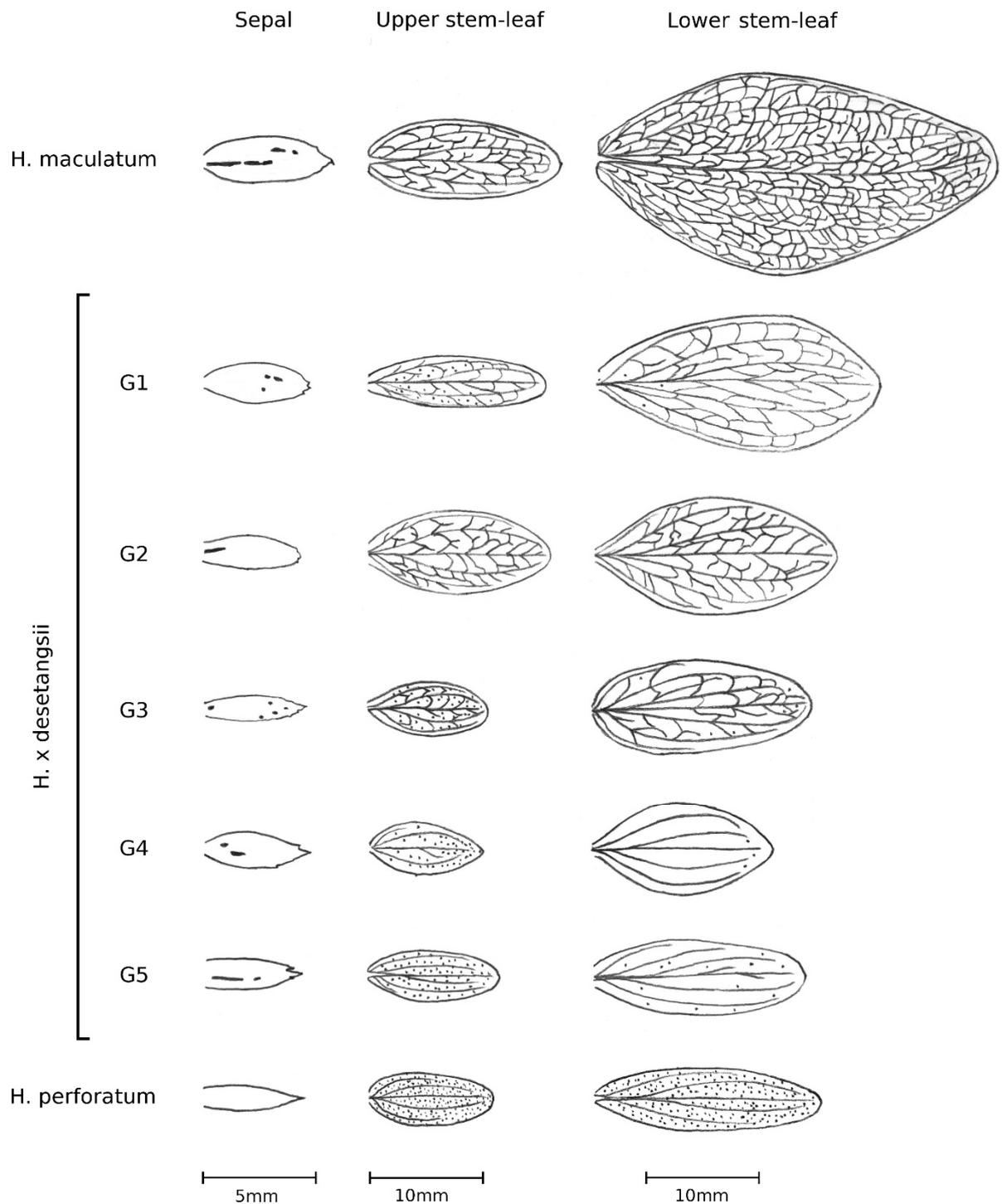
within the *H. maculatum*–*H. perforatum* group in the vice-county, (and not necessarily a smooth variation in a given character from one end to the other), it is usually possible to say roughly where in the spectrum a given hybrid lies, and to this end I have divided the plants I have seen into five broad groups: G1, close to *H. maculatum*; G2, tending towards *H. maculatum*; G3, a ‘good’ halfway-house between the two, perhaps in some cases corresponding to a first-generation hybrid; G4, tending towards *H. perforatum*; and G5, very close to *H. perforatum*. It should be emphasised that these groupings are not intended to be prescriptive, or to have any taxonomic significance, but rather to provide a practical way of describing the plants I have seen in v.c. 29, and to enable comparison with future finds. Characters are given in Table 1, and to aid identification, illustrations of typical sepals and leaves are provided in Figure 1.

#### *Usefulness of the key characters – a summary*

I have found the sepal-width to be particularly variable, even within one flower on specimens of pure *H. maculatum*. However, the overall shape is usually a good guide, and in addition the sepals of *H. maculatum* curve out later in the season, giving plants in fruit a distinctive appearance even from a distance. This character seems to be absent in other plants in the group. Sepal denticulations are usually pale and tiny, and can be tricky to spot even with a ×10 hand-lens, but teeth of any sort on more than a few sepals on a plant are a reliable indicator of the influence of *H. maculatum*. The distribution of translucent glands on the leaves is a useful character, but the upper leaves usually have more glands than the lower leaves, so the frequency on both should be noted. In some plants, e.g. G4 from the SW edge of Ten Wood, the glands were quite variable in size. Leaf-width can be helpful – lower leaves are increasingly large as one moves towards *H. maculatum*. Care should be taken when using stems as a character – it is best to examine plants in mid-season, and even then, in some plants the raised lines can be difficult to detect. Plant height is not to be relied upon, although there is a general tendency for an increase in size from *H. perforatum* to *H. maculatum*. Plants putting out a flowering stem after being mown can look rather spindly, and care should be taken in these cases. I have not paid a great deal of attention to the petals, as many of my finds have been out of the main flowering season. However, the greater frequency of black glands in *H. maculatum* (Robson, 1990) may be a helpful character.

To compensate for these difficulties, I have found that leaf-venation – mentioned as a key character by Rich & Jermy (1998) and Poland & Clement (2009) but not in most field-guides – is a useful diagnostic character. Leaves of pure *H. maculatum* show a dense network of thick veins when held up to a bright light, while the veins in the hybrid (even G1) are narrower and less net-like.

I have found G1 and G2 to be fairly distinct entities, in contrast to G3–G5, which seem to form a continuum with *H. perforatum*. However, G2 has only one representative (from Longstowe), and was rather difficult to place. Overall, the



**Figure 1.** Sketches of representative sepals and stem-leaves of *Hypericum* from v.c. 29. Black glands are shown on the sepals. The veins and perforations shown on the leaves were those easily visible when the leaf was held in front of a table-lamp. Sepals and leaves were from single plants collected from the following locations: *H. maculatum*: Byway N of Lucy Wood, TL671578. *H. × desetangsii*: G1: Madingley Hall, TL392605; G2: by track to Longstowe church, TL310553; G3: Duchess Park Estate, Cheveley, TL601622; G4: SW edge of Ten Wood, TL663557; G5: just SE junction of A1307 with Bartlow Road, TL573464. *H. perforatum*: Cambridge Science Park, TL463617.

Character	<i>H. maculatum</i>	<i>H. × desetangsii</i>					<i>H. perforatum</i>
		G1	G2*	G3	G4	G5	
Sepal width	Usually 1.8–2.5mm	Usually 1.8–2.0mm	1.2–1.8mm	Variable but usually 0.8–1.6mm			0.7–1.5mm
Sepal shape	Obtuse	Obtuse	Usually acute	Acute	Acute	Acute	Acute
Sepal denticulations	Frequent and often obvious	Rare or absent	Uncommon and small	Often present	Scattered–abundant	Scattered–abundant	Absent or very rare
Translucent glands on lower leaves	None	None or very few	None (but see text)	Few	Scattered–frequent	Scattered–frequent	Abundant
Translucent glands on upper leaves	Sometimes a few (<5/leaf)	Often frequent	None	Scattered–abundant	Abundant	Abundant	Abundant
Venation on lower leaves	Strongly and densely net-veined	Weakly net-veined	Weakly net-veined	Only main veins obvious	Only main veins obvious	Only main veins obvious	Only main veins obvious
Width of lower leaves	10–20mm**	10–15mm	12mm	Usually <10mm	Usually <10mm	Usually <10mm	Usually <10mm
Central part of stem of mature plant	Cleanly square, four-lined	Usually squarish, 2/4-lined	Squarish, 4-lined	2-lined	2-lined	2-lined	2-lined
Height of mature plant	Typically 60cm, but occasionally up to 100cm	Variable but usually 30–80cm					Usually less than 40cm

**Table 1.** Summary of characteristics of *H. maculatum*, *Hypericum × desetangsii* and *H. perforatum* in v.c. 29. All measurements were made on dried and pressed material. \* Characteristics taken from a single collection only (see text). \*\* Leaves sometimes unsymmetrically rhomboidal (as in the specimen drawn in Figure 1).

specimen gave the appearance of being further from *H. maculatum* than G1, as the sepals and leaves were on average significantly smaller than in G1. On the other hand, the stem-leaves were without perforations, except (confusingly) for the lower stem-leaves of a vegetative shoot in the same collection, which had about 20 translucent glands per leaf.

### **Records past and present**

A summary of all the v.c. 29 records of *H. maculatum* and *H. × desetangsii* is given below, listed in order of 10km square, locality (where necessary, to indicate records from a particular area and/or continuity with historic records) and date. For *H. × desetangsii*, where information is available, an assessment of the position in the spectrum is given in parentheses as *e.g.* (G1); this is my own unless it is in italics, when it is that based on descriptions or recollections provided by Alan Leslie.

### ***Hypericum maculatum ssp. maculatum***

**TL45** Two patches in the orchard, Christ's College, C.E. Raven, 1948; orchard, Christ's College, D.E. Coombe, 7.1952, det. N.K.B. Robson, **CGE**.

### ***Hypericum maculatum ssp. obtusiusculum* (Tourlet) Hayek**

**TL35 New Ditch, E of Old North Road:** Ditch one field away from NW border of Kingston Wood, W.H. Mills, 10.10.1926 (in Mills ann. Hooker (1884)) [also other records of this site from Mills and Evans in the period 1926–1930, including ‘borders of stream running north into Kingston Wood’; Evans (1939) says of it “in small quantity”. In the current survey, the exact site of Mills’ record has not been examined, but it is not present in the first 100 m of the ditch E of the Old North Road, D.J.B., 29.8.2009]. **New Ditch, W of Old North Road:** Abundant at least for the first 200 m, 317534–318535, D.J.B., 23.8.2009. **Byway near Kingston Wood:** Three extensive groups of plants on N verge of byway from Kingston Wood to the Old North Road, 320541–322543, D.J.B., 25.8.2007 and 19.9.2008; two clumps on N side of hedge near Horse Chestnut, 319541, D.J.B., 23.8.2009; scattered along N verge of track on N side of Kingston Wood, 324544–327544, D.J.B., 29.8.2009. **Arrington–Longstowe CP boundary:** Abundant for ~7 m along bridleway ~100 m E of where track curves to the S, 31345287, N.P. Millar, 25.7.2009 and D.J.B., 23.8.2009; 1 plant ~30 m E of this colony, 313528, D.J.B., 17.10.2009. **Old railway, Longstowe:** Abundant on NW-facing embankment of bridge on N side of old railway W of Lower Farm, 300537, D.J.B., 17.10.2009. **Bourn Brook:** By brook, Toft, W.H. Mills, 1938 (in Mills ann. Bab. (1860)) [site not visited in current survey].

**TL36** By ditch W side of field inside Swansley Wood, W.H. Mills, no date (in Mills ann. Hooker (1884)); Evans (1939) says “in small quantity” [wood since destroyed].

**TL45** [Old railway bank, Trumpington, 445544, G.M.S. Easy, 1978 (a doubtful record, G.M.S.E., *in litt.*, 11.2009; none seen, D.J.B., 10.10.2009)]; Newnham

College garden, G.M.S. Easy, 9.1987; numerous clumps on raised bed in Newnham College garden, 440577–440578, D.J.B., 10.10.2009; two clumps near pond edge by limestone rock garden, Cambridge Botanic Garden, 453571, D.J.B., 7.11.2009.

**TL55** One 10 ft × 4 ft patch, Station Farm, Six-Mile Bottom, 572565, A.C. Leslie, 6.8.2009, conf. N.K.B. Robson.

**TL65 Byway running N of Lucy Wood:** In some abundance, to within a quarter of a mile of Kirtling Tower, R.A. Pryor, 5.8.1873, det. N.K.B. Robson; Green Drove, Kirtling, W.H. Mills, no date (Mills ann. Hooker (1884)); still there just north of Lucy Wood, W.H. Mills, 1935; fairly frequent all the way along the track (especially abundant just SE of the CP boundary, 673576), 681570–671579, D.J.B., 12.5.2007 and subsequently. **Wood near Parsonage Farm:** A few plants in small wood S of Parsonage Farm, 670583, A.C. Leslie, 15.4.2005. **N edge of Lucy Wood:** Near Lucy Wood, 682570, E.M. Hyde, 28.9.1989; four scattered clumps on N side of track, several sq. m on S edge of the adjoining field ~25 m E of the field entrance, and one patch in the field itself, 683570–685570, D.J.B., 3.10.2009. **Between Lucy Wood and Ditton Park Wood:** Frequent–abundant on the south side of the track, 6756, D.J.B., 12.5.2007 and subsequently; scattered plants in long meadow on N side of track (frequent at SW end), 678569–679570 and 680570–681570, D.J.B., 2.5.2009 and 3.10.2009; two patches on W side of hedge at W end of meadow, 677569, D.J.B., 3.10.2009; three patches under trees at N end of King’s Belt, and seven small–medium patches on S side of hedge between King’s Belt and Lucy Wood, 678569–680569, D.J.B., 3.10.2009. **W edge of Lucy Wood:** Frequent–abundant (especially ~100 m S of the N end) in rough grassland in partial shade, 680568–680569, D.J.B., 3.10.2009; several sq. m by footpath at SW corner of wood, 680567, D.J.B., 3.10.2009. **Woodditton Road:** Several plants on SW verge about halfway between Ditton Park Wood and Oak Farm, 673564, D.J.B., 8.8.2009; one clump on E verge 38 m N of S end of Ditton Park Wood, 672566, D.J.B., 6.2.2010. **Ditton Park Wood:** Locally abundant ... at the E end of the cleared area in Ditton Park Wood, 669572, D.E. Coombe, 23.7.1952, **CGE**; still frequent on many ride margins, 668573, A.C. Leslie, 1978, and A.C. Leslie & G. Crompton, 26.6.1987; frequent–abundant by rides in NW part of wood (e.g., abundant by ride junction at 665569), more scattered towards SE part, 6656, 6657, 6756 and 6757, D.J.B., 3.8.2008 and subsequently. **Mill House area, E of Kirtling:** Five small–medium patches on NE verge of road NW of point where footpath joins, 693569–694569, D.J.B., 24.5.2009 and 25.9.2009; abundant on NE verge of road from Mill House to junction with footpath, 694568–695568, D.J.B., 25.9.2009; three extensive patches by footpath to Prince of Wales Wood, within 180 m of road, 694568–695570, D.J.B., 24.5.2009 and 25.9.2009; one smallish patch in rough grassland at SW end of Prince of Wales Wood, 696570, D.J.B., 25.9.2009; one small plant by footpath 24 m NE of more recently planted part of Prince of Wales Wood, 699574, D.J.B., 25.9.2009; 4 m stretch just E of Mill House junction, 696568, D.J.B., 25.9.2009; one patch on N verge of road E of Mill House junction, ~100 m E of barn, 698568, D.J.B., 25.9.2009. **By footpath S of Kirtling Green:** One

small clump on SE bank of stream 15 m below weir to SW of bend, 679556, D.J.B., 6.2.2010; a few spindly stems on mown bank W of stream, 15 m N of bend, 679557, D.J.B., 6.2.2010. **Nutting Grove area:** A few small groups in ditch on SW side of lane, 698599, D.J.B., 4.5.2009; one large patch on N side of grassy area marking junction of old lane at edge of Nutting Grove, 698597, D.J.B., 19.7.2009. **Lower Wood area:** Numerous patches, with ~100 flowering stems, mostly in ditch on S side of track on S side of Horse Pastures, 626529–627529, D.J.B., 11.4.2009 and 25.7.2009, det. N.K.B. Robson; one small non-flowering patch by path just inside Lower Wood, 626529, D.J.B., 25.7.2009; one patch on W side of footpath to Weston Colville, 628529, D.J.B., 25.7.2009.

**TL66** Frequent–abundant in medium–long grassland amongst planted trees and shrubs by footpath S of Ashley, within ~150 m W of road, 695606–699609, D.J.B., 4.5.2009.

### *Hypericum* × *desetangsii* nothosp. *desetangsii* Lamotte

**TF40** W side of old railway, N of Chainbridge level crossing, N of March, 42300007, A.C. Leslie, 14.7.2007 (G5).

**TL34** Side of track between Kneesworth and Whaddon, 351447, P.D. Sell, 7.7.1988, **CGE** (G5)<sup>2</sup>; Keith Wood, Bassingbourn, 342429, P.D. Sell, 15.7.2003, **CGE** (G5)<sup>2</sup>; N side of track between A10 and railway bridge, SW of Melbourn, 36844367, A.C. Leslie, 14.10.2006 (G5).

**TL35** Meadow by the track to the church, Longstowe, 310553, A.C. Leslie, 9.1975, det. N.K.B. Robson, **herb. A.C.L.** (G2) [none seen – meadow W of track heavily sheep-grazed, D.J.B., 17.10.2009]; scattered around Orwell Pit, 3650, A.C. Leslie (CFG exc.), 23.6.2007 (G5); edge of open area in centre of Kingston Wood, 3254, 4.8.2007, A.C. Leslie & P.J. Reynolds (*perhaps* G3); thinly scattered along old railway W of Old North Road (but frequent near Broad Close Spinney), 309541–314545, D.J.B., 20.10.2007 and 19.9.2008 (G5); one plant on S verge of track about one-third of the way from Kingston Wood to the Old North Road, 322543, D.J.B., 19.9.2008 (G3); one plant ~30 m E of bend in footpath along Arrington–Longstowe CP boundary, 30755274, N.P. Millar, 25.7.2009 and D.J.B., 17.10.2009 (G5).

**TL36** Swansley Wood, W.H. Mills, *c.* 1930 [wood since destroyed]; about 10 plants towards top of meadow below Madingley Hall, 392605, D.J.B. (CFG exc.), 1.8.2009, det. N.K.B. Robson (G1).

**TL44** Side of ride, Chrishall Grange Plantation, 455425, A.C. Leslie, 13.9.2008, **CGE** (G5).

**TL45** Botanic Garden, Cambridge, H. Gilbert Carter, 22.8.1941, **CGE** (G3–4); Newnham College garden and car park, G.M.S. Easy, 21.7.1987, **herb. G.M.S.E.** (G1); area planted with wild flower seed, Trumpington Road end of Cambridge

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<sup>2</sup> Peter Sell is currently preparing a treatment of *Hypericum perforatum* that recognises several new species. Two specimens from TL34 in **CGE** thus determined appeared to correspond to what I would have recognised as *H.* × *desetangsii* G5, and so I have treated these as such here.

Botanic Garden, 453571, P.D. Sell, **CGE**, 26.7.2005 (G3); base of hedge beside track along margin of field on W edge of Barton, 40225604, A.C. Leslie, 23.8.2005, **CGE** (G5); by path from Newmarket Road Park & Ride to Fison Road, 49155964, A.C. Leslie, 12.6.2007 (G5); several sq. m (with *H. perforatum* nearby) in rough grassland under trees, Jesus College Garden, 45085897, A.C. Leslie, 14.9.2009, det. N.K.B. Robson (G1); landscaped slope opposite Next Generation Club, old pit site SW of Coldham's Lane, 48345728, A.C. Leslie, 14.9.2009 (G5).

**TL46** N side of old railway, between Milton Road and Cambridge Regional College, 4661, A.C. Leslie, 27.8.2006, det. N.K.B. Robson (G4); edge of planted border in front of surgery, Mansel Way, 453607, A.C. Leslie, 27.5.2007 (*probably* G4); one plant with abundant *H. perforatum* at edge of scrub, Cambridge Science Park, 463617, D.J.B., 18.9.2008 (G5); bank of ditch on E side of Milton bypass, 47246315, A.C. Leslie, 5.7.2009, det. N.K.B. Robson (G5).

**TL49** Waste ground NE of March railway station, 41949785, A.C. Leslie, 5.11.2006 (G5).

**TL54** Waste ground by abandoned section of Bartlow Road, E of Linton, 57304650, A.C. Leslie, 11.8.2007 (G5); about 10 plants just SE of junction of A1307 with Bartlow Road, 573464, D.J.B., 24.8.2009 (G5).

**TL55** Old dumped soil just S of Worsted Lodge Fm, 52905186, A.C. Leslie, 15.10.2006 (G5); predominant plant on Fleam Dyke, NW of old railway, 5355 and 5454, A.C. Leslie, 15.10.2006 (G5); banks of road run-off pit NW of A11, just S of Worsted Lodge, 52765185, A.C. Leslie, 15.10.2006 (G5); E bank of A11, W side of Allington Hill, 576587, A.C. Leslie, 6.8.2009 (G5).

**TL56** NW side of track running parallel to A14, just SW of junction with track to Vicarage Farm, 5962, A.C. Leslie, 28.8.2006 (G5); steep cutting on W side of A11, just S of A1303 bridge, W of Hare Park, 5760, A.C. Leslie, 8.8.2009 (G5); one clump in waste ground at N end of byway, close to A1303, 580600, D.J.B., 27.9.2009 (G4–5).

**TL57** A few robust plants on N bank of Witchford Road, E of roundabout, 518790, D.J.B., 25.7.2008 (G5).

**TL64** West Wickham Wood [this description, which refers to the place called Leys Wood on modern maps, appears on the herbarium sheet, but on a CNHS list it is given as “roadside near Barton End, West Wickham, on the right going away from West Wickham” on the authority of the same recorder], T.G. Tutin, 31.5.1931, **CGE** [this is a young shoot with no flowers – it is difficult to place, but it is certainly not *H. perforatum*, *H. maculatum* or *H. × desetangsii* G5. None seen on quick visit in 2009, but the area needs further examination]; old railway embankment SE of Park Hill, SE of Horseheath, 62964657, A.C. Leslie, 23.10.2005 (G5).

**TL65** Ditton Park Wood, 668571, P.H. Oswald and D. Wells, 11.7.1994; clearing at SE corner of Lower Wood, 626527, C. Turner and D. Mackay, 10.6.2008 and 30.7.2008; a few plants (with *H. perforatum*) in ditch on W side of lane just N of

entrance to Banstead Manor Stud, 698594–698595, D.J.B., 4.5.2009 (not conclusively identified due to mowing – perhaps G3?); a couple of small patches on S side of track on S side of Horse Pastures, 626529–627529, D.J.B., 25.7.2009, det. N.K.B. Robson (G3); scattered by fence near hill-summit along SW edge of Ten Wood, and a few plants by ditch just SE of Ten Wood, 666554–667554, D.J.B., 31.8.2009 (G4); frequent in grassland at E end of Great Widgham Wood, 672551–672552, D.J.B., 31.8.2009 (G4); scattered plants on N side of track running along the N side of Lucy Wood, 681570–685570, D.J.B., 3.10.2009 (G4–5).

**TL66** Waste ground at junction of New Cheveley Road and Cricket Field Road, Newmarket, 64906285, A.C. Leslie, 12.10.2005 (G5); bank on NE side of footpath running along S side of Lower Links Covert, 63486082, A.C. Leslie, 13.11.2005 (G5); about eight clumps in small rectangular meadow at back of houses, Duchess Park estate, 661622, D.J.B., 2.8.2009 (G1); two clumps in small rectangular meadow at back of houses, Duchess Park estate, 661622, D.J.B., 2.8.2009 (G3).

**TL76** Abundant for 4 m along verge/ditch on S side of road, SW of Silverley church, 701600, D.J.B., 25.9.2009 (G3).

## Discussion

### *General distribution*

There are two main areas for *H. maculatum*, corresponding to the historical localities just west of Kingston Wood and near Lucy Wood (Figure 2). In both of these areas the plant is locally abundant. In addition, this survey uncovered apparently native populations close to Lower Wood at Weston Colville, in the Ashley–Silverley area, and a single clump at Six-Mile Bottom. We can add to these a couple of sites in Cambridge, at which it was very likely introduced (*vide infra*).

The situation for *H. × desetangsii* is less straightforward (Figure 3). G1 is rare, and has been found only as isolated colonies in a few places. G2 has only been seen once, and could not be found in 2009. G3 mostly occurs as individuals, with a substantial patch on a roadside at Silverley. G4 is rather uncommon, although there is an extensive population from Ten Wood south-eastwards to the county boundary. Finally, G5 has been found in numerous places mostly in the southern half of the vice-county, but especially on old railway lines and waste ground. It is worth noting that the occurrence of G5 often appears to bear no relation to the presence of *H. maculatum*.

### *The native sites for H. maculatum*

The exact site near Kirtling where Pryor saw *H. maculatum* in 1873 was not stated, but it seems reasonable to assume that it is the same place where Mills





Imperforate St. John's-wort (*Hypericum maculatum*) drawn by Lucy Hulmes

also recorded it in 1935, *i.e.* the track running north of Lucy Wood. It is now a conspicuous feature in this area, especially just south-east of the parish boundary (see Plate 1, inside front cover), on the western side of Lucy Wood, along the track towards Ditton Park Wood, and in Ditton Park Wood itself. It virtually replaces *H. perforatum* in these areas, with *H. × desetangsii* only recently seen in small quantity on the northern side of Lucy Wood. There is also an extensive population of *H. maculatum* by a roadside ditch east of Kirtling, with several outliers, and a small amount by the weirs to the south of Kirtling Green.

At Kingston Wood, the exact site where *H. maculatum* was recorded by Mills in the 1920s has not been visited, but there is plenty on the verge of the nearby track. It is also abundant on the banks of the ditch further upstream from Mills' site. Outlying colonies are present on tracksides to the west and south-west. As at Kirtling, the hybrid is rather uncommon.

The population at Ashley is curious, because it is confined rather precisely to a broad strip planted up with shrubs and small trees that runs parallel to a footpath. Before conversion of the area to a stud farm, the whole area was a large arable field, and the strip must have been planted up at around the same time as the footpath diversion order took effect, in January 2003 (T. Woolhouse, Countryside Access Team, Cambridgeshire County Council, *in litt.*). Therefore the plants have had only had about six years to colonise this area, which suggests that, unless a very favourable set of circumstances had arisen, rhizomes or seeds may have been unintentionally imported from another (unknown?) population. It may be significant that no plants that might have acted as a seed source could be found on the nearby road-verges. The leaves of these plants were not quite so strongly veined as is typical for *H. maculatum* ssp. *obtusiusculum*, but all other characters agreed well.

To the south of the Ashley population a small number of plants are scattered along the banks of a regularly mown ditch near Nutting Grove. *H. perforatum* can be found in the area, along with two colonies of the hybrid.

At Lower Wood, a colony of the hybrid first attracted attention in 2008, with a substantial population of *H. maculatum* not far away being noticed in 2009. A couple of clumps of the hybrid are mixed in with it, and there is a little *H. perforatum* in the vicinity.

Finally, the single large patch of *H. maculatum* at Six-Mile Bottom is over six kilometres away from the nearest known site – how it got there remains a mystery.

#### *Possible introductions of H. maculatum and H. × desetangsii*

The history of *H. maculatum* and its hybrid in Cambridge city is an intriguing one. In the Botanic Garden, there are two flourishing clumps of (unlabelled) *H. maculatum* at the edge of the limestone rock garden. It is not clear how it got there – *H. maculatum* (collected from the wild) is mentioned in the 1981 inventory (Yeo & King, 1981) but not in the 1990 inventory (King, 1990). *H. × desetangsii* appears in neither list, but there is a 1941 record from the garden, and Peter Sell has found specimens of what appear to be *H. × desetangsii* in an area sown with wild-flower mix.

*H. maculatum* also persists in a raised bed at Newnham College, where it was first noted by Graham Easy, and where he considers it to have been intentionally planted. However, his 1987 site for *H. × desetangsii* (G1) in an area of rough ground nearby is now built on. At two other sites for *H. × desetangsii* G1, Jesus College and Madingley Hall, accidental introduction would appear to be the most likely reason for their presence.

#### *Habitat preferences*

A preferred habitat for *H. maculatum* seems to be at the top of (or close to) wayside ditches on the boulder clay, as between Lucy Wood and Ditton Park Wood, where it can be found with another uncommon plant, *Pimpinella major*. *H. perforatum* is well known to be able to tolerate drier ground than *H. maculatum*, a fact that was apparent during the current survey. *H. × desetangsii* G1–G4 were intermediate in their situation between the two parents; I did not see them in the dry sparsely vegetated ground in which one sometimes finds *H. perforatum*, or indeed *H. × desetangsii* G5. There are a substantial number of records of the latter from (now disused) railways, and this may be linked to air movement or other railway activities aiding the spread of seeds, as suggested by Crackles (1990).

#### *The situation in adjacent counties*

Neither *H. maculatum* nor *H. × desetangsii* has received detailed critical attention in adjacent counties, making a comparison with Cambridgeshire populations difficult. However, their distributions are fairly well worked-out in Essex (v.cc. 18 and 19), where there is a thin scattering of records for *H. × desetangsii*, but only one confirmed site for *H. maculatum* (K.J. Adams, *in litt.*). The *Flora of Essex* (Jermyn, 1974) reports a scatter of sites for *H. maculatum*, but did not mention the hybrid, so it is likely that it was overlooked; Adams suggests that elimination of *H. maculatum* by introgression might also be involved. In Bedfordshire (v.c. 30), *H. maculatum* is found in two core areas in the south and west of the county, where it appears to be spreading (C. Boon, *in litt.*, cf. Dony, 1976).

In Hertfordshire (v.c. 20), Suffolk (v.cc. 25 and 26), Norfolk (v.cc. 27 and 28) and Northamptonshire (v.c. 32), it appears that *H. maculatum* is fairly widespread but probably over-recorded, and that *H. × desetangsii* is rather rare but almost certainly under-recorded (James, 2009; M. Sanford, *in litt.*; Beckett *et al.*, 1999; Gent *et al.*, 1995). Only in Huntingdonshire (v.c. 31) has neither taxon been found (D. Broughton, *in litt.*).

#### *Reasons for the increase in H. maculatum and H. × desetangsii records*

Several factors may have allowed populations of *H. maculatum* and *H. × desetangsii* in v.c. 29 to have escaped detection until recently. The first is their unfamiliarity to recorders in the vice-county, a likely result of their rarity in East Anglia and superficial similarity to *H. perforatum*. This is probably why the populations near Kingston Wood and Lower Wood have only just come to light, despite being apparently long-established next to well-trodden paths. In contrast,

the area around Kirtling, together with Silverley and Ashley, is perhaps less often visited by recorders, a situation compounded by frequent mowing of the verges near Nutting Grove. Finally, it is not easy to recognise *H. maculatum* and *H. × desetangsii* with certainty much before June, although the vegetative differences from *H. perforatum* become clear enough with practice.

Although these factors have played their part, it is difficult to escape the conclusion that *H. maculatum* has increased in the vice-county. At the very least, it has not diminished – Pryor's 1873 description of *H. maculatum* was “in some abundance, to within a quarter of a mile of Kirtling Tower”, a description that might equally well apply today. Suggestions of an increase can also be found elsewhere. It is difficult to believe that, of the botanists who must over the years have walked along the track from Lucy Wood to Ditton Park Wood, none had noticed the large population of *H. maculatum* here, unless it had not always been so extensive. Likewise, had *H. maculatum* been present in the well-botanised Ditton Park Wood in the 1800s, Babington or his contemporaries must surely have seen it – but they did not. It is now frequent by the rides in the northern part of the wood, and, like *Carex pendula* (a prolific producer of seed) and the strongly rhizomatous hybrid mint *Mentha × verticillata*, may have benefited from the disturbance caused by the gradual deconiferisation of the wood started in the early 1980s and completed in 2004 (S. Leatherdale, *in litt.*). Unpalatability of these species to deer may also be a factor here – indeed, although there are clearly plenty of deer in the wood, the *H. maculatum* does not seem to suffer much from grazing. Similarly, I have seen plants of *H. perforatum* left relatively unscathed in otherwise heavily rabbit-grazed grassland near Newmarket.

Within its core areas, and especially to the east of Kirtling, there are individual plants of *H. maculatum* that are small and presumably therefore quite young. The presence of such plants suggests that *H. maculatum* is currently expanding its range, but the fact that it has not got far in 130 years indicates that this expansion has been slow and steady rather than sudden. Being a rhizomatous perennial, it is able to do well in tall vegetation at the backs of road verges and in ditches, explaining why it has persisted in its known sites for so long. The seeds are produced in large quantity, although being smooth and about 1 mm long, they are unlikely to be carried significant distances by animals or by the wind. One would therefore only expect new plants to arise close to established populations, and this is to a large extent borne out by observation.

As for *H. × desetangsii*, it is too early to come to many conclusions due to the lack of records. All that one can say with any certainty is that it has been overlooked, and that it is unlikely to be decreasing. The presence of G1 in places close to human habitation suggests that it may have not arrived of its own accord, especially where neither parent is present, as at Madingley. The plants at the *perforatum* end of the spectrum (G5), which are often present in areas far removed from *H. maculatum*, are clearly very closely related to *H. perforatum* (with which they often grow). It would be interesting to examine these plants genetically, and see to what extent *H. maculatum* is part of their makeup.

## Conclusions

The number of known sites for *H. maculatum* and *H. × desetangsii* in v.c. 29 has increased substantially in recent years. Some of these populations were found as part of a determined effort to search for plants in and around the old *H. maculatum* localities at Kingston and Kirtling, but many more were discovered purely by chance – something that can be attributed to having ‘got one’s eye in’! Although difficult, identifying plants in the *H. maculatum*–*H. perforatum* group is not impossible, and I hope that this article will help naturalists in the region to become more aware of the characters to look for. In particular, it would be most useful if recorders could try to distinguish between ‘good’ hybrids (G2–G4) and the forms that closely approach the parents (G1 and G5). Judging by the number of discoveries of these limiting forms of the hybrid over the last few years, many more sites must surely remain to be found in the vice-county.

Finally, in cases of a suspected hybrid, I would encourage recorders to note down full details of the plants, with specimens if possible. Such details should enable monitoring of population changes (including possible introgression), and allow us to put future records of this interesting but challenging group in context.

## Acknowledgments

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## Small Mammal Live Trapping Studies in Hayley Wood

R M Featherstone

### Introduction

Hayley Wood is one of Cambridgeshire's best known and studied woodland nature reserves. Covering 50 ha, it provides a wide variety of habitats for small mammals, encompassing mature woodland, coppice plots of various ages, glades, rides and edge habitat where it adjoins surrounding arable farmland.

A previous trapping survey in Hayley Wood was reported by Jones (1983) and formed part of a national survey of woodland small mammals (Malorie & Flowerdew 1994). In addition some observations and casual trapping of small mammals were reported by Tony Vine and Peter Sell in *Hayley Wood; Its history and Ecology* (Rackham 1990).

The following studies were carried out by the author with assistance from members of the Cambridgeshire Badger and Otter Group (now renamed the Cambridgeshire Mammal Group) over the last ten years. They were aimed at identifying the presence of the various small mammal species, their distribution through the wood and, in one study, their population density.

**Table I** Small mammal species recorded in these studies

Common Name	Scientific Name	Abbreviations used in Tables
Wood Mouse	<i>Apodemus sylvaticus</i>	As
Yellow-necked Mouse	<i>Apodemus flavicollis</i>	Af
Bank Vole	<i>Myodes glareolus</i>	Mg
Field Vole	<i>Microtus agrestis</i>	Ma
Common Shrew	<i>Sorex araneus</i>	Sa
Pygmy Shrew	<i>Sorex minutus</i>	Sm

## Methods and Results

### 1 Mark/recapture survey in 4 and 5 year old coppice plots. R M Featherstone and M J Green, 1997.

This study was carried out during November 1997 in plots coppiced in 1992 and 1993, hence four or five years old at the time. Vegetation consisted mainly of coppiced Hazel, maple and hawthorn and pollarded Ash with some oak standards, containing moderate to heavy undergrowth, predominantly coarse grasses and brambles.

A 60 x 60 m grid was marked out with trapping points at 10 m intervals. Two Longworth traps were set at each point, giving a total of 72 traps. These were pre-baited for three days, then set to catch on two succeeding nights, captures on the first night being marked by fur clipping. Conditions during the trapping period were cold and wet.

Although 28 small mammals were caught on the first night, due to casualties and escapes, only 23 could be fur clipped and used in calculating the population density. On the second night, a total of 34 was caught of which 13 had been marked.

### Population density

The area covered by the trapping grid, taken to include a 5 m border around the outer trapping points, covered 4,900 sq m (70 m x 70 m). Using the Lincoln Index, the proportion of marked individuals (13) to the total capture on the second night (34), is the same as the proportion of the total marked on the first night to the total population of the trapping area, hence 60. This equates to a small mammal population density of 122 per hectare in this habitat.

### Species composition

This is calculated using the total catch of mammals on the first night plus unmarked captures on the second night, giving a total of individual animals caught of 49. Of these, 28 were Bank Voles (57%), 14 Wood Mice (29%), four Pygmy Shrews (8%) and three Common Shrews (6%).

Whilst the study above focuses on one particular age of coppice within the wood, the following two studies look more broadly across different ages of coppice and other woodland / wood edge habitats.

**2 Transect survey to investigate the composition and relative abundance of small mammal populations in different areas of Hayley Wood. R M Featherstone and S Parnwell, December 2002.**

Eight different areas within or bordering Hayley Wood were selected as in the table below, covering a diversity of woodland/wood edge habitats. Within each, ten Longworth traps were set 10 m apart in a straight line (or other configuration where appropriate). These were pre-baited for one night then set to catch for one night only.

**Table II Overall capture rate and species composition in the various areas**

Area	% Traps Occupied	Species Composition %				
		As	Af	Mg	Ma	Sa
Old railway line	50	60		40		
Glade	30	100				
10 yr old coppice plot	90	67		22		11
2 yr old coppice plot	70	43		29		29
New coppice plot	40	75			25	
Triangle	60	100				
Eastern quarter	40	75	25			
Northern quarter	60	66	17	17		

**3 Transect survey to investigate population composition and relative abundance in coppice plots of various ages. R M Featherstone, January 2004.**

This was a follow-up to Study 2, concentrating on the coppice plots. The trap number and trapping procedure was the same as Study 2.

**Table III Overall capture rate and species composition in various coppice plots**

Coppice Age	% Traps Occupied	Species Composition %			
		As	Af	Mg	Sa
New	40	50		25	25
2 year-old	90	56		33	11
5 year-old	90	10			
10 year-old	40	0			
		75	25		

**Discussion**

Study 1 indicates that four or five year-old coppice is sustaining a high density of small mammals at 122 per hectare, bearing in mind that the population is likely to be close to its annual maximum in November. All three studies indicate the highest densities of small mammals are in the coppice plots in the 2-10 year range as compared with either new coppice, mature woodlands or the other habitats

sampled. It is considered that this may be due to better cover from predators being offered by the heavier undergrowth found in plots of this age range.

In Study 1, Bank Voles formed the largest part of the total population (57%), compared with Wood Mice (29%). This was in contrast to the other studies where Wood Mice were the most abundance capture in all habitats; this is discussed further below. These two species together account for a very high percentage of the population in all habitats sampled, in common with most published small mammal studies in woodland. Both Common and Pygmy Shrews featured in these studies but at a relatively low level. Yellow-necked Mice hardly featured in the captures, although the tenant of Hayley Cottage reports that this species is regularly caught in Longworth traps in the cottage roof in significant numbers (Woolnough – pers. comm.). Field Voles hardly featured in the captures either, although habitats such as the glade and new coppice plots would seem to be suitable for them. Perhaps the isolation of these habitats from sources of Field Vole colonisation is the reason.

The study conducted by Flowerdew (2007) in Madingley Wood (approx 12 km to the north-east) shows large year-on-year variability in the proportion of Bank Vole and Wood Mouse, and the numbers and percentage composition in these Hayley Wood studies fall within the range at Madingley measured over the 12 year period 1982 - 1993 (8% - 59% Bank Vole). Flowerdew proposes that the population dynamics of these two species are affected by autumn fruiting for mice and autumn temperature for voles. These factors, which were not measured in any way in our study, probably account for the differences seen in the number of each species recorded in the different studies. He also comments that in years of high Wood Mouse abundance, the long winter nights may mean that the nocturnal habits of this species out-compete the trap availability over the more diurnal Bank Vole, affecting the apparent trapping ratio further.

Overall these studies have added considerably to the data on small mammals in Hayley Wood, as well as contributing data to the Cambridgeshire Mammal Atlas and providing training opportunities in this subject for many members of the Cambridgeshire Mammal Group.

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Readers may wish to help with a new survey of Cambridgeshire mammals, running until December 2011. For more details see <http://www.naturenotebook.org.uk/>.

**Contributions towards a new algal flora of Cambridgeshire (Vice-county 29), 5. Phylum Chlorophyta, continued.**

## Hilary Belcher, Eric George and Erica Swale.

Phylum Chlorophyta, Order Prasiolales: - A small order of filamentous or thalloid aquatic or subaerial algae.

*Prasiola crista* (Lightfoot) Kützing 1843. J.S. Henslow, Chesterton Church, 1836; E.A. George, Madingley Hall, on tree bases, 1955; B. & S., common between stones of worn tarmac, Washpit Lane, Girton. Figure 1A.

Phylum Chlorophyta, order Sphaeropleales: - A small order of filamentous aquatic green algae.

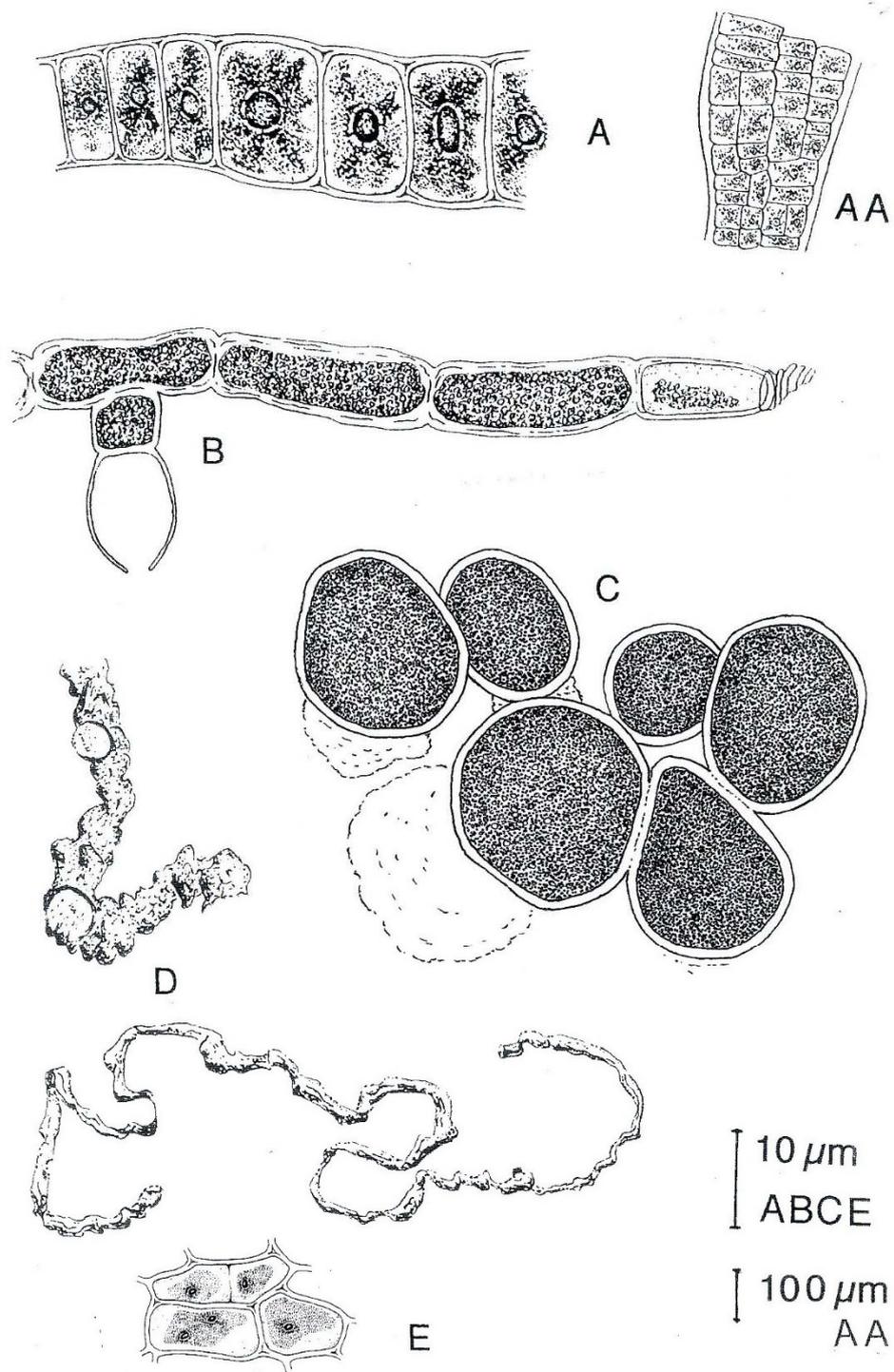
*Sphaeroplea soleirolii* (Duby) Montagne ex Kützing 1849. One record, by C. Lambert, from Histon, 1951, checked by Pierre Bourrelly. No specimen or drawing.

Phylum Chlorophyta, order Trentepohliales: - A small order of epiphytic algae, of which *Trentepohlia*, with filaments coloured by orange oil globules, is the only genus reported from Cambridgeshire, forming tawny-orange mould-like growths on wood and stone.

*Trentepohlia aurea* (Linnaeus) Martius 1817. Reported by P.W.R. (Paul Richards?) from the wall of Clare College Fellows' Garden in 1929. Since there is no specimen, drawing nor measurements, and the species is often regarded as conspecific with *T. abietina* this record must remain doubtful. Furthermore, West and Fritsch (1927), probably used for this identification, do not mention *T. abietina*, presumably including it in *T. aurea*.

*Trentepohlia abietina* (Flotow) Hansgirg 1886. Not in Eric's records. In 1975 we were in need of a specimen of *Trentepohlia* to draw for our forthcoming booklet on algae (Belcher & Swale 1976). We searched many churchyards and woodlands without success, but at last found a small orange tuft of *T. abietina* on a calcareous tombstone in the southwest of the vice-county (the exact location has been forgotten). Figure 1B shows an erect filament, 7µm diameter, of this material (see also Plate 2, inside front cover).

*Trentepohlia umbrina* (Kützing) Bornet 1878. This species was first recorded for v.c. 29 in June 2009, when we noticed it in the garden of Lucy Cavendish College, Cambridge, growing on the bark of a Tulip Tree (*Liriodendron tulipifera*) which we had planted as a sapling about 30 years ago, and had often looked at without noticing anything unusual. The alga formed a rough but not velvety tawny-orange coating on the western side of the trunk up to a height of



**Figure 1.**

**1A**, *Prasiola crisa*, filament, x1000, and, AA, multiseriate ribbon (sketch), x200, Girton;  
**1B**, *Trentepohlia abietina*, erect filament, Cambridgeshire (VC29), x1000; **1C**, *Trentepohlia umbrina*, Cambridge, part of prostrate filament scraped from a tangled mass (there are no erect filaments), x1000; **1D**, *Enteromorpha flexuosa subsp. pilifera*, R. Cam, Granchester Meadows, natural size, **1E**, Cells of this, c. x1000.

about 1.5 m. When we visited the tree in November the alga had become dark and inconspicuous. This species differs from *T. abietina* in not possessing erect filaments, the basal ones being highly contorted, with swollen often spherical cells, forming a tangled mass. The cells of both species usually contain many small orange oil globules, which obscure the other cell contents. Figure 1C.

Both of the preceding two species appear to have become more conspicuous in areas of south-east England where they were not noticed previously. In March 2009, a few weeks before we saw *T. umbrina* on the Tulip Tree we received a sample of the same species from Westleton, Suffolk (TM4469) for identification, where it was growing on twigs, and had been noticed the year before, for the first time (Kirby & Francis 2009). Subsequently Sheila Francis passed on to us samples of *T. abietina* from Suffolk (near Henham, TM463767) and Norfolk (Marsham Heath, TG167410), where it seemed not to have been noticed previously.

Ken Adams of the Essex Field Club told us that *Trentepohlia* has become a common epiphyte in Epping Forest in the last five or six years after not having been reported for this much-botanised locality. Samples he sent were of *T. umbrina*. Similarly Maurice Moss reported that *Trentepohlia* species were now common bark epiphytes in Surrey, where they were not conspicuous a few years ago. Also, in v.c. 32, the alga has made its appearance in Yardley Chase (Northamptonshire) and Bedford Purlieu (now in Cambridgeshire; and in v.c. 31 at Monks Wood (from Chris Carter and Chris Preston).

*Trentepohlia* species have always been much more common in the west of the British Isles (see Rindi & Guiry 2002 for their abundance around Galway, Ireland), but the extension of their range in the south-east of England is remarkable, and should be looked for. Oliver (2007) gives a good description with photographs of *Trentepohlia* sp. from Savernake Forest, Wiltshire, showing the typical appearance.

More Cambridgeshire records are to be expected, if the present trend continues. Jeff Bates of Imperial College London suggests that the spread is due to the reduction of SO<sub>2</sub> in the atmosphere and possibly the increase in oxides of nitrogen.

Phylum Chlorophyta, Order Ulvales:- a small order of mostly marine thalloid algae.

*Enteromorpha intestinalis* (Linnaeus) Nees 1820. This brackish or marine species has been recorded from the River Nene at Foul Anchor (Price, Tittley and Honey 1977). All the numerous freshwater records purporting to be of this species should be referred to the following species (see John *et al* 2002).

*Enteromorpha flexuosa* (Wulfen ex Roth) J. Agardh 1883 subspecies *pilifera* (Kützing) Bliding 1963. As Eric George recorded, “this plant (as *E. intestinalis*) appears to be generally distributed in the rivers and drain-dykes throughout the county.” It is usually buoyed up by oxygen bubbles within the tubular thallus. We have seen it covering the surface of the River Cam at Grantchester Meadows,

Cambridge, and also many times in drainage ditches etc, as it usually floats and is conspicuous enough to be spotted on a walk. Older records: - R. Cam at Sheep's Green and Baitsbite; Burwell Lode; R. Ouse at Ely; Sutton and Mepal, in ponds; The Washes, Sutton; Old R. Nene at March; Guyhirne – W. R. Cam at Grantchester, 1947 – E.A.G. Figures 1D and E.

### Acknowledgments

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## The Lichens of Wicken Fen

Mark Powell

This paper provides two annotated species lists of lichens for Wicken Fen separated in time by 36 years. The differences between the two lists are quite remarkable and possible explanations for these differences are discussed.

Lichens are dual organisms consisting of a fungus and a photosynthetic partner living together in symbiosis. The scientific names used for lichens are actually those applied to the fungal partner, while the photosynthetic partner has a separate name in the algae or cyanobacteria. The composite lichen association strictly speaking has no name. The photobiont provides the fungus with the products of photosynthesis, whilst the fungus provides the alga or cyanobacterium with minerals and protection from the elements.

Lichens are remarkably sensitive to air pollution, particularly sulphur dioxide. The comparatively small number of lichens present at Wicken Fen in 1972 (38 species) is partially accounted for by the background pollution of sulphur dioxide that affected much of eastern England at that time. However, the presence of a few species such as *Flavoparmelia caperata*, *Ramalina farinacea* and *Usnea*

*subfloridana* which are quite sensitive to sulphur dioxide suggest that the air was less polluted than in the midland area of England further to the west from where these lichens were almost absent at that time. The closure in 1971 of the brickworks at Little Fen, Burwell, only a mile from the area, removed a local source of pollution. Since the early 1970s there has been a steady fall in background sulphur dioxide levels across eastern England due to the decline in coal-fired power stations, heavy industry and of domestic coal fires along with stricter emission controls. The closure of brickworks in the Marston Vale (upwind of Wicken) has also removed a considerable source of sulphur dioxide. The 2008 list for Wicken Fen has 76 species of lichen, double the 38 species recorded in 1972. Much of this increase may be attributed to the lichen colonisation in the wake of declining sulphur dioxide levels but other factors must also be considered. The more recent survey looked at a wider range of man-made structures than were studied in 1972; the National Trust workshops, a school study shelter and a large concrete manhole cover were examined in addition to the concrete post by the windmill. Saxicolous lichens are more complicated than corticolous species in their response to declining sulphur dioxide levels. Calcareous substrates are alkaline in nature and served to buffer the habitat when sulphur dioxide was at greater concentrations. The change in the lichens of calcareous substrates thus tends to be less dramatic than that for bark. The concrete post by the windmill had the same number of species (twelve) in 2008 as it did in 1972, though the composition changed slightly. *Caloplaca decipiens*, *C. saxicola* and *Xanthoria parietina* were lost while *Caloplaca holocarpa*, *Lecanora albescens* and *Xanthoria calcicola* were gained. If we separate out the corticolous lichens we find that 31 species grew on bark in 1972 compared with 46 species in 2008. Species such as *Arthonia radiata*, *Lecanora carpinea*, *Lecidella elaeochroma* and *Parmotrema perlatum* are conspicuous and easily recognised and it seems likely that these have colonised due to the decline in atmospheric sulphur dioxide. The same may be true of *Arthonia punctiformis*, *Arthopyrenia punctiformis*, *Cyrtidula quercus*, *Jamesiella anastomosans* and *Lecanora confusa* but a note of caution must be made in the case of these five species. The first three are pioneer species of twigs and are not true lichens – they do not have a photosynthetic partner. They are traditionally recorded by lichenologists but are often overlooked. *Jamesiella anastomosans* was described new to science in 1972 and was presumably poorly understood at that time. *Lecanora confusa* has had, until recent years, a distinctly western distribution in England. It is likely that it has spread considerably but it may also have been overlooked – young specimens are similar in appearance to *Lecanora symmicta*. There is a small number of species that buck the trend and which have become less common with ameliorating atmospheric conditions. The most dramatic decline has been that of *Lecanora conizaeoides*. J. R. Laundon describes this species in 1972 as “The most common epiphyte. Occurs also on wooden posts”. This species was not found as an epiphyte during the 2008 survey and it is now rarely found on bark in East Anglia. *Hypogymnia physodes* is also undergoing a general decline in lowland England. In 1972 it was frequent in carr woodland on Wicken Fen. The only record in 2008 was on a roofing sheet of the school study shelter. Now that sulphur dioxide concentrations have fallen below

the level where it is a limiting factor for most lichens, the influence of other atmospheric factors is becoming apparent, though the effects are complicated and still incompletely understood. Nitrogen compounds are important; ammonia has alkaline properties and can raise bark pH while nitrogen oxides increase acidity. Both increase the nitrogen available as a nutrient. Some lichens such as *Candelariella reflexa* thrive in highly eutrophicated environments - it is sometimes a feature of the "canine zone" at the base of tree trunks frequented by urinating dogs. This species has colonised Wicken Fen since 1972 and has become quite widespread on the site. In 1972 nitrophilous lichens were very localised. In St Edmund's Fen by Monk's Lode there were a few mature trees (*Populus* spp., *Salix fragilis*) and a dead willow shrub (*Salix cinerea*) bearing nitrophilous lichens (e.g. *Amandinea punctata*, *Physcia* spp., *Xanthoria* spp.). The lichens grew chiefly in the rain tracks from the platforms at the top of the trunks of two pollarded crack willows, and from a bark wound on a poplar. Nitrophilous matter was washed down the rain tracks in sufficient quantity to enable the nitrophilous lichen community *Xanthorion* to become established. Some nitrophilous species also occurred on the isolated trees and shrubs on Adventurer's Fen. *Amandinea punctata* and *Physcia adscendens* which were confined to these specialised situations have spread to become frequent across Wicken Fen by 2008.

Unfortunately there appear to be few records of lichens before 1972. The earliest lichen record appears to be of a specimen of *Flavoparmelia caperata* collected by Mr B Ing in 1960 and housed in the herbarium of the Botany School, University of Cambridge. The woodland and carr of Wicken Fen is of comparatively recent origin, none is believed to be ancient. A small Silver Birch (*Betula pendula*) wood developed from planted trees between Spinney Bank and Sedge Fen Drove. Other areas of carr began to develop in the late nineteenth century when strip mowing of the Fen died out. During the twentieth century shrub and tree colonisation of the Fen continued and provided extensive habitats for corticolous lichens. J. R. Laundon considered that such habitats were previously much more restricted and so the lichen flora was probably richer in 1972 than at any time before. The corticolous lichen communities of eastern England have shown a spectacular re-colonisation in recent decades but they have not fully recovered from past industrial pollution and the re-colonisation is not a simple reverse of the order in which lichens are lost with increasing sulphur dioxide. Some species appear to be able to spread rapidly, other including many members of the genus *Pertusaria* appear to be poor colonists and none has been found at Wicken Fen.

Sawn wood provides a specialised and valuable habitat. *Lecanora conizaeoides* which was abundant on trees and shrubs at Wicken Fen in 1972 now "hangs on" at the site on the cladding boards of the windmill and Tower Hide. The only record of *Parmelia saxatilis* at the Fen was from a weathered field gate. There is a growing realisation of the importance of sawn wood for lichens and their associated invertebrate communities. When fences are renewed, the retention of old posts in the line of the new fence should be considered.

Lichens are frequently overlooked by non-lichenologists even though they grow in close proximity to humans on many man-made structures. The effort

expended in recording lichens on a single concrete post (next to the windmill) in 1972 and 2008 reflects the importance of such structures in describing the lichen composition of a site. A final observation regarding the domesticity of lichens is of the community that has colonised the roofing sheets of the school study shelter (TL 563704). These sheets are a corrugated, lightweight, fibre-based board. With tens of acres of mature carr in close proximity, these roofing sheets exhibit some of the best “corticolous” lichen assemblages at Wicken Fen. *Melanohalea exasperatula* and *Hypogymnia physodes* were found nowhere else.

### List of species recorded by J. R. Laundon in 1972

The following is a transcript of the list that was published in the leaflet “Lichens of Wicken Fen” by J. R. Laundon, Number 10 in the “Guides to Wicken Fen” series published by the National Trust in 1973. The nomenclature has been updated and follows “The Lichens of Great Britain and Ireland”, C. W. Smith *et al.*, 2009.

*Amandinea punctata*. Local. On two trees and a dead shrub in St Edmund’s Fen.

*Caloplaca citrina*. Local. Scarce on a *Populus* in St Edmund’s Fen. Frequent on the concrete post by the windmill.

*C. decipiens*. Rare. One plant on the south-west side of the concrete post by the windmill.

*C. saxicola*. Rare. Several plants on the concrete post by the windmill.

*Candelariella aurella*. Rare. Several plants by the concrete post by the windmill.

*C. xanthostigma*. Local. Frequent on a *Populus* in St Edmund’s Fen.

*Cladonia fimbriata*. Local. On several boles of *Salix pentandra* in the north-east corner of the Sedge Fen. Rare elsewhere.

*Diploicia canescens*. Local. Several plants on a *Salix fragilis* on the north side of St Edmund’s Fen. On *Salix fragilis* in Adventurers’ Fen.

*Evernia prunastri*. Occasional. In carr and on immature *Fraxinus*.

*Flavoparmelia caperata*. Rare. One plant on mature *Salix pentandra* in the north-east corner of the Sedge Fen.

*Hypogymnia physodes*. Frequent. In carr.

*Hypotrachyna revoluta*. Rare. Several plants on mossy trunk of mature *Salix pentandra* in the north-east corner of the Sedge Fen.

*Lecanora campestris*. Rare. One plant on the top of the concrete post by the windmill.

*L. chlarotera*. Local. Several plants on dead stems of *Salix cinerea* in St Edmund’s Fen. On *Salix fragilis* in Adventurers’ Fen.

*L. conizaeoides*. Abundant. The most common epiphyte. Occurs also on wooden posts.

*L. dispersa*. Local. Scarce on a *Populus* in St Edmund’s Fen. Abundant on the concrete post by the windmill.

*L. expallens*. Frequent. In carr etc.

*L. muralis*. Rare. A few plants on the top of the concrete post by the windmill.

*L. pulicaris*. Local. On *Fraxinus*, *Populus*, *Salix*, etc.

*Lecidella stigmatea*. Rare. One plant on the south-west side of the concrete post by the windmill.

*Lepraria incana*. Abundant. Chiefly on the rough bark of older trees.

*Melanelixia fuliginosa* subsp. *glabratula*. Local. Chiefly on *Fraxinus*.

*M. subaurifera*. Local. In carr etc.

*Parmelia sulcata*. Frequent. In carr etc. The most common foliose lichen.

*Phaeophyscia orbicularis*. Local. Frequent on a *Populus* in St Edmund's Fen, and on the top of the concrete post by the windmill.

*Phlyctis argena*. Local. On *Salix pentandra* in the north-east corner of the Sedge Fen.

*Physcia adscendens*. Local. A few plants on a *Populus* in St Edmund's Fen. On *Salix fragilis* in Adventurers' Fen.

*P. caesia*. Rare. Several plants on the concrete post by the windmill.

*P. tenella*. Local. Frequent on a *Populus* and on three *Salix fragilis* in St Edmund's Fen. Scarce on *S. cinerea* in carr near the windmill. On *S. fragilis* in Adventurers' Fen.

*Physconia grisea*. Rare. Several plants on a *Salix fragilis* in St Edmund's Fen.

*Punctelia subrudecta*. Frequent. In carr etc.

*Ramalina farinacea*. Local. One plant, one cm tall, on dead stem of *Salix cinerea* in St Edmund's Fen. Four plants, one cm tall, on old *Salix fragilis* on Spinney Bank.

*Rinodina oleae*. Local. Scarce on *Populus* in St Edmund's Fen. Frequent on the concrete post by the windmill.

*Trapeliopsis granulosa*. Rare. At base of *Fraxinus* in St Edmund's Fen.

*Usnea subfloridana*. Rare. One plant, one cm tall, on mature *Salix pentandra* in the north-east corner of the Sedge Fen.

*Xanthoria candelaria* sens. lat. Local. On a *Populus* and on two *Salix fragilis* in St Edmund's Fen.

*X. parietina*. Local. Several plants on a *Populus* in St Edmund's Fen, and on the concrete post by the windmill.

*X. polycarpa*. Rare. Several plants on dead stems of *Salix cinerea* in St Edmund's Fen.

## List of species recorded by M. Butler and M. Powell in 2008

Descriptions of abundance give a suggestion of how frequently the species was found during the survey. Voucher specimens of some species are housed in Herb. Powell.

*Amandinea punctata*. Frequent. On twigs and mature bark of tree trunks, widespread on the Fen.

*Anisomeridium polypori*. Rare. At base of mature willow trunk (tagged 0058) and on a *Sambucus* stem in Sedge Fen. TL5570.

*Arthonia punctiformis*. Rare. On *Alnus* twigs near the north edge of Baker's Fen. TL567699.

*A. radiata*. Occasional. On *Prunus* sp. suckers in visitor car park, on *Rhamnus* in St Edmund's Fen and on *Acer campestre* at north edge of Bakers Fen. TL5669 and TL5670.

*A. spadicea*. Rare. On *Fraxinus* trunk at south side of St Edmund's Fen. TL567699.

*Arthopyrenia punctiformis*. Rare. On *Alnus* twigs near the north edge of Baker's Fen. TL567699.

*Aspicilia contorta*. Rare. On concrete base at south side of National Trust workshops. Not identified to subspecies level. TL563704.

*Bacidia arceutina*. Rare. On heavily shaded *Fraxinus* trunks in St Edmund's Fen. TL566700.

*B. sulphurella*. Rare. On shaded bark in St Edmund's Fen. TL566701.

*Buellia griseovirens*. Rare. On sawn wood and corrugated roofing sheets of school study shelter. TL5670.

*Caloplaca citrina* sens. str.. Occasional. On calcareous substrates including the walls of the National Trust workshops and a concrete manhole cover in the overflow visitor car park. TL5670.

*C. decipiens*. Rare. On wall of the National Trust workshops. TL563704.

*C. flavocitrina*. Occasional. On wall of the workshops and on the concrete post by the windmill. TL5670.

*C. holocarpa*. Occasional. On wall of the workshops, on concrete manhole cover in the overflow car park and on the concrete post by the windmill. TL5670.

*C. obscurella*. Rare. On *Fraxinus* trunk at south edge of St Edmund's Fen. TL567699.

*C. saxicola*. Occasional. On walls of the workshops and on concrete manhole cover in overflow car park. TL5670.

*C. teicholyta*. Occasional. On concrete base at south side of the workshops and on concrete manhole cover in overflow car park. TL5670.

*Candelariella aurella*. Occasional. On walls of the workshops and the concrete post by the windmill. TL5670.

*C. medians*. Rare. On walls of the workshops. TL563704.

*C. reflexa*. Occasional. On various trees and shrubs in St Edmund's Fen and Sedge Fen. TL5570 and TL5670.

*C. vitellina*. Rare. On sawn wood including the frames of reed fencing panels next to the Anglian Water site. TL563704.

*Cladonia chlorophaea*. Occasional. On weathered boards of bird hide and on rotting stumps in Sedge Fen. TL5670.

*C. fimbriata*. Rare. On damp bark in St Edmund's Fen. TL566701.

*Chaenotheca ferruginea*. Rare. On bark of mature willow tree (tagged 0054) in Sedge Fen. TL559707.

*Cliostomum griffithii*. Rare. On bark of willow pollard to south east of visitor centre. TL563704.

*Cyrtidula quercus*. Rare. On *Quercus* twigs of scrubby tree along central ride. TL566701.

*Diploicia canescens*. Rare. On bark of mature willow in St Edmund's Fen and on willow pollard south east of visitor centre. TL5670.

*Evernia prunastri*. Rare. On blackthorn in Sedge Fen. TL5670.

*Flavoparmelia caperata*. Rare. On oak trunk in Sedge Fen. TL5670.

*Jamesiella anastomosans*. Rare. On upper surface of inclined *Betula* and *Crataegus* trunks in St Edmund's Fen. TL563704.

*Hypogymnia physodes*. Rare. On corrugated roofing sheets of school study shelter. TL563704.

*Hypotrachyna revoluta*. Occasional. On the bark of various trees and shrubs in St Edmund's Fen and Sedge Fen. TL5570 and TL5670.

*Lecania cyrtella*. Rare. On *Sambucus* twigs near north edge of Baker's Fen. TL567699.

*L. erysibe*. Rare. On concrete manhole cover in overflow car park and walls of National Trust workshops. TL5670.

*Lecanora albescens*. Occasional. On concrete structures including the concrete post by the windmill and the walls of the workshops. TL5670.

*L. campestris*. Occasional. On concrete structures including the concrete post by the windmill. TL5670.

*L. carpinea*. Rare. On *Prunus* sp. stems in the visitor car park.

*L. confusa*. Rare. On *Prunus* sp. stems in the visitor car park.

*L. chlarotera*. Occasional. On twigs of various tree and shrub species on Sedge Fen and St Edmund's Fen. TL5570 and TL5670.

*L. conizaeoides*. Rare. On sawn wood including the windmill, the Tower Hide and fence posts beside the Anglian Water site. TL5570 and TL5670.

*L. dispersa*. Occasional. On the walls of the workshops and on the concrete post by the windmill. TL5670.

*L. expallens*. Frequent. On the bark of various tree species in St Edmund's Fen and Sedge Fen. TL5570 and TL5670.

*L. muralis*. Rare. On concrete structures including the concrete post by the windmill. TL5670.

*L. pulicaris*. Rare. On *Quercus* twigs in Sedge Fen. TL558707.

*L. saligna*. Occasional. On sawn wood including fence panels beside the Anglian Water site and wooden seats in Sedge Fen. TL5570 and TL5670.

*L. symmicta*. Rare. On *Quercus* twigs in Sedge Fen. TL558707.

*Lecidella elaeochroma*. Occasional. On sallow in St Edmund's Fen and *Prunus* sp. stems in the visitor car park. TL5670.

*L. stigmatea*. Occasional. On concrete structures including the post by the windmill. TL5670.

*Lepraria incana*. Occasional. On shaded trunks of various tree and shrub species in St Edmund's Fen and Sedge Fen. TL5570 and 5670.

*L. lobificans*. Occasional. On shaded bark in St Edmund's Fen and Sedge Fen. TL5570 and TL5670.

*Melanelixia fuliginosa* subsp. *glabratula*. Rare. On sallow in St Edmund's Fen. TL5670.

*M. subaurifera*. Frequent. On various species of trees and shrubs in St Edmunds Fen and Sedge Fen. TL5570 and TL5670.

*Melanohalea exasperatula*. Rare. On corrugated roofing sheets of school study shelter. TL563704.

*Opegrapha ochrocheila*. Rare. On *Fraxinus* bark in St Edmund's Fen and Sedge Fen. TL5670.

*Parmelia saxatilis*. Rare. On wooden gatepost of roadside gateway opposite No. 26 Lode Lane. TL564705.

*P. sulcata*. Frequent. On various species of trees and shrubs in St Edmund's Fen and Sedge Fen. TL5570 and TL5670.

*Parmotrema perlatum*. Occasional. On various species of trees and shrubs in St Edmund's Fen and Sedge Fen. TL5670.

*Phaeophyscia nigricans*. Rare. On weathered gate opposite No. 26 Lode Lane and on cast iron manhole cover in overflow car park. TL5670.

*P. orbicularis*. Frequent. Occurs both as an epiphyte and on concrete including the post by the windmill. TL5670.

*Phlyctis argena*. Rare. On sallow in St Edmund's Fen and on the trunk of mature willow (tagged 0058) in Sedge Fen. TL5570 and 5670.

*Physcia adscendens*. Frequent. As an epiphyte in St Edmund's Fen and on corrugated roofing sheets of school study shelter. TL5670.

*P. caesia*. Rare. On concrete structures including the post by the windmill. TL5670.

*P. tenella*. Occasional. On sallow in St Edmund's Fen and *Quercus* and *Prunus spinosa* in Sedge Fen. TL5570 and TL5670.

*Physconia grisea*. Rare. On *Sambucus* near north east corner of Baker's Fen. TL5669.

*Placynthiella icmalea*. Rare. On weathered gate opposite No. 26 Lode Lane and on fence next to Anglian Water site. TL5670.

*Porina aenea*. Rare. On shaded *Fraxinus* stems in St Edmund's Fen. TL5670.

*Punctelia subrudecta*. Occasional. On mature *Populus* sp. in St Edmund's Fen and on *Prunus spinosa* in Sedge Fen. TL5670.

*Punctelia jeckeri*. Rare. On *Populus* sp. in St Edmund's Fen and on corrugated roofing sheets of school study shelter. TL5670.

*Ramalina farinacea*. Rare. On sallow in St Edmund's Fen. TL5670.

*Rinodina gennarii*. Rare. On concrete post by the windmill. TL562705.

*R. oleae*. Rare. On wooden seat in Sedge Fen. TL5570.

*Sarcogyne regularis*. Rare. On concrete base at south side of workshops. TL563704.

*Xanthoria calcicola*. Rare. On concrete including the post by the windmill. TL5670.

*X. parietina*. Frequent. Occuring both as an epiphyte and on concrete structures. TL5670.

*X. polycarpa*. Occasional. On sallow in St Edmund's Fen and on *Prunus spinosa* in Sedge Fen. TL5670.

*X. ucrainica*. Occasional. As an epiphyte on various species in St Edmund's Fen and Sedge Fen. More rarely on sawn wood including the weathered gate opposite No. 26 Lode Lane. TL5670.

Unconfirmed lichen records (2008)

*Caloplaca* cf. *chlorina*. Rare. On base of *Sambucus* trunk, north edge of Baker's Fen. TL568698.

*Lecanora* cf. *compallens*. Rare. On the trunk of the willow pollard just southeast of the visitor centre and on corrugated roofing sheets of school study shelter.

*Punctelia* cf. *borreri*. Rare. On sallow in Sedge Fen. TL560704.

*Verrucaria* cf. *macrostoma* f. *macrostoma*. On concrete manhole cover, on walls of the workshops and concrete post by the windmill. TL5670.

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## Water-dropworts *Oenanthe* species in Cambridgeshire: does Narrow-leaved Water-dropwort (*O. silaifolia*) still survive in the vice-county?

C. James Cadbury

The aim of this paper is briefly to review the status of all seven species of *Oenanthe* recorded in Cambridgeshire (v.c. 29) and to provide in more detail the history and ecology of Narrow-leaved Water-dropwort (*O. silaifolia*) in the county.

### Status of water-dropworts in Cambridgeshire

All seven British water-dropworts (*Oenanthe* spp.) have recently been recorded in Cambridgeshire. Probably the most widespread is Tubular Water-dropwort (*O. fistulosa*), a nationally Vulnerable species because of appreciable declines. It has been recorded from 15 10-km squares since 1987 (Table 1).

**Table 1. Occurrence of *Oenanthe* species in Cambridgeshire (v.c. 29) since 1970 (numbers of 10-km squares)**

	Total 31 10-km squares	
	1970–1986	1987–2009
<i>O. fistulosa</i>	8	15
<i>O. silaifolia</i>	3	3 (may be extinct)
<i>O. pimpinelloides</i>	0	2 (introduced)
<i>O. lachenalii</i>	9	4
<i>O. crocata</i>	1 (introduced)	1 + 1 (introduced)
<i>O. fluviatilis</i>	16	6
<i>O. aquatica</i>	10	12

This species occurs on ditch-banks and in marshy sites that are flooded in winter. For example, it was recorded at 10 sites at the Ouse Washes in v.c. 29 in a 1992 survey (Cadbury *et al.*, 1993) and has subsequently been found at two others between Mepal and Sutton Gault. It has been known from Grantchester Meadows (TL442569) from 1834 (W. H. Coleman in Crompton, 2006) to the present. Next in frequency is Fine-leaved Water-dropwort (*O. aquatica*), a fairly robust plant of shallow ditches and ponds in the Fens. River Water-dropwort (*O. fluviatilis*) grows in slow-flowing rivers and drains in the Fens such as the Counter Drain and Old Bedford River at the Ouse Washes and in Wicken and Monk's Lodes at Wicken Fen. It appears to have declined in Cambridgeshire. At several sites *O. fluviatilis* appears to be associated with water enriched with calcium carbonate from the mortar of bridges and sluices. Hemlock Water-dropwort (*O. crocata*), though a frequent riparian plant in western and southern Britain, is rare in East Anglia. Indeed it was not recorded as an indigenous plant in Cambridgeshire until one plant was discovered on the River Ouse embankment in Middle Fen, Swavesey, at TL35987068 (A. C. Leslie, N. P. Millar & J. D. Shanklin in Leslie, 2007). Previously the only record was as a persistent alien at 93 Barton Road,

Cambridge, at TL435575 from 1973 until the present, by C. J. Cadbury. It probably originated from North Devon as a seed on fishing waders. *O. crocata* seems to be spreading and it has recently been seen at a number of sites in the Godmanchester area, Huntingdonshire (v.c. 31) (N. P. Millar, pers. comm.).

The three other species are plants of somewhat drier habitats, at least in summer. Parsley Water-dropwort (*O. lachenalii*) has a largely coastal distribution in Britain, but, as in Cambridgeshire, does occur locally in damp grasslands inland. It may now occur at only three or four sites in v.c. 29: Foul Anchor (TF4417) – last recorded in 1997, Wicken Fen (TL5570) – last recorded in 1996, Shepreth Moor (TL3847) – last recorded in 1999, and just north-east of the RSPB's Fowlmere reserve, where it was recorded in 1994 (J. C. A. Rathmell). Here it still grows in ungrazed grassland at TL410460, 411454 and 412460 (C. J. Cadbury, P. H. Oswald *et al.*). Interestingly, there is a specimen in the University of Cambridge Herbarium (CGE) collected by the Revd J. E. Leefe from 'Foulmire' some time before 1842 (A. C. Leslie, pers. comm.). Foul Anchor, at the north-west extremity of Cambridgeshire, is influenced by brackish water from the River Nene; the other three sites have fresh water. There are many other 19th-century records for sites where it has become extinct and some where it was probably identified wrongly (Crompton, 2006).

Corky-fruited Water-dropwort (*O. pimpinelloides*) is a plant of hay meadows, pastures and roadsides in southern and south-west England, where it can be locally abundant; it is, however, rare in East Anglia, though it may be expanding its range into Essex. *O. pimpinelloides* was virtually unknown in Cambridgeshire until 9 June 2006 when J. D. Shanklin discovered a number of plants around fishermen's platforms dug into the bank of a lake at Waterbeach airfield at TL48996726 (Leslie, 2007). It was considered to be an introduction, but the source is unclear. In 2007 Shanklin also found about a dozen plants naturalised in a lawn around a small pond at the British Antarctic Survey Headquarters at High Cross, Cambridge (TL420611). Again the source is not obvious, but it was probably introduced with pond aquatics that included *O. crocata*. In the Cambridge Herbarium there is, however, a specimen with rounded tubers collected in a thicket by a brook at Fulbourn, possibly at TL5255, in June 1879 by A. Shrubbs (identification confirmed by G. Crompton & D. A. Wells in 1995).

### **History and status of Narrow-leaved Water-dropwort in Cambridgeshire**

*Oenanthe silaifolia* is also a species of damp hay meadows but with a much more restricted distribution. In the 1987–99 B.S.B.I. Atlas survey it was recorded in only 37 10-km squares (Nationally Scarce) (Preston *et al.*, 2002) and it is considered Near Threatened (Cheffings & Farrell, 2005) on account of the number of sites lost through ploughing and more intensive treatment of meadows. In Huntingdonshire (v.c. 31) it is still locally plentiful at Port Holme (TL738706 and 739706) and Bury Fen, Earith (TL379747 and 380745). In May 2008 just under 1000 flowering plants were counted by the author along the north side of Bury Fen and it was abundant over a broad area on the south side. On 30 May 1993, when 27,200 plants were recorded on Bury Fen, 19,200 of them were growing in the south-west part of the fen (376745). Mapping of *O. silaifolia* has shown a shift

in distribution on this washland. It has, however, always shown a tendency to avoid the lowest wet areas and to be most prolific over a narrow zone on slightly higher ground at the margins. It was also formerly abundant in a field upstream to the south-west of Bury Fen (374740) until 1975/76 when ploughing destroyed the colony. Only a single plant could be found there in 1976 (C. J. Cadbury).

In Cambridgeshire (v.c. 29), on the east side of the River Ouse, *O. silaifolia* was abundant in three hay meadows north-east of River Drove on Middle Fen between Swavesey and the river (TL358701, 359702 and 359703). It was recorded there in 1980 (D. Donald), in 1981 (R. Payne in Crompton, 2006), in 1993, when there were at least 3350 flowering plants (C. J. Cadbury), and in 1997 and 1998, when there were 1480 and about 4000 flowering plants respectively (J. C. A. Rathmell in Crompton, 2006). On 11 June 2007 I searched the Middle Fen meadows but failed to find the water-dropwort, but A. C. Leslie (pers. comm.) discovered three flowering plants at TL35847006. I returned on 27 May 2008 and again on 19 June 2009 with no success. The particular fields were intensively grazed by Hereford cattle in 2009.

*O. silaifolia* has been known from the Sutton Gault area of the Ouse Washes (v.c. 29) since 1877 and it was recorded from Sutton Chain in 1879 and 1899 (A. Fryer in Crompton, 2006). On 3 June 1980 the author found three flowering plants in a wash south-west of the Sutton Gault road at TL425796. At the end of May 1993 this particular wash that had formerly been a hay meadow was heavily grazed by cattle and there was no sign of the water-dropwort, nor has it been seen there subsequently.

Downstream on the Ouse Washes, 2.5 km north-east of Mepal, *O. silaifolia* was discovered in two small washes, each about 1.6 ha, at TL455826 and 456827, in late May 1972 (Cadbury, 1972). It was recorded there again in 1973 (C. J. Cadbury), 1979 (D. Allen and C. Carson), 1993, 1998 and finally 2000 (all C.J.C.). In the 1970s it was rare, but at least 273 flowering plants were counted in 1993, 535 in 1996 and 118 in 1998. Only one plant could be found in the very wet summer of 2000. Searches in subsequent years failed to find it again at this site. In 1994 10 flowering plants were, however, detected by T. Strudwick on the third Singing Wash on the Ouse Washes upstream of Welches Dam (TL473849). As far as I know it has not been seen there again.

Elsewhere in Cambridgeshire there are other records (see Crompton, 2006), including the first field (Cambridge end) of Grantchester Meadows, probably at TL442569 (Relhan, 1802; Babington, 1860); Babington wrote that it was there in 1833 but he had “not again found it there”. Evans (1939) declared it “no longer at Relhan’s station”, but this is an existing site for *O. fistulosa*. It was recorded from Stretham in 10-km square TL57 in 1833. There are other records in the Swavesey and Over area in 10-km square TL37 – Swavesey Locks, Over, in 1803 (A. S. Shrubbs), Over Fen in 1860 (W. W. Newbould), Over in 1946 (W. H. Mills) and a riverside meadow opposite Holywell (TL345703) in 1953 (S. M. Walters).

So, though *O. silaifolia* still thrives at several sites along the River Ouse in Huntingdonshire, it seems to be only just hanging on or even extinct in Cambridgeshire.

### **Plant communities associated with *O. silaifolia* in v.cc. 29 and 31**

The main associates with Narrow-leaved Water-dropwort in the three meadows in Middle Fen, Swavesey, on 30 May 1993 were *Poa trivialis*, *Ranunculus repens* (both abundant in all three fields), *R. acris* (abundant in one), *Alopecurus pratensis* (frequent in all three), *Lolium perenne* and *Cynosurus cristatus* (both frequent in one). This community appears to equate with **MG7** subcommunity *Lolium perenne* – *Alopecurus pratensis* grassland (Rodwell, 1992). In late May 2008 the dominant grasses in the meadows north-west of River Drove on Middle Fen were again *Poa trivialis* and *Alopecurus pratensis* (both abundant) together with *Lolium perenne* and *Festuca pratensis* (both frequent). *Hordeum secalinum* was not recorded in 2008 but was abundant in June 2009, perhaps because it is later-flowering and the awned panicles were avoided by grazing cattle. This community was again **MG7**, but the *Lolium perenne* – *Alopecurus pratensis* – *Festuca pratensis* subcommunity (Rodwell, 1992). A feature of these meadows in both 2008 and 2009 was not only the absence of *O. silaifolia* but the sparsity of herbs such as *Ranunculus repens*, *R. acris*, *Rumex crispus*, *R. acetosa* and *Cirsium arvense*. The indications were that the meadows had been treated with herbicides such as MCPA that would have resulted in the demise of *O. silaifolia*.

The predominant plants associated with *O. silaifolia* in a rough, ungrazed wash north-east of Mepal in late May 1993 were *Filipendula ulmaria*, *Agrostis stolonifera* (both abundant), *Phalaris arundinacea* and *Rumex crispus* (both frequent) with patches of *Thalictrum flavum*. Such a community suggests fairly wet conditions and approximates to **S28** (Rodwell, 1995). Indeed the disappearance of Narrow-leaved Water-dropwort shortly afterwards from the site which had formerly been mown for hay may well have been directly due to increased spring and summer flooding or the resulting more robust vegetation.

At Bury Fen, Earith (v.c. 31), in late May 1993, the prominent associates of *O. silaifolia* were *Poa trivialis*, *Rumex crispus*, *Ranunculus repens* and *Agrostis stolonifera* with *Alopecurus pratensis* and *Persicaria amphibia* locally frequent. By late May 2008 the community in which the water-dropwort was growing had changed rather little: *Lolium perenne*, *Poa trivialis*, *Alopecurus pratensis*, *Cirsium arvense* and *Rumex crispus* were the main associates, indicating a **MG7** community.

At Port Holme (again v.c. 31) in mid-June 2009, *Hordeum secalinum*, *Agrostis stolonifera*, *Silaum silaus*, *Bromus racemosus* and *Centaurea nigra* were all present in seven or more of the 10 2 × 2 m quadrats taken where *O. silaifolia* was plentiful. Where the water-dropwort mainly occurred was slightly lower and damper than more species-rich areas where *Centaurea* and *Silaum* were more abundant and *Filipendula ulmaria*, *Galium verum*, *Ranunculus acris*, *Rhinanthus minor*, *Cynosurus cristatus*, *Anthoxanthum odoratum* and *Lolium perenne* were prominent.

### **Identification of *O. silaifolia***

Of the other water-dropworts, *O. silaifolia* is most easily confused with *O. lachenalii*. Both of them grow in damp grassland. *O. lachenalii* generally has

a more coastal distribution, while *O. silaifolia* is usually a plant of meadows on lowland flood plains inland. It flowers in late May and early June, earlier than *lachenalii* and before the grass is cut for hay. In 2009 *O. lachenalii* was still in full flower at Fowlmere on 1 August whereas all plants of *O. silaifolia* at Bury Fen were in late fruiting stage and the aerial vegetative parts were dead and dried. The main identification characteristics of the two species are given in Table 2 together with those of *O. pimpinelloides*.

**Table 2. Identification characteristics of *O. silaifolia* and *O. lachenalii***

	<i>O. silaifolia</i>	<i>O. lachenalii</i>
Root tubers	Markedly swollen, spindle-shaped	Narrowly swollen along length
Stems	Thin-walled, hollow, but main stems may have pith	Thick-walled, hollow or with pith
Upper stem leaves	Usually bipinnate	Often elongated unipinnate (but not consistent)
Pedicels of umbel at fruiting	Stiff, thickened	Remain thin
Umbel bracts	Usually none	Up to 5 per umbel
Persistent style of fruit	As long as fruit	Somewhat shorter than fruit

In *O. pimpinelloides* (see Stace, 1991) the root tubers are markedly **swollen** but **ellipsoid**, the stems are **thick-walled** and have pith, the pedicels are **thickened** at fruiting, there are up to **5 bracts** per umbel and the persistent style is **as long as the fruit**. The bipinnate or tripinnate segments of the basal leaves tend to be ovate.

## Conclusion

Refinding Narrow-leaved Water-dropwort (*O. silaifolia*) in Cambridgeshire presents a worthwhile and not impossible challenge. In unimproved meadows the renewable tubers enable the plant to persist for a long time. Sadly such damp meadows, which tend to receive some winter flooding and are mown for hay, are now a rarity. Once damaged by agricultural intensification they are extremely hard to restore or create. *O. silaifolia* is unlikely to be as adaptable as Corky-fruited Water-dropwort (*O. pimpinelloides*), which can withstand a certain amount of hard mowing and can colonise roadside cuttings and embankments (S. J. Leach & M. J. Southam in Stewart *et al.*, 1994).

## Acknowledgments

Though I have spent many hours surveying the flora of Cambridgeshire wetlands, reviewing a history of water-dropworts in the county was hugely helped by Gigi Crompton's most valuable website. I wish to acknowledge the help and encouragement that I have received from R.S.P.B. staff at the Ouse Washes. Alan Leslie provided some most helpful observations and comments. I also thank Philip Oswald for his careful editing of my text.

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## **The high living Tardigrades of Cambridge; a brief introduction to some of our smallest animals**

Cass Bromley

Having learnt of the existence of tardigrades whilst studying at Anglia Ruskin University, Cambridge, these microscopic animals caught my imagination and have led to an extracurricular source of study, taking me to a number of interesting and, at times, challenging places, including the roofs of some of Cambridge's most historic buildings, Cambridge Natural History Society's Conversazione and an international symposium in Germany.

### **What is a tardigrade?**

The questions many people ask when one mentions these organisms are "tardi what?" or "What on earth is a tardigrade?". Phylum Tardigrada was first identified in the late 1700s by early microscopists, who named all the tiny microscopic creatures "animalcules". Popular names for tardigrades include "Water Bears" and "Slow Walkers" due to their characteristic movement - a DVD of a moving tardigrade is guaranteed to keep people completely mesmerised. Tardigrades occur worldwide in marine, freshwater and terrestrial habitats. They are metazoans, not unicellular organisms, with four pairs of legs, nervous and digestive systems, excretory organs, and a variety of reproductive methods, including sexual reproduction and parthenogenesis. Diet includes algae and bacteria growing on moss and, for predatory species, meiofauna, including other tardigrades. Their exact taxonomic position remains contentious - they are so different that they have been placed in their own phylum, though the current consensus of opinion is that they are probably related to the Arthropoda

(containing the more familiar arachnids, crustaceans and insects). Most tardigrades are transparent, although some are coloured, and whilst most have a smooth skin or cuticle (Eutardigrades), others are clad with armoured "plates" (Heterotardigrades) (Plates 3 and 4, inside back cover). Many species produce eggs elaborately ornamented with spines, tubercles, and other projections, the functions of which are unknown but provide a useful diagnostic tool for species' identification.

Despite being so tiny, 50 – 1200  $\mu\text{m}$  (0.05 to 1.2 mm), tardigrades have earned a reputation for being extremely resilient to environmental extremes. By undergoing the process of cryptobiosis, where they effectively shut down their metabolism, they are able to cope with extremes of temperature, prolonged dehydration, low pressure and oxygen availability. The "tun" formed in this state is basically a highly resilient, dried up tardigrade that can rapidly rehydrate to become a fully functioning animal when conditions improve. Many microscopic organisms are capable of cryptobiosis but tardigrades have become almost legendary, with claims being made for 100 year old tuns being successfully revived after simply adding water (I have experience of individuals in samples that have been frozen for several years reviving). They have therefore become a major focus of research into the cryptobiotic process both on Earth and in space research (via the European Space Agency's TARDIS ("TARDigrades In Space") research programme).

Cushions of mosses, especially *Grimmia* and *Andreaea* species, are a favourite tardigrade terrestrial habitat, and represent a veritable miniature "Serengeti" - an entire ecosystem of tiny grazers and predators; not only tardigrades but also mites (Acari); rotifers (Rotifera); springtails (Collembola); threadworms (Nematoda) and ciliates, single celled mobile predators.

### **Tardigrades in Cambridge**

After reading about tardigrades, I started to investigate moss conveniently growing on a flat roof outside the Life Sciences building on Anglia Ruskin's Cambridge campus. Whilst studying small samples of this moss under a low power microscope, I found at least three species of tardigrade, together with mites, rotifers, nematodes, and ciliates.

Whilst tardigrades have been studied in some of the most remote parts of the world, including Antarctica and Easter Island, there have been very few studies carried out involving urban dwellers. The initial explorations on campus have since led to a small-scale, novel, biogeographic study of moss samples obtained from building roofs in and around Cambridge to examine whether buildings may act as "islands", *sensu* MacArthur & Wilson's classic 1967 "Theory of Island Biogeography". There were some interesting experiences exploring roofs such as those of Cambridge University Library, King's College, Trinity College's Great Gate, Great St. Mary's Tower, and colleagues' houses to collect samples and other data. Tardigrades and other organisms were later extracted from the moss samples and counted, identified as far as possible and photographed or mounted on slides for more detailed study.

The initial results indicated that even in such simple ecosystems, many factors are at play, including human influences, and may affect the composition of the faunal assemblage present and even the availability of suitable meiofaunal habitat. For instance, the choice of construction materials, such as the lead used on church roofs, may produce unsuitable conditions for moss growth and therefore no habitat for the associated meiofauna; and cleaning of roofs, etc. will remove moss and its inhabitants, affecting colonisation, propagule sources and so on. Air quality, aspect, exposure, height above ground, specific tolerances, community dynamics and roof area and/or size of moss cushion may all be interacting to determine what species will be present in a given area. Interestingly, the genera (*Echiniscus*, *Macrobotus*, *Milnesium*, *Minibiotus* and *Ramazzottius*) identified in Cambridge are consistent with those in studies carried out in cities in Argentina (though species would be expected to be different) (Peluffo et al., 2007), suggesting that some genera may be better adapted to urban living. The initial study being a new approach and on a small scale, there is much scope for further work, for example by extending the study in Cambridge or even to other urban areas.

I hope that this brief introduction to Tardigrades has whetted your appetite to discover more about these fascinating tiny creatures. Conservation of biodiversity is high on the agenda, especially in 2010, the "International Year of Biodiversity". Tardigrades may have a reputation for being tough but they often colonise fragile and vulnerable habitats, which may even harbour previously undescribed species. Even though they cannot be seen with the naked eye, meiofauna constitute a part of ecosystems, including possibly playing a role in bryophyte spore dispersal and secondary metabolite production (Kinchin, 1994), and food chains, and deserve more recognition than they currently receive.

### **Acknowledgments.**

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- Tardigrada Newsletter** - [www.tardigrada.net](http://www.tardigrada.net) has links to recently published scientific papers, etc.

## **The flora of a flat roof**

## Peter Reynolds

### Introduction

In the last issue of this journal, David Barden and Chris Preston concluded their paper on Polypodiums in Cambridgeshire with a paragraph entitled ‘The rewards of roof-top botany’ (Barden and Preston, 2009). I hope that what follows makes an interesting contribution to the study of our tectorial flora.

### The site

In June, 2007, my next-door neighbour, Mrs Susan Gell, asked me to clear some weeds from her flat garage roof at Wychwood, Crane’s Lane, Kingston (TL345549). I’d been aware of vegetation in the distance for some months, but hadn’t thought to take a closer look. On the 27<sup>th</sup> June I went round to remove the plants: the roof was clearly waterlogged and I discovered a mass of willow seedlings and *Epilobiums* forming a semi-circle about 1.8 m in radius. The roof’s covering of stone chippings and the roots of the willows and *Epilobiums* formed a substrate for a mat of bryophytes and other plants. Most of the flora must have begun life the previous year, 2006.

The garage roof in question was on the N.E. side of Wychwood, in size 2.5 m by 5.25 m. It was of the ‘built-up felt’ system of construction, renewed about 2002. Roofs of this type are usually made with a slight fall of around 1 in 60 to facilitate drainage, but here the gradient was negligible. A 15 mm layer of 7 mm granite chippings (finer than usual) covered the whole surface.

There were two sources of water: the one, sporadic – a down-pipe from the main S.W. facing, pitched roof adjacent; the other, constant – a steadily dripping overflow pipe from the loft water tank, hitherto unnoticed. The semi-circle of vegetation was centred directly below this pipe, its height increasing from *c.*50 mm at the edge to *c.*800 mm in the middle. The saturated chippings, and the silt they held, had obviously provided an ideal seedbed, and a fertile growing medium, for a range of water-loving plants.

### The flora

At first sight the flora appeared unexceptional. A closer inspection led to the determination of the flowering plants and bryophytes listed below; there were also single species of algae and fungi. The dominant flowering plants were willows in variety, and the willowherbs, *Epilobium hirsutum* and *E. montanum*; *Bromus sterilis*, *Poa annua*, and *Senecio vulgaris* were also abundant. Of the eight bryophytes *Eurhynchium praelongum* was by far the most plentiful.

### Some noteworthy finds

Discussion with Alan Leslie revealed that the flora included two new vice-county records: *Sedum nicaense* (which I had thought to be *S. rupestre*) and *Salix babylonica* L. var. *pekinensis* Henry ‘Tortuosa’. The former, Pale Stonecrop, found on the drier edge of the roof, derives from a planting made by the late Prof. Philip Gell on his sandstone rockery in about 1985: the species has since spread in his garden borders and into mine. This Mediterranean sedum is said to be “well

naturalised by road in W. Kent” (Stace, 1997). The latter, the Dragon’s Claw or Corkscrew Willow, is a commonly planted tree, and there is a mature example in the garden immediately to the south of Wychwood, the source, presumably, of the roof-top specimen. But this willow is a mutation or sport, always propagated from cuttings in the nursery trade. How, then, did it reproduce here? Three possible answers: it may be that the plant wasn’t a seedling but a vegetative propagule, perhaps brought over from next door by bird or wind. Secondly, it may be of hybrid origin. Crosses of ‘Tortuosa’ are known in cultivation: one with *Salix alba* var. *vitellina* (L.) (which occurs in an old osiery in Kingston on the Bourn Brook) is called *S. x sepulchralis* Simonk. ‘Caradoc’; and another with *S. x sepulchralis* Simonk. var. *chrysocoma* (Dode) Meikle, is known as *S. ‘Erythroflexuosa’*. Finally, there is the remote possibility that the parent is a hermaphrodite.

To discover *Lemna minor* on the roof-top seems extraordinary, but it may have come here from one of several ponds in the village on the feet of ducks. The single *Acer platanoides* was a seedling from a nearby purple-leaved cultivar of the Norway Maple.

### Lower plants

The green alga, *Haematococcus pluvialis*, was growing over waterlogged granite chippings apart from the other plants at the S.E. corner of the roof, beside the down-pipe. It formed a pink gelatinous mass, about 600 mm by 300 mm in area and 20 mm in depth, described accurately by Dr. Hilary Belcher as “like raspberry blancmange”. This species is commonly found in ponds and other water bodies. The red pigment, astaxanthin, a carotenoid, is synthesised in its sporulation stage, but also under conditions of environmental stress, presumably as here, when it develops a non-motile palmella stage. Dr. Belcher had not previously seen *H. pluvialis* in this form (pers. comm.). There is currently much interest, incidentally, in the medical applications of astaxanthin and in its commercial production from this alga (Suseela and Toppo, 2006).

Fruiting bodies of the fungus *Peziza cerea* (syn. *Peziza muralis*), Cellar Cup, were found on the wet brickwork of the house wall, just above the roof, underneath the dripping pipe. This cup fungus is well known to favour damp mortar, bricks and paving. The bryophytes, all common mosses, were unremarkable. *Cratoneuron filicinum* is indicative of wet, calcareous conditions.

### Willows

Willows make up, perhaps, the most interesting component of this flat roof flora. The seedlings were transplanted and grown on in my garden for later identification. About 25 of them died. In 2008 and 2009 representative specimens of the 69 surviving were sent to the B.S.B.I. *Salix* referees, Desmond Meikle and Jeanne Webb (R.D.M. and J.W.), for determination; one remains unnamed.

*Salix* is a notoriously difficult genus: taxonomy, nomenclature, status and distribution remain unresolved in some cases. Species and hybrids alike are polymorphous and determination from immature plants cannot be definitive. Only six plants flowered in 2009 (identified by R.D.M. and J.W. as two female *S. alba*, two male *S. alba*, one female *S. fragilis* and one male *S. fragilis*). The rest were

named from material without catkins. In all, ten *Salix* taxa were found (see list below). *Salix cinerea* ssp. *oleifolia* was the most abundant (38%) with *S. caprea* x *S. cinerea* (*S. x reichardtii*) in second place (25%) and *S. alba* in third (19%). There were small numbers of *S. cinerea* ssp. *cinerea*, *S. fragilis* and *S. x rubens*, and singletons of ‘Tortuosa’, mentioned above, and of *S. viminalis*.

Readers will know that willows are nearly always dioecious and generally insect-pollinated. Sexual reproduction therefore requires male and female individuals, flowering at the same time, within the range of pollinators. Bees, for example, will usually forage over areas of about 0.5 km in radius, but sometimes travel as far as five kilometres. There are possible parents within two or three kilometres for all the seedlings recorded on the roof-top at Wychwood. Of course, in *Salix* dispersal is principally by wind, and so the source of seed may be a long way from the place where seedlings are found.

Fertile willow seed has limited viability (one to ten weeks) but is often produced in prodigious quantities and usually germinates readily when wet for 24 hours or more. What is critical for recruitment is the availability of a ‘safe site’ for establishment *after* germination. “Willows seldom reproduce themselves from seed except as colonists of open, competition-free sites – sand-spits by rivers, gravel-pits.... and the like – and it is in such sites that the majority of spontaneous hybrids and hybrid complexes are found” (Meikle, 1975). The roof-top in Kingston is precisely this kind of location. It is the lack of favourable habitat that makes seedlings generally rare in the British Isles (excepting those of *S. cinerea* and *S. x reichardtii*). In S.E. Australia, by contrast, suitable terrain is abundant and introduced European (and other) willows have become highly invasive along thousands of kilometres of watercourses, hybridising promiscuously (Cremer, 2003).

### ***S. cinerea* L., *S. x reichardtii* A. Kerner and *S. viminalis* L.**

*Salix cinerea* L. ssp. *oleifolia* Macreight is a very common self-seeding willow of woodland coppices and margins, stream sides and older hedgerows in Kingston. Three seedlings were found to be *Salix cinerea* L. ssp. *cinerea*: this, on the other hand, is a rarity in the parish, with only two specimens previously recorded. It is more commonly found in the fens; the distribution of the two segregates overlaps in Cambridgeshire. Note the large numbers of the hybrid *Salix x reichardtii* A. Kerner (*S. caprea* L. x *S. cinerea* L.), which is widespread and probably far more abundant than *S. caprea* in this area. (*caprea* seems to be characteristic of ancient woodlands like Kingston and Eversden Woods). This hybrid is fertile and backcrosses readily, giving rise to highly variable progeny (Meikle, 1975).

*Salix viminalis* L. is found on and near the Bourn Brook in Kingston where it has been planted in the past (with *S. triandra* L.) in osieries. It is also known from coppiced areas of Eversden and Pincote Woods, where it may be spontaneous.

### ***S. alba* L., *S. fragilis* L. and *S. x rubens* Schrank**

Separating *Salix alba*, *S. fragilis* and their hybrid *S. x rubens* has long vexed salicologists. Meikle (1984) argued for the distinction of *alba* and *fragilis* as

species but admitted that “The apparent infertility of most populations of *S. fragilis* ... may be an argument in favour of [its] hybridity” and accepted that “Under the name *Salix x rubens* one finds a wide range of variants, at one extreme merging with *S. alba* var. *caerula* (Sm.) Sm., and at the other difficult to distinguish from *S. fragilis* L.”. Continental authorities have regarded *S. fragilis* L. var. *russelliana* (Sm.) Koch as itself a hybrid of *S. alba* L. and *S. fragilis* L. var. *decipiens* (Hoffm.) Koch (Meikle, *ibid.*).

It might be thought that genotype analysis would sort out the taxonomy. Not so; at least, not yet. Triest determined molecular variation in *Salix alba* and *S. fragilis* with random amplified polymorphic DNAs, and concluded that both species “have kept their gene pools well separated and that morphologically intermediate plants are not necessarily genetically intermediate” (Triest, 2001). Kehl et al. found differently: that *Salix x rubens* is genotypically and phenotypically distinct from its parent species, *S. alba* and *S. fragilis* (Kehl et al., 2008).

More recently, *Salix fragilis* L. has been re-classified. *S. x fragilis* L., a hybrid between *S. alba* and *S. euxina* I. V. Belyaeva, a newly described willow, native in Asia Minor; and *S. x rubens* Schrank, *S. decipiens* Hoffm., and *S. fragilis* var. *decipiens* (Hoffm.) Koch have all been confirmed as synonyms of *S. x fragilis* (Belyaeva, 2009).

Keeping to the pre-Belyaeva nomenclature for the moment, determinations by R.D.M. and J.W. gave a tally for the roof-top at Wychwood of thirteen *Salix alba* (one of these var. *alba*), with four *S. x rubens* (*S. alba* x *S. fragilis*), and three *S. fragilis* (of which one appeared to be var. *russelliana*).

*Salix alba* – male and female – is common in Kingston, as throughout Cambridgeshire, and finding it on this roof-top is not too surprising. *Salix fragilis* var. *russelliana* is found occasionally in the parish on the Bourn Brook, in the village, and in Pincote Wood. Four trees of *S. fragilis* var. *furcata* Seringe ex Gaudin are also known on the Bourn Brook. These two varieties of Crack Willow are regarded as clones, the first always female, the second male, both reproducing only vegetatively and usually planted where they are found (Meikle, *ibid.*). They are recorded throughout Cambridgeshire, with *russelliana* the more common (Crompton, 2007). Crompton and Whitehouse (1983) stated that *S. fragilis* var. *fragilis* “has not been found in the county” although there are three records on the Cambridgeshire Flora Records website (Crompton, 2007).

Most of the existing records for *S. x rubens* in the vice-county (nearly all made by Peter Sell) are of the taxa *Salix x rubens* nothovar. *basfordiana* (Scaling ex Salter) Meikle forma *basfordiana* Meikle and *S. x rubens* nothovar. *basfordiana* forma *sanguinea* Meikle, both willows almost certainly of horticultural origin with *S. alba* L. var. *vitellina* (L.) Stokes and *S. fragilis* L. as parents (Crompton, 2007; Meikle, 1984).

So, what should we make of these roof-top *fragilis* and *x rubens*? There seem to be no records of either, in any of their varieties or forms, recorded for Cambridgeshire as definitely of seedling origin. R.D.M. knows of no proven cases of *S. fragilis* reproducing by seed in the British Isles. It seems most likely that what appear to be morphologically *fragilis* specimens are back-crosses (probably

of var. *russelliana*) to *S. alba* and, if so, should be properly categorised as *x rubens*. But if Belyaeva is correct – and her thesis has yet to be digested by salicologists – then the taxon *S. x rubens* is redundant and all should rather be named as *Salix x fragilis*. What we probably have is a small hybrid swarm where variant forms have been subject to backcrossing, and in such a case it is very difficult to be absolutely conclusive about the identities of seedlings. It is hoped that these young trees will be transplanted to a nature reserve owned by Kingston Parish Council, ‘The Swards’ (TL355557), adjacent to the Bourn Brook, where they can be examined as they mature.

## Conclusion

The waterlogged flat roof in Kingston afforded a virgin site eminently suitable for colonisation by a range of plants, most of which disperse as airborne seed. The flora included, unexpectedly, two species new to v.c.29, an alga in an unusual stage, and willows of particular interest. The moral of this article is that the naturalist should not overlook what’s on the doorstep, nor neglect the roof.

## Acknowledgments

I am indebted to Susan Gell for drawing my attention to these plants; to Hilary Belcher for identifying the *Haematococcus*; to Robin Stevenson for determining the bryophytes; and to Alan Leslie and Chris Preston for helpful comments. I am particularly grateful to Desmond Meikle and Jeanne Webb for looking at the willow specimens and answering my inquiries.

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<b>Flowering plants</b> (with numbers of individuals)	
<i>Acer platanoides</i> – 1	<i>Salix babylonica</i> var. <i>pekinensis</i> ‘Tortuosa’ – 1
<i>Bromus sterilis</i> – c.30	<i>Salix caprea</i> x <i>S. cinerea</i> (= <i>S. x reichardtii</i> ) – 17
<i>Epilobium hirsutum</i> – abundant	<i>Salix cinerea</i> ssp. <i>cinerea</i> – 3
<i>Epilobium montanum</i> – abundant	<i>Salix cinerea</i> ssp. <i>oleifolia</i> – 26
<i>Epilobium parviflorum</i> – 1	<i>Salix fragilis</i> – 2
<i>Juncus effusus</i> – 1	<i>Salix fragilis</i> var. <i>russelliana</i> – 1
<i>Lemna minor</i> – c.25	<i>Salix viminalis</i> – 1
<i>Picris echioides</i> – 1	<i>Sedum nicaense</i> – 2 (det. A.C. Leslie 04.08.07)
<i>Poa annua</i> – abundant	<i>Senecio vulgaris</i> – c.25
<i>Salix alba</i> – 12	<i>Taraxacum officinale</i> agg. – 1
<i>Salix alba</i> var. <i>alba</i> – 1	<i>Tripleurospermum inodorum</i> – 1
<i>Salix alba</i> x <i>S. fragilis</i> (= <i>S. x rubens</i> ) – 4	<i>Tussilago farfara</i> – 1
(Salices det. R.D. Meikle & J. Webb 2008 & 2009)	
<b>Bryophytes</b> (det. C.R. Stevenson 19.04.08)	
<i>Barbula unguiculata</i>	<i>Cratoneuron filicinum</i>
<i>Bryum argenteum</i>	<i>Didymodon vinealis</i>
<i>Calliergonella cuspidata</i>	<i>Eurhynchium praelongum</i> – abundant
<i>Ceratodon purpureus</i>	<i>Funaria hygrometrica</i>
<b>Algae</b>	
<i>Haematococcus pluvialis</i> (det. H. Belcher 09.07.07)	
<b>Fungi</b>	
<i>Peziza cerea</i>	

## **The appearance of a large number of Bog Oaks in Haddenham's Fens in February 2009**

Paul Mason

For many years I have monitored the wildlife in my home parish of Haddenham, which also includes land around the hamlet of Aldreth. After initially

starting with the bird life, I moved on to butterflies and dragonflies and finally the wildflowers, excluding grasses and sedges, were recorded. Therefore you can imagine I was always on the look out for any changes in the local fen landscape not experienced before.

Envisage therefore my amazement when 50 or so bog oaks appeared over a short space of time. It was in the months of January - February 2009. We had experienced a longish spell of snow, the first of any depth for several years, so I had not ventured out on the fens for about three weeks because I didn't want to get stuck in my car, and long walks, in this sometimes deep white stuff that could fill up ditches and dykes so one could not be too sure of one's footing, were not to my taste. When I did venture out, the snow had mostly melted, so my friend, Ian Dickerson, and I sought to find what the weather had done to the resident birds out there. Soon though, it was not the birds that attracted our attention.

The area of the fen in question is Gall Fen and Long Drove, west of Aldreth roughly centring on TL424735. I noted a bog oak in a field to our left that I had not seen before but did not initially think too much about it. Odd specimens are found most years, usually no more than one or two at a time. However I then noticed another quite close to it so I got out of the car to inspect it and in so doing looked around and to my surprise found a third, and then another. So I scanned around with my binoculars and saw yet more, mainly spread over two large fields. We then decided to count them: they totalled about 50 lying in a roughly north-south direction.

It was as though they had risen in a ghostly fashion, an impression reinforced by the dull and misty weather.

Of course, they had actually come to the top before the bad weather, and had been found as a result of the farmer of the land carrying out sub-soiling prior to ploughing the land in preparation for a potato crop. Sub-soiling is done by using an implement that reaches between three or four feet into the ground to open up the harder base of the soil so that any water is drained off into field ditches more easily. To find so many at any one time has, I believe, not been experienced before. Certainly not in my knowledge of those around Haddenham in 50 odd years. One can imagine that the patience of the tractor driver doing the work was sorely tested as he struck more and more. Then would come the operation of digging them out and it was after this operation had been carried out that I had come across them, giving the illusion of sudden appearance!

Nowadays, thanks to ever-bigger farm machinery, the raising of the buried trunks is much easier than it was in the past. In the 1950s when I farmed land in the same area I came across one that eventually turned out to be approximately 80 feet long. We had to dig, by hand, around all of it before cutting it in two and using a Fordson Major tractor, far less powerful than today's giants, fix chains under the trunk and pull it out making sure it did not slip back in the hole. The nature of black peat fen soil does not help tyres grip when under too much pressure; at least it didn't then, so it was quite an operation. Now, of course, an excavator merely loosens the soil and lifts the petrified tree out, which may well break up, but that does not matter when the machinery can easily repeat the

process. Later the same machinery loads the wood on to large trailers and it is carted off.

These relics are the remains of a forest that existed after the Ice Age. The tree trunks rotted just above root level and fell into the peat soil, providing a snapshot of ancient natural history. It is believed that the peat is disappearing at the rate of about an inch a year, but in this area there is probably about three to four feet of fen soil left. Michael Church, the clerk to Haddenham Level Drainage Board, in conjunction with David Jordan, the drainage engineer, think the bottom of the drains in Adventurers Fen are still peat, so probably five to six feet. Similarly in close by Gall Fen though the drain there appears to have a sandy or gravelly base. Interestingly this deep drain is County Wildlife Site containing some quite rare or scarce plants (details of this and other County Wildlife Sites in Haddenham can be found on line or obtained through the Cambridge Wildlife Trust).

In Hillrow and North Fen, further to the north, the higher land which follows the river is a more mineral soil with a much lower organic content, and a gravel subsoil, from the Sutton pumping engine to Earith Bridge. This is probably due to the deposit left by the river. In Over fen there is a layer of topsoil 12 to 18 inches deep, then a layer of peat, which was formed by the river flooding, bringing the clay downstream. All the lower land running from Hillrow to Sutton pumping station is still organic and oaks are still struck when ploughing at Sutton and in Adventurers Fen.

Although the trees are known locally as “bog oaks”, they can also be yew or pine and can vary in colour from black to blue or even to dark red as a result of the residue of minerals they have absorbed. (Plate 5, back cover) They were created after the Ice Age when the glaciers retreated. At that time the sea level was low and the Fen basin was a very dry area, and covered in woodland consisting of very tall trees. As sea levels rose, rivers couldn't drain out to the sea fast enough so they started to flood the low lying basin and that created the big Fen wetland, at which time all the trees that existed died and fell into the emerging peat soil. In effect the base of the trunks of each tree became rotten and so weak that when any great northerly storms came they mostly fell in the more or less north-south direction we now find them in. In the 17th century the main landowner of the vast marshy, reedy, sedge fen, the Duke of Bedford, engaged a Dutch drainage engineer Cornelius Vermuyden to drain them all, and he created what are now known as the Ouse Washes leading to the mainly agricultural landscape we now know.

### **Dendrochronology of Haddenham bog oak 2009.**

The department of Archaeology at Sheffield University were sent one of the specimen oaks and Cathy Tyers, a research fellow at the department carried out tests to date the example and this is the result of her findings.

"Analysis of the bog oak sample from Haddenham Fen that was sent to the laboratory has now been undertaken using standard methodological approaches (English Heritage 1998; [www.english-heritage.org.uk](http://www.english-heritage.org.uk)). The sample contained 199 rings and thus, allowing for the missing innermost rings to the pith and the

outermost heartwood and sapwood rings to the bark surface, it is clearly derived from a tree well in excess of 200 years old when it died.

The measured ring sequence was successfully dated to the period 2149-1951 BC. This indicates the year in which each ring present in the sample was formed. In the absence of any trace of the outer part of the tree, the sapwood, it is unfortunately not possible to determine precisely when this tree died. However, based on the minimum number of missing sapwood rings, it is clear that the tree died no earlier than 1941 BC. By taking into account previous analyses of bog oak groups and the degradation of the outer surfaces, it seems reasonable to suggest that this tree had however died by the mid 1800s BC." This is largely in line with others found at Flag Fen near Peterborough.

In this case, the 50 bog oaks were carted off for use as winter fuel. It was estimated that they would provide enough for two winter's free heat for the farmhouse. They burn at variable rates according to species, but the true oaks give out the best heat. They have to be cut up within a short period after being raised because then they are quite soft in nature. If left too long they become very hard and will blunt any saw blade. Wood turners and carvers like them, and their products become very attractive shiny black works of art.

The whole event attracted the attention of the BBC and their environment correspondent, Sarah Mukherjee, spent two days with a cameraman filming and interviewing Chris Gerrard of the Great Fen Project, Maisie Taylor of Flag Fen and me for programmes that went out on national and local television and on the prestige BBC radio programme "Today". Many national newspapers carried the news and a report was even carried in the Tehran Times in Iran!

It is also interesting to note that later in 2009, 50 more were brought to the surface in a four acre field about 500 metres away in Adventurers Fen and maybe as the fen peat is finally extinguished we shall have an end to the bog oak story.

Co-incidentally with finding the bog oaks, a short distance away another piece of fenland history was encountered. Completely unconnected and much more related to man's activities, an isolated block of stone was found. It had obviously been shaped by masons and was almost a cube but slightly tapered to one side. Marks of the artisan's chisel could be seen and it was obviously very heavy measuring approximately 18 x 30 x 19 inches square and some 24 inches deep. We wondered if it might have been a block of stone that was extracted from Barnack and was being transported from there to Ely via the rivers through the Fens in Norman times for use in building the cathedral. Did the boat it was in sink during some sort of accident? It was sited near to but not by the course of the present Old West part of the river Ouse.

Further information on the Fens can be found in the following references:

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## **The Cherry Hinton Survey**

## A report on the CNHS Survey project for 2009

Jonathan Shanklin

*The Cambridge Natural History Society project for 2009 was a survey of the flora of some of the wildlife areas of Cherry Hinton, running from Cherry Hinton Brook to the Cherry Hinton Chalk Pits on Lime Kiln Road. We logged over 500 plant species, more than double that previously recorded, and also recorded some other phyla. Each sub-unit was logged separately and individual record sheets for each area are available on the Society web pages. Many species were re-found from previous surveys. East Pit underwent a dramatic transformation during the year and it will be interesting to see how it develops over the coming years.*

Over the past few years the Cambridge Natural History Society (CNHS) has selected a different area of the city and made regular survey visits to it over the course of a year. Primarily these surveys have concentrated on the vascular plants; however other phyla have been recorded on a casual basis. This year's survey covered Cherry Hinton Brook from Burnside to its source at Giant's Grave, the grounds of Cherry Hinton Hall and the Cherry Hinton Pits Local Nature Reserve (LNR), comprising East Pit, West Pit and Lime Kiln Close. We logged separately the two lengths of Cherry Hinton Brook in different tetrads. Large parts of this area are City Wildlife Sites (CityWS), and are surveyed by the Wildlife Trust from time to time, primarily for indicator species. These surveys are usually carried out over one or two days every seven years by one or two people and do not provide a comprehensive list of what grows on the site, although that for East Pit was more comprehensive in the run-up to the Trust acquiring it and opening it as an LNR on June 20<sup>th</sup> 2009. In addition, the CNHS had visited the chalk pits on several occasions in recent years, and had noted some species and others had been noted during conservation work. Information from these surveys and the Cambridgeshire flora was incorporated into our list of species to look for, although we failed to find roughly 17% of them. The following site descriptions are taken, with some alterations, from the Wildlife Trust's 2005 survey reports.

### **Cherry Hinton Chalk Pit SSSI**

The Cherry Hinton Chalk Pit SSSI overlaps our survey area. It consists of East Pit, part of West Pit and some roadside verges, and was primarily notified for the populations of four nationally uncommon plant species: Moon Carrot (*Seseli libanotis*), Greater Pignut (*Bunium bulbocastanum*), Perennial Flax (*Linum perenne* ssp *anglicum*) and Grape-hyacinth (*Muscari neglectum*); the last growing outside our survey area on the verge on the other side of the hill. All have a long history in the area with the first records being: *Seseli libanotis* "Cherry Hinton Chalk-pit Close, found by Mr Relhan and brought me.... Rev Mr Davies, Fellow of Trinity College, 26.8.1783". *Bunium bulbocastanum* "Went to Cherry Hinton, and found the *Bunium bulbocastanum* in a corn field on the south side of the road

to the hill, going by the great chalk pit. 8.7.1840. Charles Babington.”. *Muscari neglectum* “Hills nr Cherry Hinton, W.L.P.Garnons, 4.5.1825”.

### **West Pit**

West Pit was worked more recently than Lime Kiln Close (LKC), certainly well into the 20th century, but the majority of the 4.4 ha site has experienced succession to scrub and ash woodland. The site generally climbs upwards to the south, where at the top there is an area of species rich chalk grassland. The western part of the site is leased to the Caravan Club. The area is noted as being important for birds and insects.

John Ray described “*Linum sylvestre radice perenni, flore caeruleo* [Perennial Flax, (*Linum perenne*)] in some closes about Cherry-Hinton, in large quantities”, and Jenyns noted in 1824 that “*Linum perenne* abounds everywhere about the chalkpits of Hinton, & appears very ornamental with its bright blue flowers. There is a succession of these all through the summer, and even now we found it in full flower - as well as seed.” but this year there were just a few vegetative shoots in the meadow at the top of West Pit. Ray also noted “*Orchis sive Cynosorchis purpurea spica congesti pyramidalis* [Pyramidal Orchid (*Anacamptis pyramidalis*)] in a chalkie close at Hinton near where they burn lime.” but it has not been seen here for over 100 years. Longleaf (*Falcaria vulgaris*), grows on the boundary of West Pit, but is a more recent discovery: “WH Mills has known this for two or 3 years at this locality, before the turf was moved– verb. comm. to me at the Ray Club meeting at Sir Lionel Whitby's, 2.6.1951. DE Coombe”.

### **East Pit**

East Pit is the newest addition to the nature reserve complex, having been acquired by the Bedfordshire, Cambridgeshire, Northamptonshire and Peterborough Wildlife Trust in 2008 and was opened to the public in June. After cessation of quarrying activities in the mid 1970s there was natural succession from a bryophyte dominated vegetation on thin pulverized chalk, through chalk grassland into buddleia and cotoneaster scrub. The “hills and holes” left by the quarrying operation were deemed unsafe for public access, and so the interior of the pit has been extensively landscaped to give several chalk bowls.

The extensive bare chalk thus created will be colonised by bryophytes and chalk grassland plants, together with invasive plants such as cotoneaster and buddleia that will need controlling. Remaining bare patches will heat rapidly in the sun, providing basking areas in which insects and other invertebrates can rapidly raise their body temperatures, and thus be more active. Much of the surface of the pit was solid hard chalk, and it is hoped that the landscaping will have produced a softer, more open surface, which will provide more breeding opportunities for species of insect that excavate nest-chambers in soil, or lay eggs directly into its surface.

### **Geology of the area**

The chalk pits are dug in Cretaceous Middle and Lower chalk dating between roughly 100 and 130 m.y.. The south (top) of East Pit is zig zag chalk, with the

Melbourn Rock, which runs roughly through the middle and through the top of West Pit, forming the base of the Middle Chalk. The Holywell nodular chalk marks the top of the Lower Chalk and the Totternhoe Stone lies at the lowest level, the aquifer providing the source of Cherry Hinton Brook at Giant's Grave. North of this, Cherry Hinton Hall lies on the West Melbury marly chalk. The chalk either side of the Totternhoe Stone is commonly known as "clunch". Although some of the formations do contain fossils we did not find any. We did find several pyrite nodules in East Pit, which fragment into radial shards when struck with a hammer.

### **Chalk Pit Archaeology**

At the south end of East Pit lies the site of the "War Ditches", an Iron Age monument partly obliterated by quarrying and construction of a reservoir on top of Limekiln Hill. The site was smaller than the nearby Wandlebury hill-fort and it may not have been completed before it was overrun and destroyed. A small section of the remaining structure was excavated by Oxford Archaeology East during the pit restoration. They found around 300 fragments of Iron Age pottery, along with human remains and Roman artefacts.

### **Lime Kiln Close**

This site is a long abandoned chalk pit dating from mediaeval times. The pit, covering approximately 2.7 ha, has steep banks along the eastern and southern boundaries and the floor of the pit has an undulating relief with many small hollows and chalky mounds. The habitat is a mosaic of high recent woodland, younger woodland and scrub, large clearings of sheltered neutral grassland with a calcareous influence in places, and exposed chalk especially on the steep banks. The site is bordered to the south by East Pit, and West Pit lies nearby to the southwest. It is managed as a nature reserve and is well used by local residents, but suffers from litter blown in from the road and dog excrement.

The recent woodland and scrub covers most of the site, and has a very good structure. The canopy is dominated by Field Maple (*Acer campestre*) and Ash (*Fraxinus excelsior*), with a grove of Wild Cherry (*Prunus avium*). Some trees may approach 200 years old. A wide range of shrubs is present, with Blackthorn (*Prunus spinosa*) and saplings of the canopy trees predominating within the high woodland, and some areas of scrub, particularly the south-east corner, dominated by Elder (*Sambucus nigra*) and Traveller's Joy (*Clematis vitalba*). The diverse ground flora has a wide range of woodland plants such as Herb Robert (*Geranium robertianum*), and the ancient woodland indicator Hairy St John's-wort (*Hypericum hirsutum*) which also grows in the clearings.

There are several large clearings of mostly neutral, species-rich grassland, with a tall and rather rank sward consisting mostly of species such as False Oat-grass (*Arrhenatherum elatius*), Cock's-foot (*Dactylis glomerata*) and Hogweed (*Heracleum sphondylium*). Several indicator species are present, including Yellow Rattle (*Rhinanthus minor*) and Agrimony (*Agrimonia eupatoria*). In places mounds of chalk spoil have a more calcareous grassland, including Wild Basil (*Clinopodium vulgare*), Wild Parsnip (*Pastinaca sativa*) and Wild Liquorice (*Astragalus glycyphyllos*). Several other indicator species have been recorded in

the recent past but were not recorded in this survey, including Salad Burnet (*Sanguisorba minor* subsp *minor*) and Perforate St John's-wort (*Hypericum perforatum*). The grassland is managed by annual cutting and raking.

A number of beetle species associated with deadwood habitats was found in intermittent recording work between 1995 and 1998; there has been no more recent recording work, but the habitat is essentially unchanged, and the beetles can be assumed to persist. The rare Chalk Screw-moss (*Tortula vahliana*), which is of national importance, has been recorded at this site since 1882; the reserve warden reports seeing it in 2002/3 around the exposed chalk of the southern steep bank. The site also supports a number of scarce but exotic species, including Yellow-flowered Teasel (*Dipsacus strigosus*) and Perfoliate Honeysuckle (*Lonicera caprifolium*).

Botanical recording in the area has a long history. John Ray noted several species in his 1660 catalogue that are still there today. Examples include Wild Liquorice "by the lanes side that leads to Cherry-hinton church and elsewhere", and which is still found in Lime Kiln Close. He also noted *Dipsacus minor sive Virga pastoris* Shepherds Rod, or small wild Teasel [Small Teasel (*Dipsacus pilosus*)], which Charles Babington also noted in Chalk-pit-close in his 1860 catalogue. Subsequent studies have determined the species in the chalk pit as Yellow-flowered Teasel, and it did well this year, with some rosettes seen just outside the reserve.

### **Giant's Grave**

This site comprises a small chalk spring-fed pool known as Robin Hood's Dip or Giant's Grave and the first section of Cherry Hinton brook to the north-west. The pool is surrounded by poor semi-improved grassland with scattered trees and scrub.

The pool water is approximately 20 cm deep and there is much fine sediment covering the bottom. Aquatic macrophyte vegetation is very limited with a couple of patches of Watercress (*Rorippa nasturtium-aquaticum*). Marginal vegetation is also sparse and includes Hard Rush (*Juncus inflexus*) and Yellow Flag (*Iris pseudacorus*). Other species occur at the edge of the grassland and include Hairy Sedge (*Carex hirta*), Common Fleabane (*Pulicaria dysenterica*), Greater Willowherb (*Epilobium hirsutum*), Water Figwort (*Scrophularia auriculata*) and Square-stemmed St John's-wort (*Hypericum tetrapterum*). The pool contains a small tree-covered island with Hawthorn (*Crataegus monogyna*), Buckthorn (*Rhamnus cathartica*), Blackthorn and a Weeping Willow (*Salix x pendulina*); the trees support much Ivy (*Hedera helix*). On the southern and eastern side of the pool the ground slopes steeply up to the level of the adjacent road and path, while on the western side the ground is level and part of the floodplain.

The pool is surrounded by scattered broadleaved trees and shrubs over mown, poor semi-improved grassland. The trees and shrubs include frequent Ash together with a range of native and exotic species such as Elder, ornamental *Prunus*, Ginkgo (*Ginkgo biloba*) and poplar *Populus* spp.. Under the trees, the ground flora is dominated by Ivy, Bramble (*Rubus fruticosus*) and Traveller's Joy.

The outflow of the pool to the brook contains a quantity of twigs, small branches and dead leaves. Access to the section of brook immediately to the north-west of the pool is not possible. In 1998 it was described as 10-20 cm deep, 1-2 m wide and fast flowing; this enlarges to 45 cm deep and 2-3 m wide beyond the road bridge at Forest Road. The brook is generally heavily shaded by trees and shrubs from the neighbouring gardens and significant stretches of bank are reinforced with wooden piling, particularly along the northern side. Aquatic vegetation is very sparse or completely absent along most stretches.

In the 1960s cold water flatworms were recorded, but these were not looked for during our survey.

### **Cherry Hinton Hall**

Large parts of the grounds of the Hall are mown grassland with planted, often ornamental trees, and there are some tennis courts and play areas. The City Active Communities depot is adjacent to the Hall, and provides a good area of brownfield site. A sub area is “wilder” and is a CityWS crossed by a number of well-used public paths.

This site is largely occupied by planted and naturally regenerating woodland around an artificial lake supplied by Cherry Hinton Brook. The woodland canopy density varies considerably in different parts of the site. There are areas of dense woodland in the north-west, north-east and south-eastern areas of the site whereas open woodland and clearings with a grassy flora are frequent in the western part of the site and around the northern arm of the lake. The woodland species composition contains a large complement of planted native and exotic broadleaved trees and shrubs. Although significant planting has occurred, the woodland is mostly semi-natural and there is a good regeneration of many species.

Today the lake supports a large population of waterfowl and is stocked with carp; aquatic vegetation is sparse and the water is turbid. The lake margin is reinforced with piling and the lake supports little marginal or emergent vegetation. Fifty years ago the setting was very different, and a report on the fauna of the aquatic habitats in the Hall grounds, published in an early edition of Nature in Cambridgeshire (No 3), records pondweed *Potamogeton* spp, Reed (*Phragmites australis*) and Yellow Flag from the lake.

Cherry Hinton Brook not only supplies the lake but a separate channel forms the eastern boundary of the site. The extreme northern part of this site comprises a short section of the Brook on the north-western side of Daws Lane. This section is 3-4 m wide, 40 cm deep and fast-flowing, though the section beyond the trees is silted. A short stretch of the brook is shaded by bankside trees and shrubs and in other areas the banks are vegetated mainly by bramble. Aquatic vegetation includes Water-cress (*Rorippa nasturtium-aquaticum*), Fool's Water-cress (*Apium nodiflorum*), Water Mint (*Mentha aquatica*) and Water Speedwell (*Veronica anagallis-aquatica* agg).

### **Cherry Hinton Brook**

The CityWS is a stretch of chalk stream running from Daws Lane, Cherry Hinton north-west for approximately 1.7 km before being swallowed by a culvert

just past Coldham's Lane, which takes it under the Cambridge–Ipswich railway. The brook is fed from Giant's Grave, and re-emerges from the downstream culvert as Coldham's Brook CityWS. A footpath runs along the top of the western bank for nearly the entire length of the brook, and the majority of it is tarmacked and used as a cycle-path. Beyond the eastern bank are flooded chalk-pit areas, including Cambridge University Officer Training Corps Pit CityWS. Beyond the western bank are allotments, gardens and a school playing field.

Some channel vegetation is cut annually from the brook, and the arisings dumped on the eastern bank, however this has been patchy in recent years. The bottom of the brook is rather muddy and silty throughout, with very little gravel. The water is not very clear, carrying quite a high load of fine detritus that coats much of the submerged vegetation.

As the brook gently winds along its length it passes through more open sections to heavily shaded patches. The heavily shaded areas sustain little aquatic vegetation, but the more open areas range from being choked by sedges (*Carex* spp), Reed Canary-grass (*Phalaris arundinacea*) and Fool's Water-cress to beds of Water Starwort (*Callitriche* sp) with open water between. The banks have mostly coarse vegetation, but there are one or two areas verging on chalk grassland. In places pilings had recently been installed, and the bank behind these had a number of ruderal species. Some Water Vole (*Arvicola terrestris*) holes appeared active.

The final length of the brook runs along Burnside, and this section has a shade problem from the line of Weeping Willow that grows above the eastern bank. Opposite-leaved Pondweed (*Groenlandia densa*), which was one of the plants monitored for the Botanical Society of the British Isles "Threatened Plant Project", has been lost from this section.

## Diary for 2009

The major contributors to the survey were: David Barden (DBa), David Brookes (DBr), Lizzie Cooke (LC), Monica Frisch (MF), Steve Hartley (SH), Alan Leslie (AL), David Seilly (DS), Jonathan Shanklin (JS) and Charles Turner (CT). Altogether 30 people participated in the monthly visits.

**January 1.** The traditional New Year's Day outing took place under cold, cloudy but dry conditions. AL, JS, MF and SH first toured round Lime Kiln Close, where we added over 20 vascular plant species to the preliminary list, which was somewhat surprising given that we had made several summer visits here. The most notable find was a liverwort, *Radula complanata*. The group then moved on into East Pit, which had just had new fencing put up around the margin. At one place in the south-west corner we found seed heads of the Moon Carrot, for which the pit is designated as a SSSI. Visiting "The Boulder", which hosts several liverworts including the red listed *Lophozia perssonii*, we found it encased in a sheet of ice, as were many of the exposed but shaded chalk boulders. Although we did find two liverworts here, this didn't include the rare one. Our route back towards Cambridge took us along Cherry Hinton Brook, and then to Monica's

house for welcome refreshments. The total for the day was 155 vascular plant species, along with a miscellany of birds, bugs, mosses, lichens and liverworts.

**January 2.** JS and MF met for a follow up visit to cover West Pit and Cherry Hinton Hall, under similar weather conditions. Gentle progress through the Pit added a steady haul of species and uncovered the marker posts from a former nature trail. Monica had to leave at midday, but Jonathan continued to the top of the pit, where there is a chalk grassland meadow. In the afternoon a quick look at Giant's Grave, the source of Cherry Hinton Brook, suggested that we should add this small area to our survey schedule. Finally a walk round the Hall grounds produced the preliminary listing for this large area of public space. Over the two days we found a total of 196 vascular plants, something of an achievement for the height of winter.

**January 25.** The weather was poor, with light rain getting heavier throughout the excursion, until it ceased just as we finished for the day. Despite this, turnout was good, with MF, DBr, DS, JS, CT and several others all getting very wet. We started by having a quick look at Giant's Grave, the springhead for Cherry Hinton Brook. We added several vascular plants to the list, and also tried our hand at a few mosses. As is frequently the case, the quick look took us past 2pm when we were supposed to be at Lime Kiln Close! We started with a few more mosses, then, at 2:30, we made a start on the RSPB Big Garden Bird Watch. At this point everything had flown off or was in hiding, so we continued round the pit. JS positively identified a few liverworts, including *Radula complanata*, which was in fruit. DS showed us where the snowdrops were coming up, and this gave a good vantage point to see a pair of Chaffinch (*Fringilla coelebs*) in bushes. Going back into the pit we noticed the strong smell of Fox (*Vulpes vulpes*). By now the Wood Pigeons (*Columba palumbus*) were returning to roost, and we noted nine, confirming their status as one of the commoner birds around. Finally we had a quick foray into West Pit to confirm some ferns, which were all Male Fern (*Dryopteris filix-mas*). Altogether we added half a dozen vascular plants, taking the total over 200, a good handful of mosses and three liverworts.

**January 31.** A nice sunny, albeit cold, morning allowed the morning surveyors (JS, Louise Bacon, MF and SH) to meander round East Pit, primarily looking for lichens. We found 17, all common, as we weren't experts (in contrast the next day a visit round Wimpole Hall estate in company with the Bedfordshire recorder gave a total of nearly 100!). We also found another liverwort - *Frullania dilatata*, rather surprisingly growing on Buddleia, but a scarlet fungus growing on another Buddleia defied identification. We saw a flock of partridge in the pit, but weren't able to identify the species. In the afternoon the group was joined by DBr, DS, and several others for a gentle ramble round Cherry Hinton Hall. On the way Lily (our youngest participant) soon spotted some fungi, and we found another ten in the Hall grounds. We added a few more lichens to the list, including some *Cladonia*. In the pond SH found a leech, which was much admired, although on later reading up on leeches we found that it could be one of dozens.

**February 28.** A small party (JS, LC and MF) gathered at Burnside to walk along the Brook and began by trying to identify some mosses – Silver-moss (*Bryum argenteum*) was easy, but one found on the side of a wood piling led to an unlikely possibility. Subsequently it turned out that having a moist specimen made all the difference and it turned out to be Wall Screw-moss (*Tortula muralis*). Having managed to cover 500 m in an hour we were joined by SH, and continued adding odds and ends to the list, before deciding it was lunch time. Neither of our first two choices for a pub did food, so we continued to the Robin Hood where we had a good welcome. The afternoon excursion covered Cherry Hinton Hall and we were joined by DS, Josephine Brearley and Pete Michna. Pete's expertise at identifying exotic trees in winter proved invaluable and he added a dozen species to the list. On a maple (*Acer* sp) near the Hall entrance we found over a dozen Orange Ladybirds (*Halyzia 16-guttata*) nestled in crevices in the bark. From here we moved to West Pit, although the numbers dropped off. DS explained some of the recent work he had been doing as warden. At the top of the pit we hunted for the rare liverwort *Lophozia perssonii*, but were only able to find the rather common *Leiocolea turbinata* in mats on the chalk. With the light beginning to fade we returned, with MF providing welcome refreshments. Although the stated aim had been to try and identify bryophytes and lichens we ended up doing rather better on vascular plants and added nearly 40 to the list, taking it to over 240.

**March 29.** The morning group (JS, AL, CT, DBa, LC, MF and SH) met for a tour of East Pit, where the contractors had just started work, so there was no public access. Fumitories were coming up near the entrance, though at this stage we were reluctant to identify the species. On the eastern side we found the Greater Pignut starting to come up and noted several plants. We added quite a few common species in the body of the pit and noted two additional cotoneasters (*Cotoneaster bradyi* and *C. dammeri*). The afternoon group was rather depleted, as four of the morning party departed across the border to Norfolk to see Yellow Star-of-Bethlehem (*Gagea lutea*). JS and SH were joined by DBr and Rod Mulvey for a walk along Cherry Hinton Brook. We didn't see anything exceptional, but spotted some large Roach (*Rutilus rutilus*) in the brook, a pair of Mute Swans (*Cygnus olor*) building their nest, and the fertile stem of Field Horsetail (*Equisetum arvense*) coming up. We also found a couple of dead creatures - a Short-tailed Vole (*Microtus agrestis*), seemingly only recently deceased, and a couple of Toads (*Bufo bufo*), which were very desiccated. With the clocks having gone forward an hour Jonathan had time for a quick tour of the remaining areas, finding Danish Scurvy grass (*Cochlearia danica*) on the road-side verge running along West Pit and the cross between Hairy and Sweet Violet (*Viola x scabra*) at the top of the Pit. Around another 30 plants species were added during the day, taking the total above 280.

**April 26.** Although the Met Office had forecast showers, JS's verdict was a less than 10% chance and we had a lovely spring day for the survey. The morning group (JS, David Price, Helen Holmes, LC and SH) again started with East Pit,

which had been transformed since our last visit. The lumps and bumps had been bulldozed into three bowl shaped depressions of a glistening white chalk field. We found further sites for the Greater Pignut on the eastern side of the pit. SH collected some dandelions (*Taraxacum agg*) for later determination. We searched in vain for Common Spotted-orchid (*Dactylorhiza fuchsii*) but when we sat down at the chosen lunchtime location Steve pointed out "there it is". Helen and LC left to revise in the afternoon, but we were joined by DB, Lily and her mother for a wander round Limekiln Close. Here we found a recently cleared bank, where there was Star-of-Bethlehem (*Ornithogalum angustifolium*) and Wild Liquorice. We also saw several butterflies and Lily used her hand lens to look at a red spider mite. SH found the only recorded fungus of the day - a Common Morel (*Morchella esculenta*). The party then crossed to West Pit, where Lily found a large assembly of woodlice, although the majority were Pill Millipedes (*Glomeris marginata*), of which one was reddish brown, there was a Common Shiny Woodlouse (*Oniscus asellus*) amongst them. Once we got to the top, most of the party departed, but David P and JS had a look round, easily finding the Greater Pignut, and also finding Dog Violet (*Viola riviniana*) on a bank. David suggested looking round the caravan park at the base of the pit, which has an extensive network of bays cut into the old chalk workings. This added a further 15 species to the list for the west pit area. To finish the survey for the day, JS carried on till near sunset to look at the remaining areas, although he didn't find anything very exciting. The finds during the course of the day pushed the plant species list to well over 300.

**May 24 and 28.** Both days were dry and sunny, something of a problem at East Pit, where "chalk blindness" was a distinct possibility. The Sunday visit (JS, David Price, MF and SH) was the last to the pit behind closed doors and revealed a good number of additional species, most notably Fine-leaved Fumitory (*Fumaria parviflora*), which had come up with Common Fumitory (*Fumaria officinalis*) in a freshly disturbed bank at the side of the pit. We also found a new cotoneaster for the pit - Entire-leaved Cotoneaster (*Cotoneaster integrifolius*). On the Thursday we (JS, CT, DBr, MF and Sue Wells) had the first evening walk of the summer and started slowly to allow late comers to arrive, although the pace never picked up. Along the open section of the Brook we saw several Painted Lady (*Vanessa cardui*) butterflies, flying very fast and often quite high - part of the large migration that had spread north from the Atlas Mountains. Most of the botanical additions to the list were weedy species, although they often provoked debate on their identification. In total the floral total rose to over 380 species.

**June 25.** A sunny summer's evening saw the stalwarts (JS, MF and SH) meet up for a visit to West Pit. Moving up through the woodland section we stopped to investigate invertebrates amongst the leaf litter, finding ants, centipedes, millipedes, snails and woodlice. On a bramble leaf we saw a spiny larva, which on checking the ladybird sheet proved to be a Kidney-spot (*Chilocorus renipustulatus*). Emerging at the top we turned to looking at the flowers of the meadow adding several chalk grassland species, including the Moon Carrot for

which the pit gets is designation as a SSSI. The Greater Pignut was not visible, and there was no sign of the Perennial Flax, which we feared was now extinct at the site. Longleaf was still present at its usual site along the boundary with the school playing field, with a few plants some 10 m further up the hedge. We returned via the road edge, which is protected road verge as it has a good population of the Moon Carrot, along with several other grassland species including Lucerne (*Medicago sativa* subsp *sativa*) and Sainfoin (*Onobrychis viciifolia*). There was just enough light for a quick look round Giant's Grave, where somewhat surprisingly we added several trees to the list. When combined with an earlier visit to Cherry Hinton Brook and Cherry Hinton Hall by JS, and a conservation work visit to LKC and East Pit by JS and SH the flora total rose to over 420 species.

**July 19.** JS had a walk round the sites that the group wouldn't have time for on the Thursday evening, though several heavy showers made recording harder. He failed to find Opposite-leaved Pondweed in Cherry Hinton Brook, but did add a few common species. Cherry Hinton Hall provided a very interesting small area, where protective matting had been infilled with spoil from an unknown but probably fluvial, location. Here there were several goosefoots, Common Fiddleneck (*Amsinckia micrantha*), Water Chickweed (*Myosoton aquaticum*), Water Speedwell (*Veronica catenata*), Golden Dock (*Rumex maritimus* and Annual Beard-grass (*Polypogon monspeliensis*). Giant's Grave added Toad Rush (*Juncus bufonius*) and Brookweed (*Samolus valerandi*), as well as both the small Sweet Grasses (*Glyceria* spp.). Entering West Pit a surprise find was Butchers Broom (*Ruscus aculeatus*), and getting to the top of the pit the meadow had two different species of eyebright (*Euphrasia nemorosa* and *E. pseudokernerii*). Returning via the protected road verge there were three spikes of Knapweed Broomrape (*Orobanche elatior*) along with abundant Moon Carrot. JS added over twenty species in East Pit, including some more rare arable weeds such as Small Toadflax (*Chaenorhinum minus*) and Wild Pansy (*Viola tricolor*). LKC added nothing new, but the Yellow-flowered Teasel is doing exceptionally well this year.

**July 23.** Showers were threatened and the team of AL, DBa, JS and MF did indeed get slightly damp at times, though it eventually turned into a dry evening. We carried out a sweep around the floor of East Pit, but failed to find the Basil Thyme (*Clinopodium acinos*), which may have been disturbed by the construction works to the remodelled interior. We looked at several specimens of eyebright, but weren't entirely convinced as to whether there were one or two species in the pit. AL re-found a cotoneaster and added another two new species for good measure, bringing the total reported from the two pits to 16. AL also found the hawkweed reported from the pit, but was not immediately able to identify it. The Moon Carrot was well in flower, though mostly on inaccessible cliff ledges. After dinner in the local pub, JS and MF returned to the pit, where we were joined by DS, Rosie Trevelyan and Sue Wells to hunt for Glow-worms (*Lampyris noctiluca*). Having expected to see a dim light we were very surprised to see a brightly

glowing green 'LED' that on inspection proved to be a female Glow-worm. The glowing lights were well scattered, mostly near scrub edges or on chalk edges, and a survey of the entire pit suggested a minimum of 45 active females - the highest count recorded so far. A quick look at the meadow in West Pit showed no activity at all, perhaps because there are distracting lights visible, unlike in East Pit where the pit wall shields off the worst of the Cambridge light pollution - indeed we had a good view of some of the summer constellations, with Jupiter low to the south. The two visits pushed the floral total over 450 species.

**August 30.** The return to Sunday visits allowed the morning party (AL and JS) to cover the Brook, Giant's Grave and part of Lime Kiln Close. Once again we didn't find the Opposite-leaved Pondweed that used to grow by Burnside, however we did spot a little Gypsywort (*Lycopus europaeus*). The edge of LKC adjacent to East Pit added a few extras, including a rather obvious Rowan (*Sorbus aucuparia*), which we had previously managed to walk past without noticing. The afternoon party (joined by Jane Wilkerson, MF and SH) started with a look at a few of the more interesting areas of Cherry Hinton Hall, with Jane noting that she had seen Goldilocks Buttercup (*Ranunculus auricomus*) growing there earlier in the year. Moving on to West Pit, we progressed relatively quickly to the top, where there was a splendid display of Autumn Gentian (*Gentianella amarella*). We also found a few non-flowering plants of the Perennial Flax. A slightly reduced party then had a wander round East Pit, noting a Pear tree (*Pyrus communis*) and a Gooseberry bush (*Ribes uva-crispa*). Once again we failed to find the Basil Thyme on the floor of the pit, suggesting that the reconfiguration may have prevented its appearance this year, though it may reappear next year.

**September 27.** Another warm, sunny day, with scarcely a cloud until towards the end of the day. After over three weeks without rain, everywhere was dry and dusty once the early morning dew had evaporated, rather ruling out the hope of finding many fungi. The morning party (JS, MF and SH) started with a look round Cherry Hinton Hall grounds, spotting a poplar near the entrance that had previously been missed. Having completed a circuit, finding very little new, we decided to finish with a look round the central compound, which proved more rewarding, with several new finds, including Indehiscent Amaranth (*Amaranthus bouchonii*), Thale Cress (*Arabidopsis thaliana*) and Creeping Yellow-cress (*Rorippa sylvestris*), showing the value of a brown-field site. We then had a quick walk round East Pit, with the most interesting find being another arable weed - Sharp-leaved Fluellen (*Kickxia elatine*). For the afternoon we were joined by a couple of local ladies, and decided on a return to East Pit for a gentle walk round the access route. Here we showed a few of the chalk species still in flower, and tried to find a few creepy crawlies, though these too were lying low in the dry heat. We did manage to find Black Garden Ants (*Lasius niger*), Yellow Meadow Ants (*Lasius flavus*), the Garden Spider (*Araneus diadematus*), an Orb-web Spider (*Metellina segmentata*), a Common Field Grasshopper (*Chorthippus brunneus*) and the snail *Monacha cartusiana*. A few of the party then continued round LKC

and West Pit, finding a few rusts and mildews and some King Alfred's Cakes (*Daldinia concentrica*), and the Brown Ant (*Lasius brunneus*) in LKC.

**October 25.** We had delayed the fungal foray weekend until the end of the month, in the hope of damper weather than over the past few years. We did not delay it far enough, as it was another dry autumn, and despite some rain in the run-up to the weekend, the ground was generally bone dry. The morning party had a look round East Pit. We confirmed one, added another and re-found a third vascular plant, but only found three fungi. Around a dozen gathered at Cherry Hinton Hall for the fungal foray proper, and it was clear that it was going to be a struggle to find much. Fortunately Lily, the youngest member of the group, had joined the party and her eagle eyes soon spotted a few specimens. The going remained hard however, though we did find a nice *Coprinus* at the edge of the pond. JS had decided a change of venue was needed, but on crossing a patch of bare ground near the Brook on the way back to the gates we saw a few mushrooms and patches of orange on the ground, which were later provisionally identified as *Pulvinula cinnabarina*. On the way to Lime Kiln Close we noted a nice patch of Shaggy Scalycap (*Pholiota squarrosa*) by an almond tree and a polypore on a cherry tree. Sadly Lime Kiln Close was no better, though we did find our largest specimen of the day, a rather gone over Blackfoot Polypore (*Polyporus leptcephalus*).

**November 29.** The weather forecast promised rain and we got it! The morning visit was cancelled, but JS and AL started at 1pm for a walk round East Pit, both having seen the brilliant blue of a Kingfisher (*Alcedo atthis*) whilst travelling alongside Cherry Hinton Brook. Three garden introductions were found by the gate, but we had barely started the circuit before the rain started falling. Apart from a patch of fungi on the bonfire site by the archaeological dig, nothing else was added. On returning to the gate we were joined by MF, and a little later by DS. The rain continued on and off and we managed to find several additional species of cotoneaster, though not all were immediately identifiable to species. Below the archaeological dig we found a large area covered with small discs of a bright orange fungus Orange Cup (*Melastiza chateri*). AL spotted a Sweet Briar (*Rosa rubiginosa*), and also Bristly Ox-tongue (*Picris echioides*), which quite surprisingly hadn't made it on to the "to be found" list. With the light fading we retreated to join MF in her offer of a welcome cup of tea, thus concluding our survey of the Cherry Hinton area.

The 2010 survey is covering Coton Countryside Reserve and adjacent areas. The Reserve is owned by Cambridge Past, Present & Future, which has slowly been converting some arable land to public access meadows, though large areas are still a working farm. Although the present CNHS group tends to concentrate on plants, we make records of other organisms too and would welcome beginners and experts with other interests. Do come and join in. Dates for the monthly surveys, and flora lists for many of the wildlife sites near Cambridge are on the Society web page at <http://www.cnhs.org.uk>

*Text for several of the site descriptions is adapted from survey reports compiled by Martin Baker and Steve Hartley for the Wildlife Trusts. Particular thanks are due to Alan Leslie and Steve Hartley for comments on my original text.*

## Vascular Plant Records

Alan Leslie

A pleasing aspect of the records listed below is the number of plants refound in old localities or where careful searching in well-known areas has revealed more populations than we realised existed. It just goes to show that it is often worth having another look at an old site or when visiting a well-known population just casting about a bit more widely and not assuming either that it has all been done before or that nothing has changed. Of particular interest in the first category are three native plants not reported from their respective localities for about a century: *Bupleurum tenuissimum* at Sutton (1913), *Carex lasiocarpa* at Chippenham Fen (1901) and *Myosurus minimus* at Chatteris (1890s). No less welcome is the first notice in these pages of a comfrey hybrid recently described as new to science and named after Frank Perring: Frank was a stalwart of Cambridge botany for many years and the national referee for *Symphytum*, so this is a fitting epitaph. There are also records for county rarities in new areas, such as those listed for *Carex pilulifera*, *Rosa micrantha*, *Ceterach* and *Cladium*. The *Carex* was one of several good things we found on a Cambridge Flora Group excursion to the plantations on the sands to the east of Chippenham and there may well be more to report from this area when expert eyes have looked over the *Dryopteris* and *Rubus* specimens collected from here later in the season.

The CFG excursions have been a productive source of new finds and have succeeded in introducing all of us to new plants and new places within the county throughout the season: reports of these excursions are written up by Nick Millar in the CFG Newsletter. In September we enjoyed the muddy, maritime delights of Foul Anchor and in the process added a species never seen before in Cambridgeshire: *Spartina anglica*. In view of its rampant colonizing ability, it remains to be seen if this is a welcome addition to our Flora. Most new maritime records in recent years have been from our main road network and although no new species came from this source this year, investigation of the A11 verges produced good new populations of *Elytrigia atherica*, *Hordeum marinum*, *Sagina maritima* and *Parapholis strigosa*. In the process of this survey new records were also made for *Cirsium eriophorum*, *Clinopodium calamintha* and *Medicago sativa* subsp. *falcata* so it was not all aliens and invaders!

New aliens do however continue to proliferate and some of these will be transient, others are here to stay. Individual records for some of these may sometimes seem to be of little consequence, but one soon finds that when comparing our lists with those from other areas that we are merely part of a national trend and few of our aliens are unique. Recording them now will help to

map these trends over the years and careful observation can often help to explain how they are getting about. Recently imported Italian nursery stock has been suggested as a potential source for some of these and the record for *Lotus angustissimus* below is an almost certain example of exactly that route of introduction.

There is much recording work going on that is not directly reflected in these records: quite a number of recorders, for example, helped survey the species on this year's BSBI Threatened Plant project, others have been surveying underworked areas (Jonathan Shanklin deserves special mention here) or have been pursuing records for individual species. David Barden's account in this issue of *Hypericum maculatum* shows how worthwhile it can be to look at one species in detail: it has been something of an *annus mirabilis* for this plant with a whole host of new records and a growing understanding of the occurrence and variability of intermediates between this and *H. perforatum*. James Cadbury's studies on *Oenanthe*, however, emphasize that even today our local rarities can disappear almost overnight as a result of management changes.

The preparation of the new Flora is coming on well: progress continues to be slower than I would like but remains steady. Accounts have now been prepared as far as the end of *Polygonaceae* (following the order of Clive Stace's *New Flora of the British Isles*, 1997). By this time next year I am hoping to be a third of the way through the task. It remains a challenging but ultimately rewarding project and I am grateful to all those who have patiently answered queries, provided records and even gone out searching for particular plants. I am trying to keep those accounts already written up to date with significant new finds; the recent interest in Cambridgeshire ferns has necessitated some significant rewrites in a few cases; but then as most of this is positive news it is really very welcome!

Once again the records below span a large part of the county (from 10km squares 40, 41; 34, 35, 36, 38, 45, 46, 47, 48, 49, 55, 56, 57, 58, 65, 66, 67, 68 – one more than last year) and records have been made in every month of the year except January and November. In these accounts 'recent' refers to the period from 1987 onwards and the records are compared with those in the possession of the BSBI county recorders: as always we would be glad to hear of any that change or update anything stated here. No records are considered for inclusion here if the plants are known to have been planted.

*Adoxa moschatellina* Locally abundant for c.120 m, on ditchbank running north from the north-east corner of Horse Pastures, Weston Colville, TL627531-2, D.J. Barden, 11 April 2009. Long known by trackways just to the east of here, this westward extension could be the site of earlier records listed as 'Weston Colville on the way to Brinkley' in 1867 and 1957.

*Alopecurus aequalis* A small colony in water of drain running south-east from the now derelict Ring Farm, Sutton Fen, TL40217706, A.C. Leslie & N.P. Millar, 16 July 2009. Orange Foxtail remains a rare grass in the county, but was reported from this general area by Alfred Fryer in the late nineteenth century and by Humphrey Gilbert-Carter and Max Walters in 1945.

*Atriplex micrantha* Over 30 plants scattered on bank by layby on south-west side of A14, just south-east of the crematorium, east of Dry Drayton, TL40106263, A.C. Leslie, 1 August 2009,

**CGE.** First v.c. record for an annual orache with large rounded fruiting bracteoles, rather like *Atriplex hortensis*; a south eastern European species that is now spreading across western Europe.

*Bassia scoparia* Five plants on gravel between the crash barrier and a fence on north-west side of the A11, just north-east of the Fleam Dyke footbridge, TL549542, A.C. Leslie, 27 June 2009. A rare alien in v.c. 29 and not previously seen on the sides of our main roads, a habitat in which, in some other parts of the country, it has become abundant: we may see more of it here.

*Bellis perennis* f. *disciformis* A patch about 30 cm wide, on south-west verge of Cambridge Road, between Stapleford and Sawston, TL47835053, A.C. Leslie, 4 April 2009. This is a daisy entirely lacking ray florets, which has previously been reported from Cambridge by C.C. Babington in 1850 and from a garden at Girton by M. Wallace in 1988. A piece removed to cultivation produced just a few irregular ray florets later in the season.

*Bupleurum tenuissimum* Two small plants on an open bank on north side of B1381, The America, Sutton, TL435786, A.C. Leslie, 19 September 2009. Slender Hare's-ear was first discovered here by Alfred Fryer in 1892, when it was abundant down the whole length of Water-gull Hill, but he noted later that it could vary in quantity from year to year. Last recorded at Sutton by C.E. Moss in 1913 (**CGE**). This species was formerly in a few other inland sites in the county, but is now known otherwise only at Foul Anchor, where its continued presence was confirmed on the CFG excursion there in September 2009.

*Carex lasiocarpa* A good colony in shallow water at the edge of reeds, in a clearing on the west side of the main north/south drove, Chippenham Fen, TL64796951, CFG excursion, 5 July 2009; tentatively recorded here earlier in the year by a Cambridge Bryology Group excursion and confirmed by this later visit through the combination of its very narrow leaves and densely hairy fruits. Apparently last recorded on the fen by A.H. Evans in 1901 (**CGE**).

*Carex pilulifera* One large clump in sandy grassland at south-east edge of Heath Plantation, Chippenham, TL68176928, D.J. Barden & N.P. Millar (CFG excursion), **CGE**, growing with *Galium saxatile*. Our second extant site for Pill Sedge and never before reported from this area. Only last year reported again in the county when it reappeared in an old Gamlingay haunt. There are tantalising early records from Newmarket Heath and the Devils' Ditch, which have previously been thought 'unlikely' and indeed the only relevant specimen, collected by Leonard Jenyns in 1824 (**BATHG**), has recently been redetermined as *C. caryophyllea*.

*Ceterach officinarum* (a) two tiny plants in brick wall separating the back gardens of 37/39 Collier Road from the Anglia Ruskin University campus, Cambridge, TL46055817, A.C. Leslie, 23 September 2009 (b) one large plant (with noticeably crenate pinnae), on outside of crumbling churchyard wall, Burrough Green, TL63555543, A.C. Leslie, 5 December 2009. We now have six extant sites for this fern: in 1964 it had never been recorded in the county.

*Cladium mariscus* One well-established clump in dry reedbed, in a previously worked area of quarry adjacent to Kingfisher's Bridge, Wicken, TL543724, C. Turner & P.H. Oswald, 28 July 2008. This species was reported in 2005 from Kingfisher's Bridge as an apparent example of natural colonisation of this former agricultural area: this new site seems even more convincing. New colonisation of this sort is very uncommon in the county.

*Clinopodium vulgare*, with pure white flowers Several plants on both sides of ditch on east side of Milton bypass, Milton, TL47126301, A.C. Leslie, 5 July 2009. Such white-flowered forms seem to be of very local occurrence and no other records have been traced for v.c. 29.

*Crocus tommasinianus* x *C. vernus* Apparently spreading in turf, New Road cemetery, Chatteris, TL3986, A.C. Leslie, 6 March 2009. First v.c. record for a hybrid crocus which is widely grown, but often treated as one or other parent; any naturalised crocuses are still uncommon in Cambridgeshire.

*Cyrtomium fortunei* (a) one large mature plant and at least 30-40 young ones, all self-sown at the base of shaded brick wall by steps up to 56 Bateman Street, Cambridge, TL456573, A.C. Leslie, 15 February 2009, specimen collected 26 February (CGE) det. as *C. fortunei* var. *fortunei* by F.J. Rumsey (b) two plants self-sown in deep, heavily shaded, storm drain on Cambridge Science Park, TL46616161 & 46676157, A.C. Leslie & D.J. Barden, 22 May 2009. First certain v.c. records for this evergreen, Asiatic fern, which is much hardier than *C. falcatum*, the species to which naturalised plants of *Cyrtomium* elsewhere are usually attributed and thus perhaps overlooked. The latter has only been seen in Cambridgeshire as a weed of heated greenhouses.

*Echium pininana* One small self-sown plant at base of low wall, east side of Tennis Court Road, Cambridge, TL450579, P.H. Oswald, September 2009. First v.c. record for a Giant Viper's Bugloss, a Canary Island endemic, grown in the University Botanic Garden where it self-sows; no closer potential source has yet been discovered. Milder winters have enabled these imposing plants to be grown and flowered outside away from the far south and west of England to which they had traditionally been restricted. It is not possible entirely to rule out that this may have been a *pininana* hybrid; these are in gardens and are reputed to be hardier.

*Eccremocarpus scaber* One self-sown plant at base of wall of Department of History and Philosophy of Science, Free School Lane, Cambridge, TL44925816, A.C. Leslie, 13 September 2009. First v.c. record for the Chilean Glory Flower, a perennial, tendril-bearing climber, with the capacity to flower in its first season. Now much more commonly grown and certainly present in Pembroke College gardens nearby. Reported recently also as a garden weed in two places in Ely.

*Elytrigia atherica* (a) a large colony, straddling the vallum footpath, Devil's Ditch south-east of Galley Hill, near Reach, TL58556432, A.C. Leslie, 3 October 2009, CGE, conf. T.A. Cope; a record for a glaucous Common Couch (*E. repens*) was made in what appears to be the same spot by Terry Wells in 1974, so if it is the same plant, this patch may have been here for at least 35 years - but how Sea Couch arrived here in the first place is a mystery (b) in two places along the verge of the A11, Great Wilbraham, TL559549 (11 October 2008) and TL56515538 (8 August 2009), A.C. Leslie, here associated with other maritime invaders on salted verges. An earlier roadside record along the A14 still requires confirmation.

*Fraxinus pennsylvanica* Hundreds of self-sown young plants (up to 40 cm tall), scattered over a large area of uncultivated field, east side of A10, just north of Milton. TL48576397, A.C. Leslie, 18 October 2009, CGE. First v.c. record for Red Ash, a dioecious North American species, quite widely planted on roadsides in the county, as it is along this stretch of the A10.

*Fumaria densiflora* Several plants on apparently locally excavated waste soil dumped on a former arable field, Cambourne, TL32675869, N.P. Millar, 13 October 2009. Dense-flowered Fumitory is still locally abundant along our southern chalk, but is rare away from that area and then often associated, as here, with disturbed areas/dumped soil.

*Fumaria parviflora* var. *glauca* Frequent in small field by farm buildings, Limlow, Litlington, TL319419, A.C. Leslie, 26 May 2002, CGE, det. P.D. Sell, 2009. First v.c. record for this variant of Fine-leaved Fumitory, which differs from other variants of this species in the rather

broader upper petal, the flowers aging to pink and the whole plant being more glaucous. Peter Sell also reports that it is grown on the systematic beds in the University Botanic Garden.

*Galium saxatile* Scattered over a small area of sandy grassland at south-east edge of Heath Plantation, Chippenham, TL68176928, D.J. Barden & N.P. Millar (CFG excursion). A new site for Heath Bedstraw, which has otherwise only been recorded recently from Gamlingay, although there are some earlier records for the Chippenham/Kennett area.

*Genista hispanica* subsp. *occidentalis* A small flowering hummock, self-sown on top of a tall brick wall, The Chase, off Gaul Road, March, TL41339650, A.C. Leslie, 8 March 2009, **CGE** (specimen collected 9 June 2009). First v.c. record for Spanish Gorse, a native of south-western Europe, cultivated in this country as an ornamental and locally naturalised. This subspecies has appressed not patent hairs.

*Geranium thunbergii* Several plants self-sown at wall base in access alley between front gardens of 173/175 Chesterton Road, Cambridge, TL45425953, A.C. Leslie, B.A. Tregale & M. Wilcox, 2 August 2009, conf. E.J. Clement. First v.c. record for a rather weedy, sprawling Asiatic perennial, hardly worth its place in cultivation and apparently now a weed in the adjoining gardens.

*Gnaphalium luteoalbum* (a) street weed in Cambridge Place, Cambridge, TL45705760, A.C. Leslie, 4 May 2009 (b) street weed, Norwich Street, Cambridge, TL455.574, A.C. Leslie, 1 September 2009 (c) paving crack weed, Waverley Park, Great Shelford, TL467525, A.C. Leslie, 10 September 2009. Although Jersey Cudweed could not be refound on the Chesterton sidings in 2009, it seems that it is trying to spread in other places; it is a weed in the University Botanic Garden.

*Gypsophila paniculata* One large flowering plant, south-facing bank above the North Level Main Drain, just west of Foul Anchor, TF46011791, S. Hartley (CFG excursion), 12 September 2009, **CGE**. First v.c. record for a perennial Baby's Breath from east and central Europe; its status here is unclear, it was not accompanied by any other aliens and was not very near any potential garden source.

*Jasminum beesianum* Several apparently bird-sown plants, on face of old wall surrounding the swimming pool garden, Wilbraham Temple, Great Wilbraham, TL55315797, A.C. Leslie (CFG excursion), 6 June 2009. First v.c. record for a Chinese jasmine grown for its clusters of scented rose to carmine flowers and small black fruits. A potential parent was cultivated elsewhere in the garden.

*Lonicera xylosteum* One small flowering shrub on face of ditch, north-west side of Swaffham Prior bypass, TL56906377, A.C. Leslie, 3 May 2009; on 16 May several more were found on the other side of the road, nearer the planted parents, which are rather hidden amongst trees and shrubs planted on the a bank above the road on that side. Second recent record for Fly Honeysuckle.

*Lotus angustissimus* One large sprawling plant, as a weed at the base of a large potted *Cordyline*, DJ's Garden Centre, London Road, Chatteris, TL3884, A.C. Leslie, 25 July 2009, **CGE**. This planted tub had been imported directly from Italy and appears to be a good example as to how alien plants can arrive in this country. Slender Bird's-foot Trefoil is a rare native of parts of southern England but has never been recorded in Cambridgeshire.

*Malva pusilla* One large plant, on field edge track by A1101, south-east of Flanders Farm, east of Littleport, TL62288506, A.C. Leslie, 25 October 2009, **CGE**. A very rare alien in

Cambridgeshire, but the previous occurrence of two plants in a field corner, a mile or two nearer Littleport, in 2005, suggests that it may be persistent in this part of the Fens. In general this is an area with surprisingly good weed flora in untended/unsprayed corners.

*Medicago minima* Several large plants on sandy/gravelly waste ground, south end of Ely Hospital grounds, Ely, TL54918178, A.C. Leslie, 11 October 2009. Probably originated with dumped soil from a Breckland source. A rare native of our Breckland fringe and recently discovered in some quantity, again as an unintentional introduction, on the Cambridge Science Park.

*Miscanthus sinensis* One plant, self-sown between the pavement and the base of the front garden wall of 37 Rock Road, Cambridge, TL46505651, A.C. Leslie, 10 October 2009. First v.c. record for an ornamental grass from eastern Asia, now widely cultivated in gardens and starting to be found self-sown in urban areas.

*Montia fontana* subsp. *amportitana* One large plant on newly opened up area of vegetable garden (formerly a grass field), on the greensand at Monksilver Nursery, Oakington Road, Cottenham, TL43806625, J.L. Sharman, June 2009, CGE, det. ACL. First v.c. record for this subspecies of Blinks, all other Cambridgeshire records for this species which that have been critically examined have been placed in subsp. *chondrosperma*.

*Myosurus minimus* Several hundred plants at cornfield margin, by track from Langwood Hill Drove to Chatteris, TL41168574, A.C. Leslie, 23 May 2009, CGE. Known to Alfred Fryer in the Chatteris area in the latter part of the nineteenth century, but not seen since: Fryer reported it to be 'covering acres of cornfields' on Muslick Fen (just to the south of this site; searches the same day in this area proved fruitless) and also noted it as 'common at Langwood on Sandy Highlands', the latter area just about the site of the current record.

*Potamogeton compressus* Fairly abundant up- and downstream of sewage treatment works, Twenty Foot River, March, TL44209920, N.C. Hall, 9 October 2009, conf. C.D. Preston (and first seen earlier in the year). Only re-found in the county in 2005, this new site extends its distribution further east from the other localities along the R. Nene and in Morton's Leam between Whittlesey and Peterborough.

*Potamogeton praelongus* Obtained with a grapnel from the Cambridgeshire bank of the R. Lark, north-west of Isleham, TLc.635775, R. Hawksley & C. Perry, conf. N.P. Millar, 24 August 2009. Formerly much more widespread in the Fens and along the R. Cam, but recently reported only from Welches Dam and Wicken. Here in the Lark it probably straddles the county boundary.

*Prunella laciniata* Forty flowering heads in roughly mown chalk grassland, golf course on Gogmagog Hills, Cambridge, TL49085428, S. Lambert, 30 July 2002; this record has only just come to light. Last seen in the county on the east margin of the East Pit at Cherry Hinton in 1969.

*Prunus armeniaca* One young plant (either bird-sown or the result of a stone discarded by a human), in shrubbery at the junction of Sturton Street and Hooper Street, Cambridge, TL463580. A.C. Leslie, 17 May 2009, CGE, conf. E.J. Clement. Subsequently seen in similar conditions in two other localities within Cambridge city. First v.c. records for Apricot, which is now much more commonly available commercially as a fresh fruit and thus increasingly liable to occur as an alien from discarded stones.

*Rosa micrantha* One large bush, Wilbraham Common, TL53295770, M. Frisch, June 2009 (det. R. Maskew, specimen collected July 2009); on 19 August 2009 ACL and MF found three further bushes scattered over the site, together with an evident hybrid which Mr Maskew considers probably a complex hybrid involving *R. micrantha* and *R. x dumalis* (*R. canina* x *caesia*). *R. micrantha* is a rare Cambridgeshire rose, not previously noted at this site, but reported by W.H. Mills at Fulbourn (pre 1959); our only other recently confirmed records are from Chippenham Fen and Eversden Wood.

*Rubus polyanthemos* Several good colonies in and around Heath Plantation, Chippenham, e.g. TL68216928, A.C. Leslie, 27 June 2009. A common British bramble, but in Cambridgeshire only seen recently at Gamlingay and never before reported from the eastern sands.

*Rubus tricolor* Numerous plants bird-sown around margins and in dried out base of run-off pit, by Babraham Road park and ride site, Cambridge, TL47665448, A.C. Leslie, 14 August 2009, CGE. First v.c. record for a prostrate, evergreen, Chinese species, widely planted as ground cover, as it is elsewhere on this park and ride site.

*Sanguisorba officinalis* (a) two clumps, north side of Meadlands Main Drove, Sutton Meadlands, TL40727822, A.C. Leslie & N.P. Millar, 16 July 2009 (b) along track north of Meadlands Main Drove, three at TL40037848, one at TL40017852, N.P. Millar, 20 July 2009. Great Burnet was recorded in the Sutton area by Alfred Fryer in the late nineteenth century, but had not apparently been seen since; it is a very local plant in the county.

*Selaginella kraussiana* Two patches under a low box hedge (in an area otherwise dominated by the liverwort *Lophocolea heterophylla*), near the north wall of Wimpole Hall, Wimpole, TL33575100, J.D. Shanklin, 2009, det. ACL. First v.c. record for Krauss's Clubmoss, an African species, often a weed in heated greenhouses, but increasingly reported outside, sometimes even in damp lawns.

*Silene uniflora* Two plants, self-sown at wall base, Ferry Path, Cambridge, TL45505945, A.C. Leslie, B.A. Tregale & M. Wilcox, 2 August 2009. First recent record for Sea Campion, here of course naturalised from a cultivated source nearby.

*Sonchus palustris* Four to five clumps at edge of a borrow pit, on west side of disused railway, between Ring's End and Twenty Foot Road, March, TF 4001, P. Harrington, 2009. A new site for the imposing Marsh Sowthistle: the Chatteris/March area is now the headquarters for records of this species in the county.

*Spartina anglica* One clump on east bank of tidal R. Nene, just south of Foul Anchor, TF46581682, CFG excursion, 12 September 2009, originally spotted independently from the west bank (using binoculars!) by Lynne Farrell and Jonathan Shanklin; ACL visited the site on 16 September to confirm the identity (specimen in CGE) and found three further flowering clumps scattered along the muddy margin of the river further to the north; all are just below the high water mark and are showing signs of vigorous vegetative expansion. First v.c. record for Common Cordgrass, an allopolyploid species that arose in this country on the south coast and which has spread widely, often as a result of deliberate introduction. Common around the Wash where it was recorded as introduced in the Lynn Cut in 1909.

*Symphytum orientale* x *S. x uplandicum* (*S. x perringianum*) This hybrid Comfrey has recently been named as new to science by Peter Sell and Philip Oswald and commemorates the late Frank Perring. It has been recorded on three neighbouring roadsides in Newnham: (a) Clare Road, TL44205750 (b) Millington Road, TL44155744 and (c) Barton Road, TL44165749. All three sites were first located by P.H. Oswald in c.1998. Only the Barton Road plant is extant *in*

*situ*, although material from the Clare Road plant, that was taken into cultivation by Frank Perring, is now in the University Botanic Garden and was used as the source for the holotype specimen in **CGE**. Two plants of the hybrid are now present at the Barton Road site (2007, A.C. Leslie, **CGE**); Graham Easy considers that in the 1980s more than one sort of comfrey was present on the Barton Road, but that the current hybrids were not present then and have arisen since. *S. orientale* is the only other comfrey present there now.

[*Stipa tenuissima* In *Nature in Cambridgeshire* **51**:91 (2009) this was reported from 15 Union Street, Cambridge. This should have read 15 City Road]

*Thuja occidentalis* One self-sown plant (c.15 ft tall), on grave in Station Road cemetery, March, TL42029747, A.C. Leslie, 8 March 2009, **CGE**. Second v.c. record for the Northern White Cedar, a North American conifer much less frequently encountered as a naturalised alien than the Western Red Cedar, *T. plicata*.

*Trachelium caeruleum* (a) numerous plants, self-sown on old, sheltered brick wall beside Cathedral Veterinary Surgery, Newnham Street, Ely, TL544805, A.C. Leslie, 1 March 2009, **CGE** (specimen collected 11 October) (b) numerous plants, self-sown in narrow light well below the west face of Clare College, Cambridge, TL446584, A.C. Leslie, 12 July 2009. Not now cultivated in gardens near either site. First v.c. records for Throatwort, a west Mediterranean *Campanula* relative, long known to be naturalised on walls in Guernsey and now also in a few places in south-east England.

*Trifolium ochroleucon* (a) in small quantity in two meadows at Caldecote, TL34945807 & TL34825781/43825777, J.D. Shanklin, 28 June 2009 (b) in good quantity on rough trackside, Hardwick, TL36685938 and many more just further to the north-east. Sulphur Clover is well known in the Caldecote/Hardwick area, but it is encouraging to see that new sites can appear, as none of these had been reported before.

*Urtica membranacea* (a) numerous plants in crack between pavement and the front walls of both a hair salon and an adjoining public house (the Sir Isaac Newton), Castle Street, Cambridge, TL44415933, 22 March 2009 (also in the gravelly car park behind the pub) (b) numerous plants in crack between pavement and wall of house, south end of Herbert Street, Cambridge, TL45465955, A.C. Leslie, 29 March 2009, **CGE**, also scattered further along the road and extending as far as 16/17 Herbert Street, as well as around the base of a planted *Acer negundo* at the south end of the street. First v.c. records for an annual nettle from the Mediterranean region, which has recently also been seen in Warwickshire and London.

*Veronica austriaca* subsp. *teucrium* One clump on bank above the south side of A1303, just east of Quy Water Bridge, Stow-cum-Quy, TL511594, first seen 30 May 2004, D.J. Barden, but not identified until 2009 (when it was still present). Second v.c. record for a European species often grown in gardens; the known introduction of other garden plants on the opposite bank of the road casts some doubt on the status of this record.

*Vicia cracca* f. *albida* Scattered over c.8 m at the bottom of the north-east face of the vallum of the Devils' Ditch, c.20m south-east of the Well Gap, Newmarket Heath, TL611621, D.J. & K Barden, 28 June 2009. This pretty white-flowered variant of Tufted Vetch has persisted here in the neighbourhood of the Well Gap since at least 1981.

*Vicia lathyroides* Scattered plants in dry, open, sandy, rabbit-grazed turf, north-east of Isleham Plantation, TL66157132, CFG excursion, 5 May 2009, with a few at east edge of closely horse-grazed paddock just to the west. Spring Vetch appears to have last been reported here in 1955,

so it was welcome confirmation that despite all the changes here, this rare species was still to be found in this area.

*Viola hirta* f. *rosea* In two places on the south-west face of the vallum of the Fleam Dyke, between the A11 and the Bedford Gap, TL55155382 (five small clumps) and TL55275368 (one plant), D.J. Barden, 29 March 2009. Colour forms of Hairy Violet are much less commonly noted than those for Sweet Violet (*V. odorata*) and remarkably this rose pink variant was recorded as being plentiful on the Fleam Dyke almost a century ago by Mr Wilmott, as quoted by Mrs Gregory in *British Violets* (1912). It had not been recorded there again until now and there are no other records.

*Viola odorata* var. *sulfurea* A patch, with much more numerous plants of var. *odorata*, on verge of De Freville Road, Great Shelford, TL466523, L. Evans, 29 March 2009, det. ACL. Second v.c. record for a rare variant of Sweet Violet with apricot petals and a purple spur.

## Bryophyte records

C.D. Preston and M.O. Hill

The formal recording for the proposed new bryophyte flora of Cambridgeshire (v.c. 29) finished at the end of 2009. Jonathan Graham and C.D.P. visited the last two 5-km squares, tiny fragments of v.c. 29 in TL68NE & SE, on 7 December 2009. On 31 December 2009 a small group celebrated the end of the campaign by visiting one of the least well-recorded 5-km squares, TL58SW, to make some last-minute records. In writing up the results we will benefit by having to hand Richard Fisk's excellent new account of the bryophytes of Suffolk in *The Flora of Suffolk* by M. Sanford & R. Fisk (2010).

There are not many records to publish this year, in part because the very dry early autumn followed by an unusually severe winter has curtailed fieldwork, and in part because in 2010 the focus of the Cambridgeshire Bryological Group moved away from v.c. 29. As in several previous years the outstanding records are those made by Robin Stevenson (C.R.S.) on his systematic survey of a sample of fruit trees in Cambridgeshire's surviving orchards; all the orchard records listed below were found in the course of surveys funded by the Cambridge & Peterborough Biodiversity Partnership. The most remarkable find this year was *Pterigynandrum filiforme* (Plate 6, back cover).

### Mosses

*Brachythecium populeum* Epiphytic on a dessert apple tree in a sheltered orchard, Cranwell Lodge, High Street, Elm, TF4707, C.R.S., 22.2.2010. There is only one recent record of this species in the county, from a churchyard at Friday Bridge, not far from Elm (see *Nature in Cambs.* 46: 92, 2004).

*Didymodon nicholsonii* Tarmac drive, W. end of Marshal Drove, Little Downham, TL532834, C.D.P. & M.O.H., 31.12.2009. This species has been spreading in Britain in recent decades. So far all our records have been from the south (and particularly the south-west) of the county; this is the first record from Fenland.

*Leucodon sciuroides* Two very healthy colonies on adjacent apple trees, Franklin's Old Orchard, Cottenham, TL4466, C.R.S., 2.3.2010. This provides further evidence that this species is increasing as an epiphyte in the county, after a long period in which it was known only on inorganic substrates.

*Orthotrichum speciosum* On two trees, a Discovery apple at TF41500627 and a Bramley at TF41620641, Garner's Orchard, The Broad, North Brink, Wisbech, C.R.S., 29.2.2009. The larger patch, on the Discovery, had both mature and immature capsules and its identity has been confirmed by R.D. Porley. In 2008 we reported the discovery of this species in Balsham Wood, the first English record since the 19th century. This is the second county record.

*Pterigynandrum filiforme* Epiphytic on a dessert apple tree, with *Hypnum cupressiforme*, *Orthotrichum lyellii* and *Syntrichia intermedia*, in sheltered orchard, Cranwell Lodge, High Street, Elm, TF4722307118, C.R.S., 22.2.2010, BBSUK, conf. T.L. Blockeel, & 1.4.2010. New to v.c. 29. Until 2005 the only post-1960 British records of *P. filiforme* were from Scotland, where it is found on basic rocks and more rarely as an epiphyte, but in 2005 Richard Fisk found it on the trunk of an unidentified *Acer* in King's Forest, West Suffolk. It is a Boreal-montane species which appears to have spread in the Netherlands in recent years. The species rarely fruits in Britain but often (as at Elm) bears gemmae.

#### Liverworts

*Cololejeunea minutissima* Small patch about 1 cm in diameter on trunk of *Salix caprea*, Lower Wood, TL62535297, J. Shanklin, 13.12.2009. A further record of this tiny liverwort, which is spreading into eastern England.

*Riccia cavernosa* Vehicle track over peat in winter-flooded area, with *Aphanorrhagma patens*, Kingfishers Bridge Wetland, TL542732, C.D.P., 18.8.2009. Five rosettes on bed of dried up pond (gravel and mud) created in the last year, Bramblefields Nature Reserve, Chesterton, TL47366065, J. Shanklin, 8.9.2009, conf. C.D.P. (from photograph). These records show that this species, though nationally scarce, is an effective colonist of newly created habitats.

## Invertebrate records 2009

### Louise Bacon

Last year was a very mixed one, depending on your invertebrate preferences. Beetle-hunters assure me it was one of their worst seasons; lepidopterists could argue it was one of the most interesting for a while, purely on the basis of a single event. Those two comments highlight the different impacts that our weather has for different insects.

Whilst I am not aware of any new species for the county, there have been a few interesting species found, and a very spectacular butterfly event.

#### **Coleoptera.**

One Violet Oil Beetle (*Meloe violaceus*) on Devils Dyke, 10 May 2009 (Louise Bacon). Oil beetles are rare, and appear to be declining; in Cambridgeshire we

have at least two of the four UK species, only on quality chalk grassland, and these appear to be very rare insects, despite being large and visible in spring.

## **Diptera**

The only group covered here is the hoverflies (*Syrphidae*). All but one of the records come from studies conducted by Peter Herkenrath and John O'Sullivan (the latter is hoverfly recorder for Bedfordshire).

*Callicera spinolae*: The presence of this endangered hoverfly has been confirmed at another site in South Cambridgeshire, west of the well-documented site at Wimpole Hall. An adult was seen on 24 September 2009, feeding on ivy flowers at the site, the location of which the landowner has asked should remain confidential (John O'Sullivan).

The larvae inhabit water-filled rot holes in large, old trees. Adults are seldom found, but several records refer to individuals feeding on *Hedera* flowers in the autumn. This extremely rare species has always been confined to East Anglia, and there are recent records only from Cambridgeshire sites. This nationally rare insect is a UKBAP species.

*Ferdinandea cuprea*: TL3557 Hardwick Wood, 5 September 2009 (Vince Lea, Louise Bacon). Two observed on oak sap-run.

The larvae, which when present are often numerous, are usually found in sap runs on deciduous trees. They are adapted to manoeuvre into small spaces such as below bark, and remain hidden deep within the sap. The pupae usually occur under loose bark near a sap run. Widespread throughout Britain but never common, occurring most frequently in areas with plenty of deciduous woodland.

Records of some locally uncommon species from Fen Drayton Lakes, from a survey undertaken for the RSPB:

*Cheilosia grossa*: TL3370 Fen Drayton Lakes, 21 March, 2+ hovering at willows (Peter Herkenrath).

The larvae mine the stems and roots of a wide range of thistles (*Cirsium* and *Carduus* spp., especially *Cirsium palustre*). Adults are found visiting flowers such as *Salix* catkins in the early spring, usually in sheltered situations at considerable height and thus records are scarce.

*Cheilosia soror*: TL3470 Fen Drayton Lakes, 29 August, a female of this Nationally Notable species (Peter Herkenrath, John O'Sullivan).

Adults are recorded from July to September and are especially attracted to the flowers of umbels such as Wild Parsnip (*Pastinaca sativa*) and Wild Carrot (*Daucus carota*).

*Eristalis horticola*: TL3470, Fen Drayton Lakes, 29 August, a female (Peter Herkenrath, John O'Sullivan).

The larvae are of the ‘long-tailed’, aquatic type, in most types of wetland, but especially pond and stream margins, especially wooded streams. Adults are usually found visiting flowers, especially white umbels, often in the vicinity of trees or scrub. They sometimes visit garden flowers. Appears to be more common in the north. Not easy to separate from others in this genus.

*Paragus haemorrhous*: TL3468, Fen Drayton Lakes, 27 June, a male and a female (Peter Herkenrath, John O’Sullivan).

The larvae feed on a range of ground layer and arboreal aphids. Adults are generally found resting on, or hovering above, bare ground along tracks and paths in a variety of situations. They can occasionally be seen visiting flowers. Males patrol sunny patches and stands of flowers. Common in southern England, but scarcer elsewhere.

### **Hymenoptera (Aculeata) - Bees**

Trevor Grange has located a colony of a mason bee, *Osmia bicolor* in Over (TL3868). This striking bee makes its nest in vacant snail shells. The shells are covered with small twigs or leaves in order to camouflage them from predators. It is found only in south east England, and there are several old records for v.c. 29 – this appears to be the first colony reported for several years - the only other v.c. 29 records are from the 19<sup>th</sup> and early 20<sup>th</sup> centuries, according to NBN Gateway data. There are more recent records from the Peterborough area (1990s).

Up to 3 individuals were seen at any one time, on three dates in April, 5 dates in May and again in early June. The concealing of a snail-shell of eggs was observed on two occasions, Apr 22 and May 23. The insects were observed frequently on flowers, such as bramble, and to enter and exit empty snail shells.

*Bombus hypnorum* continues to be found in new locations although still scarce – this distinctive white, black and ginger bee has been in the county for a few years, as part of its spread across Britain this century. Easy to identify, it is one to look out for.

### **Lepidoptera.**

In general, this was an average year, with no notable moth migration until late summer when a few regular migrant species were recorded across the county in low numbers.

One moth which has appeared in the county in the last couple of years is the Raspberry Clearwing (*Pennisetia hylaeformis*), which appears to have been recorded for the first time in the UK from the Cambridgeshire/Hertfordshire border in 2008. This species is potentially a significant horticultural pest species.

Many people, however, did notice the massive influx of Painted Lady butterflies into the whole of the UK in late May. This was possibly the largest ever influx of this species, and was observed Europe-wide following a successful period of breeding in north Africa.

The first indication of their arrival in Britain came on Thursday May 21 when Butterfly Conservation members first reported seeing large numbers off Portland Bill in Dorset. After that, thousands were seen flying north at locations across southern England, from Cornwall to East Anglia. This big NW movement occurred 24/25 May when at a guess 10-50 million arrived, mainly fresh individuals (those that have bred in southern Europe) plus first generation faded African insects. Big counts came from all over southern Britain (~50,000 counted), especially East Anglia. This was aided by classic weather conditions: low pressure over northern France feeding warmer air to southern/eastern England. Warm, sunny with easterly winds over eastern Britain allowing butterflies to migrate strongly NW with a favourable tail wind. Personal observations of this event from Louise Bacon follow:

On Bank Holiday Monday, 25 May, whilst driving home from visiting several sites, we noticed several, all flying strongly north over the road from the village to our house – six in the space of a couple of minutes. This was the day when several other observers observed a large passage heading north during the afternoon.

Three days later, whilst surveying farmland for birds, between 8 and 9 am, I noted that they were once more on the move after two intervening days of duller weather. I observed at least a hundred in that hour, many moving through, but several stopping either to nectar or, as the field was rather thistly, a few were, I think, ovipositing. During the same hour, I observed probably 20-30 Large Whites. This species is not as well known as a migrant, but it does migrate, and in years such as the one we were having, it is no surprise that this species was on the move as well. I only observed one Silver Y moth during the same time, and based on comments from others, the immigration of moths was not anywhere near as substantial.

Later the same day, the Ladies were still coming – whilst down the allotment they were flying past at about 12-15 individuals per hour through the afternoon, again, all heading north.

In June, this influx seemed to have slowed down considerably. Interestingly, in Cambridgeshire, we did not see a massive summer generation; large numbers, but not a thistle-stripping horde.

## **Plant Galls**

Seán L.M. Karley

The study of galls was neglected in Britain for a long time. The British Plant Gall Society was formed 25 years ago, partly to redress this. Since then they have published first a set of simple keys, then a thorough guide to identifying galls in the British Isles, and this guide is now approaching its second edition.

Meantime the galls themselves have not been idle. Several gall-causers which were unknown here until very recently, are now galloping across the countryside.

The latest invader is *Neuroterus saliens*. This gall-wasp causes galls on Turkey Oaks, where the sexual generation causes Anemone Galls on the catkins, and then the asexual generation causes Jumping Galls on the leaves. The galls were first recorded in Hackney in 2006. Since then it has turned up in Essex 2007; Berkshire 2008; Surrey and Wiltshire 2009. Last October I found the Jumping Galls in Maulden Wood, Bedfordshire. It may already be in Cambridgeshire. Please look out for them, and tell me if you find any. The Anemone Gall is about 10-15 mm across and looks a bit like its namesake. It starts green, but often turns red. The Jumping Galls occur on the leaves, usually on the midrib, a large vein, or the petiole, on either surface. It causes a split in the surface, and the gall grows out of this, swells and takes the shape of a Cornish pasty but without the ridge on the back. The two ends also swell a little, making distinct knobs. It is about 3 mm long. The colour is pale green, but can turn red in sunshine. When mature they detach from the leaf. They can then jump, about two millimetres! This may work them down into the leaf litter to overwinter. From Hackney to Bedford is about 60 km. That sounds like 30,000,000 jumps. Good going! Actually, of course, the wasps fly and no doubt use the wind to spread around.

If you would like to know more about Galls, or need some help with identification, please contact me. S Karley, (Gall recorder for the area of The Wildlife Trust), 30 Harrowden Road, Wellingborough, Northamptonshire, NN8 5BH. Tel. 01933 225397. e-mail:- seankarley@tiscali.co.uk

## OBITUARIES

### **John Hammond (1935-2009)**

John Alfred Hammond was an Emeritus Fellow of Homerton College who gave much to fostering an awareness of natural history in trainee teachers in Cambridge over a period of some 37 years (1965-2002). He served on the committees of the Wildlife Trust (then CAMBIENT), the local group of the Fauna and Flora Preservation Society and the Cambridge Natural History Society. He had a passion for wildlife and education.

John Hammond was a country-boy from rural Suffolk. The small Rendlesham village school that he attended had one teacher and children from 5 to 14 in a single mixed-age class of some 20 pupils. The older children in such remote schools taught their underlings - a perfect training for becoming a teacher - and, importantly, he grew up through the 1940s and early 50s familiar with the natural history and the richer Suffolk wildlife of those years. After a scholarship to Framlingham College, RAF service and London University, he taught with distinction at a London grammar school, before joining the staff at Homerton College as a zoologist to complement the botany taught by William Palmer. John Hammond was the College Head of Biology, following Palmer's retirement, and latterly the College Senior Tutor. Hammond followed in Palmer's footsteps with regular field trips with his students to the breadth of local environments at different seasons of the year. Such trips included his native breckland heaths, oak/ash woodlands like Hayley, chalk grasslands at Royston and regular visits to

Fulbourne Reserve and to Wicken Fen in high summer for its abundance of insect life. Several hundreds of trainee teachers enjoyed these trips and those experiences live on with them and their pupils today. There were also memorable annual trips from Homerton to the FSC Centre at Slapton Ley, in Devon, and even to the Norwegian Jostedal in several summers. John Hammond did much to promote children's education "both in the environment, through the environment and for the environment".

In the 1970s and 1980s school natural history slowly evolved into this wider environmental education and that in turn gave birth to our contemporary more global awareness. John Hammond served on the (CAMBIENT) wildlife trust Education Committee from 1977-1987, and on the Trust Council from 1984-1986. Homerton hosted several regional Environmental Studies Exhibitions for schools; there was even a falconry demonstration for children in the College dining hall! In the early 1980s the local group of the Fauna and Flora Preservation Society (now FFI) was very active. As President of the Cambridge Natural History Society (1981- 83) John Hammond combined special meetings of these two groups to bring an international conservation focus to the Natural History Society's affairs. In the years of his Presidency there were some 15 sectional meetings and three General Meetings in any one academic term, one of which would be an evening talk, with a wine-buffet supper and a tin-shaking at the door to raise needed funds for FFPS and its hard-pressed conservation projects. Hammond saw the need to address the political aspects and educational implications of the 1981 'Wildlife and Countryside Bill'. He therefore organised a full evening debate on this topic alone. Such major meetings as this, were addressed by notable individuals such as Sir Peter Scott, Gerald Durrell, David Shepherd the artist, Peter Melchett and Dame Miriam Rothschild. Hammond persuaded Durrell to draw animal sketches on a flip chart during one talk and then auctioned them at the end of the evening. John Hammond was a Vice-President of CNHS (1983-89) and Wildlife Trust Council member (1984-86) and among other things then raised money - in memory of his old colleague - for the William Palmer Memorial Fund. This effort contributed in no mean way to the survival of this journal. John Hammond died on 5th December 2009. The quality of environmental education delivered now by many teachers is his memorial.

Stephen P Tomkins

### **Peter Ivan Lake (1915–2009)**

Peter Lake, who died aged 94 on 26 June 2009, won an MC and the Croix de Guerre and became a Chevalier de la Légion d'Honneur as a result of his notable achievements while serving with the Special Operations Executive in enemy-occupied France from 9 April till August 1944. After a short period with the Italian section of the SOE, he joined the Foreign Office and served as British Consul in Mozambique, France, Iceland, Syria, Indonesia, Italy, Belgium and Brazil among other postings. After retiring in 1975 he worked for CAMBIENT,

the predecessor of the present Wildlife Trust, first as Secretary and then as a volunteer.

Peter Ivan Lake, the son of the acting Consul in Majorca, was born on 30 January 1915 at Limpsfield, Surrey, and educated at Clifton College and St John's College, Oxford, where he read Modern Languages. At the outbreak of the Second World War he was working for a merchant bank in West Africa, but he was called up in October 1940 and served with the Intelligence Corps before being recruited by the SOE. With Ralph Beauclerk, a radio operator, he was parachuted as "Jean Pierre" into the Dordogne valley to help Captain Jacques Poirier, a Frenchman with a British commission, to start a new circuit, code-named "Digger". Lake's rather stiff, punctilious manner belied his sense of humour and dare-devil exploits. He had to travel widely, using minor roads in the Corrèze, Lot and Dordogne; knowing that his cover would not hold up under expert interrogation, he carried his forged papers in one pocket and a revolver in the other, planning to shoot his way out if necessary. Once, bicycling with radio messages hidden in a bag below some vegetables, he encountered a German patrol with some Vichy support. Knowing that his French could fool the former but not the latter, he dropped his bicycle while talking to the Germans and the vegetables tumbled out; the *miliciens* picked them up for him and so omitted to question him! After other narrow escapes and as D-Day approached, Lake made his headquarters at a château at Limeuil. On 4 June Beauclerk reported that the BBC had broadcast the long-awaited message, "The giraffe has a long neck." It was the precursor of a series of major sabotage operations, during which Lake and three comrades blew up the track ahead of an armoured train carrying troops to threaten the Allied bridgehead in Normandy. On 15 August Lake played a notable part in negotiating the surrender of the German garrison of Brive-la-Gaillarde; a British uniform was dropped specially for him by parachute. Afterwards he and his three colleagues triumphantly entered the city, standing in the back of an open car to great acclaim.

Peter twice met General de Gaulle. The first time, in Marrennes, the General wounded him deeply by telling him that, as an Englishman, he had no business to be in France and then turning his back on him. On the second occasion, however, when he was serving in Brazil and the French Ambassador invited him to a reception in the General's honour, de Gaulle greeted him charmingly.

In October 1975 Peter Lake was appointed full-time paid Administrative Secretary of CAMBIENT, a post that he held for two years, working in the small building next to 1, Brookside at the entrance to the Botanic Garden. Mrs Joyce Morley, appointed in 1972, remained as Assistant Secretary. Lake's predecessor, Robert Payne, continued for a while to be responsible for fieldwork on a part-time basis. (For his obituary see *N. in C.*, No. 41 (1999): 30–31.) In 1977, the year that the Trust celebrated its 21st birthday, Joy Greenall was appointed as its first professional Conservation Officer and in the following year she was joined by Keith McNaught as Field Officer, when she took on the joint post of Secretary and Conservation Officer. In November 1979 CAMBIENT launched its Cambridgeshire Wildlife Appeal and Peter was one of the numerous volunteers who made it so successful. He served on the Trust's Council from 1980 to 1982.

Peter Lake married Kathleen (Kay) Sheffield in 1944; she survives him with their son and daughter.

Philip Oswald

(based largely on an obituary in the *Daily Telegraph* of 13 July 2009)

Keith McNaught, who was CAMBIENT's Field Officer from 1978 till 1985, writes:

At the time that I joined the Trust in 1978, Peter Lake was no longer Secretary, a post he had held until October 1977. As a new member of staff, I remember Peter as knowledgeable, helpful and very supportive and I worked with him (until I left in 1985) in his subsequent volunteer roles as a member of both the Trust Council and the Appeal Committee for the Cambridgeshire Wildlife Appeal (which raised £100,000 for purchase and maintenance of land and property at the Ouse Washes, Overhall Grove, Soham Meadows and Hayley Wood Cottage).

I don't recall Peter Lake speaking about his wartime exploits or consular activities, but there is no doubt that his skills in diplomacy and organisation were considerable assets to the work of the Trust. Peter Lake was involved at a time of very limited resources for the Trust, and it is to him and other volunteers who willingly brought their expertise that so much was achieved in those early years: the reputation and strength of the Trust grew because of their involvement.

### **Peter Frederick Yeo (1929–2010)**

Peter Yeo was born at Kingston-upon-Thames in Surrey on 30 March 1929. He came up to Queens' College, Cambridge, in 1948, where he read Natural Sciences, taking Part II Botany and becoming B.A. in 1951; he received his M.A. degree in 1955. He went to Leicester University to do research on the genus *Euphrasia*, for which he received a Ph.D. He joined the Botanical Society of the British Isles in 1951 and was a Fellow of the Linnean Society for 34 years. Later he became a Fellow of Wolfson College, Cambridge.

Peter was appointed Taxonomist and Librarian at Cambridge University Botanic Garden in 1953, where he remained until his retirement in 1993. With his assistant, the late Clive King, he worked hard on accurately naming all the plants in the Garden and formed a large herbarium of the species that grew there. They became some of the best labelled plants in any garden in the country. He was one of the Editorial Committee of, and a contributor to, *The European Garden Flora*, Volumes 1–5 of which were published by Cambridge University Press between 1986 and 2000. Together with Clive King he compiled *Catalogue of plants in the Cambridge University Botanic Garden* in 1981.

Peter Yeo's three main botanical interests were *Euphrasia*, which he studied for his Ph.D. thesis and continued to write about for the rest of his life, the taxonomy and cultivation of *Geranium* species, and the pollination of plants. He wrote numerous taxonomic papers on many other genera, a list of which would show what a wide knowledge of plants he had.

For his Ph.D. at Leicester he had dealt with *Euphrasia* in the British Isles. In 1972 he published an account of the European species of this genus in *Flora Europaea* **3**: 257–266, after writing detailed *notulae* in *Botanical Journal of the Linnean Society*, **64**: 353–361 (1971), and in 1978 descriptions of the Turkish species in *Flora of Turkey*, **6**: 756–763 and a monograph on the European species in *Bot. J. Linn. Soc.*, **77**: 223–334. The last was preceded by a long tour of West European herbaria while he was on sabbatical leave in 1977. In 1970 I was his co-author of a paper on the North American species published in *Bot. J. Linn. Soc.*, **63**: 189–234. It was while working on this long paper that I got to know him best. He was not a great talker and most of our discussions were very much to the point. When things got taxonomically difficult I would tend to put them off to start on afresh another day, but he would keep on to the bitter end of the time he had allotted. Where we were in full agreement was in producing a detailed description of each taxon rather than picking out certain characters. This was important for us in understanding and recognising the numerous hybrids that occur in the genus. It may well have been because both of us started our work on critical taxonomy, Peter in the genus *Euphrasia* and I in *Hieracium*, using the detailed and accurate descriptions of these genera in monographs by Herbert William Pugsley.

In his detailed account of *Geranium* in Madeira and the Canary Isles Peter named a new species from Madeira *Geranium rubescens*. This was later found to be a homonym and Aedo and Muñoz Garmendia gave it the new name of *Geranium yeoi* after Peter. Peter's wide-ranging work on the genus resulted in his book *Hardy Geraniums* in 1985, with a reprint in 1992 and a new edition in 2001. This describes over 140 taxa and contains over 50 coloured plates and leaf silhouettes of all the numerous taxa growing in the Cambridge Botanic Garden. These were available to Gina Murrell and me when we prepared the account of the genus for our *Flora of Great Britain and Ireland*, but unfortunately Peter was too ill to read our final version. The other account which was so helpful for our *Flora* was that of *Aster*, which he was writing for *The European Garden Flora* while we were writing ours.

The most important of all Peter's numerous publications was probably *The Pollination of Flowers* with Michael Proctor in 1973 as number 53 in the New Naturalist series. This was reprinted in 1979 and in 1996 the two original authors wrote with Andrew Lack a completely new volume in the series, number 83 entitled *The Natural History of Pollination*. This splendid volume describes all the means by which pollination is brought about, by wind, water, birds, bats and even mice and rats but principally by a great diversity of insects in a large number of different ways. In addition, in 1972 Peter himself wrote 'Miscellaneous notes on pollination and pollinators' in *Journal of Natural History*, **6**: 667–686 and in 1993 he published *Secondary pollen presentation: form, function and evolution* as Supplement 6 to *Plant Systematics and Evolution*. He was particularly interested in the Hymenoptera and with Sally Corbet wrote *Solitary wasps* as number 3 in the Naturalists' Handbooks series.

I almost forgot a work that I was particularly impressed by – 'A revision of the genus *Bergenia*' in *Kew Bulletin*, **20**: 113–148 (1966), which was followed by 'Further observations on *Bergenia* in cultivation' in *Kew Bulletin*, **26**: 47–56

(1971) and ‘Cultivars of *Bergenia* in the British Isles’ in *Baileya*, **18**: 96–112 (1972). Many of these plants too were grown in the Botanic Garden.

Peter’s specimens of British and Irish *Euphrasia* have been given to the Cambridge Herbarium (CGE) and his collection of Hymenoptera to the University’s Department of Zoology.

Sadly Peter’s last twelve years were spoilt by Parkinson’s Disease. He leaves a wife, Elizabeth.

Peter Sell

## BOOK REVIEWS

*Flora of Hertfordshire*. T.J. James. Hertfordshire Natural History Society, Welwyn Garden City, 2009. Hardback. viii + 518 pp. ISBN 978-0-9521685-8-4. £49.50.

It seems a long time since I attended my first Herts Flora Group meeting fifteen years ago. Since then I have been looking forward to the new Flora, and now it has arrived I can see that Trevor James and the rest of Hertfordshire's botanists have done a very good job at recording and documenting the county's plants in the intervening years. One of the introductory chapters makes it clear that the time period of the project was supposed to mirror that of John Dony's Flora (18 years, from 1950-1967). This might seem like a long time, but it has enabled us to have a more thorough coverage, and it has been worth the wait. One of the heartening features of the Flora is the number of localities for rare or 'lost' species that have been discovered or re-found during the survey, some of them only in the last couple of years. If the recording period had been shorter, we would have missed out on these. The other introductory chapters tell us about botanists in Hertfordshire, the county's environment, plant communities, and the changing flora. These are brief but informative, and it was interesting to learn a little about the botanists who had helped with the current survey and see photographs of them in action in the field. It appears that Trevor and I have similar feelings about natural landscapes and alien plants, but I hope that even those who disagree with us will find that he treats these provocative subjects sensitively. Indeed, throughout the book, in matters of opinion and fact, he tells us what he believes but he acknowledges that his is not the only point of view.

Following the introductory chapters are photographs of sites. This section is one of the most interesting and useful parts of the book. The photographs are all labelled with their date, and already one can see changes at some of the locations. In fifty years these will be even more useful; a couple of photographs can show how a site has changed much more vividly than tables of data, and they do it in an instant. After the introductory chapters and a useful glossary, we come to the species accounts. Many of these are illustrated with tetrad dot maps with an insert showing the map from the 1967 Flora, allowing an instant comparison with the previous survey. Those species with fewer than ten records are usually not given maps, but their localities and tetrad references are given in the text. This is a shame for those of us to whom 31/K or 90/P mean nothing. The species photographs are informatively labelled with date and location; some of them are now gone from

these sites, and the photos are a ghostly reminder of what could happen to those that remain.

Casuals get the shortest accounts; natives and well-established aliens receive several sentences telling us something of the ecology the plant in the county, outlining its distribution, and comparing the findings of the recent survey with those of the earlier Floras. The maps might show that a species is restricted to a few areas, or is commoner in one part of the county; the text attempts to explain why. For many of the rare plants we have a potted history of their occurrence at each of the sites. There is often a long time between records, and the date at which some species appear to have been lost from sites can be shockingly recent. This is a potent reminder that plants need people to keep an eye on them and to do something to help those that seem to be in trouble.

I ceased being a Hertfordshire resident many years ago, and I have rather neglected the county, even though I have not moved far. This book has shown me that there are good reasons to start exploring it again, and that it has a surprising amount to teach us about plant ecology. Trevor James has produced a model local Flora, which will be of interest and instruction to those in neighbouring counties who do not yet have their own modern accounts.

Mark Gurney

**The Golden Oriole.** Paul Mason & Jake Allsop. T & A D Poyser, London. 2009. 280 pp, 35 black and white illustrations, 8 colour plates. Hardback: ISBN 978-0-7136-7683-9. £45.00

This is a truly East Anglian book with an international flavour. Cambridgeshire-based Paul Mason and Jake Allsop have been active members of the Golden Oriole Group, which has been monitoring and protecting the tiny British Golden Oriole population for many years. Their enthusiasm for this species reads between the lines from the first sentence of the introduction: ‘The Golden Oriole, as most oriole watchers who study the bird will surely agree, is the most frustrating, intelligent, beautiful, characterful, acrobatic, brave, diverse, successful and exciting arboreal passerine there is’. The book presents the biology, ecology and behaviour of the Golden Oriole across its entire range, with a focus on the remaining British population in the East Anglian fens. The authors present the many research results of the members of the Golden Oriole Group, and one can only feel impressed by the longstanding and thorough fieldwork this group has undertaken. This is augmented by plentiful information from the literature and the authors’ many personal contacts in several other countries.

The first chapter introduces the species, its field marks and biometrics, and the other currently recognised 26 species in the genus *Oriolus*. Chapter 2, the story of Lakenheath and the Golden Oriole Group, will be of particular interest for those who have followed the establishment of the RSPB reserve at Lakenheath or the activities of the Golden Oriole Group, which have focused on this beautiful fenland area just over the border from Cambridgeshire in Suffolk and Norfolk.

The chapters on the species' habitats present not only the habitat choice of the species but also review its status throughout its range. It is fascinating to learn how closely the species is aligned with planted poplars, not only in Britain but in many other European countries as well. With major changes in the matchmaking industry, poplar plantations are increasingly replaced by native trees, sometimes for the purpose of conservation but to the detriment of the Golden Oriole! The authors have done a great job in elaborating which poplar varieties are actually used by orioles for nesting – not all varieties are suitable.

A brief chapter on climate and weather and their impact on our bird is followed by chapters on courtship and nest-building, egg-laying and incubation, nestlings and fledglings, diet, and interspecific relationships. The next chapter, on song and calls, introduces the wide range of vocalisation (although I failed to understand fully the authors' summary of Baumann's comprehensive findings on the song repertoire of the Golden Oriole in northern Germany). The chapter Population: past, present and future presents the species' status in Britain and all other countries – with the world population estimated at 3.3–12.5 million pairs – and the reasons for the population declines in northern and western Europe. The last two chapters form an extensive account of the species' migration and wintering, putting together many pieces of information to establish the current understanding of orioles' movements.

While this all makes excellent reading, I do have a few quibbles. There are quite a few inaccuracies, typos and contradictions (*e.g.* on p 68 on the occurrence or not of the species on the northwest Spanish coast). Some sections do not represent what the heading promises (*e.g.* *Oriolus percivali* is introduced under *O. monacha*). I find the misspelling of some names unfortunate; *e.g.* the name of one of the authors of an often-quoted reference, Burfield & van Bommel (2006), is misspelled throughout the text and in the bibliography. Also, the many helpful maps, often from regions in countries not many readers will be too familiar with, lack a scale.

I am very glad to see foreign publications widely referenced, including the extensive German literature, although with the exception of a key publication, the *Handbuch der Vögel Mitteleuropas* (*Handbook of the Birds of Central Europe*, Glutz von Blotzheim 1993, vol 13) with its extended chapter on the Golden Oriole. However, the multitude of spelling mistakes in the German references is disappointing. I was also surprised not to see the BTO Migration Atlas (Wernham *et al*, 2002) referenced.

These shortcomings, as well as the high price, should, however, not deter anyone interested in bird behaviour and ecology from reading this fascinating book about a fascinating bird. A highly recommended publication.

Peter Herkenrath

*From Brandon to Bungay. An exploration of the landscape history and geology of the Little Ouse and Waveney Rivers* by Richard West. Suffolk Naturalists' Society, Ipswich. 137 pp. + Appendix and 38 plates. 2009. Price: £12.

The author of this beautifully produced volume will be familiar to anyone with an interest in the Quaternary geology of East Anglia or indeed Quaternary research in general. Over a period of more than fifty years Richard West has undertaken fieldwork in East Anglia, producing seminal studies of many sites of geological and archaeological interest, as well as a classic study of the Pre-glacial Pleistocene of the Norfolk and Suffolk coasts (the Cromer Forest-Bed Formation). He was also responsible for helping to build up the stratigraphical framework of glacial and interglacial stages that characterise the Pleistocene. In this volume West turns his attention to an intriguing part of central East Anglia where a flat area, known as Lopham Ford, forms the watershed between the River Waveney that flows east to the North Sea and the Little Ouse River that flows west into the Wash. This area, which includes the National Nature Reserves of Redgrave and Lopham Fens, was well known to many geologists in the nineteenth and early twentieth centuries but a satisfactory explanation of its origin has remained elusive.

In order to resolve this mystery West has collated all the existing information from both published and unpublished sources and augmented these with detailed observations of his own that resulted from what he describes as a ‘walking survey’. This survey began in 2002 in the area of the headwaters but soon expanded in scope to cover much of the length of the Waveney and Little Ouse valleys (a total distance of about 80 km). The survey remained fundamentally simple, confining itself to a description of geological/geographical features and an interpretation of the landscape history derived from them. The only pieces of equipment, apart from maps and aerial photographs, were a 1 m soil auger, a 1.5 m peat probe and a sand ruler to estimate the coarseness of sands. The book describes the results of the survey, achieved with such basic tools, more-or-less in the order in which it was undertaken.

Sections of each valley are considered in turn and a regional synthesis is provided in chapter 9. So how did Lopham Ford form? West suggests that a lake was impounded in the valley of the Little Ouse by glacier ice in the Fenland during what he refers to as the ‘Wolstonian Stage’. He believes that the Lopham Sands, which extend across the current Little Ouse-Waveney watershed, were deposited in the lake, which overflowed into the Waveney Valley. Precisely when this happened has still to be pinned down, since the ‘Wolstonian Stage’, as defined here, covers a significant part of the late Middle Pleistocene. There is clearly scope for others to conduct their own ‘walking surveys’ to address these unresolved issues.

The book, printed in A4 format, contains many figures and includes an extensive bibliography and an appendix with a glossary of terms intended to make this volume accessible to the non-specialist reader – the main target audience. The book concludes with a series of 38 photographs (most in colour), which are of excellent quality. There is a wealth of information presented in this volume, much of it completely new, including maps, sections and down valley profiles, which will be of interest to both an amateur and professional readership. Such detailed local studies are now virtually impossible to publish in standard journals and the Suffolk Naturalists’ Society, aided by GeoSuffolk, are to be congratulated for facilitating its publication in such an attractive fashion. Moreover, its price, at just £12, makes this volume excellent value for money.

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Toby Carter

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## Weather Summary for 2009

John Kapor

January started cold with the first eleven nights all experiencing an air frost, and the maximum temperature staying just below freezing ( $-0.6^{\circ}\text{C}$ ) on the 9<sup>th</sup>. A milder spell followed, giving way to a very wintry spell in the first half of February. From the evening of the 1<sup>st</sup> right through to the 15<sup>th</sup> February, there was some snow constantly on the ground somewhere within the Garden. The greatest depth fell on the morning of the 2<sup>nd</sup> with 7.5cm blanketing the Garden. Over this period there was some slow thawing during the day; however five more falls of snow kept the snow base topped up to around 3cm. By the end of the month there was a definite milder trend with  $14.7^{\circ}\text{C}$  on the 27<sup>th</sup>. March received lower than average rainfall and the Garden began to dry out, with a pleasant  $17.1^{\circ}\text{C}$  reached on the 16<sup>th</sup>.

April was a very dry month with only 13.2mm of rain, the heaviest shower yielding only 6.1mm on the 16<sup>th</sup>. The last touch of air frost occurred on the 5<sup>th</sup>. The temperature reached the twenties on three days. May was also on the dry side, with the exception of a 19mm downpour on the 25<sup>th</sup>, the wettest day for six months. Again June saw lower than average rainfall, with the last week of the month very warm and a maximum of  $29.6^{\circ}\text{C}$  recorded on the 29<sup>th</sup>. The lawns were starting to brown up in places as a result of four months on the trot of below average rainfall.

July reversed the dry trend in style and we received 108.6mm rainfall - at least double the average for the month and making it the wettest month since May 2007. It is also worth noting that July's total was only a fraction less than the total for March, April, May and June combined. Conditions were generally showery and there were seven days with thunder, the most notable of these was on the 17<sup>th</sup> when 31.7mm fell. During this month the Garden took on a green, lush and healthy appearance, and the lawns recovered quickly. The warmest day of the year was on the 2<sup>nd</sup> when  $30.0^{\circ}\text{C}$  was reached.

August started as July had ended, with the 6<sup>th</sup> August being the wettest day of the year when 37.5mm gave the Garden a real soaking. It is unusual in our area for two drenchings of over 30mm to occur within three weeks of each other. However after the 12<sup>th</sup>, things dried out again and only 2.6mm fell in the remainder of the month, but the Garden managed to retain its lush appearance. September was a dry month with only the first two days receiving any rain at all (11.2mm in total), followed by thirty days of no measurable rainfall.

October was also on the dry side with 33.8mm in total for the month. Notwithstanding six slight ground frosts, the temperature did still manage to get to a very pleasant 20.4°C on the 6<sup>th</sup>.

November had eleven ground frosts, with the lowest being -3.4°C on the 10<sup>th</sup>. But with no air frosts to bring down the leaves, the autumn colour lasted very well on the trees and many herbaceous plants completed their displays unscathed by frosts. It was a very wet month with 16.9mm falling on both the 12<sup>th</sup> and 28<sup>th</sup>, contributing to the month's total of 102.7mm. Again, it is unusual for this part of the country to have over 100mm precipitation in two months in the same year.

December started on the wet and relatively mild side with a succession of fronts already giving us 26.2mm in just over the first week. We also had our first air frost of the season on the 1<sup>st</sup> with -1.6°C, this was a taste of things to come as the second half of the month became much colder with widespread frosts and a heavy snowfall on the 17<sup>th</sup> gave a covering of 11.5cm. Strong winds combined with the heavy snow caused some damage to the trees, with several branches breaking off, the snow was then slow thaw but the 15.0mm that fell on the 29<sup>th</sup> helped cleared the last patches. The month was wet with 71.6mm falling.

#### Monthly Mean Temperatures (°C) and Rainfall (mm)

Month	Maximum	Minimum	Rainfall per month (mm)
Jan 2009	6.14 (9.8)	-0.38 (-7.0)	38.0
Feb	7.56 (14.7)	1.65 (-5.0)	55.7
March	12.31 (17.1)	2.54 (-2.3)	32.6
April	16.71 (21.9)	5.30 (-0.2)	13.2
May	19.13 (25.9)	7.95 (1.8)	28.5
June	20.65 (29.6)	10.60 (4.0)	37.5
July	22.74 (30.0)	11.95 (7.2)	108.6
Aug	24.09 (29.2)	13.14 (7.5)	56.3
Sept	20.50 (27.8)	10.49 (4.1)	11.2
Oct	15.56 (20.4)	7.88 (0.9)	33.80
Nov	11.57 (16.7)	6.23 (1.4)	102.7
Dec	6.29 (12.6)	0.52 (-5.7)	71.6
Total			589.7



**Plate 3.** Heterotardigrade: *Echiniscus* sp. (Photograph by Cass Bromley) (See article on page 40).



**Plate 4.** Eutardigrade: *Ramazzottius* sp. (Photograph by Cass Bromley) (See article on page 40).



**Plate 5.** Thirty-five foot bog oak found near Haddenham, 27 February 2009. (Photograph by Paul Mason) (See article on page 49)



**Plate 6.** *Pterigynandrum filiforme* (shoots with more tightly appressed leaves) and *Hypnum cupressiforme* on an apple tree at Elm. (Photograph by Robin Stevenson) (See Bryophyte Records page 73)