NATURE IN CAMBRIDGESHIRE

No 48 2006

MAX WALTERS 1920 - 2005

Elater ferrugineus, a rare click-beetle from Wimpole. See the article by Simon Damant.

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Cover Illustration. Max Walters in the wildflower garden of Great St Andrews Church, Cambridge, in June 2000.

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EDITORIAL

This is the first issue of Nature in Cambridgeshire that I have had to produce without the guiding presence of Max Walters. Max was always helpful and understanding, and I am certain that I speak for the rest of the Editorial Board when I say that he will be sorely missed, both as a friend and as the Chairman. The current form of this journal, and its survival since 1985, is largely due to Max's support. The first article in this issue is an obituary of Max by Peter Grubb, and on the front cover is a photograph of Max taken by Philip Mynott in June 2000. We are grateful to Mr Mynott for his permission to reproduce this photograph.

Unfortunately, with this issue, we have had to introduce a further price increase, from £4.50 to £5. If we could increase the number of subscribers, it would greatly help our finances, so please recommend this journal to your friends!

We have a wide variety of articles this year, from the first part of a new algal flora of Cambridgeshire, via a survey of ladybirds in the county, a look at the flora of the Cambridge Science Park and a study of two rare Cambridgeshire moths to an account of the new species of bryophytes that have been found in the county in the last fifty years. Graham Easy gives his views on Cambridgeshire farm bird numbers and Simon Damant writes on bats and on rare invertebrates, both at Wimpole.

Toby Carter begins a Natural History Bibliography for Cambridgeshire. Our intention is to include this on our website, and to update it annually. Please notify a member of the Editorial Board if you know of any additions or omissions.

As usual, we have updated records of vascular plants and bryophytes, book reviews and John Clarke has provided weather records.

ERRATA

There was some confusion about last year's cover picture. It was captioned as *Callicera aurata*, but I am assured that is, in fact, *Callicera spinolae*. I apologise for this mistake.

Max Walters (1920–2005)

Stuart Max Walters, who died on 11 December 2005 aged 85, made a more sustained and inspiring contribution to the activities of the Cambridge Natural History Society, the Naturalists' Trust movement in Cambridgeshire, and this journal *Nature in Cambridgeshire* than any other person. These specific contributions he made in the context of a very general concern for natural history and conservation at a local scale. He was wonderfully gifted at uniting the efforts of professionals and amateurs, spotting individuals who had a lot to give and inspiring people to achieve far more than they could have imagined possible. People who worked with him in the Society or the Trust, or on *Nature in Cambridgeshire*, talk of him as their 'mainstay' or 'tower of strength'. Before spelling out this side of his life, I shall summarise his career as an academic.

Max was born in Oughtibridge near Sheffield on 23 May 1920; his father Bernard was a furnace foreman in a steel rolling mill who had been apprenticed to his own father, and his mother was a teacher. Soon after 1920 they moved a short distance to Stocksbridge, where Max grew up. Both towns lay in a smoke-covered valley within the 'Socialist Republic of South Yorkshire'. Max was proud of the fact that the Grammar School he attended at Penistone, between Sheffield and Huddersfield, was founded in 1392. From his parents he inherited the deep Christian faith and socialist principles that guided his whole life, and also his love of the countryside (even though the moorlands were covered in soot!). From his childhood he was fascinated by plants, especially their variation and their relationship to their habitats.

He went up to St John's College, Cambridge, in 1938 with an Open Exhibition from the College and a County Major Scholarship from the West Riding. His elder brother, Alec, a mathematician, had preceded him to Cambridge (Peterhouse). Max was promoted to an Open Scholarship after one year and gained First Class Honours in Part I of the Natural Sciences Tripos in 1940. As a pacifist, he worked from 1940 to 1945 in hospitals, first in Sheffield and then in Bristol, returning to Cambridge in 1945 and gaining a First in Part II Botany in 1946. Max left school expecting to become a biochemist but two experiences led him into field botany instead. First, he was hugely impressed by his time botanising in the Swiss Alps between school and university, on a travelling scholarship from the West Riding, and by his time in the Cairngorms a year later on a high-powered field trip from the Cambridge Botany School: Max was sufficiently outstanding to be allowed to join a trip meant only for second and third year students. The second key experience was the teaching in Cambridge by Mr Humphrey Gilbert Carter, first Director of the University Botanic Garden, and Dr (later Professor Sir) Harry Godwin.

In 1946, when he began research for a PhD on a DSIR grant, Max did not choose to work on mountain plants despite their fascination for him, but decided instead to study certain lowland sedges. His topic was 'Variation in *Eleocharis palustris* agg.'. In the introduction to his dissertation (submitted and approved in

1950) he notes that he had been introduced to the taxonomic problems of *Eleocharis* by Richard Libbey (an amateur botanist) in 1944 in the context of identifying all the Cyperaceae of Norfolk fens. Max's doctoral work was partly in classical taxonomy and the related fields of cytology, morphology and anatomy, and partly in the relatively new field of experimental taxonomy, which involves cultivating plants in uniform conditions to establish how far differences in the field are genetically determined. He did his experimental work at Wicken Fen. He received very light supervision from Godwin, who wanted to encourage experimental taxonomy in Cambridge and recognised Max's self-motivation. In 1947 Max spent a summer in Sweden, where some of the seminal work in experimental taxonomy had been done; he was based in Uppsala, where Linnaeus had worked. While in Cambridge he learned Swedish from Brita Mortensen, a granddaughter of August Strindberg.

In 1949 Max was elected to a three-year Research Fellowship at St John's. He was made Curator of the University Herbarium in the same year and, while retaining the Curatorship, became a University Lecturer in Botany in 1962 and Fellow of King's College in 1964. He moved his base to the University Botanic Garden in 1973 on becoming Director. During the period 1949–73 he worked actively on a number of projects in parallel. He supervised several PhD students in the experimental taxonomy of groups within *Galium*, *Linum*, *Ononis*, *Ranunculus* and *Silene*, while becoming an expert on the classical taxonomy of *Alchemilla*, *Aphanes*, *Montia* and *Viola*. He published two popular volumes in the New Naturalist series (*Wild Flowers* in 1954 with John Gilmour and *Mountain Flowers* in 1956 with John Raven). With Franklyn Perring he produced the *Atlas of the British Flora* (1962). With Franklyn, Peter Sell and Harold Whitehouse he wrote *A Flora of Cambridgeshire* (1964). He was one of seven editors of *Flora Europaea* and wrote accounts of many genera (Volumes 1–3 of five were published in 1964–72). With David Briggs he wrote the well-received *Plant Variation and Evolution* (1st edn 1969, 3rd 1997). He also gained a grant which enabled Richard Pankhurst to make pioneering studies on the construction of computerised keys for the identification of plants (1971–74). The *Atlas* was enormously influential, its scheme of mapping species in 10-km squares being adopted for many kinds of organism in various parts of the world. *Flora Europaea* involved scientists from across the continent, with very different points of view. Max's linguistic skills and his relaxed and engaging personality played a vital role in achieving consensus. He had a special responsibility for liaising with authors in eastern Europe; he visited many of them and facilitated their visits to Britain. In 1967 he was a Royal Society Visiting Professor in Ljubljana, and in 1971 he held a British Council award that enabled him to work for three months in various parts of Yugoslavia.

During this period Max was also devoting much time to teaching. From 1952 he gave the second year students lectures on experimental taxonomy, variously entitled over the years 'Evolution and Reproduction', 'Taxonomy and Evolution' and 'Genetics and Experimental Taxonomy'. Otherwise he continued Gilbert

Carter's practice of teaching the third years the families of flowering plants in a global context and giving classes in elementary German. These last were needed because in the end-of-year practical exam in taxonomy candidates were required to identify an unknown plant using a German flora (Garcke's *Flora von Mittel- und Nord-Deutschland*), detailing every step in the key. [I fear that in my exam in 1957 I recognised the *Globularia* instantly and worked backwards through the key from the genus!] An important part of the ritual was to take the students interested in taxonomy to the Royal Botanic Gardens, Kew, for an informative but relaxing day between the theory and practical exams. Max also followed Gilbert Carter in taking students of various years on afternoon bicycle rides to get to know the local flora.

It is well to remember that Max also 'supervised' (i.e. gave tutorials to) first year students in Botany (up to 1964) and in Biology of Organisms (from 1966) on the whole range of disciplines from morphology and anatomy through ecology to physiology. In the Easter vacation or in the summer he took students on excursions covering taxonomy and ecology, mostly abroad and generally at two-year intervals – Sweden (1950), Portugal (1951), Scotland (1953), Austrian Alps (1954), Wales (1955), Ireland (1959), Bavaria (1961), Slovakia (1963), southern France (1965), Slovenia (1967), Majorca (1969 and 1973) and Montenegro (1971). Gently but effectively he conveyed his enthusiasm: deep down botany was a serious matter, but it was also to be fun. I was Max's junior in running four of these excursions, and it was a great privilege to see at first hand how he kept up the flow of scientific ideas while seeming so relaxed. One more thing should be recorded about Max as a young teacher: he was unusually handsome. At the end of one of his lectures the prettiest young woman in the class, who was sitting to next to me, said "He is just so good-looking!"; being rather a serious young man, I was quite shocked and thought she should be concentrating on the lecture, not the lecturer!

When Max took on the Directorship of the Garden (1973–83), its future seemed rather uncertain, and it is a great tribute to his personality and style that the Garden was a happy place to work in despite the threats in the background. The number of occasions on which colleagues at the Botany School brought undergraduates had fallen greatly, as had the number of specimens sent up to Downing Street for use in practical classes, and some people in the University were saying that the Garden cost more than could be justified. Max's approach was to take care of the scientific side and external relations and leave the care of the plants to the staff: he was an enthusiastic grower of vegetables and for years had an allotment, but he was not a conventional 'keen flower gardener'. During his time the documentation and labelling of the collections were brought to a very high standard. Max did everything he could to get people of all kinds to come into the Garden and to emphasise its role in the education of individuals of all ages. He encouraged Roland Randall to write the first modern educational leaflets for the Garden, those on native trees and shrubs (illustrated by Rosemary Nicholls), and appointed the first Education Officer working with local schools. In insisting on first-rate labelling and getting all kinds of people into the Garden Max was consciously

following the example of J.S. Henslow, the Professor of Botany who established the Garden on its present site. He also relaunched the Friends of the Botanic Garden organisation, which had lapsed after its foundation in the 1930s. Max's efforts to revitalise and 'save' the Garden received enthusiastic and invaluable support from Dame Rosemary Murray, President of New Hall, who was Chairman of the Botanic Garden Syndicate (the governing body) from 1977 to 1985, immediately after her two-year term as Vice-Chancellor.

About the time when Max moved to the Garden, Gigi Crompton had been given a contract by the Nature Conservancy Council (NCC) to survey rare species in eastern England, chiefly Breckland initially. Max happily provided Gigi with a base in the Garden and developed the project by gaining extra funds from the NCC to employ a succession of conservation propagators to study the responses of key species to their environment under cultivation. He supervised the construction of a new display bed of rare plants of the region and also provided a home for conservation of rare plants from Majorca and St Helena. In these ways Max put Cambridge among the first of the great gardens to concern themselves with conservation (cf. his article in the North American journal *Garden* for Jan.–Feb. 1980, pp. 20–23). He was strongly involved from the beginning at both national and local levels in the National Council for Conservation of Plants and Gardens (NCCPG), the leading charity for the conservation of cultivated plants, established in 1978. At the national level he was a member from the start of the Steering Committee and then for several years of the National Council, chairing its National Collections Committee. A meeting to form a Cambridgeshire Group was hosted by Max at Cory Lodge in the autumn of 1981 and he was President of it from soon after its public inauguration in 1982 until he died. He was instrumental in establishing the nine National Collections of specific genera, including *Alchemilla*, *Geranium* and *Lonicera*, held at the Cambridge Botanic Garden.

Meanwhile work on *Flora Europaea* continued, the two final volumes being published in 1976 and 1980. At the Royal Botanic Garden, Edinburgh, in the summer of 1976, when Max was on a visiting review group and James Cullen was a senior member of staff there, they found that they both had embryonic ideas about producing floras of garden plants. So was born *The European Garden Flora*, edited by James, Max and others (6 vols, 1986–2000). Max served as President of the Botanical Society of the British Isles for 1973–75. In 1974, 1977, 1980 and 1981 he organised important conferences in Cambridge, the first on 'European floristic and taxonomic studies' (BSBI Conference Report No. 15, edited by Max with the assistance of Clive King and published in 1975), the second the final symposium for *Flora Europaea*, the third on 'The Biology of Rare Plant Conservation' (proceedings edited by Hugh Synge and published in 1981) and the fourth marking the 150th anniversary of the founding of the present Botanic Garden (recorded in a mimeographed booklet edited by Max). Max was awarded his ScD in 1980 and received the Royal Horticultural Society's Victoria Medal of Horticulture in 1984 and the Linnean Medal of Botany in 1995.

Max had a deep interest in, and knowledge of, the history of botany, both on a world scale and locally. While at the Botanic Garden, he wrote *The Shaping of Cambridge Botany* (1981). During retirement he produced with Anne Stow, formerly Head of the Scientific Periodicals Library, *Darwin's Mentor: John Stevens Henslow, 1796–1861* (2001). About 2000, when he realised that on 1 March 2004 there would fall the centenary of the official opening of the new building for the Botany School (renamed Department of Plant Sciences in 1992), he suggested that a substantial booklet be produced to mark the occasion. With Anne Stow and Max, I wrote *100 Years of Plant Sciences in Cambridge 1904–2004*; Anne and I were kept on our toes by a wonderful succession of weekly meetings over tea in his home. His interest in the history of botany was inseparable from his concern for the philosophy of plant classification. He did not write much in this area, but an early paper made a deep impression on many of us – 'The shaping of angiosperm taxonomy' in the *New Phytologist* of 1961 (**60**: 74–84). He stressed the arbitrary nature of the genus and highlighted the fact that families much studied in connection with agriculture or commerce (notably the grasses and orchids) contain many very small genera: no wonder they also contain so many 'intergeneric hybrids'.

In his retirement years he did not write only about history. From 1982 until his death he was an active Editor of the *New Naturalist* series, and for that series he wrote *Wild and Garden Plants* (1993), in which he spelt out his plea that botanists should feel equally at home with plants in semi-natural communities and in gardens and should blur the distinction between these two situations. In his Nature Note for the Grantchester Parish Magazine of May 2004 he rejoiced that attitudes as to what was appropriate in a 'garden' had changed dramatically and that "a patch of nettles, apparently casually 'left', could be labelled 'food plant of many butterflies'". In 1989 he and Frank Perring produced a popular identification book, *The Macmillan Field Guide to British Wildflowers*, with specially commissioned photographs by Andrew Gagg. *Trees: a Field Guide* (written with John & Jill White) appeared in 2005. Max's last publication is a substantial essay to accompany the facsimile edition of *The Wisdom of God Manifested in the Works of Creation* by John Ray, recently published by the Ray Society to mark the tercentenary of that author's death.

I turn now to Max's role in the Cambridge Natural History Society (CNHS), the Naturalists' Trust and *Nature in Cambridgeshire*. He joined the CNHS in November 1938 and was elected Junior Secretary in February 1939. In November of that year an Emergency Committee was set up to look after the interests of the Society during the War; the draft Notice for Council setting out the powers of the Committee was written by Max. In February 1940 he was elected Senior Secretary. He exhibited at the Annual Conversazione in 1939 and 1940 and was the Organiser in the latter year. He resumed his practice of exhibiting at the Conversazione in his first summer back in Cambridge after the War (1946). He was Botanical Curator 1947–61, Botanical Recorder 1961–74, Acting President of the Botany Section for

the Lent Term 1955 while David Coombe was in Nigeria, President 1973–75 and Vice-President 1975–94. In that last year the position of Member of Council was created for him, a position he shared with others from 1998. He retired from Council in 2000 after being on it continuously for 53 years in addition to his time before the War. His was a truly remarkably act of devotion to an institution that meant so much to him. In 1990 he organised, as part of the Annual Conversazione, a Vintage Exhibition for those who contributed in 1940 and who could still be contacted: 23 members made a contribution of some sort and 18 attended in person. Max remained enthusiastic about the Conversazione until his last year, 2005.

In the mid-1950s Max was one of a small band of enthusiasts who established first the Cambridgeshire and Isle of Ely Naturalists' Trust and then *Nature in Cambridgeshire*, which was sponsored equally at the start by the Natural History Society and the Naturalists' Trust. Max gave a huge amount of time and energy to CAMBIENT. From its inauguration in 1956 until 1965 he was one of the two Joint Secretaries – the one for Cambridgeshire while Tony Vine was the one for the Isle of Ely. He was the Vice-President 1965–75 and President 1975–86. The previous President (1958–75) had been John Gilmour, Director of the University Botanic Garden from 1951 to 1973. During 1964 John had arranged for the Naturalists' Trust to have (for a nominal rent) its first ever office in a room in the attic of 1 Brookside, a large house belonging to the Garden with the Director's office on the first floor. The Trust's office was next to that in which Franklyn Perring had worked on the *Atlas*; it was staffed initially by Gigi Crompton and other volunteers; when Franklyn left, the Trust got his room too. A great step forward was taken when Max became Director of the Garden. He persuaded the Managers of the Garden's Cory Fund to pay for the conversion of the stable block at the eastern end of 1 Brookside, which had become a bicycle shed, into quarters for CAMBIENT. Joyce Morley, the paid Secretary, and the many volunteers moved in during April 1975; they stayed there until 1986, when CAMBIENT became The Wildlife Trust and new accommodation was found at Fulbourn Manor. There was a good-sized inner room for the office and an outer room for sales of material produced by the Trust and by the Garden (this latter where the ticket office at the Bateman Street entrance to the Garden is now).

Returning for a moment to earlier years, the purchase in 1962 of CAMBIENT's first reserve, Hayley Wood (for £5000), now one of the Wildlife Trust's best-known reserves, was a major undertaking. Donald Pigott, who was doing research in the wood, found that it was about to be sold for its remaining large oaks and that it would almost certainly be coniferised. After Donald had made a plea that the Trust buy the wood, Robert Payne (Honorary Secretary) and Max agreed and pulled out the stops to raise the money. It gave Max enormous pleasure to see Oliver Rackham's pioneering book *Hayley Wood – Its History and Ecology* published by CAMBIENT in 1975 and to be asked to write the introduction for it. In 1981 an article by Max in the *Cambridge Review* on 'The Future of the Countryside' sparked off a series of discussion meetings between farmers and

naturalists in the county, and these did much to increase mutual understanding (see *N. in C.*, No. 26: 13–14).

Max must be credited also with a significant part in getting the Society for the Protection of Nature Reserves (SPNR, now the Royal Society of Wildlife Trusts) reinvigorated in the late 1950s, despite the fact that the chief role was played by Ted Smith of Lincolnshire. When a buffet supper was held to mark the 40th birthday of CAMBIENT, Ted Smith made a speech in which he paid special tribute to Max's part in arranging the meeting on 19–20 June 1957 which led to the 'Cambridge Declaration' on the need for an 'association of Trusts' and the desirability of persuading the SPNR to undertake the co-ordinating function. Ted Smith's speech can be found in a special booklet published by the Wildlife Trust entitled *CAMBIENT 40th Anniversary 15 November 1996*.

Max stepped down from the Presidency of CAMBIENT at a time of great change for the Trust movement. The various contentious issues were spelt out with quintessentially Maxian fairness in an article in the very slender issue of this journal for 1985 (No. 27: 1–5); there had been no issue at all in 1984. Max had a pivotal role in the first 21 years of *Nature in Cambridgeshire*, playing a large part in choosing the successive Editors and giving them great encouragement. That it survived the crisis years was very much due to his determination. Knowing of the late William Palmer's enthusiasm for the journal, he successfully argued for the use of half of the money raised in his memory to become a 'float' to relaunch it (see *N. in C.*, No. 28: 1). He persuaded Philip Oswald to continue as Editor and invited him and others to form an independent Editorial Board, of which he himself was Chairman and Treasurer until the summer before he died.

Over the years he contributed 34 articles – 15 standard articles, seven book reviews, five obituaries, five notes or reports, and two 'state of the nation' reports on *Nature in Cambridgeshire*. His first article was on wild juniper on the Fleam Dyke (No. 4: 22–23), and he returned to this theme in a two-part article 40 years later (No. 43: 2–6; No. 44: 2–7). Other particularly memorable articles were 'Cambridgeshire ferns – ecclesiastic and ferroviatic' (No. 12: 22–25) and 'Song thrushes and snowdrops: some thoughts on nature recording' (No. 47: 41). Max was very proud of the levels of detail and accuracy achieved by successive recorders of vascular plants for Cambridgeshire and especially delighted by the placing of all the records for vice-county 29 on the web by Gigi Crompton (www.cambridgeshireflora.com: see *N. in C.*, No. 45: 70–71).

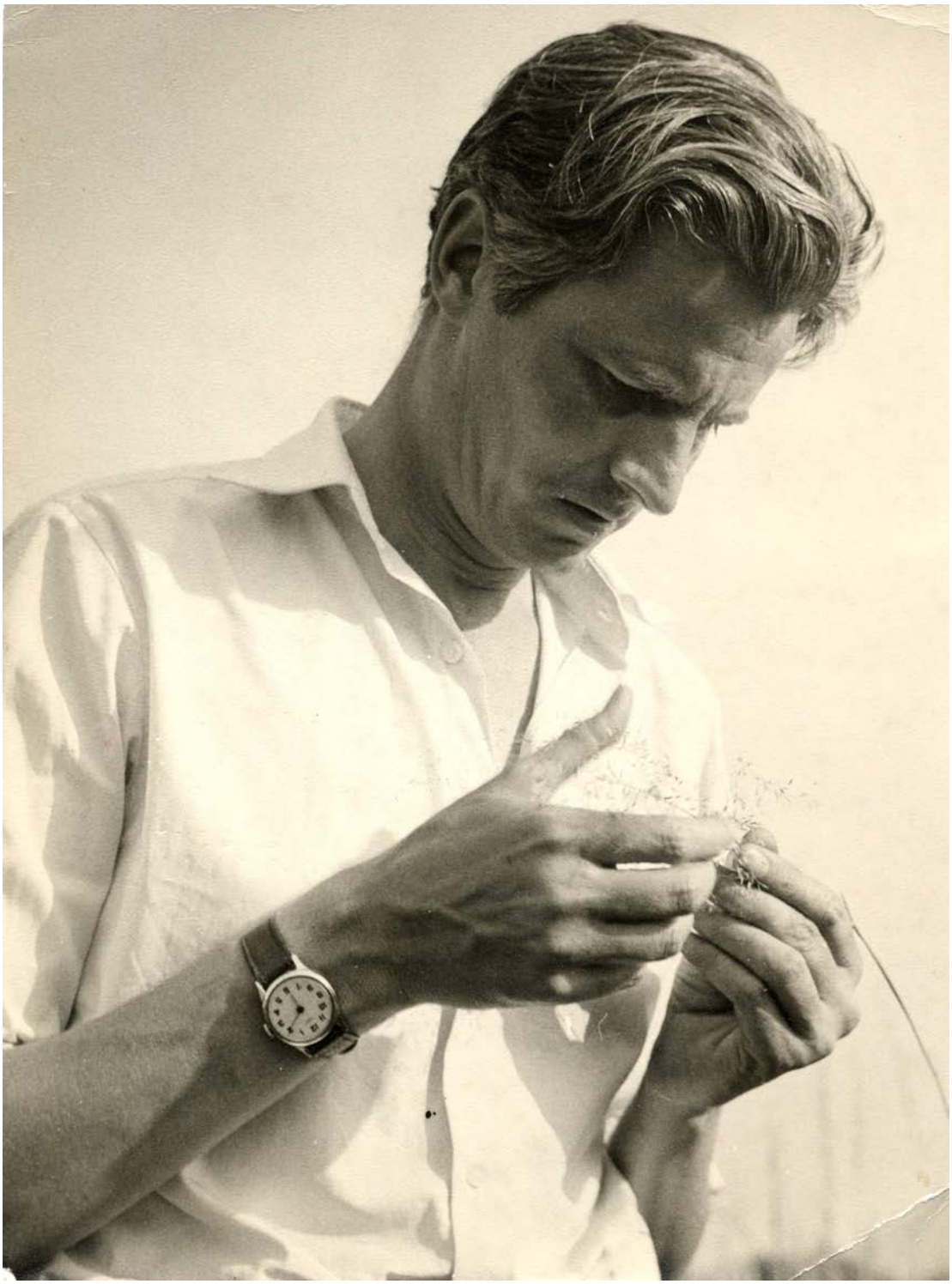
Of all the nature reserves in Cambridgeshire the one known to most people nationally was not established by CAMBIENT (or by the Nature Conservancy, now absorbed in the ridiculously named Natural England) but by the National Trust. Wicken Fen held a special place in Max's heart. His fascination with the place began on his first visit in 1939 under the eccentric and hugely inspiring Humphrey Gilbert Carter, who took the students there (often with some additional young ladies) partly by bicycle and partly by boat. Max's fascination was cemented during his PhD days (1946–50). He was a member of the National Trust's Local

Committee from 1949 to 1995, the Botanical Secretary 1949–76 and 1986–90, and Chairman 1979–85, and he continued to advise and influence until 2004. Whereas by the 1980s I despaired of Wicken as a place to teach the major floristic and ecological features of fen and fen woodland as found across Europe (and I took classes to the Bure Valley Marshes National Nature Reserve in Norfolk instead), Max was never worried by the rare and uncharacteristic features of Wicken. He was a great supporter of the research done there, the subject of several papers in this journal and summarised in *Wicken Fen: the making of a wetland nature reserve* edited by Laurie Friday (1997: see *N. in C.*, No. 39: 56–58).

The U3A Botany Group also received loyal support from Max for many years – all through the 1990s until 2002; in most years he either gave the opening lecture or took the opening excursion, often a walk along The Backs. He also liked to take the students to Magog Down and from the start had been a keen supporter of the Magog Trust – dedicated to conserving the chalk landscape south of Cambridge.

Max was at various times active in the Fellowship of Reconciliation, the Campaign for Nuclear Disarmament and Christian Aid. With his son Martin he worked hard for the restoration of the Botanic Garden and Museum in Sarajevo after the civil war; those institutions had been on the green line between the two sides and had been badly damaged. A fountain in the Garden records his enthusiasm and generosity. From 1995 to 2001 Max was a Churchwarden at Grantchester, where a Service of Thanksgiving for his life is to be held at 2.30 p.m. on Saturday, 3 June 2006. Max received tremendous support in all he did from Lorna Strutt, whom he married in 1948; she survives him, as do their three children. In their successive homes – the maisonette at the west end of 1 Brookside for 25 years, Cory Lodge for ten, and then the bungalow and the house in retirement at Grantchester – Max and Lorna welcomed countless guests for friendly discussion and congenial company. As James Cullen put it in *The Times*, "The discussion might cover botanical subjects, but was just as likely to involve theology, literature, linguistics, film and poetry – especially T.S. Eliot's *Four Quartets*, which were very important to him." Many will remember Max for his great contributions to botany and conservation alongside a sense that he was simply a marvellous person to be with.

Peter J. Grubb



Max Walters at Wicken in July 1959, examining *Poa palustris*.

Photograph by W. Martin Lane, reproduced by kind permission of Brian Lane

Ladybird recording in Cambridgeshire and Huntingdonshire

Peter Brown, Helen Roy and Michael Majerus

Introduction

Ladybirds (Coleoptera; Coccinellidae), perhaps surprisingly, are a rather under-recorded group, or at least they were until last year. The arrival of the alien Harlequin Ladybird (*Harmonia axyridis*), prompted the launch of a major UK-wide survey, which collects records for all native ladybirds and also Harlequins. For many years Cambridgeshire has been at the heart of ladybird recording in the UK, and the current survey is a collaboration between three Cambridgeshire institutions – Biological Records Centre at Monks Wood, University of Cambridge and Anglia Ruskin University.

Native ladybird records are important and interesting in their own right, but now that there is an ecological threat to ladybirds from the Harlequin, it is especially important to record them. It will take several years of recording before a thorough assessment of the impact of the Harlequin on native species can be attempted.

We will not go into the detail of harlequin ladybird ecology or identification here (see Roy *et al.*, 2005 or www.harlequin-survey.org), but its threat to native species (ladybirds, other aphid-feeders and some other insect groups) can be summarised as follows:

- Harlequin Ladybirds out-compete native species for food
- They are polyphagous and if aphid supplies run low, may eat the eggs and larvae of native species

Over 4,500 verified ladybird records for 2005 were received by the UK survey. Of these, 539 are from Cambridgeshire and Huntingdonshire (the records here are from vice counties 29 and 31). This is a brief summary of the records.

Method

The ladybird records presented here are an amalgamation of incidental species records made by members of the public, subsequently verified and collated at the Biological Records Centre, and data from site surveys. As such, they are a mixture of records made by direct observation, sweep netting and tree beating in a wide variety of habitats, including gardens.

Results

Nineteen coccinellid species were recorded in the 539 ladybird species records for Cambridgeshire and Huntingdonshire in 2005. Each species record represents one or more individual ladybirds recorded at a site on a single date.

The number of locations where each ladybird species was recorded is shown in Table 1. Due to the site surveys (for which sites were visited five to ten times during the year), some of the less noticeable ladybird species have a fair number of

records, but often from few locations. As an example, there are fourteen records for the 18-spot Ladybird, but all from only three locations.

Table 1 – Summary of 2005 coccinellid records for Cambridgeshire and Huntingdonshire, in order of decreasing number of species records.

Species name	Vernacular	No. records	% of total	No. locations
Coccinella 7-punctata	7-spot Ladybird	110	20.4	53
Adalia 2-punctata	2-spot Ladybird	73	13.5	34
Adalia 10-punctata	10-spot Ladybird	68	12.6	23
Harmonia axyridis	Harlequin ladybird	54	10.0	39
Propylea 14-punctata	14-spot Ladybird	45	8.3	15
Halyzia 16-guttata	Orange Ladybird	38	7.1	15
Exochomus 4-pustulatus	Pine Ladybird	31	5.8	14
Subcoccinella 24-punctata	24-spot Ladybird	27	5.0	8
Psyllobora 22-punctata	22-spot Ladybird	19	3.5	11
Harmonia 4-punctata	Cream-streaked Ladybird	16	3.0	4
Calvia 14-guttata	Cream-spot Ladybird	15	2.8	7
Myrrha 18-guttata	18-spot Ladybird	14	2.6	3
Micraspis 16-punctata	16-spot Ladybird	9	1.7	4
Aphidecta obliterata	Larch Ladybird	7	1.3	2
Chilocorus renipustulatus	Kidney-spot Ladybird	4	0.7	3
Rhyzobius litura		4	0.7	1
Adonia variegate	Adonis' Ladybird	2	0.4	1
Anatis ocellata	Eyed Ladybird	2	0.4	2
Anisosticta 19-punctata	Water Ladybird	1	0.2	1
		539	**100.0**	

Unsurprisingly, the most frequently recorded species was the 7-spot Ladybird, followed by the 2-spot and 10-spot. The Harlequin Ladybird was the fourth most recorded.

Discussion

The Harlequin invasion of Cambridgeshire

Only three Harlequin Ladybird records for Cambridgeshire (and none for Huntingdonshire) were received in 2004, the first year that the species was recorded in the UK. Despite lots of publicity encouraging members of the public to look for and report this species, most of 2005 passed without a single verified harlequin record for the two vice counties. However, in September 2005 Bob Frost found a suspicious larva in Bar Hill that was identified as a Harlequin. Shortly afterwards, an adult Harlequin was found in a light trap at Witcham, near Ely. Ian

Wright (the finder of the first Harlequin Ladybird, in Essex) and others subsequently found Harlequins in many locations around Cambridgeshire and Huntingdonshire, from Upwood in the north to Melbourn in the south and from St Neots in the west to Isleham in the east. Harlequins seem to like churchyards, so these were targeted for searches in the autumn, the majority yielding positive results, with Harlequins being found on lime or sycamore trees.

In Cambridgeshire and Huntingdonshire Harlequins are obviously widespread, at least in small numbers, but are considerably less abundant than in Suffolk, Kent or London, where they have been found in their hundreds on a single tree. So far, autumn has been the key time for spotting Harlequins in this country. This is probably the result of a build up in numbers following summer and autumn reproduction. It will be fascinating to see where and when 'the most invasive ladybird species on earth' turns up in 2006.

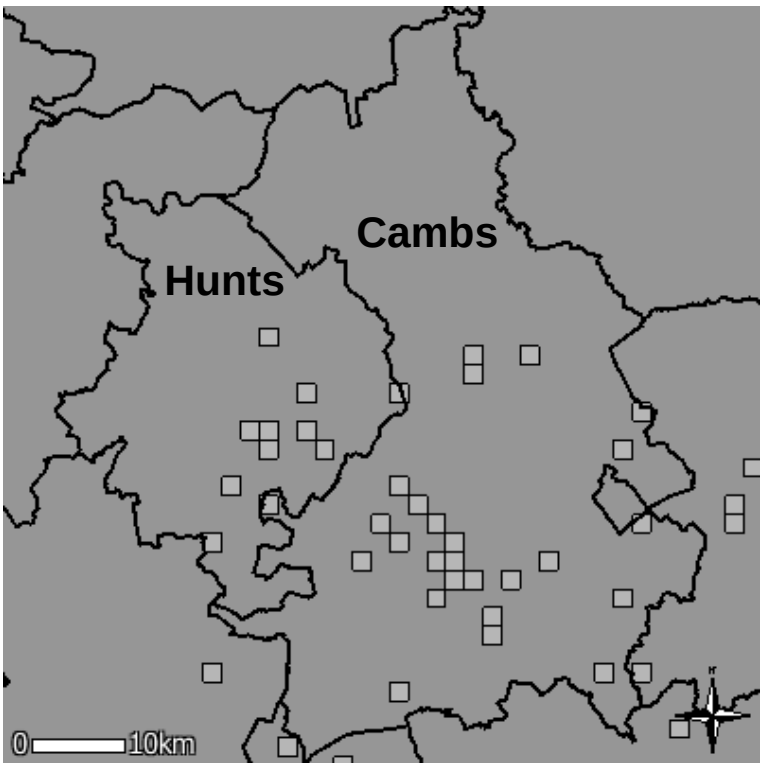


Figure 1 – Verified records of Harlequin Ladybird in 2km squares in Cambridgeshire & Huntingdonshire (2004 and 2005). Map reproduced with kind permission of National Biodiversity Network and Biological Records Centre.

Wicken Fen NNR and Monks Wood NNR surveys and notable records

The Orange Ladybird (*Halyzia 16-guttata*), a species never before recorded at Wicken Fen, was found there by Owen Mountford in spring 2005. This mildew feeding species is typically found on deciduous trees, and while it was categorised as local and scarce in the past (Majerus & Kearns, 1989), it now seems to have

become much more common and widespread. Following Owen's initial discovery, PB found the species at the Fen on most subsequent visits in 2005. At other sites PB has noticed an association between the Orange Ladybird and hawthorn. The species has increased dramatically in the last 20 years, probably as a result of adaptation to feeding on mildews on new tree species: first sycamore (Majerus and Williams, 1989), and more recently ash (Mabbott, pers comm., 2004). If the species has now adapted to using hawthorn as a host, numbers may receive another boost. This possible association will be further explored in 2006.

The Orange Ladybird was the sixth most recorded species in 2005, with 38 records from 15 locations. The records for this species and for the Harlequin Ladybird were boosted by moth light trapping records. Most ladybird species are not attracted to light, but the two species mentioned are exceptions. We would be grateful for further records of any ladybird species from moth traps.

Another species of note recorded at Wicken Fen in 2005 (on two occasions) is the Cream-streaked Ladybird (*Harmonia 4-punctata*). This species, usually found on coniferous trees, has only been recorded once before at the site, in 1978. The Cream-streaked Ladybird is only known in the UK since 1937, but is not invasive like its close relative the harlequin ladybird.

A notable find at Monks Wood in 2005 was Adonis' ladybird (*Adonia variegata*), It was found twice in the meadows close to the woodland, initially by Henry Arnold and Trevor James. The species favours sandy soils, and there are only two previous records of it anywhere in Cambridgeshire and Huntingdonshire. Adonis' Ladybird is commoner in warmer climates, particularly around the Mediterranean, and it may be that the increase in records of this species in Britain over the last two decades is associated with global warming.

Harlequin Ladybirds have so far not been found at either Wicken Fen or Monks Wood.

A final species worth singling out is the Eyed Ladybird (*Anatis ocellata*), for which there are very few historic records in the two vice counties. This is the largest native UK ladybird and a beautiful beetle, usually found on Scots Pine. It has only been recorded in Cambridgeshire once before 2005. The two 2005 records came from Cambridge itself, with one of the specimens being an unusual colour form of the species.

The Cambridgeshire & Huntingdonshire Ladybird Atlas project

A project to compile a comprehensive ladybird atlas for the two vice counties has begun and is being co-ordinated by Bob Frost. The counties will be surveyed and mapped at tetrad (i.e. 2km square) resolution. Since there are close to 900 tetrads involved, this is clearly a large and long-term project. The very impressive Surrey atlas (Hawkins, 2000) took about 20 years to produce and Bob fears that this project may outlive him!

Anyone who has historic ladybird records to contribute, or who would like to carry out some surveying for this project, please contact Peter Brown.

Further information

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Websites

www.ladybird-survey.org www.harlequin-survey.org

Acknowledgments

Thank you to the many members of the public who contributed records to the survey. Thanks also to Bob Frost, Ian Wright, Henry Arnold, Trevor James and David Roy for their contributions to recent ladybird recording in Cambridgeshire & Huntingdonshire.

References

Hawkins, R.D. (2000). *Ladybirds of Surrey.* Surrey Wildlife Trust, Woking. 136pp.

Majerus, M. and Kearns, P. (1989). *Ladybirds (Naturalists' Handbooks 10).* Richmond Publishing, Slough. 103pp.

Majerus, M.E.N. & Williams, Z. (1989). The distribution and life history of the orange ladybird, *Halyzia 16-guttata* (L.) (Coleoptera: Coccinellidae) in Britain. *Ent. Gaz.*, **40**:71-78.

Roy, H.E., Rowland, F., Brown, P.M.J. and Majerus, M.E.N. (2005). Ecology of the Harlequin Ladybird: a new invasive species. *British Wildlife* **16**(6):403-407.

Cambridgeshire Verbascums

Graham Easy

Verbascums have a very poor seed dispersal system. The seeds are very small and light and from lofty capsules can be catapulted a short distance from the parent plant but have very little wind resistance and are best suited to rolling along the ground. The capsules are not eaten by birds or mammals and the smooth seeds do not adhere to any passing animals (including humans). Distribution seems to rely upon the lightness and vast production of the seeds which are blown with dust across the plains and often arid situations where these species are native.

Our Cambridgeshire species, *Verbascum nigrum* and *V. thapsus*, are mostly found where such dirt- and sand-blows were once commonplace and still occasionally occur. We must therefore conclude that the wide and scattered distribution of other Cambridgeshire Verbascums is the result of introduction by deliberate planting or by being brought here as seeds in soils used in the construction of rail and road systems or the infilling of pits and the like.

A survey of Verbascum distribution across the county in 2001 and 2004 produced the following list of species and hybrids and in the main supported this theory.

Verbascum blattaria Moth Mullein: a group by the roadside at Meldreth had presumably spread from nearby gardens; similarly, a few plants near the Whittlesey rail crossing are the relicts of the erstwhile gate-keeper's garden. Fifty plants scattered over waste ground near the pits between Fordham and Burwell could have arrived with dumped soil and thousands at Long Road, Cambridge appeared after disturbance of sand ballast at the former sidings, a site that had held a small colony for many years.

Verbascum virgatum Twiggy Mullein: major colonies in Cambridgeshire at Long Road, Cambridge, Chesterton – Milton, Barton – Comberton and at March are all associated with railway systems and have doubtless been introduced along with the sand ballast used to support the lines. Well over a thousand plants have become established at both Chesterton – Milton and at Long Road and 800 grow in the vicinity of the old Lords Bridge railway station. Colonies have been noted at various rubbish tips in the past but were only found at Cherry Hinton during this survey.

Verbascum virgatum x *pulverulentum*: not only were there several widely scattered plants of this hybrid at the Chesterton sidings but almost thirty plants which suggested *V. virgatum* x *pulverulentum* x *thapsus* were present at the same site. These agreed basically with *V. pulverulentum* x *thapsus* hybrids but exhibited various amounts of purple filament hairs suggesting a second generation of hybridisation.

Verbascum pyramidatum Caucasian Mullein: a colony at Kentford Heath was grubbed up in 2003 while that at Fordham hangs by a thread. Other roadside groups, planted or garden outcasts, have also gone. Only the Swaffham Prior to Burwell former rail system colony remains with its 300 – 350 flowering heads showing impressively; however, the number of *V. pyramidatum* x *thapsus* hybrids among them has been reduced to four or five plants.

Verbascum pyramidatum x *nigrum*: the former landfill site at Kentford Heath had 78 flowering plants in 2001 and a few still survived in 2004 after cultivation there to grow Pheasant food. The only others noted were along the Milton bypass where a few plants were introduced along with other hybrids in 1975 in the unfulfilled hope that they would catch the eye of passing botanists.

Verbascum bombyciferum Broussa Mullein: a species frequently grown in gardens which is occasionally planted in open country or spreads from gardens, as did the 2001 example growing on a wall near De Freville Avenue, Cambridge.

Verbascum phlomoides Orange Mullein: this is another frequently grown garden species and many of our scattered colonies are the result of past plantings or garden outcasts. A plethora of groups that formerly occurred along the Royston to Abington road verges may have been introduced when the road system was improved in the 1960s. The largest groups found during this survey were in the Kennett – Chippenham area.

Verbascum phlomoides x *thapsus*: as in the past there were examples at Chesterton sidings site. At Hauxton gravel pit, where non-seeding examples had been present, none was found in this survey although plants more resembling *V. densiflorum* were collected there by P D Sell in 2001.

Verbascum thapsus Great Mullein: occurs throughout the county. Most are simple or few-branched plants, but some, possibly garden outcasts, are many-branched specimens with larger flowers which approach *V. densiflorum* in appearance but lack that species' decurrent, elongated stigmas.

Verbascum nigrum Dark or Black Mullein: this is present as a native species along many roadside verges and railway systems in south and east Cambridgeshire and has been introduced at a few remote sites – as at March.

Verbascum nigrum x *thapsus* is a not infrequent hybrid where both species grow alongside each other. There is a significant group along the Fleam Dyke near the A11.

Verbascum speciosum Hungarian Mullein: a garden grown species often labelled *V. olympicum*. Its appearance at newly embanked roadside verges at Teversham and Little Abington in the mid 1970s suggests deliberate planting or accidental introduction with soil by council workers. The Little Abington colony remains and thrives, spreading into the adjacent field. It was also at March sidings in 2001 and near Wimblington in 2004.

Verbascum speciosum x nigrum grew alongside both parents in 2001 and in 2004 *V. speciosum* x *phlomoides* plants were discovered among the extensive colony of *speciosum* at the Abington site.

Verbascum pulverulentum Hoary Mullein: this native of Suffolk and Norfolk has seemed poised to spread naturally into Cambridgeshire. While we have two sites with thousands of plants at Chesterton and Kennett, these are both disused railway sites which suggest introductions with ballast. Earlier records from Milton in 1984 presumably originated from the Heacham quarry, as did garden escapes at Histon. Plants formerly at Cottenham are known to have been grown from seed collected at Heacham beach. Indeed it is difficult to see how any of our records are other than introductions when a high proportion of the roadside populations of Norfolk and Suffolk have been spread by using soil from a few quarries where the species does seem to be native.

Verbascum pulverulentum x *thapsus*: one plant grew at March and hundreds occupy the Chesterton sidings where *V. thapsus* is very restricted, suggesting that the hybrid seed was brought along with the sand ballast when the sidings were laid down 50 or more years ago, germinating once the clinker and granite chipping surface was recently removed.

Verbascum pulverulentum x *phlomoides* was again recorded at Chesterton sidings, differing from the wide variety of *pulverulentum* x *thapsus* hybrids by their larger flowers with ragged edged petals.

Verbascum lychnitis White Mullein: at Chesterton and March railway sidings there were mainly non-flowering rosettes – a disappointing showing after previous years' displays.

Verbascum lychnitis x *thapsus* was still present at March.

Mention should also be made of the collections at the Botanic Garden, Cambridge and of the author's collection at Milton where hybrids have included *V. densiflorum* x *nigrum*, *V. densiflorum* x *pulverulentum*, giant *V. bombyciferum* x *pyramidatum* and handsome *V. phoeniceum* x *pyramidatum*, some straying some distance from the original plantings.

Roads, toads and automobiles.

Tim Sparks

A new housing development in Girton, The Quills, is being built on former farmland at approximately TL429610. Access to the building site has been made from Wellbrook Way. The long straight access road has no dropped kerbs and numerous gullies (road drains). The road appears to cut the migration route of a sizeable Common Toad (*Bufo bufo*) population to its breeding pond at approximately TL429612.

I became aware of this problem by chance on 17th March 2005 whilst walking a borrowed dog. Large numbers of toads were trapped between the two raised kerbs where they were either being channelled to drop into the gullies (from which they couldn't escape) or being squashed. That first morning I lifted 83 toads into the pond.

From 17th March until 30th March I made daily or twice daily visits to collect toads, an absence from Girton then followed and the last two visits were made on 5th and 8th April. A total of 750 toads were lifted from the road, 187 of which were recovered from gullies. The maximum lifted on any one day was 201. In addition 23 immature newts (probably Smooth Newt (*Triturus vulgaris*)) and a small but uncounted number of Common Frogs (*Rana temporaria*) (probably less than 30) which are better equipped to scale the kerbs were helped on their way. Toad rescue was most effective at night with early morning (daylight) numbers being lower. I would estimate road kill was running at 20 per day but this was difficult to assess as corpses appeared to be quickly scavenged by crows. A large number of toads would have also died in the road gullies which I couldn't access.

Considering these numbers just represent migration from one point of the compass to the breeding pond this population may be a major Cambridgeshire

colony. Why wasn't this detected in an Environmental Impact Assessment? At the time of writing (February 2006), shortly before the next migration, nothing has been done to assist toad migration although both the developers and the planning authorities are aware of the problem. Many of the houses are now inhabited and road traffic along the access road has increased considerably. Can this toad population persist under such pressure?

The totals rescued in 2006 are 402 toads, 25 frogs and 22 newts, with 188 corpses on the road. (Note added 18th April)

A 'Breckland-type' flora on Cambridge Science Park

David Barden

Cambridge Science Park, occupying some 152 acres, is located on the north-eastern side of the city in the parish of Milton, immediately north of the old St Ives railway and south of the A14. Most of the land has been owned by Trinity College since 1443 and, where undisturbed, consists of a layer of clayey soil resting on free-draining river gravels. Up until the Second World War, the whole area was farmland, but during the war the western half of the site was requisitioned by the US army, when it was known as Milton Army Camp. Rail sidings and concrete roads were put in place and used for the marshalling and storage of tanks. The area continued to be used by the military for some time after the war, but, even when operations were complete, much debris remained. Returning the land to agriculture would not have been cost-effective, and so it was used as rough grazing.

In the early 1970s, Trinity College applied for planning permission to develop the area as a Science Park and, after clearance and landscaping of the south-eastern part of the site, the first tenant arrived in 1973. It has since grown to occupy most of the available land and houses over 70 companies in a low-density park-like setting.

At first sight the Science Park might not appear to be very promising botanically, but I have been able to find over 220 native and adventitious, non-native vascular plants on the site since I first took interest in it in the spring of 2004. Much of the area that is not built on is mown grassland, but there are substantial patches of dense scrub and planted shrubberies. The First Public Drain (a steep-sided scrubby ditch) cuts off the south-eastern corner of the Park, and there are also several large ponds. The most south-easterly of these was originally a gravel-pit excavated during the war, but the others were installed in the early to mid 1980s to enhance the site.

The main botanical interest of the Science Park lies in the substantial areas of grassland, which contain an interesting range of species, some of them quite local in this part of East Anglia. The areas of particular note are the banks that were built

up when the site was landscaped and the roadside verges. These areas are very sandy, frequented by rabbits, and become parched quickly during warm dry spells, which no doubt limits the species that can grow there. Much of the grassland is mown regularly, although some areas remained uncut during summer 2005.

An abundant species in this dry grassland is Common Stork's-bill (*Erodium cicutarium*), which is accompanied both by a white-flowered form and by its larger relative Musk Stork's-bill (*Erodium moschatum*) in a couple of places. Dove's-foot Crane's-bill (*Geranium molle*), Small-flowered Crane's-bill (*G. pusillum*), Buck's-horn Plantain (*Plantago coronopus*), Blue Fleabane (*Erigeron acer*) and Early Forget-me-not (*Myosotis ramosissima*) are also frequent in these areas.

The banks and verges where these plants grow are also home to patches of Field Madder (*Sherardia arvensis*), Knotted Hedge-parsley (*Torilis nodosa*), Mouse-ear-hawkweed (*Pilosella officinarum*) and Biting Stonecrop (*Sedum acre*); the last is particularly abundant on the roadside verges. Where the sandy soil is exposed, species such as Parsley-piert (*Aphanes arvensis*), Henbit (*Lamium amplexicaule*), Common Whitlowgrass (*Erophila verna*), Dwarf Mallow (*Malva neglecta*) and Thyme-leaved Sandwort (*Arenaria serpyllifolia*) are typical.

Perhaps the most interesting plant found is the nationally scarce Bur Medick (*Medicago minima*). This species has its stronghold in the Breckland and has always been rare in Cambridgeshire; it has only been seen recently at Kennett. It grows in several places on the Science Park, usually with other *Medicago* and *Trifolium* species. However, it can be distinguished by its small, round, spiral pods: Ray's name for it, 'the smallest Hedgehog-trefoile', remains an apt description!

Another uncommon species, Spring Vetch (*Vicia lathyroides*), was found in April 2005 in two places, both rather dry and disturbed by rabbits. This is an inconspicuous purple-flowered annual, rather similar to a small form of Common Vetch (*V. sativa* subsp. *nigra*), which is also present. Nationally it is fairly widespread on sandy soils, especially by the coast, but was last seen in Cambridgeshire on Kentford Heath in 1982.

On a sandy bank by one of the ponds, both Bur Medick and Spring Vetch can be found growing with Hare's-foot Clover (*Trifolium arvense*) and the narrow-leaved form of Sheep's Sorrel (*Rumex acetosella* subsp. *acetosella* var. *tenuifolius*). These taxa may also be found in several other places on the Science Park, but again are rather scarce in the Cambridge area. On the same bank grow both lowland saxifrages – Meadow Saxifrage (*Saxifraga granulata*) and Rue-leaved Saxifrage (*S. tridactylites*). The latter also grows in profusion on a roadside verge. Viper's-bugloss (*Echium vulgare*) gave a fine show in Summer 2005 and was remarkably vigorous, flowering even after repeated mowing.

Other species found that are often associated with well-drained soils include Common Centaury (*Centaurium erythraea*), Bugloss (*Anchusa arvensis*) and Evening-primrose (*Oenothera* sp.), which grow in small quantity, as does the increasingly scarce Common Cudweed (*Filago vulgaris*). Hairy Rock-cress (*Arabis hirsuta*), a rather uncommon plant of bare places and walls, has also been noted;

this species has not been seen in the Cambridge area for some years.

The bare areas around the shrubs and trees also have a distinctive flora: Small Nettle (*Urtica urens*), Bur Chervil (*Anthriscus caucalis*) and the North American alien Springbeauty (*Claytonia perfoliata*), all more frequent on sandy soils, are abundant in suitable places. In similar but somewhat damper areas grow Bee Orchids (*Ophrys apifera*). These are frequent over the site (over 230 rosettes were counted in winter 2004–5) and can also be found in the grassland, although plants growing here tend not to get the opportunity to flower. Finally, Little Mouse-ear (*Cerastium semidecandrum*) has been tentatively identified on a semi-concreted parking area.

Few of the species mentioned above would be particularly noteworthy if they occurred on their own, but the fact that so many plants typical of 'Breckland-type' grassland occur together is of some interest. Indeed, out of the 26 species mentioned by Perring *et al.* (1964) as being particularly characteristic of the Breckland, nine occur on the Science Park. It is highly improbable that all of these could have spread naturally from other native sites, so how might they have arrived?

Certain species – e.g. Rue-leaved Saxifrage, Thale Cress (*Arabidopsis thaliana*) and Little Mouse-ear – are quite likely to have spread from the railways; large amounts of ballast would have been brought onto the site during the war. Plants might also have spread from the old St Ives railway and Milton–Chesterton sidings: for a review of the wildlife of the latter, see Easy, Tribe & Napier (2001).

Another means of colonisation could have been in imported soil when the site was landscaped. However, the landscape architects were able to confirm that material from the on-site excavations was used to build up the embankments and that imported soil was only used around the shrubberies and on a few lawn areas near the buildings. In addition, there are no records of specialist wildflower mixes being sown, so the possibility of uncommon plants having arrived in this manner seems to be excluded.

That leaves the possibility of wartime operations being responsible for the unusual association of species. When visiting the site in the 1960s and 1970s, Graham Easy noted that the sandy bases left behind when the wartime roads were removed were the best areas for the 'Breckland-type' plants (although Bur Medick, Spring Vetch and Meadow Saxifrage were not recorded at that time). It is therefore very likely that this sand originated from the Breckland and that these species were introduced in this manner. Disturbance by landscaping and rabbit activity has helped to perpetuate this open sandy habitat. The continued diversity of the banks and verges reflects the absence of chemical treatment and the regime of frequent mowing, which have kept the soil fertility low and ensured the survival of a species-rich sward.

The managers of the Science Park have been contacted with regard to the wildlife value of the site, which is by no means restricted to its plants. It will be interesting to continue to study this area: perhaps there are more 'Breckland-type'

species to be found?

Acknowledgments
I am indebted to Alan Leslie and Nick Millar (with whom a full species list has been deposited) for finding and identifying a number of species, to Graham Easy for his recollections of the area, and to all three for their valuable comments and advice. I would also like to thank Jonathan Billingsley at The Landscape Partnership (the landscape architects for the Science Park development) for some very useful information.

References

Easy, G., Tribe, H., & Napier, J. (2001). The Milton–Chesterton sidings. *Nature in Cambridgeshire*, No. 43: 7–14.

Perring, F.H., Sell, P.D., Walters, S.M., & Whitehouse, H.L.K. (1964). *A Flora of Cambridgeshire*. Cambridge University Press, Cambridge. (pp. 28–29).

For general information, maps and photographs:

Carter, N., & Watts, C. (1984). *The Cambridge Science Park.* Surveyors Publications, London.

Trinity College (1970). *A Cambridge Science Park.*

Trinity College (2000)**.** *Cambridge Science Park* (Directory).

Cambridge Science Park website: http://www.cambridge-science-park.com/home.htm

Masked assassin in Girton

Tim Sparks

Whilst relaxing in an armchair and reading a newspaper on 27 June 2005 I was shocked to see a large invertebrate crawling along the arm of the chair. The specimen was captured and taken to colleagues at Monks Wood who identified it as the Masked Assassin Bug (*Reduvius personatus*), a fearsome monster that can reach 17mm with antennae up to 6mm. To my embarrassment the larvae of this species are said to live in balls of fluff in damp conditions. The larvae cover themselves in fluff or dust as camouflage. The species is usually found in old buildings, and occasionally in cavities in trees. It is relatively rare in this part of the world, probably because few have looked for it. According to Bernard Nau, the national recorder for terrestrial heteroptera, the colleges in Cambridge must offer great opportunities for this bug.

Contributions towards a new algal flora of Cambridgeshire (Vice-county 29). I. Phylum Euglenophyta

Hilary Belcher, Eric George and Erica Swale

Introduction

The main concern of E.A. George, who died suddenly in February 2005 (Belcher & Swale, 2005), was the isolation, maintenance and supply of pure cultures of algae. After graduating from Downing College, Cambridge in 1947, Eric assisted Professor E.G. Pringsheim, who had fled from Prague before the 1939-45 war with a suit-case full of algal cultures. He then established a collection of world importance in the Botany School (now the Department of Plant Sciences) of Cambridge University. On Professor Pringsheim's retirement Eric took charge of the culture collection, and in 1970 it was moved to purpose-built accommodation in Storey's Way, with Eric as the Director. The cultures are now at Oban, and the Storey's Way laboratory is an office block.

Eric's other major interest was the occurrence and distribution of freshwater algae in Cambridgeshire (V.C. 29), and he gradually built up a detailed card index of his own and Prof. Pringsheim's records, along with all previous published ones. On his retirement in 1980 the cards were passed to us, and it is proposed, with Eric's agreement, to use the records, together with our own, as a basis for a new algal flora of Cambridgeshire, even if it has to be finished by others. The cards have now been deposited in the Herbarium of the Department of Plant Sciences, and we are working from photocopies of them.

County freshwater algal floras of any sort are very few, but one for Cambridgeshire (V.C. 29) was compiled by G.S. West, at first in separate parts, then reprinted as a whole (West, 1899). It covered only Chlorophyta (green algae), Bacillariophyta (diatoms) Rhodophyta (red algae) and Cyanophyta (blue-green) algae, now recognised as belonging to the bacteria, and alternatively named Cyanobacteria. We propose to produce the new flora in a similar manner, but dealing with more groups, as the modern concept of the algae is as a heterogeneous assemblage of at least fourteen phyla, some only distantly related to the others (John et al., 2002).

Euglenophyta (Euglenoid flagellates)

This part is devoted to the photosynthetic green members of the phylum (the well-known Euglena and its allies), with two colourless species closely related to the green ones. It is dealt with first as E.G. Pringsheim, whose records are included, was an expert on this group (Pringsheim, 1956), and also because excellent taxonomic accounts, mainly of the photosynthetic species, have been produced recently by Prof Konrad Wołowski of Krakow, following the classification of Leedale (Wołowski, 1998; and in John et al., 2002; Wołowski & Hindák, 2005;

Leedale, 1967). An exhaustive taxonomic survey of the whole group, in German, is that of Huber-Pestalozzi (1955).

Many of the euglenoid flagellates are colourless and exist either by absorption of organic compounds from the surrounding water or actively feed on other organisms. The photosynthetic ones possess so-called gullets, but seemingly never ingest food particles (Leedale, 1967). DNA studies indicate a closer relationship to the trypanosomes than to the green flagellates which some of them superficially resemble (Tudge, 2000).

Species dealt with below are those recorded from Cambridgeshire (V.C. 29), predominantly by E.G. Pringsheim, E.A. George and ourselves. There were no illustrations accompanying Eric's record cards, so all the figures except those of *Colacium vesiculosum* var. *cyclopicola* show species collected by us within the vice-county, mostly in the vicinity of Cambridge.

The 200 ornamental ponds, muddy pools and puddles from which most of the records came have a pH on the alkaline side of neutral. Some were from small rain-filled polythene containers of about 41. capacity, into which dead leaves had fallen. These imitation rock pools also had a pH of 7 - 7.5.

The occurrence and distribution of the flagellates seems to be very sporadic, and nowhere did we find them in abundance of individuals or species, possibly because the countryside around Cambridge consists of arable fields with no dairy farms and the accompanying eutrophic pools and water-filled hoofprints rich in euglenoid speicies. The vice-county is also lacking in peaty or other acid habitats.

For conciseness, and since this is a preliminary account, we have only given the locality of one record of each of the species noted, though the rest are in our notebooks. Unless otherwise mentioned the names used are those of Wołowski in John et al 2002. We have also attempted to indicate the relative abundance of each species.

In the following list EGP denotes E.G. Pringsheim, EAG E.A. George, B & S J.H. Belcher and E.M.F. Swale and the number in brackets the 10 km grid square.

Photosynthetic species of Euglenophyta and two close colourless relatives of these in Vice-county 29.

Colacium Ehrenberg 1833

C.epiphyticum Fritsch 1933. B. & S., on detritus, garden pond, Girton (46) 1955, Figure 1A, B, and 1 other record.

C. vesiculosum Ehrenberg 1830 fo. *cyclopicola* (Gicklhorn) T.G. Popova 1939. B. & S., on Cyclops sp., pond, Cambourne (36) 1993 and one other record. Lacking a figure of ours from Cambridgeshire, Figure 1C is from Fordham, Essex (92).

Euglena Ehrenberg 1830

E. acus Ehrenberg 1830. E G P, Cambridge (45) 1940; E A G, Coe Fen (45) 1967; B & S Dry Drayton (35) 2001, school pond, and 27 other records. Figure 1E.

E. agilis H.J. Carter 1856. EGP, Balsham (55) 1948, Cambridge (45) 1948, 1949; EAG, Coe Fen (45) 1963; B & S, Girton (46) 2001 and 31 other records. Figure 1D.

E. anabaena Mainx 1926. EGP, Trumpington (45) 1940, Cambridge (45) 1941.

E. cantabrica E.G. Pringsheim 1956. EGP, Madingley (35) 1943.

E. caudata K. Hubner 1886. EGP, Grantchester Meadows, Cambridge (45) 1941.

E. clara Skuja 1948. EGP, Shelford (45) 1949; B & S, Cambridge (45) 1997, and one other record. Figure 1G.

E. deses Ehrenberg 1833. EGP, Cherry Hinton (45) 1941, Balsham (55) 1948, Hayley Wood (25) 1948; EAG, Doddington (49) 1960.

E. deses fo. *intermedia* G.A. Klebs 1883. B & S, Grantchester Meadows (45) 1995, and 4 other records. Figure 1H.

E. ehrenbergii G.A. Klebs 1883. B & S, Cambridge (45) 1997 and one other record.. Figure 1I.

E. geniculata (F. Schmitz) Dujardin 1841. EGP, Cambridge (45) 1942.

E. gracilis G.A. Klebs 1883. EGP, Swaffham Prior (56) 1948, Wicken Fen (56-7) 1948, Cambridge (45) 1948; EAG Hayley Wood (25) 1962, Shepreth L – Moor (34) 1967; B & S, Girton (46) 2004 and 1 other record.

E. granulata (G.A. Klebs) Schmitz 1884. EGP, Cherry Hinton (45) 1940.

E. mutabilis F. Schmitz 1884. M.E. Godward, Wicken Fen (56-7) 1939; EAG, Coe Fen (45) 1960.

E. oblonga F. Schmitz 1884. B & S, Cambridge (45) 2001 and 6 other records.

E. obtusa F. Schmitz 1884. EAG, Guyhirne (30) 1960.

E. oxyuris Schmarda 1846. EGP, Cambridge (45) 1940; EAG, Coe Fen (45) 1960; B & S Cambridge (45) 1995 and 1 other record.

E. polymorpha P.A. Dangeard 1901. B & S, Cambridge (45) 1997, Figure 1J.

E. proxima P.A. Dangeard 1901. EGP, Cambridge (45) 1940, Cherry Hinton (45) 1940; B & S, Cambridge (45) 1995, Figure 1K.

E. sociabilis Dangeard 1901. EGP, Trumpington (45) 1940 (not in John et al, See Wołowski & Hindák 2005).

E. spirogyra Ehrenberg 1838. EGP, Fen Ditton (46) 1943, EAG, Upware (57) 1956, Coe Fen (45) 1967, Harlton (35) 1972; P.J. Hastings, Sheeps' Green (45) 1962, B & S, Histon (46) 1993, Figure 2A, and 7 other records.

E. splendens P.A. Dangeard 1901. EGP, Cambridge (45) 1944.

E. texta (Dujardin) Hübner 1886. EAG, Shelford (45) 1949 as *Lepocinclis texta* (Dujardin) Lemmermann; B & S, Girton (46) 2002, Figure 1L.

E. tripteris (Dujardin) G.A. Klebs 1883. EAG, Barton (45) 1943; EAG, Coe Fen (45) 1962, 1967, Comberton (35) 1962, Madingley (45) 1963, B & S, Histon (46) 1993, Figure 2A, and 7 other records.

E. viridis Ehrenberg 1830. EGP, Cambridge (45) 1940. Balsham (55) 1948, Shelford (45) 1949, Fen Ditton (46) 1949; EAG Hayley Wood (25) 1948; B & S, Cambridge (45) 1995, Figure 2C and 38 other records

Eutreptia Perty 1852

Eutreptia viridis Perty 1852. EAG, Toft (35) 1948, Coe Fen (45) 1963.

Hyalophacus Pringsheim 1936

H. ocellatus Pringsheim 1936. B & S, Girton (46) 2002, Figure 2D. Resembles a colourless *Phacus* (Description in Wołowski 1998).

Khawkinea John & Mckibben 1937

K. quartana (Moroff) Jahn et Mckibben 1937. B & S, Coton (45) 2000, Figures 3 N & O, and 1 other. Resembles a colourless *Euglena*, with a stigma.

Lepocinclis Perty 1852

L. ovum (Ehrenberg) Lemmermann 1901. EGP, Cherry Hinton (45) 1995, Figure 3B, and 16 others.

L. steinii Lemmermann 1901. EGP, Cambridge (45) 1940; B & S, Girton (46) 1996, Figure 1C.

L. steinii var. *suecica* Lemmermann 1901. B & S, Dry Drayton (36) 1995.

Phacus Dujardin 1841

P. acuminatus A. Stokes 1885. B & S, Histon (46), 2000, Figure 2F, and 18 other records.

P. agilis Skuja 1926. B & S, Barton (45) 2001, Figure 2G and 11 other records.

P. alatus G.A. Klebs 1883. EGP, Cambridge (45) 1940, Trumpington (45) 1940.

P. granum Drezepolski 1925. B & S (36) 1995, Figure 3A.

P. helicoides Pochmann 1941. B & S, Cambridge (4) 1995. Figure 2E, and 1 other record.

P. pleuronectes (O. F. Müller) Dujardin 1841. EAG, Cambridge (45) 1949. Hayley Wood (25) 1962, Madingley (36) 1963, Coe Fen (45) 1967; B & S, Histon (46) 2000, Figure 2H, and 18 other records.

P. pseudonordstedtii Pochmann 1941. B & S, Barton (45) 2001, Figure 2J, and 9 other records.

P. pusillus Lemmermann 1910. EGP, Cambridge (45) 1945; EAG, Hayley Wood (25) 1962; B & S, Barton (45) 2000.

P. pyrum (Ehrenberg) Stein 1878. EGP, Cambridge (45), 1940, EAG Coe Fen (45) 1963, 1967, Madingley (36) 1961, 1963; B & S, Dry Drayton (36) 1995, Figure 2L, and 2 other records.

P. similis Christen 1962. B & S, Girton (46) 2000, Figure 2M, and 6 other records.

P. striatus (Drezepolski) France 1893. B & S, Histon (46) 1998, Figure 2K, and 1 other record.

P. tortus (Lemmermann) Skvortsov 1928. B & S, Milton (46) 1994, Figure 2I, and 7 other records.

P. triqueter (Ehrenberg) Dujardin 1841. EGP, Shelford (45) 1948, Balsham (56) 1949; EAG, Coe Fen (45) 1963, Madingley (36) 1963.

Strombomonas Deflandre 1930

S. acuminatus (Schmarda) Deflandre 1930. B & S, Comberton (35) 1995, Figure 3F.

S. eurystoma (F. Stein) T.G. Popova 1966. B & S, Madingley (36) 1995, Figure 3E.

Trachelomonas Ehrenberg 1833

T. abrupta (Svirenko) Deflandre 1926. EGP, Cambridge (45), 1940.

T. armata (Ehrenberg) F. Stein 1878. B & S, Cambridge (45) 2001, and 3 other records.

T. hispida (Perty) F. Stein emend. Deflandre 1926, including var. *crenatulicollis* (Maskell) Lemmermann. In most records this variety was not distinguished. Both occur. EGP, Cambridge (45) 1948, Balsham (55) 1948; EAG, Comberton (35) 1962; B & S Cambridge (45) 2001, Figure 3I, and 55 other records.

T. lacustris Drezepolski 1925. B & S, Cambridge (45) 2000, Figure 3H.

T. lefevrei Deflandre 1926. EGP, Cambridge (45) 1948, Shelford (45) 1948.

T. oblonga Lemmermann 1899. B & S, Girton (46) 1995, Figure 3J.

T. volvocina Ehrenberg 1833. EGP, Cambridge (45) 1940, Balsham (55) 1948, Fen Ditton (46) 1943; EAG Madingley (36) 1961, Comberton (35) 1962; B & S, Girton (46) 2001, Figure 3K, and 71 other records.

T. volvocina var. *subglobosa* Lemmermann 1913. B & S, Coton (45) 2000, Figure 3L, and 1 other record.

T. volvocinopsis Svirenko 1914. EGP, Waterbeach (47) 1943, B & S, Dry Drayton (36) 2000, Figure 3 M, and 24 other records.

T. zorensis M. Lefevre 1933. EGP, Cambridge (45) 1940.

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References

Belcher, Hilary, & Swale, Erica. (2005-6). E.A. George, M.A., 1920-2005. *Freshwater Biological Association News*, 32:3.

John, D.M., Whitton, B.A., & Brook, A.J. (2002). *The Freshwater Algal Flora of the British Isles.* Cambridge University Press.

Hüber-Pestalozzi, G. (1955). *Das Phytoplankton des Süsswassers.* Vol. 16, Part 4. *Euglenophyceen.* Schweizerbart, Zürich.

Leedale, G.F. (1967). *Euglenoid Flagellates.* Prentice-Hall, New Jersey.

Pringsheim, E.G. (1956). Contributions towards a monograph of the genus Euglena. *Nova Acta Leopoldiana* 18 (125): 3-168.

Tudge, Colin (2000). *The Variety of Life.* Oxford University Press.

West, G.S. (1899). The alga-flora of Cambridgeshire. *Journal of Botany, London*, 49-58, 106-116, 216-225, 262-267, 291-299.

Wołowski, K. (1998). *Taxonomic and environmental studies on euglenophytes of the Kraków-Czestochowa Upland (Southern Poland).* Polish Academy of Sciences, Kraków.

Wołowski, K., & Hindák, F. (2005). *Atlas of Euglenophytes.* Slovak Academy of Sciences, Bratislava.

Figure 1

1A *Colacium epiphyticum* Fritsch 1933. Girton (46), pond, on detritus particles, Feb. 1995, & 2000. **1B** Habit sketch of this, & C.300. **1C** *Colacium vesiculosum* Ehrenberg forma c*yclopicola* (Gicklhorn) T.G. Popova 1939. Fordham, Essex 943 263. pond on Cyclops, April 1996, since we do not have a figure of our Cambridgeshire material. **1D** *Euglena agilis* H.J. Carter 1856. Girton (46), garden pond, April 2001, x 2000. **1E** *Euglena acus* Ehrenberg var. *acus*. Dry Drayton (35) school pond, April 2001, x 1000. **1F** *Euglena gracilis* G.A. Klebs 1883. Girton (46), puddle in cow field, May 2004, x 1000. **1G** *Euglena clara* Skuja 1948. Cambridge (45), Pellew's Pond, Nov.1997, x 1000. **1H** *Euglena deses* Ehrenberg 1833 fo. *intermedia* G.A. Klebs 1883. Coton (45), puddle, Dec. 2000, x 1000. **1I** *Euglena ehrenbergii* G.A. Klebs 1883. Cambridge (45), Pellew's Pond, May 1997 x 500. The large cells are flattened in cross section. **1J** *Euglena polymorpha* P.A. Dangeard 1901. Cambridge (45), Pellew's Pond, May 1997, x 1000. **1K** *Euglena proxima* P.A. Dangeard 1901. Cambridge (45). Pond, Botanic Garden, Sept. 1995 x 1000. **1L** *Euglena texta* (Dujardin) Hübner 1886. Girton, small plastic container, May 2002 x 1000

Figure 2

2A *Euglena spirogyra* Ehrenberg 1838. Histon (46), pond in woodland, May 2001, x 1000.
2B *Euglena tripteris* (Dujardin) G.A. Klebs 1883. Coton (45), puddle Dec.2000, x 1000.
2C *Euglena viridis* Ehrenberg 1830. Cambridge (4), Queens' Green Backwater, April 1995, x 1000. **2D** *Hyalophacus ocellatus* Pringsheim 1936. Girton (46) small plastic container, May 2002, x 1000. **2E** *Phacus helicoides* Pochmann 1941, Cambridge (45), Cavendish Laboratory Pond, August 1995, x 1000. **2F** *Phacus acuminatus* A. Stokes 1885. Histon (46), muddy stream, November 2004, x 1000. **2G** *Phacus agilis* Skuja 1926. Barton (45), pond, Nov. 1901, x 2000. **2H** *Phacus pleuronectes* (O.F. Müller) Dujardin 1841. Histon (46), puddle in stubble field, Nov. 2000, x 1000. **2I** *Phacus tortus* (Lemmermann) Skvortsov 1928. Milton (46), Todd's Pit, Nov. 1994, x 1000. **2J** *Phacus pseudonordstedtii* Pochmann 1941. Barton (45), pond, Sept. 2001 x 1000. **2K** *Phacus striatus* (Drezepolski) Francé 1893. Histon (46), small eutrophic lake, Sept. 1998, x 1000. **2L** *Phacus pyrum* (Ehrenberg) Stein 1878. Dry Drayton (36), pond, Sept. 1995, x 1000. **2M** *Phacus similis* Christen 1962. Girton (46), pond, Feb 2001, x 1000

Figure 3

3A *Phacus granum* Drezepolski 1925. Dry Drayton (36), pond, Sept. 1995, x 2000.
3B *Lepocinclis ovum* (Ehrenberg) Lemmermann 1901. Cambridge, Cavendish Laboratory Pond. July 1995, x 2000. **3C** *Lepocinclis steinii* Lemmermann 1901. Girton (46), pond. July 1996, x 2000. **3D** *Lepocinclis steinii* var. *suecica* Lemmermann 1901. Dry Drayton, (36), pond, Sept. 1995, x 2000. **3E** *Strombomonas eurystoma* (F Stein) T.G. Popova 1966. Madingley (35), lake, June 1995, x 2000. **3F** *Strombomonas acuminatus* (Schmarda) Deflandre 1930. Comberton (35), pond, x 2000. **3G** *Trachelomonas armata* (Ehrenberg) F. Stein 1878. Cambridge (45), pond, x 1000. **3H** *Trachelomonas lacustris* Drezepolski 1925. Cambridge (45), pond, Sept. 2001, x 1000. **3I** *Trachelomonas hispida* (Perty) F. Stein emend. Deflandre 1926 var. *crenatulicollis* (Maskell) Lemmermann 1913. Cambridge (45), pond, Feb. 2001 x 1000. **3J** *Trachelomonas oblonga* Lemmermann 1899. Girton (46), pond, April 1995, x 1000. **3K** *Trachelomonas volvocina* Ehrenberg 1833. Girton (46), small plastic container, Nov. 2001, x 2000. **3L** *Trachelomonas volvocina* var. *subglobosa* Lemmermann 1913. Coton (45), Dec. 2000, x 2000. **3M** *Trachelomonas volvocinopsis* Svirenko 1914. Dry Drayton (36), pond, April 2001, x 2000. **3N** and **O** *Khawkinea quartana* (Moroff) John et McKibben 1937. Coton (45), puddle, Dec. 2000 x 2000.

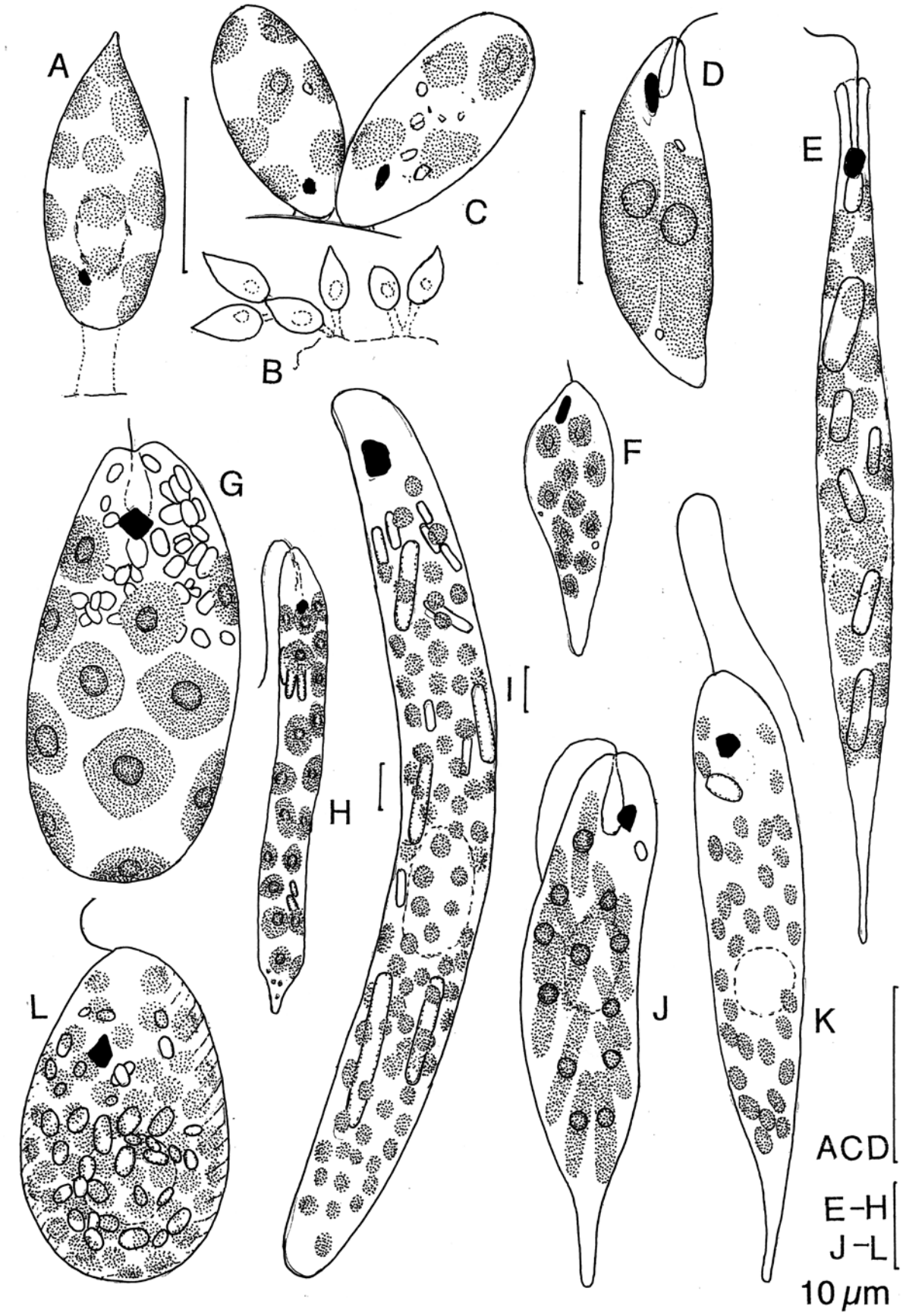

Figure 1

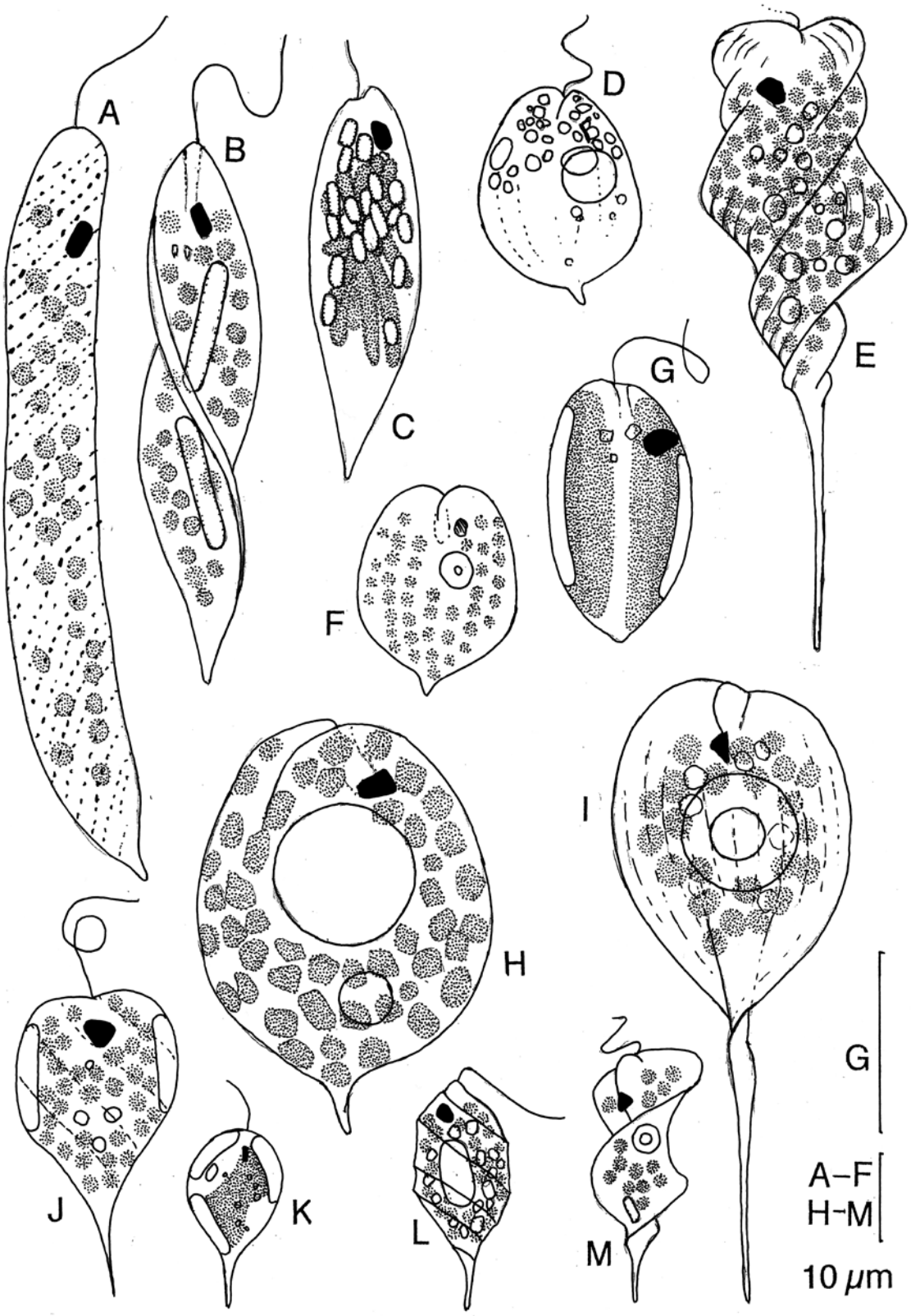

Figure 2

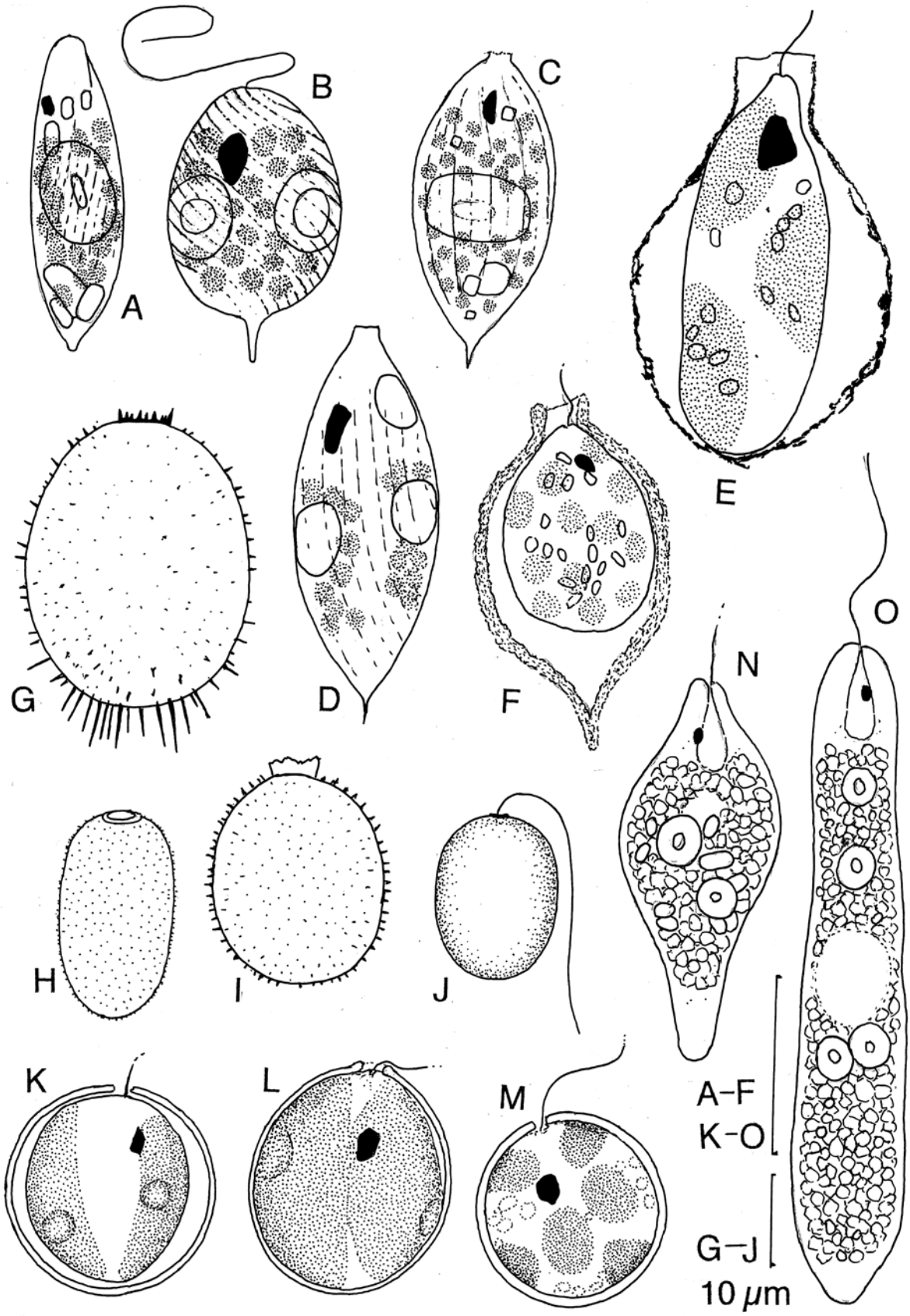

Figure 3

Rummers Lane: A moss-rich Cambridgeshire orchard

C. Robin Stevenson

Orchards are the New Hedgerows: after decades of neglect and destruction, the potential value of orchards for a variety of different forms of wildlife has become a matter of concern.

In the case of the more obscure groups of organisms such as bryophytes (mosses and liverworts), there are relatively few facts available on which to base judgements concerning the relative value of different sites.

Bryophytes within orchards include not only the epiphytic species which grow attached to the trunks and branches of the trees, but also those which grow on the orchard floor and are associated with incidental features such as dykes and drains. However, the most important species are generally the epiphytes, and it is only they that will be considered here.

The ecology of Epiphytes

Bryophytes as a group are heavily reliant for their nutrient supply upon rainwater (Brown, 1982). The factors controlling the distribution of epiphytic mosses are still not fully understood, but they include bark pH, bark texture, the architecture of the trees, the age of the trees, the proximity of sources of inoculation. Smith (1982) notes, however, 'it is not even possible to state that any one factor or factors are more or less important than others as there is no means of isolating effects which may vary with circumstances'.

Epiphytes may be divided into two groups: Obligate and Facultative. Obligate epiphytes ought only to grow attached to host plants but in fact they may occur (very rarely) on other surfaces. Facultative epiphytes are able to grow on a variety of substrates but may display varying degrees of affinity for the epiphytic habit: some may prefer to grow epiphytically, and only occur on other substrates occasionally, whilst for other species the reverse may be true. Levels of preference may vary regionally, according to local circumstances. Despite the lack of precision, this division is still a useful one to make; the allocations used by Bates *et al* (1997) were used in this study. (In addition some Casual species may occur – species which only occur as epiphytes under exceptional circumstances.)

Orchard Management

A distinction is usually made between 'traditionally' managed and modern, 'commercial' orchards. Many traditional orchards consist of standard trees, planted at low density (150 per ha); many of the trees may be over 60 years old, and the orchard floor is grass-covered and grazed by sheep. Modern orchard trees, by contrast, are grafted onto dwarfing rootstocks; are heavily pruned each year; are planted at much higher densities (up to 2200 trees per ha), and are very young, being replanted every 12 - 15 years. A strip of bare earth is maintained under the trees by the application of herbicide, and they are sprayed (Cambridgeshire County

Council, 2003). Pruning, and the application of herbicides, is essential to improving crop yields and quality (Jackson, 2003). Implicit in this distinction seems to be an assumption that the traditional management is better for wildlife.

However, in East Anglia most trees were grown as 'half –standards', and spraying certainly was part of the normal management regime. Watson (1908) speaks of spraying the bark with a variety of substances, including 'Paris Green', 'London Purple', arsenate of lead and Bordeaux mixture, that were used as insecticides or fungicides; in other words, some traditional orchards relied just as heavily on spraying as do modern orchards. As mosses were known to harbour potentially damaging insects, trees were treated specifically to get rid of them: a paraffin naphthalene wash, combined with a caustic alkali wash "also removes the vegetal encumbrances which shelter numerous other insect pests during the cold part of the year" (Theobald, 1902); as Smith & Wilcox (1950) observed, "The effect of spraying…gives the trees a sleek polished appearance." So old orchards in their heyday may have been largely moss and lichen free.

As Jackson (1965) points out 'The low-spreading shape of the Bramley trees is convenient for hand picking without ladders, although *originally it was designed to match the capacity of the spraying machines then available*.' One also suspects that pruning in the past, when labour was much cheaper, was probably just as intensive as at present. The lack of pruning, and cessation of spraying in traditional orchards, probably has more to do with the lack of demand for their produce than any 'organic' ethos.

Many modern commercial orchards keep spraying to an absolute minimum, on cost grounds, and, certainly in the Wisbech area, many of the orchards are maintained at lower densities than those quoted above; the trees are also frequently much older, and are still managed as half-standards, rather than being grafted onto dwarf stocks.

Rummers Lane

On the southern edge of Wisbech St Mary, just off Rummers Lane, lies a large block of orchards, occupying about 12 hectares. These were originally individual plots owned by parishioners, although they are now managed by a single tenant, on behalf of Cambridgeshire County Council. The individual plots having fallen into disuse, and management having been abandoned, the site was deteriorating until it was designated as a County Wildlife Site and taken into Stewardship.

The orchards are devoted almost entirely to apples, though one block of young plum trees is also present. A northern block is separated from a southern block by a drain, whilst both blocks can be roughly divided into two on an east-west axis, with the easternmost blocks being dominated by large Bramley's, whilst those to the west are dominantly much smaller dessert apples. The mean trunk diameter for the Bramley's was 211cms, that for the dessert apples 82 cms. Normally, when tree age is being estimated, the trunk diameter at breast height is used (Mitchell, 1996); in the case of these trees

this was impossible, so diameter was measured at base. Their girth suggests the dessert apples are younger than the Bramley's but this cannot be taken for granted since the two varieties may develop at different rates.

The shape of apple trees, which typically branch at low angles, means that water does not drain off them quickly; this encourages moss growth.

How rich is Rummers Lane?

A total of 43 epiphytic species has been recorded from the orchard, two of which were new vice-county records (Appendix 1). In addition 14 other species have been found in associated habitats, such as the orchard floor, sides of dykes, old concrete, etc. (Most of these records were made by members of the Cambs Bryophyte Group; however, several independent visits have added to their totals.) The figure for epiphytes certainly belies the assertion by Barkman (1992) that plantations usually contain few epiphytes.

Conservation generally comes at a cost, so conservationists have to exercise judgements as to which of several sites may be most worthy of conservation. However, in the case of habitats such as orchards, where existing data are sparse, proxy data from related habitats may have to be used – in this case data from other forms of woodland.

Orchards differ from normal mixed woodlands in the spacing, age, and species composition of the trees. They are generally monocultures where the trees are evenly spaced, allowing, particularly amongst younger (or smaller) trees, much greater permeability in regard to wind movement – which may influence the spread of propagules such as spores. The trees are all of the same age (except for replacements), and the species composition is fixed. However, different varieties of apples appear to exert some influence on their bryofloras: in the Flitcham orchards in Norfolk, Laxton's Fortune apples were significantly richer in species than Cox's (Stevenson: unpublished data). This is a topic that needs further investigation; however, the richness of the bryoflora at Rummers Lane may be related to the diversity of fruit varieties present.

The plum trees at Rummers Lane yielded only 10 species, and the vast majority of the trees had no moss on them at all. The youth of the trees, their architecture (most of the branches are at an acute angle to the trunk - which allows water to drain away more quickly), and their low bark pH probably account for the poverty of the flora.

Comparisons with wooded areas: Because most orchards are monocultures the most appropriate comparisons would be with natural or planted monocultures. Many of the natural monocultures which exist e.g. alder, beech, birch, pine (Peterken, 1981) have acidic barks which do not support much of an epiflora. However, some monocultures of trees with more basic bark do exist e.g. sallow, elder and elm; these species generally support richer epifloras, though much depends on their surrounding microclimates. Rothero (2002) has pointed out the importance of aspen as a host species in Scotland. However, apart from conifers there are few tree

monocultures planted, and conifers, with their dense shade, very acid bark and consequently limited bryofloras, tell us little.

Normal mixed woodlands vary greatly: in size; in management style; in the age spectrum of trees species; in the range of tree species present; in soils; etc. This makes it difficult to draw direct comparisons with orchards. Rackham (2003, Fig 30.3) shows the relationship between bryophyte numbers and the size of ancient woodlands in West Cambridgeshire. As one might expect, the bigger the wood the richer the bryoflora – but there is no way of separating off the purely epiphytic totals from this diagram, which must include species growing in habitats such as ponds, ditches and rides which are not going to occur in orchards. However, it would seem logical that orchards should follow this pattern, and that larger orchards should be richer than smaller ones; similarly, older orchards might be expected to be richer than younger ones, having had more time to acquire their flora.

Species lists available from woodland sites do not always mention which, if any, of the species listed were occurring as epiphytes. A certain amount of judicious guesswork is involved in creating lists of probable epiphytes. This exercise was, however, attempted and the results plotted in Fig. 1.

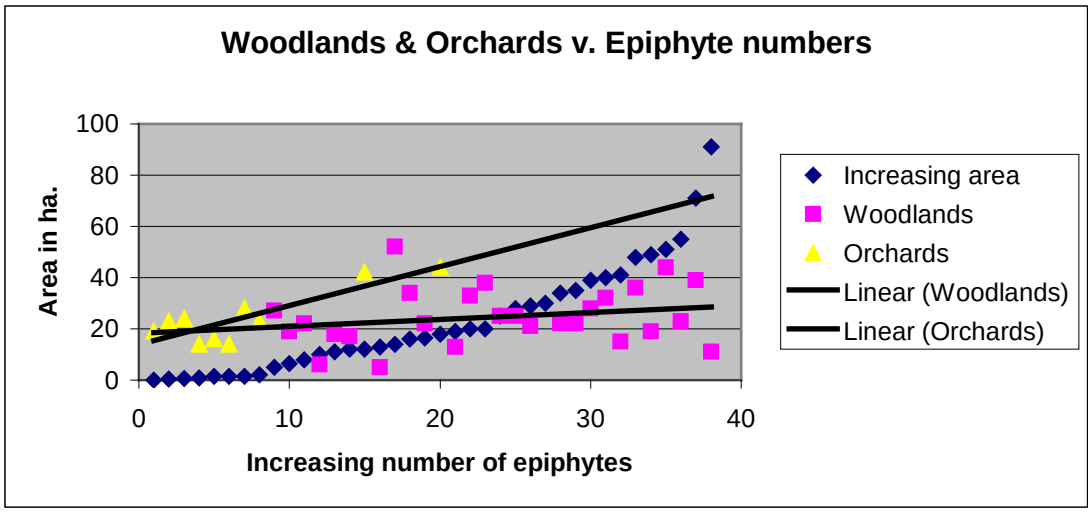

Figure 1. A comparison of overall epiphyte numbers in local woodlands and orchards, plotted against increasing area. (The data for the Cambridge woodlands was supplied by Dr. CD Preston; that for orchards is based on orchards both in Cambridge and adjacent areas in Norfolk.)

Comparisons with other orchards: The most useful data for evaluating the richness of an orchard must come from comparisons with other orchards; even so, the conclusions drawn can, as yet, only be tentative. Orchards vary a great deal in size; their methods of management may have varied considerably over time; the type of tree grown may have an influence, and their pollution histories may also have been significantly different.

The data presented in Appendix 2 is gathered from a selection of the few apple orchards, both traditional and commercial, which have been examined

so far. Most of them are in Fenland or on the Fen edge, though the Royal orchards at Flitcham in Norfolk are on higher ground (c. 60m).

Bates *et al* (1997) in their study of epiphytic bryophytes occurring in a transect across southern Britain noted a total of 24 species of obligate and 32 facultative species which occurred frequently in the recording units used for their survey; 58% of their obligate species and 43% of the facultative species have been found in local orchards.

Results

Figure 1 and Appendix 1 illustrate clearly that larger orchards, such as Rummers Lane and Flitcham have richer bryofloras. The bulk of the species, however, also occur in smaller orchards.

A very high percentage of species are common to all of the sites examined so far. These are mostly facultative species, though there are some exceptions, such as *Frullania dilatata, Orthotrichum affine* and *Ulota bruchii*. If there are such things as bryophyte communities, then one might reasonably expect that, in an experiment where a large series of replicates is laid out under essentially identical conditions, the substrates would eventually support more-or-less identical communities of plants. An orchard is such an experiment. However, the moss flora of individual trees varies so much, not only in the species present, but also in the amount of moss present, as to suggest that the concept of a specific well defined bryophyte community is only valid at orchard level.

Within Rummers Lane only a few species were anywhere near ubiquitous, and even then the amount present on any one tree was quite variable. *Amblystegium serpens, Brachythecium rutabulum, Bryum capillare, Dicranoweisia cirrata, Homalothecium sericeum, Hypnum cupressiforme, Hypnum resupinatum, Orthotrichum affine, Orthotrichum diaphanum, Rhynchostegium confertum* and *Zygodon viridissimus* were all widely distributed across the whole site. Only the two species of *Hypnum* were abundant; all the others were, at best, frequent but more commonly occasional. *Zygodon viridissimus* was, whilst widely distributed, only ever rare – except on a few trees. (Nomenclature follows Blockeel & Long, 1998.)

Whilst adjacent trees usually had a reasonable number of species in common, most trees had at least one unique species that was absent from its neighbours. Even adjacent branches on the same tree sometimes varied enormously, both in the species and amount of moss present.

As seen in Appendix 1, the commercial Royal Orchards at Flitcham in Norfolk have roughly as many species as does Rummers Lane. There is also a very considerable overlap in the species present, suggesting that spraying has little or no effect on bryophytes (Flitcham is sprayed every 10 days during the season). The percentage of casual species is higher in Flitcham, probably due to the differences in management, the open soil under the trees acting as a source.

The obligate species were most consistently found in the two largest orchards, with occasional appearances elsewhere. Differences between these

two sites could be quite marked: *Orthotrichum pulchellum* was found as a single stem at Rummers Lane, whilst it has been found at several places in Flitcham; Bates et al (1993) noted that this plant declines with shading, so the regular pruning (and therefore lightening of the canopy) which occurs at Flitcham may have encouraged this plant more. (The effects of pruning may be highly significant, in creating the light and other microclimatic conditions favourable to both good fruit production (Jackson, 2003) and moss growth. This topic requires further investigation.) Only three species, *Orthotrichum stramineum, Pylaisia polyantha* and *Platygyrium repens* are restricted to single sites. So far.

A small, but interesting, group of species includes *Leptodictum riparium,* and *Leskea polycarpa*. As a group they are generally considered typical of habitats in or by water – their appearance here, in the canopy of trees, is somewhat surprising. It is curious that they can co-exist with species such as *Grimmia pulvinata, Tortula muralis* and *Syntrichia intermedia* which normally grow on rock or stonework and were found in Bates *et al*'s (2004) survey only in areas with low moisture status.

Although in western Britain *Isothecium myosuroides* can occur high up the trunks of trees, in East Anglia it is generally restricted to the base of mature woodland trees, so it too was a surprise find in the canopy of orchard trees.

Over the last 100 years or so a variety of types of pollution have affected epiphytic bryophytes. At one time sulphur dioxide pollution was dominant, then it began to decline in importance (Farmer, Bates & Bell, 1992, Bates, 2000), to be replaced by nitrous compounds, fertiliser spray drift, etc. (Lee *et al.*, 1998) At various times a complex cocktail of chemicals may have been acting on bryofloras and it is by no means clear which forms of pollution are most significant today.

However, it is clear that in many parts of the country species appear to be 'recovering' from the higher pollution levels of the past: species such as *Frullania dilatata, Orthotrichum lyellii, Orthotrichum pulchellum, Orthotrichum stramineum, Radula complanata, Sanionia uncinata, Syntrichia laevipila, Syntrichia papillosa* and *Ulota phyllantha* are all species which either are, or may be, recovering from the effects of air pollution. Some, such as *Frullania dilatata* and *Ulota phyllantha* are doing so more successfully than others – at least as far as their geographical spread is concerned; neither plant, nor any of the others listed, is common within any given orchard. The fact that these plants have to be either searched for intensively (or found accidentally) makes them difficult to use as criteria for site evaluation. (The history of past pollution and extinctions may partly account for the similarity in bryofloras between the older and newer sites; they may both have been starting from the same post-pollution base point.) *Leucodon sciuroides*, on the other hand, does not appear to have recovered at all well from the effects of pollution; the record from Rummers Lane is the first record of this species as an epiphyte in Cambs for more than 50 years (CD Preston, personal communication).

Bryum laevifilum, Leucodon sciuroides, Orthotrichum lyellii, Platygyrium repens, Syntrichia laevipila var *laevipiliformis), Ulota phyllantha* and both the species of *Zygodon* are all well known for producing abundant asexual propagules. It is interesting that the *Bryum*, *Leucodon*, and the *Zygodon*s are most frequently encountered on trunks – where passing animals (such as the sheep used in traditional management) may help to transfer their propagules from tree to tree. However, even in modern orchards, animals such as rabbits and deer are not uncommon, and may fulfil this function. In the case of those species which are more frequently found higher in the branches, presumably the agents of transport are either birds or small mammals such as mice; it would be interesting to know. (It is worth noting that recent investigations (e.g. Duckett & Matcham, 1995a & b) have discovered that a higher proportion of species than previously suspected actually possess asexual propagules which may travel via the mechanisms detailed above.)

Comparing these results with those obtained by Bates et al (1997) there are a number of differences. Several species which they claim have a markedly eastern distribution have not been found, viz. *Aulacomnium androgynum, Orthodontium lineare* and *Plagiothecium curvifolium*; this is scarcely surprising as they are all plants of much more acid habitats than normally occur in orchards. Other of the common epiphytes found during their survey, and which have not been found in the orchards surveyed, include plants which have a markedly western distribution pattern, such as *Neckera pumila*, and acidophytes such as *Dicranum tauricum*. Several of the other species they list are fairly closely associated with mature woodland – a habitat which scarcely exists in the Fen Basin, so their absence is not surprising.

The richest tree species encountered by Bates *et al* (1997) were *Fraxinus excelsior, Sambucus nigra, Salix sp.* and *Quercus sp.* which, between them, accounted for some 55% of their records. However, they do point out that their sampling methodology did mean that less common tree species (such as apple) were under-represented, even where they were rich hosts for epiphytes. Where they did sample apple, however, the average number of species per recording unit was about one. The richest trees in this survey had up to 15 species.

Conclusions

Comparing orchards and woodlands is like comparing Brie and Cheddar: both are cheeses, but they are so unlike in flavour, texture, etc that comparisons are probably misleading. However, as indicated in Fig. 1, they compare well with woodlands in the region, including ancient woodlands.

The comparisons that are likely to be most meaningful are with other orchards, where the data suggest that large orchards, such as Rummers Lane, are more species rich. However, there are few species that do not also occur in smaller orchards, many of which have still to be surveyed.

Investigations so far suggest that, in terms of species numbers alone, there is not that much difference between traditional orchards and some

commercial orchards, as Fig. 2 shows. More sampling is needed before any definite conclusions can be drawn. From a conservation point of view, however, it may be important to ensure the future preservation of some of the commercial orchards that currently have larger older trees in them, before they are ripped out and replaced by high density modern dwarf stock.

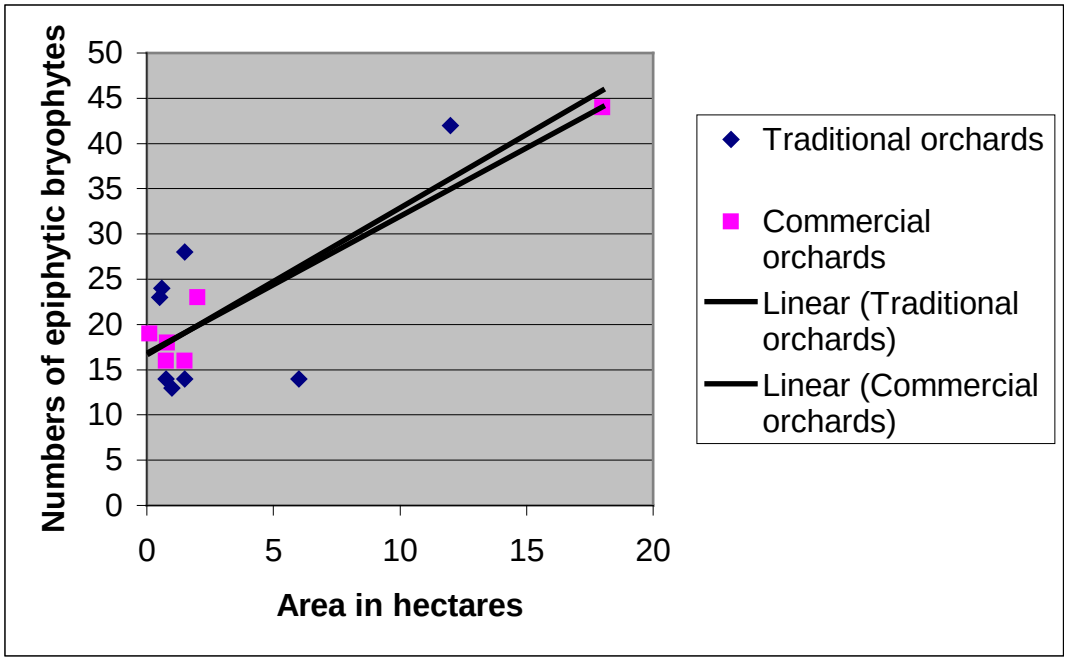

Figure 2. The relationship between area and the number of epiphytic bryophyte species present, for both Traditional and Commercial orchards.

The richness of orchards as a habitat for bryophytes probably varies regionally, according to their size, the type of fruit being grown, and the type of management followed. They may well form 'hot-spots' for such epiphytic bryophytes as occur locally, though in largely treeless areas like the Fens they are probably more important than elsewhere – hence the importance of Rummers Lane.

Orchards may appear 'good' simply because they are amongst the few places where we can conveniently examine the canopies of mature trees. Species such as *Sanionia* may, for all we know, occur quite frequently, but normally be unavailable to view. (It is noticeable, particularly in the case of *Sanionia*, that all recent E. Anglian records are from sallows or orchards – where the host trees are low growing and accessible.)

However, the significance of orchards for biodiversity is not to be measured in terms of moss alone; a host of other organisms may also be found in orchards. For some of these, e.g. molluscs and arthropods, moss may act as both refuge and foodstuff. They, in turn, may act as prey for other species, such as birds, thus the sheer amount of moss present may be just as important as the variety of species.

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Members of the Cambs Bryology Group initiated recording at Rummers Lane; members of the Norfolk Bryology Group helped in the recording at Flitcham, and the East of England Apples & Orchards Project have helped with travel expenses.

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References

Barkman, J.J. (1992). Canopies and microclimate of tree species mixtures. In: Cannell, M.G.R., Malcolm D.C. & Robertson, P.A. (eds) *The Ecology of mixed-species stands of trees.* Oxford: Blackwell Scientific Publications. (British Ecological Society Special Publication no. 11)

Bates, J.W. (2000). Mineral nutrition, substratum ecology, and pollution. In Shaw, A.J. & Goffinet, B. (eds) *Bryophyte Biology*. Cambridge: Cambridge University Press.

Bates, J.W., Perry, A.R. & Proctor, M.C.F. (1993). The natural history of Slapton Ley National Nature Reserve. XX. The changing bryophyte flora. *Field Studies*: 279-333.

Bates, J.W., Proctor, M.C.F., Preston, C.D., Hodgetts, N.G & Perry, A.R. (1997). Occurrence of epiphytic bryophytes in a 'tetrad' transect across southern Britain. 1. Geographical trends in abundance and evidence of recent change. *Journal of Bryology* **19**(4), 685 – 714.

Bates J.W., Roy, D.B. & Preston C.D. (2004). Occurrence of epiphytic bryophytes in a 'tetrad' transect across southern Britain. 2. Analysis and modelling of epiphyte-environment relationships. *Journal of Bryology* **26**(3), 181 – 197.

Blockeel, T.L. & Long, D.G. (1998). A check-list and Census Catalogue of British and Irish Bryophytes. Cardiff: British Bryological Society.

Brown, D.H. (1982). Mineral Nutrition. In: Smith, A.J.E. (ed.) *Bryophyte Ecology*. London: Chapman & Hall.

Cambridgeshire County Council. (2003). Biodiversity Action Plans: Traditional orchards – Local Habitat Action Plan for Cambridgeshire. (www.cambridgeshire.gov.uk/sub/cntryside/biodiv/plans/orchards.html)

Duckett, J.G. & Matcham, H.W. (1995a). Gemmiferous protonemata; an overlooked dimension in the reproductive biology of mosses. *Bulletin of the British Bryological Society* **65,** 22.

Duckett, J.G. & Matcham, H.W. (1995b). Studies of protonemal morphogenesis in mosses VII. The perennial rhizoids and gemmiferous protonema of *Dicranella heteromalla* (Hedw.) Schimp., *Journal of Bryology* **18 (3),** 407 – 424.

Farmer, A.M., Bates, J.W. & Bell, J.N.B. (1992). Ecophysiological effects of acid rain

on bryophytes and lichens. In: Bates, J.W. & Farmer, A.M. (eds) *Bryophytes and lichens in a changing environment.* Oxford: Clarendon Press.

Jackson, B.G. (1965). Agriculture. In: Steers, J.A. (ed) *The Cambridge Region.* Cambridge: British Association for the Advancement of Science.

Jackson, J.E. (2003). *Biology of Apples and Pears*. Cambridge: Cambridge University Press.

Lee, J.A., Caporn, S.J.M., Carroll, J., Foot, J.P., Johnson, D., Potter, L. & Taylor, A.F.S. (1998). Effects of ozone and atmospheric nitrogen deposition on mosses. In: Bates, J.W., Ashton, N.W. & Duckett, J.G. (eds) *Bryology for the Twenty-first Century.* Leeds: Maney Publishing (for the British Bryological Society).

Mitchell, A. (1996). *Alan Mitchell's Trees of Britain*. London: Harper Collins Ltd.

Peterken, G.F. (1981). *Woodland Conservation and Management*. London: Chapman & Hall.

Rackham, O. (2003). *Ancient Woodland*. Dalbeattie: Castlepoint Press.

Rothero, G. (2002). Bryophytes on Aspens. *The Biodiversity and Management of Aspen woodlands: Proceedings of a one-day conference held in Kingussie, Scotland, on 25th May 2001*. www.treesforlife.org.uk/kingussie2001/aspen_bryophytes.html.

Smith, A.J.E. (1982). Epiphytes and epiliths. In: Smith AJE (ed) *Bryophyte Ecology.* London: Chapman & Hall.

Smith, F.D. & Wilcox, B. (1950). *The country companion: a practical dictionary of rural life, and work.* London: Adam & Charles Black.

Theobald, F.V. (1902). Economic Entomology. In: Wallace, D.M., Hadley, A.T. & Chisholm, H. (eds) *The New Volumes of the Encyclopaedia Britannica (Tenth Edition).* Edinburgh: Adam & Charles Black.

Watson, W. (1908). *Thompson's Gardeners Assistant* (vol iv) (New Edition ed. Watson). London: The Gresham Publishing Co.Ltd.

Location	**Grid reference**	**Type**	**Area in hectares (approx.)**
Willingham	TL400.693	Commercial	0.1
Walton Highway	TF493.123	Traditional	0.5
Walpole Highway	TF514.137	Traditional	0.6
Girton (Old)	TL423.612	Traditional	0.75
Emneth	TF482.085	Commercial (neglected)	0.75
Wisbech B	TF448.075	Commercial	0.8
Haddenham	TL469.752	Traditional	1
Wisbech A	TF447.076	Traditional	1.5
Cottenham	TL440.665	Traditional	1.5
Girton (New)	TL424.613	Traditional	1.5
Terrington St John	TF538.161	Commercial	2
Over	TL37.69	Traditional	6
Wisbech St Mary (Rummers Lane)	TF415.075	Traditional	12
Flitcham	TF723.280	Commercial	18

Appendix 1. Apple Orchards in Cambridge and Norfolk, on which this study is based. (The previous table lists their locations, type of management, and area.)

SPECIES	Rummers Lane	Wisbech	Walpole Highway	Flitcham	Terrington St John	Walton Highway	Girton A	Girton B	Cottenham A	Willingham A	Haddenham	Over	
Amblystegium serpens	1	1	1	1	1	1	1	1	1	1	1	1	12
Barbula unguiculata				1									1
Brachythecium rutabulum	1	1	1	1	1	1	1	1	1	1		1	11
Brachythecium velutinum	1	1	1	1			1			1			6
Bryoerythroph recurvirostrum				1									1
Bryum argenteum	1									1			2
Bryum bicolor				1						1			2
Bryum capillare	1	1	1	1	1	1	1	1	1	1	1	1	12
Bryum subelegans	1	1		1		1							4
Campylopus introflexus	1	1		1									3
Ceratodon purpureus	1	1	1	1	1	1			1			1	8
Cryphaea heteromalla	1	1		1	1				1				5
Dicranoweisia cirrata	1	1	1	1	1	1	1	1	1	1	1	1	12
Dicranum scoparium	1					1							2
Eurhynchium praelongum	1	1	1	1	1		1		1	1			8
Didymodon insulanus				1									1
Didymodon luridus				1									1
Frullania dilatata	1	1	1	1	1	1							6
Grimmia pulvinata	1	1	1	1	1	1	1	1	1	1	1		11
Homalothecium sericeum	1	1	1	1	1	1	1	1				1	9
Hypnum cupressiforme	1	1	1	1	1	1	1	1	1	1	1	1	12
Hypnum lacunosum	1	1	1	1		1							5
Hypnum resupinatum	1	1	1	1	1	1						1	7
Isothecium myosuroides	1		1	1		1		1					5
Leptodictyum riparium	1			1	1								3
Leskea polycarpa	1			1						1			3
Leucodon sciuroides	1												1
Lophocolea bidentata	1												1
Lophocolea heterophylla	1	1			1								3
Metzgeria furcata	1	1		1	1								4
Orthotrichum affine	1	1	1	1	1	1	1	1	1	1	1	1	12
Orthotrichum diaphanum	1	1	1	1	1	1	1	1	1	1	1	1	12
Orthotrichum lyellii	1		1	1		1	1		1	1	1	1	9
Orthotrichum pulchellum	1			1									2
Orthotrichum stramineum				1									1
Platygyrium repens	1												1
Pylasia polyantha*	1												1
Radula complanata	1			1									2
Rhynchostegium confertum	1	1	1	1	1	1	1	1	1	1	1	1	12
Sanionia uncinata*	1	1	1	1									4
Syntrichia intermedia	1	1	1	1	1	1	1	1	1	1			10
Syntrichia laevipila	1	1		1		1				1			5
Syntrichia latifolia				1									1
Syntrichia papillosa	1	1		1									3
Syntrichia ruralis				1				1		1	1	1	5
Syntrichia virescens	1	1	1	1					1	1			6
Tortula muralis	1	1		1	1			1	1	1	1		8
Ulota bruchii	1		1	1	1	1						1	6
Ulota phyllantha	1		1	1	1								4
Zygodon conoideus	1			1		1					1		4
Zygodon viridissimus	1	1	1	1	1	1							6
	43	28	24	44	23	23	14	14	16	20	12	14	

Cambridgeshire farm bird life over seven decades

Graham Easy

Recording bird populations in Cambridgeshire over seven decades, including a working life in farming, has given me a somewhat different viewpoint to that normally taken by conservationists and ornithologists reviewing changes in bird populations. It seems worthwhile to air this experience since this does not compare well with the gloomy assessments made by the British Trust for Ornithology (BTO) on present trends in our populations.

Surely the Second World War had a much greater influence on our countryside than anything else during the last century? It saw the loss of many wetland areas, like Burwell Fen (the flooded Adventurers) brought into cultivation to make us more self-sufficient in food production. Large areas of waste ground and farmland were lost to airfields and bombing ranges, such as the Ouse Washes; and machinery took over from horsepower on the farms. Certainly there was a relaxation in the culling of Carrion Crows, Magpies and birds of prey in both farmland and on estates with the lapse in gamekeeping. As a youngster I recall climbing many a tree to collect Magpie eggs and most village lads locally had examples of Sparrowhawk, Kestrel and owls' eggs in their collections. Possibly this form of persecution was the main control of their numbers during this period (it was extended to all other bird species, of course); however, it also indicated an increase in the bird of prey population at that time. While there is little well founded information on small bird species during this period one would suspect numbers were kept in check up to the end of the 1940s with this upsurge in predatory bird and mammalian species.

By the 1950s, not only was increased pressure put on the birds of prey in this postwar period as they were again targeted by landowners and farmers, but they became the main victims of the increased usage of highly toxic sprays and seed dressings. These quickly went through the food chain, and while they had a serious effect on large numbers of seed eating passerines especially those finches, Starlings, Rooks and doves renowned for their attacks on newly sown corn crops, this had a far more devastating result on top-of-the-chain birds of prey and carrion eaters: so much so that Sparrowhawks were lost as Cambridgeshire breeders, Kestrels were reduced to a handful of nesters and Magpies became something of a rarity everywhere in the county.

By the late 1950s and during the following decade the lack of predators and presumably a parallel lack of Stoats and Weasels, with mice and rats being poisoned by the dressed seed corn, there was a record build-up in numbers of passerines especially obvious at their roosts in our countryside or during coastal immigration in autumn. We assumed these features had been overlooked by previous generations of observers; rather it seems we were observing a freak phenomenon of passerine abundance due to this lack of

predation during a sequence of winters and breeding seasons. Certainly the farming community was confronted with various plagues of mice, rats, Rabbits, Skylarks, finches (especially House Sparrows and Bullfinches) and Woodpigeons which resulted in various campaigns being waged against them. Surely by beginning the majority of their surveys at this point the BTO was inevitably going to find declines in all these species whatever other events were coming into play on the farming scene in later decades.

The 1970s will long be remembered for the loss of the Elm, so much a feature of the Cambridgeshire countryside. The dying trees affected by Dutch Elm-disease attracted hole nesting bird species, indeed Little Owls were possibly at their most widespread during this period, but the rotting trees became such a danger that a large scale felling operation became necessary. Unfortunately other tree species were lost and hedgerows cleared; farmers taking advantage of the presence of efficient tree felling companies working in their area. Certainly hedge clearance had reached such proportions by this time that some areas of southern Cambridgeshire had begun to take on an open appearance akin to Fenland. In contrast, the widespread planting of shelter belts across the fens over previous decades to help reduce the destruction of the fenland blows had resulted in many of those areas looking well wooded! Obviously some reductions in numbers of breeding birds were evident during this decade, linked to the loss of ditch and hedgerow and the increase in usage of hedgerow and ditch trimming mechanical flails; however, this seemed to be balanced by the increase in garden birds with the spread of suburbia into the countryside providing an abundance of trees and shrubs even in the more remote villages.

It has been the period from the 1980s to the present time that most of the worries concerning loss of bird populations have occurred. Obviously farming practices must have been partially responsible for this. One significant piece of legislation forced upon the industry, the banning of stubble burning, may have been an environmental improvement but it fundamentally changed farming for the next decade or more. Post breeding Lapwing and Golden Plover formerly moved across Europe to gather on these bare fields after the burning and other cultivations or chitting processes that followed. Lesser Black-backed Gulls were attracted in large numbers to these easy pickings, and many passerine species found feeding in plenty often up to and over the winter period. Unfortunately the new format after harvest now involves deep ploughing which buries straw and any unharvested grain deeply beneath the soil and does not provide a terrain suitable for the feeding flocks of old. Lapwing and Golden Plover flocks increasingly repaired to the saltings of the South Wash or moved to farmland later in the season when harvested potato and sugar beet land became available, or when next season’s corn crops were planted. To add to this there was a vast increase in both weed and insect pests which had to be suppressed by increased spraying, adding to the impurities in our food and providing additional hazards to the bird life trying to exist in this environment.

The over-production of foodstuffs became the next major change in farm management. This brought about the set-aside system which was seen as a boon for bird life yet it was alongside this potential bonus for farmland birds that some of the worst declines occurred. For the most part the regularly trimmed uncultivated land produced an unattractive sward, far less suitable for nesting birds than the fields of sugar beet and corn they replaced. Later management with wildlife conservation in mind and farmers becoming more conservationally aware has only recently shown the results that were promised. A change in crop species in the rotations, with Oil-seed Rape and the growing of vegetables for supermarkets has also provided niches for several species formerly in decline.

What of the present day predator/prey balance? Surely this is too far in predators' favour. In our gardens we have protected too many Grey Squirrels and Magpies, while Sparrowhawks seem to take more than one bird a week in our more concentrated garden feeding colonies. If you have a local large colony of House Martins or Swallows nearby you will become aware that Hobbys will carry off at least one kill a day when nesting or feeding young. Let us not forget also the plague of cats that inhabit our spreading suburbia, usually killing for pleasure. In open country we now have harriers and Buzzards in record numbers while Kestrels are possibly as numerous as they ever were. Along with the now ubiquitous Sparrowhawk, Merlins became quite a threat to the passerine flocks feeding on the open fields in the 1980s-1990s.

Thus I think we must accept that small birds' numbers will be kept in check for the time being. Some species might be in real decline, but the recent tide of gloomy forecasts notably from the BTO could well stem from the beginning of their census work when these populations were at an extreme high. While we might feel the need to respond to their various appeals, the threat to the passerines in our environment is far less catastrophic, I feel, than we are being led to believe.

Introduced 'look-alikes' and other difficult introduced plants in our Cambridgeshire flora

Peter Sell

For over 60 years I have been studying the British flora, for some 40 years I have worked with Gina Murrell in the Cambridge University herbarium (**CGE**), and for the last 20 years we have been writing the *Flora of Great Britain and Ireland* in 5 volumes. Our main aim has been to include as many races, varieties and hybrids as possible and to show, as Darwin put it, "how their differences run into one another in an insensible series". The huge British herbarium of some 200,000 specimens or more at Cambridge University has been worked through and related to what we have found in much fieldwork. In addition the Cambridge Botanic Garden has been

consulted on almost a daily basis. Because we live and work here, Cambridgeshire has received more than its fair share of our fieldwork and Bassingbourn and Histon the largest share of all – Bassingbourn because it is my native village and I know every inch of it, and Histon because I have been on over 100 walks with my good friends Brian and Rosemary Chapman, on which I have tried to name every plant I saw down to varietal level.

Very slowly I began to realise that some of our native plants were not what they seemed to be, plants now termed by Oliver Rackham and others as 'look-alikes'. Some trees and shrubs have long been introduced and are well known and easily recognised, but these 'look-alikes' actually look like our native plants.

The first shrub to attract my attention was the Dogwood, supposedly *Cornus sanguineus*, planted in Histon Wood, which appeared to be more handsome than our native plant. After a detailed examination of it I found the hairs on the under surface of the leaf were flat to the surface and medifixed, while our native plant has them upcurved and fixed at the base: it was *Cornus australis* from the Black and Caspian Seas area. I then searched the planted woods at Bassingbourn and found more of it. Later, in that village, I found it implanted in old hedgerows, where the native plant already occurred.

Careful searching produced a third species with larger leaves and longer petioles, but with hairs like our native *Cornus sanguineus*. This third species seems to be *Cornus koenigii* from southern Russia. It also is planted in new woods and implanted in old hedgerows. Intermediates with a mixture of hair types can also be found implanted in hedgerows and they may reproduce themselves. All individuals of species and intermediates in both Histon and Bassingbourn are known to have been planted in the last 30 or 40 years.

Other shrubs of a similar nature found in these new woods and implanted in hedgerows belong to the genus *Viburnum* but are more difficult to identify. *V. sargentii* from China and *V. trilobum* from North America are 'look-alikes' of our native Guelder-rose, *V. opulus*.

Viburnum lantana, Wayfaring-tree, is part of another difficult complex. *V. veitchii* is a 'look-alike' from China. Hybrids of *V. lantana* and *V. rhytidiophyllum* form part of the complex. *V. lantana* var. *rugosum* may be a distinct variety or may be part of the hybrid complex. *V. lantana* var. *glabratum* supplies an internal case of introduction: our native plant in Cambridgeshire is *V. lantana* var. *lantana*, while *V. lantana* var. *glabratum* is native from south-west England and Wales to the Isle of Wight and is also found in France and Spain. This variety comes into flower about a month earlier than our native plant in Cambridgeshire. Driving along the Royston by-pass in April 2005 I saw one bush only in flower, which was this variety. Walking into Ford Wood at Bassingbourn on 30 April 2005 I found a bush of this variety in full flower, while *V. lantana* var. *lantana* growing nearby was still in tight bud. Bushes of much of this complex can be found in Ford Wood.

Acer campestre, Field Maple, next occupied my attention. The native trees I have known all my life at Bassingbourn have hairy fruits and are subsp. *campestre*. They rarely if ever seem to produce new trees. Huge numbers of trees planted in new woods, in hedgerows and by roads are glabrous-fruited and are the introduced subsp. *leiocarpum*. It comes into flower a month earlier than our native tree and is in young fruit when subsp. *campestre* flowers. Along the Royston by-pass is a large number of these trees, which are reproducing freely in the shallow ditch by the road. Other trees at Royston have much larger, more divided leaves and seem to be the Japanese *A. miyabei*. Some of the trees of subsp. *leiocarpum* have been planted where you would never expect to find introductions, in the fields between Bassingbourn and Wendy: they were given to farmers by the County Council to plant on their land. Oliver Rackham (*Ancient Woodland*, new edition, p. 239) writes: "Maple reproduction, which seemed in the 1970s to be declining, has revived since (especially where woods are coppiced or elms have died) and is very probably adequate." Is this anything to do with the mass introduction of subsp. *leiocarpum*?

When *Betula pendula*, Silver Birch, was introduced from Europe to North America it hybridised freely with their native species *B. populifolia*. Now *B. populifolia* is introduced in our planted woods at Histon and along streets and I am reasonably sure it is hybridising with *B. pendula*. Other birches from Asia are also introduced, some related to *B. pubescens*.

Histon Wood contains all three native varieties of Alder, *Alnus glutinosa* var. *microcarpa*, var. *glutinosa* and var. *macrocarpa*, as well as the introduced *A. incana* and hybrids with all the native variants. *A. incana* is planted around many Cambridgeshire fields.

An introduced variety of Spindle, *Euonymus europeaus* var. *intermedius*, certainly adorns our planted woods and hedgerows with a splash of colour. In comparison, our native var. *europaeus* is a dowdy plant. Var. *intermedius* is said to come from Switzerland. I saw this variety recently in a field hedge at Bassingbourn, where it took me completely by surprise.

A very large-leaved, large-fruited beech, sometimes called 'Prince George of Crete', is widely planted as a hedge around fields, recreation grounds and gardens. It probably belongs to the beeches of the Balkans, which are intermediate between the main Beech of Europe, *Fagus sylvatica*, and the Oriental Beech, *F. orientalis*, and is probably best called *F. moesiaca*. A magnificent tree of it grows by the Village College at Bassingbourn, side by side with a small-leaved variety of *F. sylvatica*, var. *rotundifolia*, and the normal plant, var. *sylvatica*. A fastigiated form of *F. moesiaca* is planted along Cavendish Avenue in Cambridge. It should be remembered that *Fagus sylvatica* was not known at all in Cambridgeshire to John Ray in 1660.

The hazels of Bassingbourn are fascinating. *Corylus avellana* forma *avellana*, our native plant, grows where it ought to grow by our streams, mainly in the old fen area. The most fascinating is the Balkan Nut, *Corylus maxima*, which grew all round the area of the medieval Castle Manor and was probably brought there by Lord Tiptoft about 500 years ago. *C. avellana*

forma *schizochlamys* is frequent in the same area. Most of the bushes planted in the new woods, where I have been able to see nuts, are *C. avellana* forma *grandis*. (See the article in *Nature in Cambridgeshire*, No. 23 (1980): 50–52.)

Most people are familiar with *Sorbus intermedia*, Swedish Whitebeam, but there are two other similar species, *S. austriaca* and *S. mougeotii*. All three are widely planted in Cambridgeshire, sometimes in the corners of fields as well as on roadsides and recreation areas.

Many willows and poplars are clearly planted. It was common practice in Bassingbourn to plant new trees and shrubs of these genera when trimming hedgerows. A straight pole was trimmed and simply stuck in the ground, and it grew. One of the most common was *Salix cinerea* × *viminalis*, which produced useful, straight, pliant poles.

Where do all these trees and shrubs come from? All I can say is that most of them seem to have been planted in the last 30 or 40 years. There are eight of the new so-called 'woods' in Bassingbourn and most of the trees and shrubs in them are not native. It is also probable that the contents of all Bassingbourn hedges are mostly not native. Even those by natural streams have been implanted to some extent. At Histon the new Histon and Girton 'Woods' are also full of non-native trees and shrubs. However, Histon does seem to have good natural hedges along much of Gun's Lane.

In the garden magazine, *Horticulture Week*, of 23 September 2004, there is an article by Glen Munro entitled 'Tree Planting'. In it he makes the following statements:

"Last year the Forestry Commission planted an estimated 25,282 ha of trees. And with more emphasis being placed on issues such as nature conservation and landscape restoration, the number of trees being planted is set to escalate."

"National Forest chief executive Susan Bell believes this level of tree planting is unprecedented in Britain. A indication of the scale of work going on can be seen in the National Forest Company's new strategy for the continued creation of the National Forest. The new planting target has been set at 4,000–5,000 ha."

"Another aim of National Forest company is to create extensive biodiversity change, with the knitting together of thousands of hectares of woods, heathland, wetlands and hedgerows."

The same author, Glen Munro, in the issue of this magazine of 4 November 2004, writes:

"More trees are being imported into the UK. The value of tree importation has grown from £46.8 million in 2002 to £51.8 million in 2003, according to figures from DEFRA."

It is not only the present which is involved. Most of the hedges in Bassingbourn are enclosure hedges, which in that village were created soon after 1806. A similar state of affairs appears to occur at Histon. The most common shrub is of course hawthorn, *Crataegus*. Sometimes there are up to six kinds or more in a hedge (see the hedge around the outside of Girton

Wood); sometimes there are miles of hedge with every bush like peas in a pod (see the hedge by the old Bassingbourn track to Royston). So far I have identified in Cambridgeshire hedges *Crataegus monogyna* subsp. *monogyna*, *C. monogyna* subsp. *nordica* var. *nordica*, *C. monogyna* subsp. *nordica* var. *speciosa*, *C. monogyna* subsp. *monogyna* var. *laciniata*, *C. monogyna* subsp. *leiomonogyna*, *C. monogyna* subsp. *azarella*, *C. kyrtostyla*, *C. curvisepala* and *C. pseudoheterophylla*. These taxa all have one style and possibly only *C. monogyna* subsp. *nordica* var. *nordica* and var. *speciosa* are native. *C. laevigata* occurs in our woods and has two to three styles. Its hybrids with *C. monogyna* are frequent; if you search the bush you will almost certainly find some flowers with more than one style. I know of only one tree of *C. laevigata* in Bassingbourn hedges and that is in a hedge surrounding a meadow owned by my family. I have always been told that my grandfather planted this hedge with bushes from Waresley Wood. In gardens you will find various forms of *C. monogyna*, *C. laevigata* and their hybrid, some with double flowers and others with red flowers and some with both. They are occasionally found in the wild. *C. curvisepala* in one hedge at Dry Drayton shows intermediates with *C. monogyna*. To see the difference in these plants you need to look at the colour of the back of the leaf, division of lobes, length of petiole, size and hairiness of leaf, stipules, size of flower, overlapping of petals, and size and colour of fruit. If part of the hedge comes into flower before the rest it will almost certainly be a different taxon. Only the larger thrushes can eat some of the larger berries. Fieldfares tend to pass through and take the larger ones, leaving the small ones for the sedentary Blackbird and Song Thrush, although Redwing will also want these. Mistle Thrush will sometimes guard a large-berried tree. In this way the various taxa will be distributed differently.

At Bassingbourn, enclosure hedges on the chalk tend to be of one taxon, but on the site of the old fen they are much more likely to be of variable species and to include native *Viburnum opulus* var. *opulus* and *lantana* var. *lantana*, *Ligustrum vulgare* and *Prunus spinosa*. Presumably these plants were easily available in the old fen, while on the chalk uplands all the new plants had to be brought in. Ashwell Street has been straightened over much of its length. Sloes and Damsons are some of the main constituents of some of the hedges.

Oliver Rackham, in *The illustrated history of the countryside* (1994, p. 81), writes: “The Great Enclosures, though not a universal transformation, were a time of more new hedging than ever before or since. The hedges planted between 1750 and 1850 – probably about 200,000 miles – were at least equal to all those planted in the previous 500 years. The same applies to stone walls in moorland country as well as on former open fields. A thousand million or more hedging plants were necessary, which founded the fortunes of several Midland nursery firms.” The only disagreement I have with this is that I think as many have been planted in the last 30 or 40 years, but by roads, in new ‘woods’, in forestry plantations and on farmland. The number

of species in a Cambridgeshire hedge does not tell us its age unless the identification of the taxa is considered very carefully.

As well as the planting of trees and shrubs there is the use of wild flower seed, which is not always what it seems to be. Unfortunately there seems to be no record as to where it has been sown. On the Melbourn by-pass there have been for many years three subspecies of Chicory, *Cichorium intybus*. On the Gog Magog Hills wild flower seeds produced for several years a mass of Oxeye Daisy from May till September. First to come into flower was the introduced tetraploid, *Leucanthemum vulgare* subsp. *ircutanum*. This was followed by the native diploid, *L. vulgare* subsp. *vulgare*, and finally by the garden fertile hybrid *L.* × *superbum*. There also occurred the introduced *Senecio erucifolius* var. *viridulus* as well as the native var. *erucifolius*.

One group of plants appears to be widely sown in wild flower seed. These are plants of which a selected variant used to be grown as a hay crop: *Trifolium pratense* var. *sativum* and var. *americanum*, *Medicago lupulina* var. *major*, *Trifolium repens* var. *grandiflorum*, *Onobrychis sativa* subsp. *sativa*, *Lotus corniculatus* var. *sativus*, *Medicago sativa* subsp. *sativa*, *Cichorium intybus* subsp. *intybus*, *Anthyllis vulneraria* subsp. *polyphylla*, and *Vicia sativa* subsp. *sativa* and possibly subsp. *cordata*.

One should beware of early-flowering Primroses and Cowslips: they are not usually our native subspecies. This also applies to Snowdrops, the very early-flowering ones usually being a different subspecies or even a completely different species.

In 1998 a field of wheat in Bassingbourn near the Royston by-pass was covered with an umbellifer up to 200 cm high. It was a very large Fool's Parsley, *Aethusa cynapium*. We have two variants of this species which are common in our countryside. Subsp. *agrestis* is a dwarf plant which flowers and fruits in our stubbleland after the corn has been cut: it has clearly adapted to the height of the stubble. Subsp. *cynapium* grows from 20–50 cm and is found on waste land and field margins and flowers much earlier in the summer. These two subspecies, grown side by side from seed in the Cambridge Botanic Garden, retained their different heights and their flowering periods did not overlap at all, so they could not hybridise. The very tall plant found near Royston is another, continental subspecies, *A. cynapium* subsp. *giganteum.* In the same year I found another field of wheat by Gun's Lane in Histon containing the same plant. I am told that the representative of the herbicide firm who came to look at the Bassingbourn field thought it was Hemlock. I assume he meant *Conium maculatum* because of its height, although the old inhabitants of Bassingbourn called *Anthriscus sylvestris* 'hemlock'. The story does not finish here. In 1993 the people of Bassingbourn were given a large number of *Narcissus* bulbs to plant in the village. This they did in front of the moat, which originated with the medieval Richmond Manor and which is locally called the Horse Pond, as the horses washed their feet in it after a muddy day in the field. Among these bulbs grew up another giant *Aethusa* which was not quite the same as the

ones in the wheat field; it also is found in continental Europe and is referable to subsp. *cynapioides*. I then looked at the bulb fields on the Kneesworth–Meldreth boundary, from which the bulbs came, and found more of it. In 1994 the same plant had come up in my friend Bill Robinson's garden at Bassingbourn. The large *Aethusa* has not appeared again in the wheat fields, but the second one has appeared again in the Bassingbourn garden in 1998 and 2003.

The apomictic genus *Hieracium* is a good example of how it is possible that species can move about on vehicles. In 1952 I found several different species growing on the chalky bank of a cutting just east of Royston (but in Melbourn parish, v.c. 29). The Swedish botanist Nils Hylander had just described many new species of *Hieracium* from introduced plants in Swedish grasslands. When he visited Cambridge I took him to Royston and showed him the species there, which he recognised as being similar to those in Sweden. He suggested that the species he pointed out would retain their characters in cultivation, which they did. When the Royston by-pass was built it opened up a new area for the *Hieracium* species to spread. Not only did the old ones spread, but new species came in, probably on the tyres of the construction vehicles involved, which had probably visited other similar sites. The following species now occur at Royston (Hertfordshire, but in v.c. 29): *Hieracium aterrimum* Hyl., *cardiophyllum* Jord. ex Boreau, *firmiramum* Hyl., *gentile* Jord. ex Boreau, *grandidens* Dahlst., *koehleri* Dahlst., *lepidulum* (Stenström) Omang, *neosparsum* (Zahn) P.D. Sell, *onychodontum* Hyl., *quadridentatum* Hyl., *seriflorum* Hyl. and *sylvularum* Jord. ex Boreau. It is likely that none is native to Great Britain. Another species, *H. sublepistoides* (Zahn) Roffey, not at Royston, somehow got into Bassingbourn cemetery. It also appeared on the Gogs during the Second World War. I have seen it as a native plant high up in the Austrian Alps.

Perhaps the most remarkable of hawkweed stories is of finding a plant of *Hieracium rionii* in a crack in the pavement on the side of School Lane at Histon. When I told Bryan Chapman that it was a native of the Swiss Alps, he said that the chap who lives there probably brought it back on the wheels of his caravan; he often travels about Europe. It is not quite as simple as that. It was introduced to the Cambridge Botanic Garden, where it became a weed, and David McCosh brought me specimens from another garden where it had become a weed. The Histon plant could have come from a nearby garden.

Talking about Compositae and the Second World War, I am reminded that a large number of old tanks were stored at Milton. In this area appeared a whole range of *Picris hieracioides* of southern Europe, *P. hieracioides* subsp. *villarsii* var. *villarsii*, var. *leteae* and var. *arenaria*, and *P. hieracioides* subsp. *grandiflora*. They spread along the old Histon railway and out into the grassy areas in and between Histon and Girton Woods. None of them was the native Hawkweed Oxtongue, *P. hieracioides* subsp. *hieracioides*, which grows on the Devil's Ditch.

How far do these Composite seeds blow or travel on the muddy tyres of vehicles? I did not know Great Lettuce, *Lactuca virosa*, anywhere in the Bassingbourn area until the Royston by-pass was built. After the *Lactuca* was found in that locality it was not long before I found it in Ashwell Street and soon in other places.

One has also to beware of a species of plant in quantity where you would not expect it. In Girton Wood, which was planted over a former arable field, there have been many plants of *Crepis biennis* and some *C. tectorum* over the last few years. A grassy area, where I was told wild flower seed had been sown, near Harlton Wheatsheaf also produced a large number of plants of *Crepis biennis*. Likewise around the large roundabout south of Arrington, where it was fairly obvious that wild flower seed had been planted, *Crepis biennis* appeared in quantity. I have no evidence that *Crepis biennis* is in wild flower seed, but the circumstances are suspicious. Another possibility is that the vehicles moving from one roadside alteration to another or from one grassland to another are taking seeds in mud on their tyres.

A good example of this is the fleabanes of the genus *Conyza*: in the last few years *C. floribunda* var. *floribunda* and var. *linearifolia*, *C. sumatrensis*, *C. daveauiana* and *C. canadensis* var. *simplex*, var. *canadensis*, var. *incisa* and var. *robusta* have all occurred in quantity in and around Cambridge, particularly where building and repair work is being carried out. All also appeared in quantity in the Botanic Garden, though not deliberately introduced there.

The great difficulty in identifying most of the preceding taxa is that they are not in most books available to the public, even in the recent flood of tree books. Many genera of plants go all round the northern hemisphere and a series of taxa replace and gradually grade one into another and are often called a cline. Other taxa are confined to particular ecological situations and where they meet they hybridise. The difference is that the geographical intermediates tend to reproduce themselves exactly at any given point while the ecological hybrids are variable. Ice ages have caused taxa to retreat south by one route and go north again by another. For thousands of years Man and his animals have been moving plants either deliberately or accidentally over huge areas. Sometimes the plants remain distinct, at other times they hybridise with the taxa they come up against. A good example is Japanese Larch, *Larix kaempferi*, native of the mountains of central Honshu, Japan. When introduced to Europe it crossed with native European *L. decidua*, the hybrid being fertile and now a common tree. Most botanists would call taxa so widely separated species. Others would argue that taxa which are interfertile are not good species. My argument is that it does not matter what you call them as long as you recognise all taxa which are distinct morphologically and have their own ecology and distribution.

Two words in common usage badly need interpretation, **native** and **conservation**. Very few of our Cambridgeshire plants are native in the spots

in which they are growing. I suppose sea shores, mountain cliffs, boggy places and natural streams are the most likely places to find native plants, and those are scarce in Cambridgeshire. In other places, if Man stops interfering, many plants quickly die out. We can only end up with a list of plants which have been here for a long time as being native, but it is very unsatisfactory. Everything which is done to keep these plants going I call conservation. I am not against planting trees, but buying in plug plants from a nursery which has imported them from the continent of Europe and planting them in the countryside I do not call conservation. The County Council has recently 'cleaned up' Ashwell Street and the Bassingbourn Parish Council spent £300 on plugs to put in their planted woods. If we are not careful John Prescott will fill half of southern England with concrete and conservationists will fill the other half with plugs of non-British plants.

Three rare invertebrates at Wimpole

Simon Damant

Chrysopilus laetus

The horse fly *Chrysopilus laetus* (Diptera, Rhagionidae) was reared from woodland on Wimpole Estate. Larvae were collected unknowingly from a mature sycamore tree that had lost a major upright secondary limb. The white rot was extensive but reasonably dry to damp in places and was collected in February 2001 with cranefly larvae. The cranefly larvae turned out to be *Ctenophora pectinicornis*. The *Chrysopilus laetus* larvae then hatched in May 2001 and were pinned. It was when Alan Stubbs and Ivan Perry visited Wimpole Estate and looked at my pinned material that they identified this very rare species. It has previously been recorded by Ivan Perry in Bottisham Park, so this is a second site for Cambridgeshire.

Elater ferrugineus

Elater ferrugineus (Coleoptera, Elateridae) is a classified as Red Data Book Endangered (Hyman and Parsons, 1992). It is a large reddish-brown click beetle whose larvae develop in soft decaying wood and wood-mould in trunks and large boughs of broadleaved trees, usually those which contain, or have contained, birds nests. It is extremely local in Britain though formerly more widespread in southern England. It was regularly recorded only from Windsor Great Park, Berkshire, but has also now been found in Suffolk. It probably occurs at low population densities, requiring not only old trees but also a considerable and consistent population of large hole-nesting birds.

At Wimpole this beetle is found in large rotholes with bird nests, mainly those of Jackdaws. The population is quite substantial. Trees used at Wimpole are Ash, oak, Beech and Horse Chestnut. However a large Ash tree

with a rothole and bird nest in Stapleford also had a number of larvae that were reared in 2002. Larvae of this beetle were found in another park west of Cambridge in 2002 and reared. It is very likely that this very rare beetle will be shown to have a strong foothold in west Cambridgeshire once the large trees have been surveyed. Unfortunately the Stapleford Ash tree has been felled, and the biggest threat to this beetle and others associated with deadwood habitats is the lack of vision needed to ensure that large trees that may be unsafe to the public are reduced to pollards and not felled. It may be the medieval past history of pollarding that has lead to the survival of *Elater ferrugineus*. Of interest is a pre 1950 record from Grantchester.

Oxycera terminata

The horse fly *Oxycera terminata* (Diptera, Stratiomyidae) was recorded from Wimpole Estate on 17th August 2002, new to Cambridgeshire. A white malaise trap was set in a shaded small brook over a small shingle riffle in front of a small pool. Initially it was thought to be *Oxycera analis* which has been recorded fairly frequently in and around the same small brook further downstream. However using the new book on British soldierflies (Stubbs & Drake 2001) it was found to be *Oxycera terminata* and the identification has been confirmed by Ivan Perry. This fly has not been recorded in Cambridgeshire before; Ivan Perry has since also caught it at Wimpole.

References

Hyman, P.S. & Parsons, M.S. (1992). *A review of the scarce and threatened Coleoptera of Great Britain.* Part 1. JNCC Peterborough

Stubbs, A.E. & Drake, M. (2001). *British soldierflies and their allies*. British Entomological and Natural History Society, Reading.

The Bee Wolf (*Philanthus triangulum*)

Bill Clark

A farmer in Norfolk, upon reading of my exploits on the guided bus route, sent me a description of a bee and holes in his driveway, plus a local conservationist's explanation. Did I agree? My answer, in short, was 'No'. However, I was very pleased that my copy of 'A review of the scarce and threatened bees, wasps and ants of Great Britain' by Steven Falk could now be of great help to put together a list of possibles for him - over thirty, which I whittled down to nine. A wasp called the Bee Wolf (*Philanthus triangulum)* did not tally with his bee but makes a similar hole, and can nest adjacently, and since I am so familiar with it, I thought I would send its description. First I would check if it was to be found in his area. Yes, it was. However, to my astonishment, Falk makes no mention of it for Cambridgeshire, and lists it as 'Vulnerable' for the whole of England! I immediately rang P.F.Yeo, who

kindly looked up the dates for when he found it on flowers in the Botanic Gardens in Cambridge - 1972 - but he was surprised to hear of its existence in Wandlebury. I promised him that I would provide the information!

I arrived at Wandlebury in 1973, and on Saturday 11th August started my work as Warden. The following bright and sunny day was busy with visitors, and besides walking the paths ensuring all was well, I had notebook in hand, jotting down anything of interest, such as birds, animals and plants, jobs that needed doing, especially dangerous branches and holes in the paths, etc. As I passed by the rear garden of the Woolstreet House I noticed what appeared to be a dozen or so miniature volcanoes in the dust of the path, so knelt to observe more closely. From first one, then another, would either shoot a little spurt of soil or a wasp's face would appear, look directly at me, and withdraw. No wasps emerged until I stood further away. There was also a small wasp taking great interest in the goings on at the holes, and though I believed this to be a cuckoo of the species, I have never got round to researching it! Then as I at last moved to leave a wasp arrived carrying what I thought to be a honey bee and entered one of the holes. I had already informed the Cambridge Preservation Society of my interest in building up the flora and fauna, which had been much neglected, and indeed in the following October, the Cambridge Evening News ran a couple of reports about a talk I gave to their AGM, in which they emphasised that I was "going into battle on the behalf of at least three species of wasps"!

During the rest of that August I discovered another two nest areas on the same path, all of them with a dozen or so holes. Over the ensuing years, I was always careful when repairing path damage along those stretches, to use only either sand, chalk or finely crushed lime mortar, or a mix of these, usually depending on what I could scrounge. At two of the sites the number of holes remained similar over the years; but the third site increased to cover most of the distance between the two lots of trees - at the peak in 1998 there must have been well over a hundred holes. During the early eighties, the odd hole appeared at a fourth site in the two or three places where grass was absent on the wide path at the end of the "Games Area" - two places finally had some fifty holes each, all driven into the chalk. However these bare patches developed into deep potholes in the winter months, and I later filled them with soil and reseeded them; the wasps then left that area. In 1995 the Society decided to surface some paths to allow wheel chairs into certain areas. I designed a plank-edged, cambered path, standing proud of the grassland - so that rain water did not flow along it - built of rolled down, soft carr-stone. The whole idea was that the wasps, and bees too, could still use it. Unfortunately, it was taken out of my hands, and although the basic concept was kept to, it was built level with the surrounding land; no retaining edge was put in, and little camber - in consequence much of the path is eroding. However one part on the level at a fifth site has seen an influx of the wasps, which is very fortunate, because since my retirement, the length of path at the first three sites has been continually surfaced with wood chippings and the wasps have disappeared.

The Bee Wolf is said to take mainly honeybees, and some larger varieties of solitary species. According to Fabre, the female manipulates them to drink some nectar, and removes the rest, as it is of no use to her offspring. Falk mentions that "the adult *Philanthus* also eats a considerable number for its own sustenance" which is grossly inaccurate. I have read elsewhere, that they kill many just to provide nectar for their own needs, yet I have seen both males and females sipping nectar from flowers. I was pleased that Yeo's observations of 1972 endorsed that! I base my knowledge of their habits on the observations I made over this period of 30 years. Always extremely busy, I had little time for observation; however I could watch 20 holes for ten minutes when time permitted; do this two or three times a season over years, and you have a "Gallup Poll" on the Bee Wolf! On an average I would see one bee brought in during every third observation - only once did I see two bees in one session! This is equal to one bee for every 600 minutes - 10 hours of wasp activity, hardly making them a serious pest of bee hives, as some would have us believe. Using a similar wasp which provisions cells in rotten wood with hoverflies - which I have unearthed many times - as a reference, I believe *Philanthus* needs four to five bees for each cell, before laying the egg; constructs a maximum of fifteen cells, needing some 60 to 70 bees. Interestingly, I have noticed an upsurge in solitary bee numbers at Wandlebury during the time that *Philanthus* has declined.

I hope I have now made up in some small way for my neglect of the Bee Wolf, and that perhaps the present care of Wandlebury will take her into account!

Reference

Falk, S. (1991). A review of the scarce and threatened bees, wasps and ants of Great Britain. *Research and Survey in Nature Conservation No. 35*. Nature Conservancy Council for England; Peterborough, UK; 344 pp.

The fossil occurrence of *Truncatellina cylindrica* (Férussac 1807) at the Babraham Road archaeological site, Cambridgeshire

Richard Meyrick

In 1998, an archaeological excavation was undertaken at the proposed site of a new Park and Ride facility (that has since been constructed), located on Babraham Road, approximately 5km southeast of Cambridge city centre. Situated at the foot of the Gog Magog hills, the site forms part of a rich prehistoric landscape, which includes the Iron Age forts of Wandlebury Rings (located about 2km to the southeast) and War Ditches (about 1.5km to the north). The archaeological investigations revealed the Babraham Road

site was used for a wealth of ‘non-domestic’ activities, including human burials, from the Neolithic to the Iron Age (Hinman, 1999).

A series of fossil mollusc analyses was carried out, in order to provide an environmental context for the archaeological investigations (Meyrick, 1998, 1999). Fifty-eight samples were collected from three separate features. The molluscs, about 3000 individuals in total, were extracted from the sediments by a combination of washing and sieving. All material greater than 0.5mm was examined for shell remains under a binocular microscope at variable magnification (x6–x50).

The first sequence examined was a 180cm deep section, sampled at 5cm intervals, through a large pit referred to as Context 933. The land snail assemblage was reasonably diverse throughout (between 14 and 20 species per sample), although there was little evidence of faunal succession. The co-occurrence of open-ground (e.g. *Vallonia pulchella* and *Pupilla muscorum*) and shade-preferring taxa (including *Acanthinula aculeata*, *Clausilia bidentata* and *Carychium tridentatum*) was in keeping with open woodland, or indeed a settlement. The lack of marsh species and the presence of taxa generally preferring dry habitats (such as *Vallonia costata* and *Vertigo pusilla*) suggested conditions were not overly damp.

The sequence comprising Contexts 1140-44 and 1146 was sampled on a bed-by-bed basis (i.e. only one sample per context). It thus provided only a cursory view of the associated molluscan faunal history. Each sample furnished a mixture of open ground (e.g. *P. muscorum* and *Vallonia excentrica*) and shade-preferring taxa (including *Carychium tridentatum* and *Discus rotundatus*), except the Context 1144 sample, which was unexpectedly barren. Some evidence of faunal succession was nevertheless observed in this sequence, as the number of shade-demanding species decreased over time, suggesting increasingly open conditions.

The final section was over 100cm thick, sampled from a hollow feature labelled as Context 1600. One theory considered by the excavation team was that this feature might have once held water. However, the molluscan fauna clearly showed that this was not the case, as no aquatic species were present. Indeed, the preserved succession reflected a gradual drying out of the location, as species favouring relatively damp habitats (such as *Carychium minimum*) gave way to taxa preferring fairly dry conditions (e.g. *V. costata*). The overall impression was of a reasonably dry, predominantly open environment (indicated by elements such as *V. excentrica* and *P. muscorum*), although a limited amount of shade was indicated by the presence of taxa such as *A. aculeata* and *Carychium tridentatum*.

The occurrence of *Truncatellina cylindrica* (the Cylindrical Whorl Snail) towards the top of the Context 1600 profile deserves special comment. The shell of this tiny snail resembles a golden brown, slightly elongated barrel, approximately 2 mm tall, covered with numerous fine, evenly spaced ribs and possessing a toothless mouth (Ellis, 1969). *Truncatellina cylindrica* inhabits very dry calcareous grassy places and is characteristically associated with *Sedum* or *Artemisia*. It can also be found living on screes, among rocks

and occasionally in sand dunes (Kerney and Cameron, 1979). The inclusion of *T. cylindrica* in the Context 1600 molluscan assemblage is, therefore, consistent with an interpretation of dry, open conditions.

Truncatellina cylindrica is widespread throughout Southern and Western Europe, although populations are always extremely localised (Kerney and Cameron, 1979). It has been reported living from only three British sites in the last fifty years (Went Vale in Yorkshire, Thetford in Norfolk and Potton in Bedfordshire), although its small size may well lead to under recording. Nevertheless, recent attempts to find it living at several locations identified in the 1800s have been unsuccessful. *Truncatellina cylindrica* is, therefore, considered to be in decline in Britain (Kerney, 1999) and classified as 'vulnerable' in the British Red Data Book (Bratton, 1991).

Fossil evidence indicates that *T. cylindrica* was once significantly more common in Britain than it is today, particularly in southern England following forest clearance events by humans during the Neolithic and Bronze Age periods (Evans, 1972; Kerney, 1999). Evans (1972) expresses puzzlement at its subsequent decline, particularly its extinction in Wiltshire where suitable habitats remain widespread to this day. Kerney (1999) suggests that the increased effects of arable farming may be responsible, but acknowledges that climate change may also be a factor. Evans (1972) does not believe that the decrease in mean annual temperatures since the Holocene Thermal Optimum is the cause, citing late 19th and early 20th century observations of living populations as far north as Arthur's Seat in Edinburgh as evidence of the animal's thermal tolerance. Instead, Evans suspects increased annual precipitation may be to blame. More recent losses of *T. cylindrica* populations have been attributed to a variety of factors, including habitat destruction through wall maintenance and visitor trampling, scrub clearance and the use of pesticides. Nevertheless, the real reasons for the continuing decrease in *T. cylindrica* remain a matter of conjecture.

Whatever the explanation for the present-day rarity of *T. cylindrica* in Britain, its current plight is undeniable. Consequently, several organisations (including Bedfordshire County Council, the Wildlife Trust and the Ivel and Ouse Countryside Project) are working to protect the Potton population (details can be found at the websites cited below). Hopefully, their endeavours will prove successful and *Truncatellina cylindrica* will remain one of Britain's most beautiful, if inconspicuous, natural treasures.

References

Bratton, J.H. (ed.) (1991). *British Red Data Books: 3. Invertebrates other than insects.* Joint Nature Conservation Committee, Peterborough.

Ellis, A.E. (1969). *British Snails*. pp. 298 + XIV plates. Clarendon Press, Oxford.

Evans, J.G. (1972). *Land Snails in Archaeology*. pp. 436. Seminar Press, London.

Hinman, M. (1999). *Ritualistic prehistoric activity and inhumation on land adjacent to Babraham Road, Cambridge. Post excavation assessment of evaluation and excavation, 1997–1998.* Cambridgeshire County Council Report No. PXA 10.

Kerney, M.P. (1999). *Atlas of the land and freshwater molluscs of Britain and Ireland.*

pp. 264. Harley Books, Colchester.
Kerney, M.P. and Cameron, R.A.D. (1979). *A Field Guide to the Land Snails of Britain & North-West Europe*, 2nd Edition. pp. 288. Harper Collins, London.
Meyrick, R.A. (1998). Molluscan analysis. In: Hinman, M. *Prehistoric remains on land adjacent to Babraham Road, Cambridge. An evaluation.* Cambridgeshire County Council Report No. 147, 34-35.
Meyrick, R.A. (1999). Molluscan analysis (column samples). In: Hinman, M. *Ritualistic prehistoric activity and inhumation on land adjacent to Babraham Road, Cambridge. Post excavation assessment of evaluation and excavation, 1997–1998.* Cambridgeshire County Council Report No. PXA 10, 70-74.

Websites.
www.ivelvalley.co.uk/Snail%20report3.PDF
www.wildlifetrust.org.uk/bcnp/bedsbap/pdf/snail.pdf

The Barbastelle at Wimpole

Simon Damant and Chris Vine

The first known reference to the Barbastelle (*Barbastella barbastellus*) at Wimpole came in a letter addressed to Mrs Bambridge in the late 1960s or early 1970s. Mrs Bambridge owned all the historical manors of Wimpole which made up almost 90% of the parish (there were outlying fragments in other hands). The letter apparently asked Mrs Bambridge for access to the Folly within the historic Wimpole parkland. At this time the Folly was covered in Ivy (*Hedera helix*) and a colony of Barbastelles was alluded to. Unfortunately, at present, this letter has been mislaid but it was written by someone from one of the Cambridge Colleges. It would be extremely useful if anybody still knows of this record or the gentleman concerned and any further details.

When Mrs Bambridge died the estate was passed to the National Trust as a gift with all land being held as inalienable. Some initial work was undertaken on the bats of Wimpole in 1978 when Bob Stebbings made a systematic survey of the buildings. His report remains accurate to this day, but requires a few additions.

The report identified a number of species in the main house in the very large attic spaces: Pipistrelle (*Pipistrellus pipistrellus*), Long-eared Bats (*Plecotus* species), Daubenton's Bat, (*Myotis daubentonii*), Natterer's Bat (*Myotis nattereri*) and Serotine (*Eptesicus serotinus*). Two other species were thought to have roosted in the Hall: Whiskered Bat (*Myotis mystacinus*) and Leisler's (*Nyctalus leisleri*). All bats were identified from droppings except for the following: one Daubenton's Bat was seen hibernating under

the cellar of the old conservatory and over one hundred Pipistrelles were counted out of the east roof of the hall.

By the time the National Trust's biological survey team and Tony Mitchell-Jones from English Nature visited in 1986 there may have been a decline in bat numbers. At this time the park and surrounding arable land had undergone some rather intensive changes; not least of those was from natural causes because of the Dutch elm disease; others were due to the modern agricultural policy of the day.

It is necessary to point out that in the 1970s and 1980s use of bat detectors was limited and most records were from buildings and therefore surveys almost always omitted any predominantly woodland species.

In the late summer of 1999 Simon Damant was asked to remove a bat from the Kendal stables which was flying around in the day-time in one of the rooms being used for storing books. It was caught and easily identified as a Barbastelle. The bat was released into the upper attic rooms where it went off to roost. It is now suspected that the bat was a male.

In 2000, when the Cambridgeshire and Bedfordshire bat groups along with National Trust staff were undertaking a bat survey of the Wimpole Estate, some very unusual bat calls were recorded on very expensive sound equipment using time expansion techniques. Bob Cornes, who was the only specialist with this equipment at the time, later identified them as Barbastelle calls. Further evening work located an area within the woodlands where many Barbastelles were seen and heard. These bats usually emerged approximately half an hour after sunset, flew around the woods for up to an hour and then disappeared.

Further information was required so with permission from English Nature both bat groups and the National Trust were allowed to set mist-nets in the woodlands in 2001 in the hope of catching a Barbastelle and attaching a small radio transmitter to it. This was a success and radio tracking revealed that the bat emerged from an oak tree with loose bark over the nest few nights and flew around the woods for at least half an hour and then used a mature hedge north of 'The Gloucesters' to gain access to Eversden woods where it stayed for up to two hours before proceeding eastwards.

Since this first capture and radio tagging of a Barbastelle there have been repeated surveys using this technique, and monitoring with bat detectors. The results have largely been similar to those of previous surveys at Ebernoe, Sussex (Greenaway 2001, 2004). In most cases the Barbastelles caught in Twidlems Corner within 'The Gloucesters' woodland belt roost in oak trees which are either dead or have large dead branches and have loose bark. The woodland has a good understorey and all the radio tagged bats emerged about half an hour after sunset regardless of weather. These bats would fly around feeding within the wood and would also visit a small pond in the wood to drink very early on (they would also visit this pond prior to returning to their roost for the day; however the pond did dry up in 2005). After half an hour or so bats would fly along the woodland belts eastward and also north east to the Harcamlow Way (a very tall thin strip of woodland

come lapsed hedge) or go via the thin tall hedge northwards to Eversden woods. In nearly all cases after one hour most of the bats would be found foraging in Eversden woods. Incidentally, from information provided by the Cambridge Biological Records Centre, this woodland has been a hot spot for micro-lepidoptera which are the main food of the Barbastelle.

After another hour or two these bats would make excursions to the east, towards Cambridge. The favoured route for some bats was the old railway line with the radio telescope dishes; this also had tall neglected hedges either side and semi-natural grassland (another good source of micro-lepidoptera). Other routes were along Bourn brook and other tall hedges. The small villages of Toft, Kingston, Comberton, Barton and Harlton were also favoured. In 2003 one bat used Harlton quite frequently, including the old chalk quarry with its secondary growth of woodland and the tall hedges in and around the area.

In these early surveys it was difficult to actually pin down the bats' flight lines and really understand their foraging requirements. However, recently, with a better understanding of their requirements and the knowledge of other radio tagging survey work elsewhere in the UK we were able to anticipate their movements more accurately and certainly and pin down the better feeding areas. One such place in 2005 was at Barton where there is a double hedged trackway and the Barton area was extensively used by a single bat which sometimes flew to Barton, back to the maternity roost woodland and back to Barton in one night. It is very probable that these trackways are used because of the natural grassland margins, their quietness and also the fact that they may actually accumulate wind blown invertebrates from the surrounding arable land. Simon Damant has witnessed this in another trackway used by Pipistrelles where a short section had a tall hedge in a predominantly open landscape a long way from buildings and woodland. The Pipistrelles were seen in some number, catching insects on a moderately windy night on the lee side. This makes sense in conserving flight time energy while gaining a rich source of food. As bats may live as long as 20 years they would, over time, learn to recognise the weather patterns that would provide them with easy pickings at various sites.

All the radio tagged bats went eastwards; none went west except for one short excursion and none ventured into the parkland. This seemed extremely odd considering the large number of micro-moths present within the park (recorded by Simon Damant using a moth trap in the semi natural grasslands in the park).

In 2004 and 2005 further survey work was carried out within the park, principally for Serotines; however Barbastelles were present and were heard most of the night throughout the summer. Early indications suggested another roost of some description to the west.

In 2005 we netted a lactating female Barbastelle in the woodlands behind the lakes. At first the bat seemed to be alone, roosting in Horse Chestnut trees with split cavities and in willows under dead bark. However one night she ended up in a mature Field Maple with a split in the trunk. At least 14

bats were counted from the roost and a number caught. All appeared to have been lactating females indicating another maternity group using different roost trees. Most of these roosts were in splits rather than under loose dead oak bark.

This female spent most of her time using the woodland to the west of Wimpole estate and Valley Farm with its hay meadows and tall hedges. The bat would seem not to have flown more than three kilometres from the roost site; however radio tracking to the west beyond the A1198 was very difficult as the road system is sparse.

From the data collected to date the indication is that the population at Wimpole behaves very like those at Ebernoe. Frank Greenaway suggests that these bats would, in their natural environment, typically have a maternity roost area in the head waters of a catchment and would use the waterways as their flight lines. They would forage as they fly to richer areas of micro moths such as woodland glades along the river systems.

To some extent the Wimpole population follows this basic assumption in that they do use Bourn Brook and go into Grantchester where the River Cam joins the River Rhee, almost certainly relying on the adjacent meadows to the waterways for a rich source of food. The small River Rhee catchment and Bourn Brook seem to be the main areas for foraging, though villages to the east are also frequented. . However in a much modified human landscape the bats would seem to have also adapted to using the more unkempt wider and taller boundary hedgerows with woodland copses for their flight lines and foraging in south west Cambridgeshire. They have also used the disused railway lines which have developed a secondary tree growth and tall hedgerows with semi natural grasslands. It is important to note that south-west Cambridgeshire is well wooded compared with much of the rest of the county but even here woodland is sparse and not particularly well linked by good tall and wide hedgerows.

Much of the woodland at Wimpole where the breeding colonies roost is a result of landscape plantings from the 18th and 19th centuries. It appears that it is not the age of the woodland that is important but that it has had limited management and has not suffered too greatly from a policy of clear felling and removal of standing dead and diseased trees (an important component of a maternity roost area, where many trees are used in a single breeding season). Because of the bats' requirements and that the males tend to be solitary, outlying woodlands may provide a sanctuary for non breeding females and solitary males, both of which are said to use sub-optimal feeding areas leaving the richer foraging for the breeding females whose energy requirements are much greater. Therefore, absolutely any woodland loss within a radius of 10-15km could be of great significance for the viability of the population of Barbastelles at Wimpole.

Most outstanding of all is that when the facility from Google Earth is used, it can be seen that the flight lines and foraging areas are very limited and are very vulnerable and as such could have a significant effect on the breeding viability of this very rare species. Arable land dominates the

landscape as a monoculture of either wheat or rape with the resultant low biodiversity of invertebrates.

There is an urgent need to acquire more information on the ecology of the Barbastelle population at Wimpole especially with the current need for more housing within Cambridgeshire, which is in-filling areas of semi natural grassland within the small villages surrounding Wimpole estate.

References

Greenaway, F. (2001). The Barbastelle in Britain. British Wildlife. 12:327 – 334

Greenaway, F. (2004). Advice for the management of flightlines and foraging habitats of the barbastelle bat *Barbastella barbastellus*. English Nature Research Report Number 657

The distribution and ecology of two UK Biodiversity Action Plan moths in Cambridgeshire: The Square-spotted Clay (*Xestia rhomboidea*) and the Buttoned Snout (*Hypena rostralis*)

Robin Field and Paul Waring

Introduction

The distribution and ecology of the Square-spotted Clay (*Xestia rhomboidea*) and the Buttoned Snout (*Hypena rostralis*) were investigated between the period April 2002 and March 2005 by the Cambridgeshire and Essex Branch of Butterfly Conservation (BC). The funding was provided by an English Nature Biodiversity Action Plan (BAP) Grant with additional funding coming from the local BC Branch. Prior to the commencement of this study the known distribution of both species in Cambridgeshire was limited to several old records of adults from around the county and one record of a larva for *H. rostralis* (Field *et al*., 2003).

Square-spotted Clay

X. rhomboidea is classed as being Nationally Scarce, in that it was recorded from fewer than one hundred of the 10km squares in Great Britain from 1980 to 1999 (Waring *et al.*, 2003). The UK BAP notes that it has been lost from parts of its former range in the west of England, including Hampshire, Dorset, Devon and Cornwall (UK Biodiversity Group, 1999). The adult occurs in broad-leaved and mixed woodland during late July and August and can be found nectaring on various plants such as Lesser Burdock (*Arctium minus*) and Teasel (*Dipsacus fullonum*). Before 2002 the larvae had never knowingly been recorded in the wild. The larval foodplants in the wild were thus unknown, as were details of the larval habitat requirements, behaviour, timing and development. In captive rearing Chickweed (*Stellaria media*), docks (*Rumex* spp.), sallows (*Salix* spp.), Primrose (*Primula vulgaris*), birch (*Betula* spp.), bramble (*Rubus fruticosus* agg.) and Ribwort Plantain (*Plantago lanceolata*) were all eaten by the larvae.

There were several post 1995 records for the adult from the Fulbourn area, plus one recorded at RSPB Fowlmere in 2001 (John Dawson, pers. comm.) and 17 recorded in one night at Overhall Grove, Knapwell in the same year (Waring, 2002). One had also been recorded at Hilly Wood, near Helpston in 1994 (Waring, 1995).

Methods

Three different techniques were undertaken to further this study. The first was to search by torchlight for larvae, starting at sites where the adults have been recorded recently. These searches started about one hour after dark, to allow the larvae to climb to the top of any herbaceous plants, and involved searching all the ground vegetation in the surrounding area. In 2002, these searches started in late March but by 2005 had been brought forward to begin in mid January. The second technique was to light-trap on promising woodland edges and rides in August. This involved both all night sessions and events ending by midnight. The third method was to search for nectaring adults. This involved searching possible nectar plants from about one hour before dark to one hour after dark. These plants were generally on the woodland edge or on woodland rides.

Results

Larvae were observed at 12 different sites on 24 occasions across Cambridgeshire. Of the 117 larvae observed, 62% were feeding on Common Nettle (*Urtica dioica*), 22% on Dog's Mercury (*Mercurialis perennis*), 4.4% on Oxlip (*Primula elatior*) and 4.4% on Cow Parsley (*Anthriscus sylvestris*). They were observed active from 10th January (2005) to 12th April (2003). The largest numbers of larvae were recorded at New Farm, Madingley (33 over two visits), Fulbourn Nature Reserve (20 over four visits), Overhall Grove (16 over five visits) (Waring & Field, 2002) and RSPB Fowlmere (11 over two visits). In 21 timed-search sessions over 128 hours, larvae were recorded on average at one every 2.06 person hours. They could be located from immediately after dark, even in temperatures as low as 2°C, and were observed feeding until 5.00am on certain nights. The larvae were usually found on the drip line of woodland edges or rides or within open woodland. Very few were recorded more than two or three metres into closed canopy woodland.

Adults, both male and female, were light-trapped or observed nectaring at 18 sites between 2002 and 2004 and one record for Wimpole Hall from 2000 was discovered (Field, 2005). Eleven of these sites either were not searched for larvae or produced negative results during a search. Of the sixteen adults observed nectaring, nine were on Teasel, six were on Burdock and one was on Black Knapweed (*Centaurea nigra*). Nectaring was observed during the period from half an hour before dusk to one hour after dark.

The main adult activity around the light-traps seems to be at dusk and then much later in the night and around dawn when large numbers can come to traps (Green, 2002).

Egg-laying was never observed in the wild but eggs, laid singly on the underside of elm leaves, were found at New Farm Madingley in 2002 (Edwards & Joy, 2003). These eggs were identical to ones laid in captivity. Larvae resulting from the latter were found to feed on leaves both of elm and Common Nettle before the larvae were returned to the wood in late September (Field, 2005).

The distribution of *X. rhomboidea* in Cambridgeshire, both larvae and adults, since 1995 indicates that the moth can be found in two main areas, one in the south, and one in the north west corner, of the county (Figure 1).

Discussion

During the three years of research much progress in understanding the distribution and ecology of this species has been made. Research has found it feeding on mainly Common Nettle, Dog's Mercury and Oxlip. The NBAP suggests Common Chickweed, dock, and Ribwort Plantain as possible larval food plants but no larvae have been observed on any of these plants even though they were present at many of the sites. Also suggested were more woody species such as birch, Goat Willow and bramble and these may well be used along with elm and other tree species as egg laying sites and as food for early larval stages. However, from at least January larvae feed on the range of ground vegetation identified in this study.

While Haggett (2002) found 'one feeding at the tip of freshly sprouted Yorkshire fog *Holcus lanatus'* (1st Feb.) and feeding on Common Nettle (17th March) no larvae have been observed feeding or even climbing on any grass during this research. Larvae have been observed climbing up the dead stems of the previous year's growth of Common Nettle to feed on new growth of the plant. Larvae were observed feeding from early January until the 12th April in various locations, both on ride and woodland edges and within open woodland.

The adult was found to be numerous at several sites in Cambridgeshire where it had not been recorded recently. While a start has been made in observing adult behaviour more work is still required on egg-laying. Egg-laying on *Ulmus minor* was a new finding and needs further work to confirm. There are various records in the literature of nectaring on Lesser Burdock, but in this study all the Lesser Burdock plants seemed to have gone over by early August and Teasel was the most common plant on which the adults were seen nectaring. It could be that early nectaring is on Lesser Burdock, while later they move on to Teasel.

Haggett (2002) recorded seven adults in Thetford forest on the 7th and eleven on the 8th of July 2001. This is very early and may be due to the better-drained soil conditions and warmer microclimates in that area. Most records in our study and on the national database indicate a late July start for the flight period. The peak of the flight period seems to be between the 6th and 21st August, with adults recorded up to the end of the month.

The NBAP suggests that the cessation of coppicing and neglect of woodland management may be factors in the decline of this moth and that it

has been lost from the western parts of its distribution in England, including Hampshire, Dorset, Devon and Cornwall. In Cambridgeshire it is not exclusively found in ancient woodland. In fact several of the sites with substantial populations are plantations established on open ground in recent decades, some evidently planted on sites which have not been woodland for many years. These sites are often small or are narrow shelterbelts with an open woodland canopy. Where the moth was recorded in ancient woodland, such as Overhall Grove, the surrounding secondary woodland and plantations were also found to hold populations. The moth thus must have powers to disperse and colonise new habitat. Records from both Fulbourn, and Dry Drayton suggest that flights of at least one kilometre from woodland are not unusual.

Two sites where the moth has been recorded had species-rich hedgerows nearby. The hedge bottoms contained suitable larval food plants but no larvae were found, even though at RSPB Grange Farm other small plantations in the area were found to hold the larvae. It is likely that such hedgerows are too open a habitat for the moths.

The moth has two strongholds in Cambridgeshire. One is in the south between Cambridge and St Neots, and this spreads over the borders into the surrounding counties of Essex, Hertfordshire and Suffolk. Most woods in this area have been found to have populations of the moth and many others which have not been searched for larvae or light-trapped for adults could also hold such populations. There is then a gap as there are few woodlands between Cambridge and Huntingdon and no more records except from the north western corner of Cambridgeshire and north Northamptonshire. Here, to the west of Peterborough, is another set of woodlands with recent records of both adults and larvae, most arising from surveys in connection with or stimulated by this study. It is quite possible that many of the other woodlands in the area and in neighbouring areas of Northamptonshire and Lincolnshire may also hold populations.

No suggestion can be put forward as to whether the populations are in decline in these areas because prior to the commencement of this study only two or three recent records were available. There was no routine monitoring of these sites and without this research project little current information would be available. However several of these sites could be under threat from future housing and road developments as the Government sees Cambridgeshire and the M11/A1 corridor as prime development areas.

Buttoned Snout *Hypena rostralis*

H. rostralis is classed as being Nationally Scarce (Waring *et al.*, 2003). The UK BAP reported that the species appears to have suffered a significant decline from its former widespread distribution throughout southern England north to Lincolnshire and south Wales, based on a comparison of records received for 1980-99 with those from earlier decades (UK Biodiversity Group, 1999). It was thought that the redevelopment of derelict urban sites and the removal of hedgerows, with the resultant loss of the larval foodplant

Hop (*Humulus lupulus*), were likely to be causes of the decline, but also that climate change and the incidence of late frosts might be a factor. The latter suggestion was on the basis that the decline seemed to be less pronounced around the coast of southern England and along major water-courses inland (Waring, 1993).

The adult of this species has a life span of almost a year. It emerges in late August or early September, hibernates throughout the winter before re-emerging in mid to late April, when it can be on the wing for up to two months.

Various studies have been completed in southern England with varying results. In Hertfordshire and Middlesex (Plant, 2002) and North London (Plant, 2000), larvae were only discovered at one site in each study despite widespread searches. In contrast, Collins (2000) discovered larvae at 29 sites in Surrey, Budd (2001) discovered larvae at seven sites in south Hampshire and Townsend (2001) found larvae at 61sites in the Chilterns. Field *et al*. (in press) discovered larvae at 90 sites across Essex during the period 2002 to 2004.

Prior to the start of this study the adult had been recorded in the Fulbourn area of Cambridge in most years since 1996 (John Dawson, pers. comm.). In fact, 28 adults had been recorded hibernating, four had been light-trapped, five had come to sugar, one had been netted and two found dead since that date. Larvae had also been discovered on Hop in Fulbourn woods in 2001. That was the sum of recent records from Cambridgeshire.

Methods

The main method used for this species was searching Hop plants for larvae during July and early August. Any Hop known was searched using the "beating" technique. A beating tray was placed below the plant and then the plant was struck several blows with a stick one metre in length. Any larvae would then fall into the beating tray. In this study the method was undertaken during daylight hours and once larvae had been discovered and presence recorded, the search moved on to maximise the number of sites covered. Workshops and demonstrations were organised to encourage volunteers to do likewise to assist the survey.

Any records of adults from light-trapping, nectaring or hibernation were also collected but no specific searches for adults or light-trapping took place in Cambridgeshire. To assist with planning searches and understanding the behaviour of the species, observations were made on a captive population retained in a cage outdoors containing a box for roosting and hibernation. Data loggers were positioned outside and inside the hibernation sites from autumn to spring to allow conditions to be compared.

Results

Larvae were discovered at 24 sites across Cambridgeshire but none was any further north than Huntingdon, even though Hop, in large stands, was present and searched near Peterborough (Waring, 2004). Larvae were

observed in the wild on Hop between 4th July and 22nd August (in Essex) and Hop both climbing and spreading across the ground was used. The larvae feed nocturnally and lay up along the leaf stalks or plant stems during the day.

Adults are on the wing from late August and the move to hibernating sites starts in late September and is completed by the end of November. By early December they are inactive and do not leave the hibernation sites until mid to late April. Rousing in the spring appears to be on similar dates in most years, which suggests it is in response to day length rather than temperature. The adults seem to be most active for about one hour after dark and egg laying takes place during mid to late May. Egg laying was not seen on Hop during the study but eggs were later found on the underside of the leaves in captivity. These eggs were very small, almost translucent and easily overlooked (Down, 2005).

The distribution of *H. rostralis* in Cambridgeshire, both larvae and adults since 1995, indicates that the moth can be found mainly in the south of the county (Figure 2).

Discussion

The findings from the larval survey tend to agree with the findings of Townsend (2002) in that July is the best time for larval searches, but larvae have also been found well into the third week in August. No agreement can be made with Plant (2000) that May and early June might be a better time. In Cambridgeshire Hop is not as widespread as in Essex but the distribution of the moth does not follow the distribution pattern of the plant. No reason is known for the absence of the moth in the northern part of Cambridgeshire where there are a number of large stands of the wild larval foodplant and where acceptable cultivars are grown in some gardens.

Collins (2000) suggested that the decline in *H. rostralis* in recent years was an artefact due to a change in recording methods, from beating for larvae to over-reliance on light-trapping and a consequent decline of other methods. This research is consistent with this because populations of larvae are far more widely distributed in Cambridgeshire than the records from light-trapping suggest, and these have clearly been overlooked until now. It is instructive to note that at Writtle in Essex, only one adult has been caught during the period 1968-2004 in the Rothamsted light-trap operated throughout this time (Field & Watkins, 2005; Gardiner & Field, 2001) even though larvae have been found on the surrounding Hop plants and there are adults hibernating only 300 m from the trap. Collins (2003) recorded more adults in light-traps in spring than in autumn, and the results from Cambridgeshire follow that trend.

Hibernation is not as simple as the adults using the nearest suitable buildings. In Essex many suitable buildings near large stands of Hop have been searched and hibernating adults have only been located in two. Finding hibernating adults in natural locations such as in hollow trees, behind bark and amongst evergreen plants has proved almost impossible but these are

suspected to be the normal overwintering positions. Information from data loggers used at two sites suggests that day length is more critical than temperature with regard to both the start and finish of hibernation. The moths showed no interest in leaving the hibernation sites in warm spells in late winter and early spring and the first adults recorded at light-traps tend to occur around the end of April, which agrees with our observations in the outdoor captive-rearing cage that the adults leave hibernation around 20th April.

No adults were observed mating or egg laying. In fact the moths seem reluctant to go near another moth. When observing moths in hibernation, no moths were nearer than two to three metres to the next moth and in free flight if one moth landed near another moth the first one usually flew off. The first minute larvae were seen at the beginning of June and these would be full grown by the start of July. For larvae to start appearing in early June, the eggs would need to have been laid in mid/late May, which suggests the most likely time for mating to take place is early May, unless the females were to store sperm from matings in the autumn. Mating in early May has now been observed independently (Down, 2005) and confirms the findings of this study. Hop plants start to grow rapidly in the first week of May and thus the new growth is well developed before eggs are laid around the third week in May.

In the wild adults have been observed flying around nectar plants but no nectaring was observed during this study, despite placing seasonally appropriate and available flowers in our outdoor cage and searching the same plants in surrounding areas. The main period of activity of the adult moth seemed to be in the hour after dusk, after which they seemed to settle down and then often did not move again that night. Little movement was observed around the period of dawn.

The moth is far more widespread in the south of the county than was originally thought but Hop, the larval foodplant, is often only in small stands separated by many kilometres from the next stand. Inappropriate management of these small stands, many on the roadside, could lead to the loss of the larval foodplant and therefore the loss of colonies.

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References

Budd, P. (2001). A Survey of the Buttoned Snout moth *Hypena rostralis* (Linnaeus) sites in urban South Hampshire: June to August 2001. Wareham: Butterfly Conservation.

Collins, A. (2003). 'Seasonal Bias in Light-trap Records of Buttoned Snout *Hypena rostralis', Atropos*, **18**, 27-28.
Collins, G.A. (2000). Buttoned Snout *Hypena rostralis* (Linnaeus, 1758): larval survey. Dedham: Butterfly Conservation.
Down, D. (2005). 'Breeding Rostralis - The Buttoned Snout', *Cambridgeshire and Essex Butterfly Conservation Branch Newsletter*, **48**, 13-14.
Edwards, R. & Joy, J. (2003). Observations from New Farm, Madingley, Cambridge, of the Square-spotted Clay (*Xestia rhomboidea* (Esper, 1790)). *Huntingdonshire Moth and Butterfly Group, 13th Annual Report* 2002**.**
Field, R.G. (2005). Final Report BGNT/170 Square-spotted clay *Xestia rhomboidea*. Writtle: CERA.
Field, R.G. & Watkins, G. (2005). Final Report 2002-2005 BGNT/169 Buttoned Snout *Hypena rostralis.* Writtle: CERA.
Field, R.G., Watkins, G. & Waring, P. (in press). 'Survey for the larvae of the Buttoned Snout moth *Hypena rostralis* (Linnaeus 1758) in Essex 2002-2005'. *Essex Naturalist.*
Field, R., Deane, A., Watkins, G., & Waring, P. (2003). 'Buttoned Snout *Hypena rostralis* (L): The hunt for wild larvae during the summer of 2002 in Essex and Cambridgeshire', *Atropos*, **20**, 11-14.
Gardiner, T., & Field, R. (2001). 'Changes in macro-moth abundance on the Writtle College Estate'. *Essex Naturalist*, **18:** 139-145.
Green, D. (2002). White-spotted Pinion *Cosmia diffinis* and Square-spotted clay *Xestia rhomboidea:* Survey at Overhall Grove, Cambridgeshire 13th August 2002. Wareham: Butterfly Conservation.
Haggett, G.M. (2002). 'Square-spotted clay *Xestia rhomboidea:* its Larva and Status', *Atropos*, **17**, 41-43.
Plant, C.W. (2002). The Buttoned Snout moth *Hypena rostralis* (Linnaeus, 1758) Hertfordshire and Middlesex survey, 2001. Wareham: Butterfly Conservation.
Plant, C.W. (2000). *Hypena rostralis* (Linnaeus, 1758) Buttoned Snout: larval survey, 2000, North London. Dedham: Butterfly Conservation.
Townsend, M. (2002). A Survey of the Buttoned Snout *Hypena rostralis* (Linnaeus, 1758) in the Oxford, Reading and Buckingham Chilterns area in 2001. Wareham: Butterfly Conservation.
UK Biodiversity Group (1999). Tranche 2 Action Plans. Peterborough: English Nature.
Waring, P. (1993). Wildlife reports - Moths. *British Wildlife* **4**: 256-258.
Waring, P. (1995). 'The moths of Hilly Wood, Helpston, Northamptonshire'. *Huntingdonshire Moth and Butterfly Group, 5th Annual Report* 1994: 23-24.
Waring, P. (2002). 'Numbers of Square-spotted clay *Xestia rhomboidea* in light-traps on National Moth Night and some related observations', *Atropos*, **17**, 44-45.
Waring, P., & Field, R. (2002). 'Square-spotted clay *Xestia rhomboidea*: Discovery of wild larvae in Cambridgeshire and Northamptonshire', *Atropos*, **17**, 37-40.
Waring, P., Townsend, M. & Lewington, R. (2003). *Field guide to the moths of Great Britain and Ireland.* British Wildlife. Rotherwick.

Figure 1: *Xestia rhomboidea* distribution in Cambridgeshire 1995-2005

Square-spotted Clay (Xestia rhomboidea)

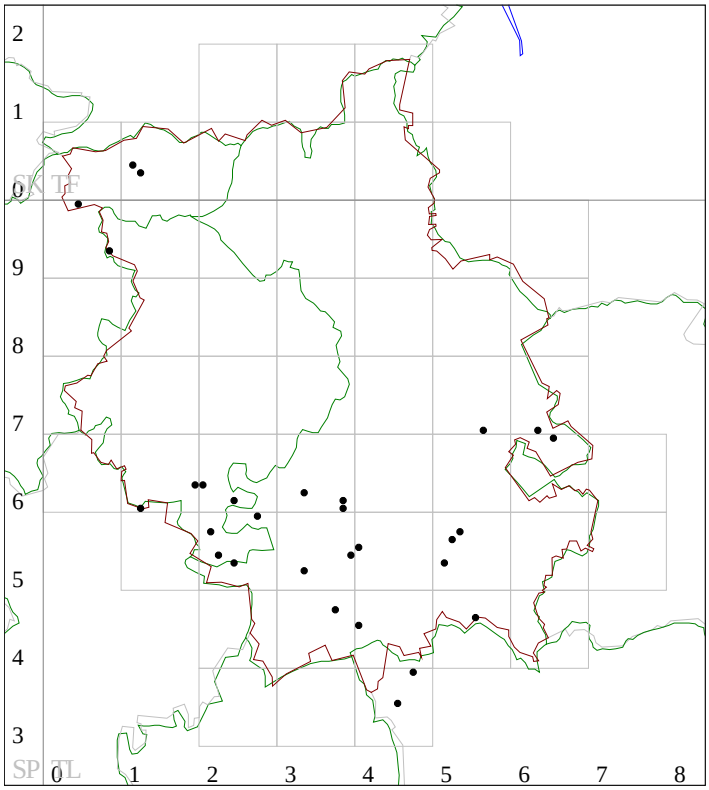
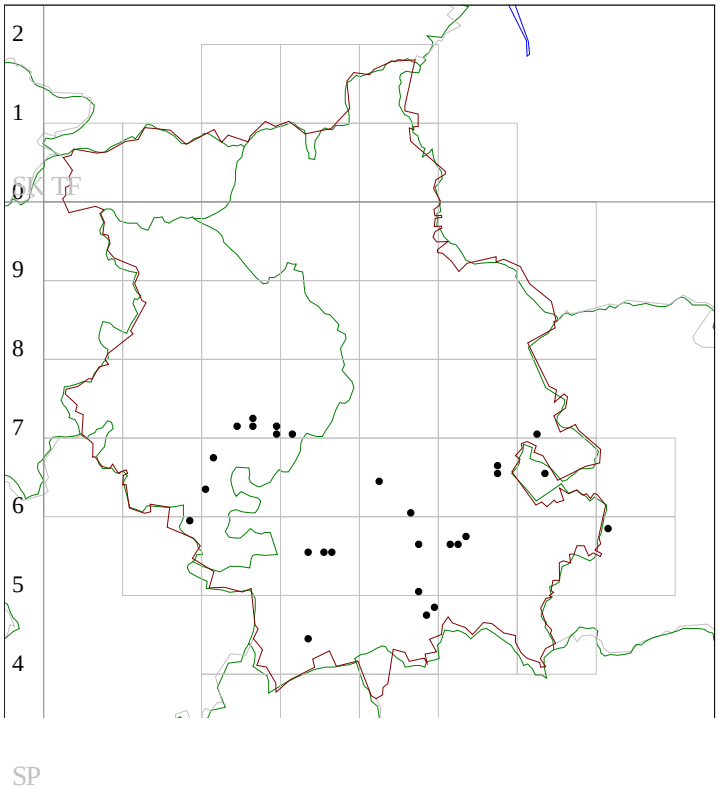


Figure 2: *Hypena rostralis* distribution in Cambridgeshire 1995-2005

Buttoned Snout (Hypena rostralis)



Additions to the bryophyte flora of Cambridgeshire (v.c. 29) in the last 50 years

C.D. Preston

M.C.F. Proctor's paper 'A bryophyte flora of Cambridgeshire' was published on 13 July 1956, 50 years ago. This flora, in Proctor's words, "embodies the accumulation of Cambridgeshire bryophyte records begun by Prof. P.W. Richards in 1927". Paul Richards decision to begin a flora in 1927 initiated a revival of bryological recording in the county which has since continued without interruption. His records were passed to Michael Proctor after he left Cambridge for Bangor in 1949. The resulting flora was the first detailed account of the bryophytes of Cambridgeshire since the third edition of Relhan's *Flora Cantabrigiensis* (1820). It is perhaps less well-known than most county floras as it was soon succeeded by Harold Whitehouse's account of the bryophytes in *A Flora of Cambridgeshire* (1964). Nevertheless, the 1956 flora is the more detailed work, and it remains an invaluable source of localised records, as well (of course) as an account of the state of bryological knowledge at the time.

This paper celebrates the 50th anniversary of Proctor's flora by reviewing the bryophytes added to the Cambridgeshire list since 1956. Its scope is deliberately limited to additions, as a full discussion of changes in the flora is best postponed until the date set for the completion of recording for the current bryophyte flora project, December 2009 (see Preston & Hill 2000). Nomenclature follows Blockeel & Long (1998).

Listing the additions to the Cambridgeshire flora since 1956

It is fairly straightforward to list the additions to the Cambridgeshire flora by comparison of the current list with that published by Proctor (1956). The electronic version of the British Bryological Society's Census Catalogue, available on the Society's website, provides an almost complete list of species for v.c. 29. To this I have added a few species accepted by the B.B.S. for the vice-county since the electronic version of the Census Catalogue was compiled, and three species not accepted for the vice-county by the national recording scheme. These are *Neckera crispa* and *Scorpiurium circinatum*, known from our county only as introductions on rockery stones, and a species, *Hedwigia stellata*, for which the voucher was sent to the BBS recorder but lost in the post. (The latter has recently been recorded by Robin Stevenson at Walsoken, West Norfolk, close to the Cambridgeshire border, and with luck it will soon be refound in Cambridgeshire.) The taxonomy follows the electronic checklist and taxa that have been recorded from the county but are reduced to synonymy in this checklist are disregarded.

The only difficulties in listing first records are in cases of taxonomic revision. For *Gyroweisia tenuis* and *Leptobarbula berica* see Preston & Whitehouse (1986) and for the *Grimmia trichophylla* aggregate see Porley *et al*. (2004). Other species that have been subdivided are *Schistidium apocarpum* and *Racomitrium canescens*. Although *S. apocarum* has been divided into numerous species since 1956 only *S. crassipilum*

has been found in Cambridgeshire, so I have assumed that the first record of the aggregate was this. However, Relhan's record of *Racomitrium canescens* cannot be identified as one of the three segregates now recognised, so I have treated S.J.P. Waters' record of *R. ericoides* as the first record of the only segregate recorded in the vice-county.

How many species have been added since 1956?

A total of 100 taxa has been added to the county flora between 1956 and 2005, exactly 2 species per year (Table 1). This is a remarkably high proportion, 43%, of the flora known at the start of the period. The proportion of liverworts added to the flora, 61%, is higher than that of mosses, 40%.

How common are the new species in the county?

A striking feature of the 100 additions to the flora is that many are apparently very rare in the vice-county. Over half have been found in just one or two sites: 38 are still known only from the site of the first discovery and a further 14 have been found in just one additional site. Most of the rest are uncommon and only nine are frequent in the vice-county. Eight of these nine are plants that were not known (or not understood) in Britain in 1956 – they were added to the British flora between 1959 and 1973. These include *Syntrichia virescens*, first reported from Britain in 1959, *Bryum rubens*, misunderstood until 1964, *B. subelegans*, separated from the very common *B. capillare* in 1973, and *Campylopus introflexus*, an alien species which has spread rapidly since it was first collected in Britain in 1941 and recognised as distinct from its native look-alike *C. pilifer* in 1963. The single widespread plant that was known to British bryologists in 1956, *Dicranella schreberiana*, grows on disturbed ground (especially arable fields) and was added to the Cambridgeshire flora in 1959.

How many people have been responsible for discovering them?

Surprisingly, 36 people are credited with the sole or joint discovery of at least one of the 95 species first collected in the county in the last 50 years (the remaining 5 species were collected earlier but not recognised as distinct). This is more than the number who had added species to the county list in the 300 or so years of recording up to the 1956 Flora. Able field botanists working in the University's Botany School between the mid 1950s and the mid 1970s often took an interest in bryophytes, inspired in many cases by Harold Whitehouse. Well-known botanists who appear on the list but spent most of their later careers elsewhere include Paul Adam, David Chamberlain, Jim Dickson, Jeff Duckett, Alan Leslie, Geoffrey Halliday and Mike Martin. Only five bryologists have a share in the discovery of more than four species, and not surprisingly they were all resident in the county for a long period: Harold Whitehouse (18 taxa), Mark Hill (14), Chris Preston (9), John Birks (7) and Mike Lock (6). Paul Richards' discovery of *Ulota phyllantha* in 1986, 58 years after his first new record from Cambridgeshire (*Fissidens crassipes* in 1928), deserves a special mention.

What are the habitats of the bryophytes added since 1956?

I have divided the 100 additions into categories, based on their habitats and native status (Table 2). This is a fairly rough and ready classification, but shows the main groups added to the flora in the last 50 years. Rather surprisingly, as acidic habitats are uncommon in Cambridgeshire, the largest single category is 'terrestrial calcifuges'. These include ten species first discovered at Gamlingay. This area of acid soils on the Lower Cretaceous Greensand has been known to bryologists since the 18th century, but is still turning up additions to the county list. The last five have been found at Great Heath Plantation, four on a single day in 1988 (*Calypogeia arguta*, *Diplophyllum albicans*, *Fossombronia wondraczekii* and *Pohlia lescuriana*), and the latest, *Pellia neesiana*, in 2002. A further seven species were discovered at Wicken Fen, where the carr was colonised in the 1960s and 1970s by a wide range of calcifuges at a period when the fen was not regularly flooded and the surface of the peat became acidified. Several were rather transient colonists (e.g. *Campylopus brevipilus*, *Hookeria lucens*), but *Sphagnum fimbriatum*, one of the first to be discovered, in 1963, was still present in 2003. Some of the other terrestrial calcifuges are also casual species, including the three *Racomitrium* species (*R. ericoides*, *R. heterostichum*, *R. lanuginosum*) discovered on the clinker of a filter bed at Madingley Hall sewage farm in 1961 and *Lophozia excisa*, found in 1968 on the disused railway line alongside Hayley Wood.

Epiphytes are the next largest habitat group, discounting the ragbag category 'other habitats'. This is not surprising, as in recent years the falling level of atmospheric SO_2 pollution in eastern England has allowed numerous species to increase in abundance or to colonise or re-colonise from less polluted areas. This probably explains the presence in the county of *Frullania tamarisci*, *Orthotrichum pulchellum*, *O. stramineum*, *O. striatum*, *O. tenellum*, *Ulota bruchii*, *U. phyllantha* and *Zygodon conoideus*. The reasons for the apparent spread of *Platygyrium repens* in England are uncertain, and it is too early to comment on *Pylaisia polyantha* and *Sanionia uncinata*, recently found by Robin Stevenson in apple orchards. Most of the other epiphytes are closely related to more widespread species and might easily have been overlooked in earlier years.

There is a substantial group of arable species amongst the additions to the flora, reflecting the greatly increased interest in this habitat in the last 50 years. The majority of these are tuber-bearing species that were scarcely known until their taxonomy was worked out by Harold Whitehouse and his contemporaries in the late 1950s and 1960s. The other two well-represented habitats are more surprising. The chalk habitats of the county have, like the acidic areas at Gamlingay, long been studied by bryologists. *Tortella inflexa* is the most frequent of the additions and is easily overlooked; the other taxa, such as *Pottiopsis caespitosa*, *Aloina brevirostris* and *Seligeria donniana*, appear to be very rare in the vice-county. Seven species have been found in well-studied woodland sites on rotting wood. Their appearance appears to relate to a general national increase in the rotting wood flora, perhaps a response to the decline of traditional woodland management and the return of some sites to a more natural state in which this substrate is more frequent.

The plants of ‘other habitats’ are a heterogeneous group of species, including four species of watersides and wetlands (*Amblystegium humile*, *Bryum tenuisetum*, *Cinclidotus fontinaloides*, *Plagiomnium ellipticum*), two saltmarsh species discovered at Foul Anchor (*Hennediella heimii*, *Tortula acaulon* var. *pilifera*), three summer-fruiting and rather weedy *Bryum* species (*Bryum algovicum*, *B. creberrimum*, *B. pallescens*), one small and very inconspicuous plant (*Gyroweisia tenuis*) and two more which, although larger, hide away in highly shaded sites (*Rhynchostegiella curviseta*, *R. teneriffae*).

The introduced species include four that are believed to be alien in Britain as a whole. In addition to *Campylopus introflexus*, there is one much less frequent aquatic liverwort, *Riccia rhenana*, first found in Britain in 1952, and three more moss species with a less clear history, all added to the British list after 1956. The remaining plants were introduced to Cambridgeshire from elsewhere in the British Isles, two on limestone imported for rockery stone (*Neckera crispa*, *Scorpiurium circinatum*) and one on an acidic boulder (*Grimmia trichophylla*).

Variations in the rate of addition of species since 1956

The number of first records is shown in Figure 1. This figure excludes five species added to the list since Proctor’s flora but with a first date before 1955: *Bryum rubens* (1834) and *B. laevifilum* (1952), segregates recognised after 1956 but which turned out to have been collected earlier, and *Weissia longifolia* var. *longifolia* (1952), *Plagiomnium ellipticum* (1953) and *Neckera crispa* (1955), which for various reasons were not reported by Proctor.

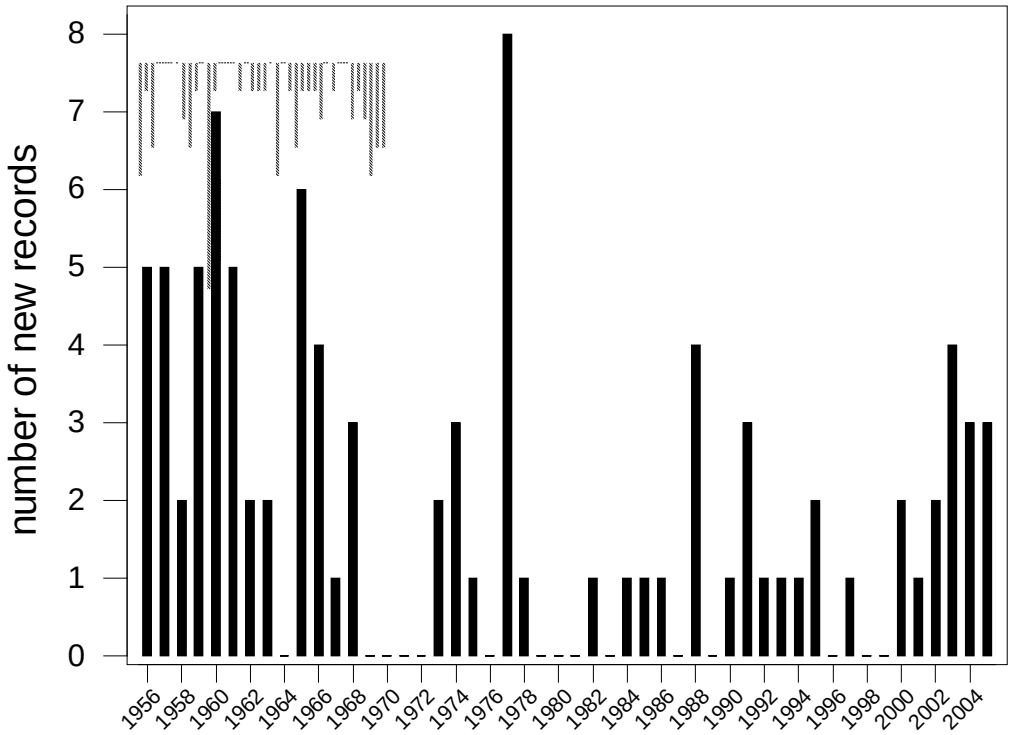


Figure 1. The number of new records per year 1956 - 2005

Up to 1963, there was a high rate of addition as fieldwork continued for the 1964 *Flora of Cambridgeshire*, and as taxonomic studies of tuberous arable bryophytes led to the discovery of several species in the county. From 1964 until 1968 further additions included plants found by keen-eyed young bryologists such as John Birks, Jeff Duckett and Mark Hill. From 1969 to 1972 there were no additions to the flora, but from 1973 to 1977 new species were found almost annually and included some of the Wicken calcifuges. The eight species discovered in 1977, the highest total in the entire period, came from various sites and have no single explanation. This year of plenty was followed by a decade, 1978-1987, in which no more than one species was discovered in any one year and only 5 in total. The drought broke in 1988, followed by regular additions in the 1990s when the totals were swollen by the returning epiphytes. An increased amount of fieldwork from 2000 onwards has resulted in annual additions, and already the total for the 2000s is as good as that for any decade since the 1960s.

This brief history shows that the variations in the rate of recording reflects changes in the intensity of fieldwork in the county, the presence at various periods of skilled bryologists with particular interests, variations in the actual flora of the county, with 'pulses' of additions as suites of species colonise newly available habitats or respond to changing ecological conditions, and presumably a certain random element in the timing of rare events such as the discovery of a new species.

Was the county list "adequately complete" in 1956?

In summing up the state of recording of the flora in 1956, Michael Proctor suggested that, despite an uneven coverage of the county with many more records from southern Cambridgeshire than from "the bryologically rather uninviting areas of flat arable Fenland north of Ely", the records "probably give an adequately complete picture of the flora of the county as a whole". At first reading he may seem to have given an unwise hostage to fortune, considering the 43% increase in recorded species since then. However, a detailed examination of the new records shows that the situation is not as simple as this. At a very rough guess, I estimate that only 40 of the additional species were taxa known to British bryologists in 1956, present in the county before 1956 but overlooked by those who contributed records for Proctor's Flora, and many of these would have been rare. A further 20 are taxa that may well have been present but were not understood until further taxonomic work took place in the following decades. The remaining 40 may well have invaded the county since that date. This suggests that the county list was indeed "adequately complete" by the taxonomic standards of 1956.

It seems appropriate to conclude this celebratory account with Michael Proctor's own words, made when reviewing the 1983 *Checklist* of Cambridgeshire bryophytes and vascular plants (Proctor 1984):

"It seems to me that v.c. 29 is beginning to show us a county flora as the dynamic entity we know it must be, and to show that even considering our long-established native species, not all change is loss. It probably shows too that we can never expect to know the flora of an area finally or completely, and probably we should rejoice that this is so".

References

Blockeel, T.L. & Long, D.G. (1998). *A check-list and census catalogue of British and Irish bryophytes*. British Bryological Society, Cardiff.

Porley, R.D., Preston, C.D. & Hill, M.O. (2004). *Grimmia trichophylla* and related species in Cambridgeshire. *Nature in Cambridgeshire*, **46**, 72-76.

Proctor, M.C.F. (1956). A bryophyte flora of Cambridgeshire. *Transactions of the British Bryological Society*, **3**, 1-49.

Proctor, M.C.F. (1984). *A checklist of the flora of Cambridgeshire*. [Review.] *Journal of Bryology*, **13**, 295-296.

Preston, C.D. & Hill, M.O. (2000). A new survey of the bryophytes of Cambridgeshire (v.c. 29). *Nature in Cambridgeshire*, **42**, 96.

Preston, C.D. & Whitehouse, H.L.K. (1986). Bryophyte records. *Nature in Cambridgeshire*, **28,** 60-62.

Relhan, R. (1820). *Flora Cantabrigiensis*, ed. 3. Cambridge.

Whitehouse, H.L.K. (1964). Bryophyta. In *A Flora of Cambridgeshire*, eds Perring, F.H., Sell, P.D. & Walters, S.M., pp. 281-328. Cambridge University Press, Cambridge.

Table 1. Number of taxa known from Cambridgeshire (v.c. 29) to Proctor (1956) and those added in the period up to the end of 2005. All numbers refer to taxa currently recognised, with species before the '+' sign followed by additional subspecies and varieties.

	Liverworts	Mosses	**Total**
Known to Proctor (1956)	31+0	199+4	**230+4**
Added up to 31.12.2005	18+1	79+2	**97+3**
Total	**49+1**	**278+6**	**327+7**

Table 2. Additions to the bryophyte flora of Cambridgeshire since 1956, arranged by habitat and native status. Mosses precede liverworts. The date of the first collection is given.

Terrestrial calcifuges, excluding calcifuges arable land and rotting wood: 25 taxa (17 mosses, 8 liverworts)

Campylopus brevipilus	1974	Sphagnum fallax	1975
Dicranella cerviculata	1965	Sphagnum fimbriatum	1963
Hookeria lucens	1963	Sphagnum russowii	2003
Plagiothecium undulatum	1965	Weissia rostellata	1957
Pohlia annotina	1982		
Pohlia lescuriana	1988	Calypogeia arguta	1988
Pohlia lutescens	1977	Calypogeia muelleriana	1973
Pseudephemerum nitidum	1977	Cephaloziella divaricata	1957
Pseudotaxiphyllum elegans	1973	Diplophyllum albicans	1988
Racomitrium ericoides	1961	Fossombronia wondraczekii	1988
Racomitrium heterostichum	1961	Lophozia excisa	1968
Racomitrium lanuginosum	1961	Pellia neesiana	2002
Rhytidiadelphus loreus	1974	Riccardia multifida	1959

Epiphytes: 17 taxa (16 mosses, 1 liverwort)

Bryum laevifilum	1952	Rhynchostegiella litorea	1960
Hypnum andoi	1997	Sanionia uncinata	2004
Orthotrichum pulchellum	1990	Syntrichia virescens	1965
Orthotrichum stramineum	1994	Ulota bruchii	1984
Orthotrichum striatum	1995	Ulota phyllantha	1986
Orthotrichum tenellum	2000	Zygodon conoideus	1991
Plagiothecium laetum	1991	Zygodon rupestris	2005
Platygyrium repens	1977		
Pylaisia polyantha	2004	Frullania tamarisci	2003

Arable land and other disturbed ground: 15 taxa (13 mosses, 2 liverworts)

Bryum gemmiferum	1956	Dicranella staphylina	1960
Bryum gemmilucens	1968	Ditrichum cylindricum	1960
Bryum klinggraeffii	1956	Ephemerum serratum var. minutissimum	1957
Bryum rubens	1834	Weissia longifolia var. longifolia	1952
Bryum ruderale	1957	Weissia squarrosa	1991
Bryum subapiculatum	1960		
Bryum violaceum	1960	Riccia sorocarpa	1960
Dicranella schreberiana	1959	Riccia subbifurca	1959

Chalk grassland or disturbed chalk: 9 taxa (7 mosses, 2 liverworts)

Aloina brevirostris	1966	Seligeria donniana	2005
Brachythecium populeum	1960	Tortella inflexa	1961
Bryum torquescens	1958		
Didymodon acutus	1956	Leiocolea badensis	1966
Pottiopsis caespitosa	1962	Lophozia perssonii	1966

Rotting wood: 7 taxa (3 mosses, 4 liverworts)

Brachythecium salebrosum	1958	Cephalozia connivens	1966
Campylopus fragilis	1977	Cephalozia lunulifolia	2005
Dicranum tauricum	1977	Lepidozia reptans	1965
		Nowellia curvifolia	1962

Other habitats (including one species for which habitat was not recorded): 19 taxa (18 mosses, 1 liverwort)

Amblystegium humile	1968	Hennediella heimii	1977
Bryum algovicum var. rutheanum	2001	Hygrohypnum luridum var. luridum	1978
Bryum creberrimum	1959	Hylocomium brevirostre	1974
Bryum donianum	2004	Plagiomnium ellipticum	1953
Bryum pallescens	2000	Plagiothecium ruthei	1956
Bryum tenuisetum	2003	Rhynchostegiella curviseta	1985
Cinclidotus fontinaloides	1957	Rhynchostegiella teneriffae	1995
Grimmia lisae	1993	Tortula acaulon var. pilifera	1977
Gyroweisia tenuis	1956		
Hedwigia stellata	2002	Marchantia polymorpha subsp. polymorpha	1967

Introductions: 8 taxa (7 mosses, 1 liverwort). Species believed to be introduced to Britain are marked with an asterisk.

Campylopus introflexus*	1965	Neckera crispa	1955
Didymodon umbrosus*	1965	Scorpiurium circinatum	1961
Grimmia trichophylla	1992		
Hennediella macrophylla*	2003	Riccia rhenana*	1959
Hennediella stanfordensis*	1977		

Coe Fen - A report on the CNHS Survey project for 2005

Jonathan Shanklin and Steve Hartley

The Cambridge Natural History Society moved on to look at Coe Fen, Sheep's Green, Lammas Land and the Paradise Local Nature Reserve (TL 446573) following the conclusion of its survey of the Coton footpath and tetrad TL45J in 2003 – 2004 (Nature in Cambridgeshire 46). This report gives some of the highlights from the monthly visits to the area.

Coe Fen covers approximately 5.5ha in a long curved oblong oriented north-south. It is an area of common land, cattle-grazed, mediaeval flood-meadow, adjacent to the River Cam. It is largely rough grazing, ditches and scattered trees. The lower reach of the Vicar's Brook City Wildlife Site (WS) runs past the south end.

Across the Cam lies Sheep's Green City WS and Paradise City WS. Little St Mary's City WS lies close to the north end of the site. Fen Causeway crosses the site roughly halfway down.

An eastern extension of Coe Fen consists of Vicar's Brook from Stone Bridge downstream to its junction with the River Cam, together with the cattle-grazed common land to the northeast known as New Bit and Coe Fen Straits. To the east of New Bit lie Hobson's Conduit City WS and Cambridge Botanic Gardens City WS. The final stretch of the brook forms the southern boundary of Coe Fen County WS. Above the brook's southern banks are private gardens.

Sheep's Green is an irregular oblong (approximately 7.0ha) of poor semi-improved cattle-grazed flood meadow, with scattered trees. It is oriented roughly north-south and is bordered to east and west by mill streams of the River Cam. It is crossed halfway up by Fen Causeway. A triangle at its southern end is fenced off and intensively managed as a picnic area, and lies outside the site. Robinson Crusoe Island lies to the east of Sheep's Green, separated from it by a minor river channel, and mostly to the north of Fen Causeway.

Paradise consists of approximately 1.2ha of varied and well-structured wet woodland adjacent to the River Cam. There is an area of swamp and fen vegetation. Directly across the river lies the Perse Girls' School Reedbed City WS. To the northeast lie Sheep's Green and Coe Fen City WSs. Southwest past Paradise Island lies Skaters' Meadow City WS. It turned out to be the most diverse region of the entire area of the survey with 223 out of the 421 confirmed vascular plants that we recorded.

Lammas Land covers approximately 5ha and is managed urban grassland with planted exotics, and includes a children's play area, paddling pool and tennis courts. Despite or because of this, it was the second most diverse area, with 166 vascular plants.

We carried out a preliminary visit in October 2004, primarily to decide on how to sub-divide the area, and then moved on to monthly excursions during 2005 to sample the flora and some of the fauna throughout the year. Jonathan Shanklin also carried out numerous additional visits, either to check on areas that it wasn't possible to include on the programmed excursion, or to check on the presence or absence of species seen in the majority of the sub-divided areas. Charles Turner was the main leader for the excursions, but we had a few other experts along from time to time, whose help was much appreciated. Regular participants in the surveys included Kate de Courcy, Lucy Evans, Monica Frisch, Steve Hartley, Simon Mentha, Christine Newell, David Seilly, Jonathan Shanklin, Henry Tribe, Charles Turner and "George".

The year started well, with the addition of a new fungus for VC29, *Coprinus romagnesianus*, which was identified by John Holden. One of the unusual species of the area, Purple Toothwort (*Lathraea clandestine*) was just beginning to emerge and we mapped which willows it was parasitizing. February gave us almost Antarctic conditions with frequent snow showers, and we took our first walk around Paradise, adding some 20 species that didn't appear on the reserve list, although several were quite common plants. We also visited Robinson Crusoe Island and found the Summer Snowflake (*Leucojum aestivum*), first noted here in 1977, in flower.

In March we walked along Coe Fen, noting the rare casual, Pink Shepherd's purse (*Capsella rubella*), near the footpath and frogspawn in one of the ditches. Crossing over to Sheep's Green, we found Wall-rue (*Asplenium ruta-muraria*) and Maidenhair Spleenwort (*Asplenium trichomanes*) on the wall by the mill race. The start of our April trip was a little delayed due to a meeting of the Cambridge canoe club, which filled most of the parking spaces in the Lammas Land car park. With the coming of spring wildlife was becoming more abundant and we added 50 new identifications to our species list. These included the Orange Ladybird (*Halyzia sedecimguttata*) and both subspecies of Lesser Celandine (*Ranunculus ficaria*).

With the longer hours of daylight we changed to evening walks in May. Grasses and sedges were becoming more prominent and after a warming drink at the Mill, we watched Soprano Pipistrelles (*Pipistrellus pipistrellus*) and Daubenton's Bats (*Myotis daubentonii*) flitting across the lower river. June should have seen us becoming experts at grass identification, but unfortunately the Council, who manage the area, cut most of the meadows the day before our excursion.

Our July excursion was on the river by punt, which allowed access to a few otherwise inaccessible parts of the area. We found several water weeds, but those present weren't expert enough to be sure of certain identification. We did agree that we found galls of the sawfly *Pontania* on willow. In August we attempted to find Flowering Rush (*Butomus umbellatus*), last seen in 1983, but were unsuccessful. We were also unable to refind Yellow Bartsia (*Parentucellia viscose*), which Jonathan Shanklin had earlier discovered on slightly disturbed ground on the part of Coe Fen by Fen Causeway. This turned out to be a new record for VC29, as reported

elsewhere by Alan Leslie. As dusk fell, biting insects emerged, and the next day Jonathan had several tennis ball sized swellings.

By September, fungi were beginning to be more prominent, and finds included Yellow Fieldcap (*Bolbitius vitellinus*), Hare's-foot Inkcap (*Coprinus lagopus*) and Oak Maze-gill (*Daedalia quercina*). We also found a few invertebrates including Dark Bush-cricket (*Pholidoptera griseoaptera*) and Dock Bug (*Coreus marginatus*). The October walk continued the fungal theme and saw the largest attendance of the year, with many participants for the advertised foray around Paradise. Interesting finds included the Earth-star (*Geastrum triplex*), Common Eyelash (*Scutellinia scutellata*) and Blackening Waxcap (*Hygrocybe conica*). We also found the slime mould Flowers of Tan (*Fuligo septica*). Philip Pugh identified some snails that we found in Paradise as Slippery Moss Snail (*Cochlicopa lubrica*), Cellar Snail (*Oxychilus cellarius*) and Drapanaud's Glass Snail (*Oxychilus drapanaudi*).

Charles Turner and Jonathan Shanklin were both on visits abroad on the November date, so Mark Hill, from CEH Monks Wood, kindly led a tour looking for bryophytes. Nothing exceptional was found, but the hard standing opposite the canoe club produced Sand Feather-moss (*Brachythecium mildeanum*), new for the 5-km square, and Kneiff's Hook-moss (*Drepanocladus aduncus*), new for Coe Fen. The car park had Water Screw-moss (*Syntrichia latifolia*), which has not been recorded from the Coe Fen area - according to BRC database - since 1960.

There was no official walk in December, but Jonathan Shanklin concluded the year with a check on some common species that we hadn't found in some of the sub-areas. He did find some of them, and also made a final addition to the species list, finding the Harlequin Ladybird (*Harmonia axyridis*) on a Buddleia (*Buddleia davidii*) at the far end of Paradise.

In addition to those already mentioned, there are a few species listed in Part 1 of Gigi Crompton's Cambridgeshire flora at www.cambridgeshireflora.com, in the JNCC Red Data List of Vascular Plants or that are otherwise notable. Musk Beetle (*Aromia moschata*) larval tunnels are apparent in a number of willows where the wood of the trunks is exposed, although we did not see the beetle. There is a single plant of Italian Lords-and-ladies (*Arum italicum*) growing in Paradise, however this is probably a garden outcast. A small clump of Whorl Grass (*Catabrosa aquatica*) grows in the sluice stream in Sheep's Green. The Butterbur (*Petasites hybridus*), which has been growing in Paradise since at least 1660 when it was recorded by Ray, is thriving.

In 2006 the CNHS is studying the Grantchester meadows, and it is planned to follow this with Ditton meadows in 2007 and Coldham's Common in 2008. Dates for the monthly surveys in 2006, and flora lists for many of the wildlife sites near Cambridge are on the Society web page at http://www.cnhs.org.uk.

From prairie farming to wildlife riches: the Countryside Restoration Trust

John Terry

Robin Page, the author, broadcaster and farmer grew up in the 1940s and 50s on his father's farm at Barton, a few miles west of Cambridge. His fond memories of those days have been described in many of his books; they were of stickleback fishing in the Bourn Brook and watching Barn Owls hunting over the riverside meadows, often to the song of the lark over spring sown corn.

He, among others, watched with great unease in the following decades as the countryside and its wildlife became demoted in the quest for a cheaper tonne of grain. Robin wrote about his concerns, mainly in the Daily Telegraph and he began to think through ways of combining farming with wildlife management. He became keen to demonstrate that the two can work together and with the generous donations from Telegraph readers, he began to buy and 'improve' (not in the intensive farming sense) land at Barton and set up the Countryside Restoration Trust in 1993.

Today the Trust owns over 400ha of land in six counties and the land management is aimed at greater sustainability with special emphasis on demonstrating a combination of farming alongside wildlife conservation.

The 120ha of arable land at Barton and Comberton is farmed for the Trust by Tim Scott and he too is passionate about managing farmland for wildlife. He has helped in the replanting of new hedges where they existed 30-40 years ago as well as planning a farming system that is fundamentally different to many in Cambridgeshire. Even though the soil is quite heavy, Tim is willing to grow spring crops, to leave over-wintered stubble ahead of those crops, to include conservation headlands and to plant grass margins and beetle banks. He also avoids block cropping (planting similar crops in adjacent fields). Block cropping saves time and fuel but reduces the feeding opportunities for wildlife and increases soil erosion risks. He also aims to reduce pesticide and fertiliser impacts and grows crops that provide food and cover for bees and birds. Many of these options have been managed under Defra stewardship schemes; these provide guidance and financial incentives.

Has the management delivered improvements? You only have to walk along one of the many footpaths on the farm to see dramatic signs of improvements to wildlife. The landscape is also more interesting because of the new hedges, new woodland and new willows alongside the Bourn Brook. The arable land next to the river has been reverted to grass, buffering the river and re-establishing water meadows that can help alleviate flooding down stream.

The improvements have carefully been recorded by a team of volunteers led by Sue Clark. Sue's team of about 15 are on the farm throughout the year recording species range and numbers of plants and animals.

The changes in the numbers of breeding birds have been tracked using the British Trust for Ornithology (BTO) Common Breeding Census territory mapping method. Volunteers make ten visits in spring and early summer to record the birds (especially territorial behaviour such as singing) and the BTO analyse and produce a report each year. Winter surveys are also conducted. Much of the land was surveyed before

habitat improvements were instigated so we have records of increases in range and numbers from a very poor start. The increase in wild game birds including Grey Partridge is exciting especially given the fairly heavy soil type. Other successes are with Skylark, Yellow Hammer, Reed Bunting and Linnet, all farmland birds on the national Red List of bird species giving concern, with population decreases of greater than 50% over the past 25 years. One member of our monitoring team, Roger Buisson warns against early optimism with woodland/hedgerow species. He suggests it takes ten years for new hedges to be big enough to attract species that were traditionally woodland dwellers, such as Blackbirds. With Partridge and Skylark, he suggests, the step change is immediate as long as the habitat has been created e.g. spring crops. Four to six coveys of Grey Partridge are now appearing each year. Similarly finches and buntings can respond quite quickly to cropping changes such as over-wintered stubble and good plant cover with lots of seed for food on set-aside. Tim leaves a lot of his set-aside down for two years which produces a wide range of seeds from the naturally regenerating cereals and annual and broad-leaved weeds.

Other volunteers perform regular systematic transects to record butterflies between April and September; these transects are part of a national scheme run by Butterfly Conservation to monitor populations across all kinds of habitats. Val Perrin reported that numbers were down in 2005 because of the lack of sunshine rather than any land-use related cause. Thanks to improved habitats on the farm, the number of species recorded has now reached 26. These include common but still beautiful butterflies like the Peacock, migrants such as the Clouded Yellow and increasing numbers of Small Copper and Brown Argus. In 2003, the increasingly rare White-letter Hairstreak was seen in some surviving elm. Marbled Whites were introduced in 2002 and continue to flourish on some dry grassy areas with flowering scabious and knapweeds.

Survey reports also include mammals, invertebrates, fungi and vascular plants found on the farms. We recognise that all parts of the food chain need to be studied for us to have any understanding of how wildlife communities are working. Wild flowers include Bee Orchids in grassland and a wide range of arable plants including the nationally scarce Shepherd's-needle (*Scandix pectin-veneris*) and Spreading Hedge-parsley.(*Torilis arvensis*). These were once common weeds but have now been sprayed almost out of existence. Visiting specialists are also invited to add to our knowledge and these areas have included species rich grassland, moths, bats and water voles. Several nationally scarce or nationally rare species of insects have been recorded over the past few years, showing what a biodiversity resource sensitively managed farmland can be.

Tim Scott is also keen to try changes to his land management, and, by using a yieldometer on the combined harvester, is able to calculate the economic cost or benefit to the farm business of these changes along side the environmental records. In 2005 he compared winter ploughing of quite heavy soil with ploughing in February, in preparing a seed bed for spring cereals. The spring ploughing was the better environmental option, because it left over-wintered stubble but because the seed bed was wet and poorly structured, it produced a yield reduction of 37% or £146/ha.less income than the winter ploughed area. This approach was compensated for by a

stewardship payment of £125/ha but the exercise has left Tim with a stark reminder that spring ploughing is best left to his lighter soils.

Tim continues to enhance the work at Lark Rise with this type of comparison as well as anecdotal evidence on aspects such as the cost in time and money of avoiding block cropping, choosing spring cereals and conservation headlands. This underlines the value of the Trust work, where we are continuing to search for ways of encouraging wildlife but also making the farm business viable, so we can demonstrate our approach with real credibility to other farmers and decision makers. The volunteer monitors help in the production of objective and professional reports and their efforts also means lots of local people enjoy the countryside and understand more about farming. This is also part of the aim of two meetings each year involving the monitoring team led by Sue and Tim. Many of the volunteer recorders also help with the practical conservation work and showing visitors around the farms.

Readers of Nature in Cambridge would be welcome visitors to the farms (by prior arrangement 01223 262999) and further information about the work is available from the Countryside Restoration Trust Office.

It is intended to follow up this introductory article with a more detailed paper on the changes in the wildlife at the CRT land in Barton and Comberton.

The Cambridge Natural History Society Year 2004-5

Toby Carter, President, CNHS

The Natural History Society year started in the traditional fashion with a Fungal Weekend. A talk on fungi by Henry Tribe and Hélène Davies started us off to be followed by forays in the Botanic Gardens on Saturday, led by Hélène, and a foray to Grantchester Woods and Byron's Pool, led by Ellis Selway and Hélène, on the Sunday. Highlights of these forays included three large patches of different species of earth stars and a truly enormous example of Chicken-in-the-woods. Further excursions in the Autumn programme included a botanical foray on Coe Fen led by Charles Turner and regular surveys of the Coton footpath led by Jonathan Shanklin.

A full programme of talks for the Autumn taught us about rain forest butterflies (Iain Bray), Red Deer on Rum (Caroline Fowler) and Wildlife Crime (Steven Parnwell). In addition Jane Clark gave a fascinating talk on Medicinal Plants, accompanied by sample materials for tasting. The Presidential Address was an entertaining account of the fish fauna of Cambridgeshire, the second fish talk provided by the President as he had earlier stepped in to replace a speaker at the last minute. Max Wade finished the Autumn programme by bringing us up to date on the West Cambridge Project.

The Spring programme included two more Coe Fen surveys led by Charles Turner, a trip to see the Swans at Welney and talks on Working with Protected Species (Jacqui Green), The Harlequin Ladybird (Michael Majerus), Primates (Andrew Smith) and Birds of Cambridgeshire (Colin Kirtland).

For the summer, the programme was dominated by outings, first to the Observatory to see bats and then to use the old telescopes to view Jupiter and Saturn.

This was fascinating until the clouds rolled in and halted observations, so we all moved indoors for an illustrated talk on astronomy by Jonathan Shanklin.

Charles Turner led five botanical outings, two to Coe Fen, and one each to Gamlingay Woods, Cherry Hinton Chalk Pit Reserve and Orwell Clunch Pit. Dave Seilly provided bat expertise for trips to Newnham and Cherry Hinton while Julia Napier added butterfly commentary to the Cherry Hinton trip. Stephen Hartley talked and walked us through the Orchids of Fulbourn Fen and Fleam Dyke and we also enjoyed the nightingales at Paxton Pits. William Seale gave an immensely enjoyable talk on wildlife sounds during the summer while the 86th Conversazione, or Public Exhibition of Natural History, was a great success.

This year saw the first society social event for many years, with a pot-luck party at Milton Country Park before an enjoyable ramble around the park led by Malcolm Busby.

The Society continues to enjoy a lot of support from both the public and the Universities and provided an excellent, and very full, programme for both members and non-members. For information about the Society and events please visit the website at *www.cnhs.org.uk*.

A new Flora of Cambridgeshire

Nick Millar and Alan Leslie

It is now more than 40 years since the publication of the last full Flora of the county by Frank Perring, Peter Sell, Max Walters and Harold Whitehouse (*A Flora of Cambridgeshire*, CUP, 1964) and already over 20 years since Gigi Crompton and Harold Whitehouse provided their invaluable updating in *A Checklist of the Flora of Cambridgeshire* (1983). The 1964 Flora followed hot on the heels of the first BSBI *Atlas of the British Flora* in 1962, which was based on maps showing the occurrence of species in 10-km squares of the national grid. The BSBI has now brought to a successful conclusion a second massive national survey in its *New Atlas of the British & Irish Flora* (OUP, 2002). It thus seems an appropriate time to consider the idea of preparing a new Flora for our county.

Recent decades have witnessed far-reaching changes in agricultural practices, increasing road and urban development and the escalating demands in the use of the countryside for recreational purposes. All of this has had and will continue to have an effect on the flora of the county. Added to this we are already seeing tangible botanical consequences of the sustained increase in average temperature, in the occurrence and spread of some alien plants in particular.

A number of schemes have been set up over the last twenty years or so to attempt, systematically, to record the county's flora in greater detail than done for either Atlas, but these have faltered through lack of support and seem unlikely to have a successful early conclusion. A previous plan to produce a historical Flora also failed to come to fruition, but Gigi Crompton has succeeded in preparing and publishing her unique web-based *Catalogue of Cambridgeshire Flora Records since 1538* (www.cambridgeshireflora.com/). Her work in extracting and organising Cambridgeshire's botanical records could give a kick-start to the preparation of any

new Flora. It is our intention now to take up this challenge: our aim will be to provide an account of current distribution set in the context of over 460 years of botanical records.

We intend the new Flora to be as inclusive as the records at our disposal allow: in other words it will include all species and hybrids ever recorded from the county, including both native and alien taxa. As far as we are able, it will also take account of all critical taxa, both variants at any infraspecific rank and all the familiar apomictic groups such as brambles, hawkweeds and dandelions, as well as a few that may be less familiar in this context such as *Ranunculus auricomus* and *Hypericum perforatum*. Where gaps exist in our records or problems occur in their interpretation, these will be highlighted. The new Flora is thus intended to provide a detailed summary of our accumulated records of plants in Cambridgeshire rather than just a snapshot of occurrence over a recent limited period.

The start of recording for the 2002 *Atlas* means that we have a ready-made starting-point to define 'recent records' for the Flora (i.e. 1987 onwards) and we believe that listing presence or absence in 10-km squares will give an adequate indication of overall distribution within the county for our purpose, based on three date categories similar to those used in the 1964 Flora (i.e. pre-1950, 1950–1986 and 1987 onwards). We do not propose to initiate any systematic new recording at a finer (e.g. tetrad) level: in other words this will not be a 'dot map Flora'. It is our deliberate intention to try to shift the focus of recording from the relentless crossing-off of names on a card (a process that has produced, and will continue to produce, benefits of its own) to a greater consideration of the plants themselves, their populations, ecology and variation. At the same time we would like to encourage recorders to make more detailed individual records, with information on habitat, status and abundance together with the usual information on locality, date and recorder.

We expect that the process of bringing together the accounts will take some time (probably no less than five years) and we would welcome new and updated records whilst this is going on. The following are some of the particular activities which would contribute towards our aim of a new Flora of Cambridgeshire:

- Choose an individual species and follow up all the listed localities to see if the plant still occurs there.
- Get to know some of the infraspecific variants of often common plants and track down localities for them.
- Get to know some of the 'look-alike' alien taxa similar to our native plants which are increasingly being planted in the county, as described by Peter Sell in this issue of *Nature in Cambridgeshire*.
- Tackle one of the apomictic groups – a more demanding option!
- Adopt a parish and study the flora of such an area more intensively.
- Select a 10-km square and concentrate on finding new plants in it.
- Select a particular habitat and concentrate on seeing as much of it as you can in Cambridgeshire.

If you feel that one or more of these approaches to recording appeal to you, please get in touch with one of us. We shall do our best to use future Cambridgeshire Flora Group excursions to further some of these aims and to try to introduce recorders to some currently unfamiliar species and variants.

Natural History Bibliography of Cambridgeshire 2000-2005

Toby Carter

There follows a bibliography of natural history articles relating to Cambridgeshire published in scientific journals which may be of interest to the readers of Nature in Cambridgeshire. In the first instance this bibliography will look at articles published between 2000 and 2005. In future issues of Nature in Cambridgeshire we expect to expand this list to include recent articles, and to fill in any gaps we may have left in this first list. An updated list will be maintained on the website. Please contact us with any suggestions for inclusion in this list. Notes are included in square brackets.

PHILOSOPHY

Wiggins, D. (2000). The Presidential Address: Nature, Respect for Nature, and the Human Scale of Values. *Proceedings of the Aristotelian Society*, **100** (1): 1-32 [uses many examples from Cambridgeshire]

BIOLOGY

Aldred, J. & Jacobs, M. (2000). Citizens and wetlands: evaluating the Ely citizens' jury. *Ecological Economics* **34** (2): 217-232

Bass, J., Blackburn, J. & Giraudy, C. (2003). Range extension of the 'Witham Orb Mussel' *Sphaerium solidum* (Normand) (Bivalvia : Sphaeriidae) or an overlooked resident of the Great Ouse? *Journal of Conchology* **38**: 61-65

Bellamy, P.E., Shore, R.F., Ardeshir, D., Treweek, J.R. & Sparks, T.H. (2000). Road verges as habitat for small mammals in Britain. *Mammal Review* **30** (2): 131-139 [North Cambridgeshire]

Bennett, A.F., Hinsley, S.A., Bellamy. P.E., Swetnam, R.D. & MacNally, R. (2004) Do regional gradients in land-use influence richness, composition and turnover of bird assemblages in small woods? *Biological Conservation* **119** (2): 191-206 [Fenland in Cambridgeshire & Lincolnshire]

Cadbury, C.J. (2002). Arable to Wetland: Restoring habitat for birds in the Cambridgeshire Fens (The Kingfishers Bridge Wetland Creation Project) *Cambridgeshire Bird Report* **76**: 133-152

Cooke, A.S. & Farrell, L. (2001). Impact of muntjac deer (*Muntiacus reevesi*) at Monks Wood National Nature Reserve, Cambridgeshire, Eastern England. *Forestry* **74** (3): 241-250

Croxton, P.J. & Sparks, T.H. (2002). A farm-scale evaluation of the influence of hedgerow cutting frequency on hawthorn (*Crataegus monogyna*) berry yields. *Agriculture Ecosystems & Environment* **93** (1-3): 437-439 [Knapwell, Cambs and sites in Yorks & Bucks]

Croxton, P.J. & Sparks, T.H. (2004). Timing of berry depletion rates of three common hedgerow shrubs. *Agriculture, Ecosystems and Environment* **104**: 663-666 [Monks Wood]

Croxton, P.J., Carvell, C., Mountford, J.O. & Sparks, T.H. (2002). A comparison of green lanes and field margins as bumblebee habitat in an arable landscape. *Biological Conservation* **107** (3): 365-374 [Little Gidding]

Croxton, P.J., Franssen, W., Myhill. D.G. & Sparks, T.H. (2004). The restoration of neglected hedges: a comparison of management treatments *Biological Conservation* **117** (1): 19-23 [Monks Wood]

Croxton, P.J., Hann, J.P., Greatorex-Davies, J.N. & Sparks, T.H. (2005).Linear hotspots? The floral and butterfly diversity of green lanes *Biological Conservation* **121** (4): 579-584 [10 sites in Cambs]

Fant, J.B. & Preston, C.D. (2004). Genetic structure and morphological variation of British populations of the hybrid *Potamogeton* x *salicifolius*. *Botanical Journal of the Linnean Society* **144** (1): 99-111 [Ouse Washes]

Field, R., Deane, A., Watkins, G. & Waring. P. (2003). Buttoned Snout *Hypena rostralis* (Linn.): the hunt for wild larvae during the summer of 2002 in Essex and Cambridgeshire. *Atropos* **20**: 11-14

Garbutt, R.A. & Sparks, T.H. (2002). Changes in the botanical diversity of a species rich ancient hedgerow between two surveys (1971-1998) *Biological Conservation* **106** (2): 273-278 [Judith's Hedge, Monks Wood]

Martin, L.A. & Pullin, A.S. (2004). Host-plant specialisation and habitat restriction in an endangered insect, *Lycaena dispar batavus* (Lepidoptera : Lycaenidae) I. Larval feeding and oviposition preferences. *European Journal of Entomology* **101** (1): 51-56 [Woodwalton Fen and other sites]

Martin, L.A. & Pullin, A.S. (2004). Host-plant specialisation and habitat restriction in an endangered insect, *Lycaena dispar batavus* (Lepidoptera : Lycaenidae) II. Larval survival on alternative host plants in the field. *European Journal of Entomology* **101** (1): 57-62 [Woodwalton Fen and other sites]

Morris, J., Gowing, D.J.G., Mills, J. & Dunderdale, J.A.L. (2000). Reconciling agricultural economic and environmental objectives: the case of recreating wetlands in the fenland area of eastern England. *Agriculture Ecosystems & Environment* **79**: 245–257

Milsom, T.P., Sherwood, A.J., Rose, S.C., Town, S.J. & Runham, S.R. (2004). Dynamics and management of plant communities in ditches bordering arable fenland in eastern England. *Agriculture Ecosystems & Environment* **103** (1): 85-99 [Mepal Fen]

Moore, N.W. (2001). Changes in the dragonfly communities at the twenty ponds at Woodwalton Fen, Cambridgeshire, United Kingdom, since the study of 1962-1988 *Odonatologica* **30** (3): 289-298

Oswald, P.H. (2000). Historical records of *Lactuca serriola* L. and *L. virosa* L. in Britain, with special reference to Cambridgeshire (v.c. 29). *Watsonia* **23**: 149-159

Preston, C.D. (2000). Engulfed by suburbia or destroyed by the plough: the ecology of extinction in Middlesex and Cambridgeshire. *Watsonia* **23**: 59-81

Preston, C.D., Sheail,. J., Armitage, P. & Davy-Bowker, J. (2003). The long-term impact of urbanisation on aquatic plants: Cambridge and the River Cam. *Science of the Total Environment* **314**: 67-87

Robinson, H., Carville, M. & Walsh, T. (2003). Advanced leachate treatment at Buckden landfill, Huntingdon, UK. *Journal of Environmental Engineering and Science* **2** (4): 255-264

Rochlitz, I. (2003). Study of factors that may predispose domestic cats to road traffic accidents: part 1 *Veterinary Record* **153** (18): 549-557

Rochlitz, I. (2003). Study of factors that may predispose domestic cats to road traffic accidents: part 2. *Veterinary Record* **153** (19): 585-588

Rochlitz, I. (2004). Clinical study of cats injured and killed in road traffic accidents in Cambridgeshire *Journal of Small Animal Practice* **45** (8): 390-394

Simons, E. (2005). Quantifying the unquantifiable: Ecohydrology on the ouse washes. *Water and Environment Journal* **19** (3): 272-279

Stacey, D.A. & Fellowes, M.D.E. (2002). Temperature and the development rates of thrips: Evidence for a constraint on local adaptation? *European Journal of Entomology* **99** (3): 399-404 [Boxworth]

Taylor, H., Williams, P. & Gray, D. (2004). Homelessness and dog ownership: an investigation into animal empathy, attachment, crime, drug use, health and public opinion. *Anthrozoös* **17** (4): 353-368 [Cambridge]

Waring, P. (2000). Parasitoid *Meteorus gyrator* (Thunb.) (Hym.: Braconidae: Meteorinae) reared from larva of the White-spotted Pinion moth *Cosmia diffinis* (L.) (Lep.: Noctuidae) in Cambridgeshire. *Entomologists' Record & Journal of Variation* **113**: 135-138

Waring, P. (2002). White-spotted Pinion moth *Cosmia diffinis* (L.) (Lep.: Noctuidae): Beating for larvae and light-trapping for adults in Huntingdonshire in 2000. *Entomologists' Record & Journal of Variation* **114**: 84-88

Waring, P. (2003). Parasitoids *Homolobus annulicornis* (Nees) (Hym.: Braconidae) and *Eumea linearcornis* (Zetterstedt) (Dipt.: Tachinidae) reared from larva of the White-spotted Pinion moth *Cosmia diffinis* (L.) (Lep.: Noctuidae) in Cambridgeshire in 2002, with notes on habitat of the host. *Entomologists' Record & Journal of Variation* **115**: 123-126

Waring, P. & Field, R. (2002). Square-spotted Clay *Xestia rhomboidea* (Esp.): Discovery of wild larvae in Cambridgeshire and Northamptonshire. *Atropos* **17**: 37-41.

Xiong, S.J., Johansson, M.E., Hughes, F.M.R., Hayes, A., Richards, K.S. & Nilsson, C. (2003). Interactive effects of soil moisture, vegetation canopy, plant litter and seed addition on plant diversity in a wetland community. *Journal of Ecology* **91** (6): 976-986 [Wicken Fen]

GEOLOGY

Barrett, P.M. & Evans, S.E. (2002). A reassessment of the Early Cretaceous reptile '*Patricosaurus merocratus*' Seeley from the Cambridge Greensand, Cambridgeshire, UK. *Cretaceous Research* **23** (2): 231-240

Boreham, S. (2004). The structure and formation of the Wandlebury area. *Proceedings of the Cambridge Antiquarian Society* **113**: 5-8

Briant, R.M., Bateman, M.D., Coope, G.R. & Gibbard, P.L. (2005). Climatic control on Quaternary fluvial sedimentology of a Fenland Basin river, England. *Sedimentology* **52** (6): 1397-1423 [Pode Hole Quarry, Thorney, Peterborough]

Coope, G.R. (2000). Middle Devensian (Weichselian) coleopteran assemblages from Earith, Cambridgeshire (UK) and their bearing on the interpretation of 'Full glacial' floras and faunas. *Journal of Quaternary Science* **15** (8): 779-788

Clayton, K.M. (2000). Glacial erosion of the Wash and Fen basin and the deposition of the chalky till of eastern England. *Quaternary Science Reviews* **19** (8): 811-822

Gao, C.H., Keen, D.H., Boreham. S., Coope, G.R., Pettit, M.E., Stuart, A.J. & Gibbard, P.L. (2000). Last interglacial and Devensian deposits of the River Great Ouse at Woolpack Farm, Fenstanton, Cambridgeshire, UK. *Quaternary Science Reviews* **19** (8): 787-810

Heaton, T.H.E., Trick, J.K. & Williams, G.M. (2005). Isotope and dissolved gas evidence for nitrogen attenuation in landfill leachate dispersing into a chalk aquifer. *Applied Geochemistry* **20** (5): 933-945 [Thriplow, Cambridgeshire]

Langford, H.E. (2002). Middle to Late Pleistocene deposits at Whittlesey, eastern England. *Quaternary Newsletter* **97**: 46-49

Langford, H.E. (2004). Middle Pleistocene deposits at Stanground (Peterborough) and March, eastern England: a discussion based on new evidence. *Proceedings of the Geologists' Association* **115**: 91-95

Langford, H.E. & Briant, R.M. (eds.) (2004). *Nene Valley. Field Guide.* Quaternary Research Association. 212 pp.

Noe, L.F., Smith, D.T.J. & Walton, D.I. (2004). A new species of Kimmeridgian pliosaur (Reptilia; Sauropterygia) and its bearing on the nomenclature of *Liopleurodon macromerus. Proceedings of the Geologists' Association* **115**: 13-24 [Kimmeridge Clay near Ely]

West, R.G. (2000). *Plant Life of the Quaternary Cold Stages: evidence from the British Isles.* CUP [Several sites in Cambridgeshire Fens]

West, R.G., Burton, R.G.O., Andrew, R. & Pettit, M.E. (2002). Evolution of a periglacial landscape in the Late Devensian: environments and palaeobotany of the Mepal area, Cambridgeshire, England. *Journal of Quaternary Science* **17** (1): 31-50

Wright, J.K., Kelly, S.R.A. & Page, K.N. (2000). The stratigraphy of the 'Corallian' facies Middle Oxfordian (Upper Jurassic) deposits at Upware, Cambridgeshire, England. *Proceedings of the Geologists' Association* **111**: 97-110

Vascular Plant Records

Alan Leslie

Whilst this list includes a great many new alien records for Cambridgeshire (v.c 29) there are also several outstanding native plant records to leaven this exotic diet. The most notable of these include the reappearance of *Herniaria glabra* at Kennett, a significant new site for *Lythrum hyssopifolia* at Fen Drayton and the discovery of *Potamogeton compressus* near Peterborough. The pondweed has not been seen in the county for almost 100 years and even more remarkably we have had no previous record from the Nene and its associated waterways before.

Just as intriguing are the discoveries made by David Barden on the Cambridge Science Park at Milton (some of which are written up elsewhere in this issue). This seemingly unpromising botanical site has produced records for a whole host of plants usually associated with the small Breckland fringe of the county and their occurrence only goes to show that even relatively recent developments can repay close and careful scrutiny.

Our roadside maritime flora gained two new additions in 2005: *Armeria maritima* along the M11 and *Juncus ambiguus* on a minor road verge at Little Downham. We can expect more to follow, with perhaps *Spergularia media*, *Puccinellia* spp. other than *P. distans* and *Plantago maritima* being amongst the most likely candidates.

There was no organised bramble ramble this year but the new species mentioned previously in these notes was finally published as *Rubus cantabrigiensis* with a type specimen collected from the Horse Fen Drove at Soham (see A.L. Bull and A.C. Leslie in *Watsonia* **25**(4): 419-422 (2005)). This has proved to be a widespread species in the county and in East Anglia in general and it is strange that it has eluded batologists until now.

This list also includes a few records of plants which are certainly deliberately introduced at the sites concerned but which are already showing signs of spread, either by seed or vegetatively (e.g. *Lysimachia thyrsiflora*, *Mimulus guttatus* and *Cyperus eragrostis*). These are on landscaped sites with open public access, not private gardens, which would generally fall outside the remit of these notes. Such cases can pose a problem for all recorders as to when they become worth recording and the best advice is to record them when seen, taking care to note their likely origin and whether or not they appear to be reproducing. Deliberate planting of obviously alien species in the countryside is becoming more common and the situation is further complicated by the involvement of 'look-alike' alien versions of native species. These are discussed more fully by Peter Sell elsewhere in this issue.

As ever, Nick Millar and I are grateful to all those who have submitted records to us during the year. This list is perforce virtually restricted to first and second records for the county but all records are welcome and as the notice on pp….indicates all will be contributing to the new Flora of Cambridgeshire which we hope to put together over the next few years. Please do read what we intend to do and see if you can find a way to make a contribution!

Allium tuberosum Several plants, apparently self sown on steps in front of 45 Panton Street, Cambridge, TL45335746, P.H. Oswald, 4.9.2005, det. ACL. First v.c. record for Chinese Chives which is a ready self-seeder as is apparent on the rock garden in the University Botanic Garden.

Amaranthus bouchonii x *A. retroflexus* (a) Several plants scattered amongst numerous plants of both parents in beet field, Cross Drove, Littleport, TL58438689, ACL, 11.9.2005, **CGE** (b) A few plants with both parents in field corner, White House Road, Littleport, TL60608726, ACL, 11.9.2005, **CGE.** First and second v.c. records.

Anthemis austriaca Several plants on old soil heap, Pembroke College sports field, Grantchester Road, Cambridge, TL43855708, ACL, 26.7.2005, **CGE**. First v.c. record for an alien chamomile that is known to be a constituent of some wild flower seed mixes and may be overlooked elsewhere.

Armeria maritima Two plants on the east side of the central reservation of the M11, north-west of Whittlesford, P.H. Oswald, 15 May 2005; on visiting the site on 22 May ACL & P.R. Green found four plants scattered along the central reservation from TL45754869-45714887. First record for Thrift since 1930 when it was last seen along the tidal R. Nene at Foul Anchor: this is a further addition to our roadside saltmarsh flora. Philip Oswald made the initial record travelling by car along the southbound carriageway of the motorway and he also recorded another fine flowering clump a few minutes earlier (similarly on the east side of the central reservation) a little way to the south of the Trumpington exit; its precise location has not yet been pinpointed.

Betula utilis x *B. pendula* One self sown tree, apparently of this parentage, on a grave at the southern end of Mill Road cemetery, Cambridge, TL46155610, ACL, 27.5.2001 (when c.6ft tall), still there 28.12.2005 (and now c.15ft tall), **CGE**. First v.c. record. Several plants of the attractive white-trunked *B. utilis* have been planted in the cemetery; this seedling resembles them in bark and catkins but has consistently more acuminate and strongly biserrate leaves and fewer hairs on the twigs.

Calepina irregularis Several plants growing on discarded rootballs of trees on waste ground, Cambourne, TL313599, N.P. Millar, 14.4.2005, **CGE**, det. ACL. First v.c. record for a rare alien crucifer that perhaps came in as seed with imported trees, which it is assumed were dug up and discarded when they failed to establish.

Caryopteris x *clandonensis* One young flowering plant, self sown on low brick wall in front of Sherlock Court, Cambridge, TL43685990, ACL, 16.8.2005, **CGE** (b) one self sown plant outside garden, Barton, TL40515585, ACL, 23.8.2005. First and second v.c. records for a popular garden shrub with bright blue flowers.

Catalpa bignonioides Two self sown young plants at base of wall in car park behind shops, Norfolk Street, Cambridge, TL46115846, ACL, 1.6.2005. First v.c. record for the Indian Bean Tree.

Chenopodium giganteum One plant on a low ridge of waste soil, Jeavons Lane, Cambourne, TL32005886, N.P. Millar, 10.10.2005, **CGE**. First v.c. record for the Tree Spinach, which resembles a giant *C. album*, but with bright purplish red young shoots and stems.

Cladium mariscus A clump, estimated as 2-3 years old, on western edge of reedbeds, Kingfisher's Bridge wetland, Wicken, TL545735, A.C. Green *et al.*, 30.11.2005. Probably arrived naturally, as the site is well away from the fenland litter-field, where plug-planting (not including this species) and hay-spreading from Chippenham Fen were carried out in 1996-97, and from the field at the north-east corner, where hay-bales from both Chippenham and Wicken Fens were spread in 1996. Since 1990 Great Fen-sedge has only been reported as a native plant in the county from Chippenham and Wicken Fens, Fowlmere and Sawston.

Clematis montana One self sown plant in paving crack below Elizabeth Way bridge, Cambridge, TL46155910, ACL, 20.9.2005. First v.c. record for this very vigorous Himalayan species widely grown in British gardens.

Cotoneaster dammeri A very large plant sprawling on old railway track, just west of the B1050, south of Willingham, TL39846811, ACL, 7.7.2005. Second v.c. record.

Cyperus eragrostis A few plants presumed to have been deliberately introduced around Lake Lambert, Cambourne, TL319598, N.P. Millar, 6.2005; further plants found here, with apparent self sown seedlings, on 30.9.2005 by NPM and ACL as well as a second site nearby in a ditch running down to the 'Ecopark'. First v.c. record for the American alien Pale Galingale.

Epilobium ciliatum x *E. roseum* One plant with both parents, at edge of pavement bordering the Cherry Hinton Brook, Burnside, Cambridge, TL47555748, ACL & C.D. Preston, 18.7.2005, **CGE**. First v.c. record.

Epilobium parviflorum x *E. roseum* (*E.* x *persicinum*) Several plants with both parents, at edge of pavement bordering the Cherry Hinton Brook, Burnside, Cambridge, TL47555748, ACL & C.D. Preston, 18.7.2005, **CGE**. First v.c. record.

Epilobium montanum x *E. roseum* (*E.* x *mutabile*) One plant with both parents, at edge of pavement bordering the Cherry Hinton Brook, Burnside, Cambridge, TL47555748, ACL & C.D. Preston, 18.7.2005, **CGE**. Second v.c. record.

Epipactis palustris var. *ochroleuca* Twenty-two flowering stems (and two eaten off), East Meadow (compartment 13), Chippenham Fen, TL653697, K. Warrington, 28.6.2005, comm. P.H. Oswald. First v.c. record for this striking variant of Marsh Helleborine with yellowish white flowers, lacking the usual reddish brown pigment. A small colony of normal-flowered plants was noted nearby.

Erodium triflorum Two plants self sown at base of fence in front of 320 Coldham's Lane (and several more at base of hedge in front of number 314), Cambridge, TL47435807, ACL, 18.12.2005. First v.c. record for an alien evergreen stork's-bill with flowers like a miniature pelargonium; introduced and now abundant in gardens on the other side of the road.

Euphorbia corallioides Numerous plants both on and beside grass track along field margin at the western end of village, Barton, TL40225604, ACL, 23.8.2005, **CGE**. First v.c. record for the perennial, hairy-fruited, Coral Spurge which does not seem to be in any of the nearby gardens.

Hebe x *franciscana* One self sown plant at base of wall, Coveney, TL48758200, ACL, 29.8.2005. First v.c. record for a familiar garden shrub, well known as a naturalised alien, usually near the coast, in the west of England.

Helichrysum italicum One self sown plant at base of wall, Front Court, Emmanuel College, Cambridge, TL4558, ACL, 14.8.2005. First v.c. record for the shrubby, evergreen Curry Plant, so-named for its strong curry-like smell when crushed.

Herniaria glabra Old gravel pit workings, Kennett: two small populations (a) at least five vigorous plants, TL68866873, M.O. Hill *et al*. (b) six plants, TL68896873, C.R. Stevenson, both found during a bryological excursion on 12.6.2005, comm. C.D. Preston. A welcome sighting of a very rare native, last seen on this (south east) side of the A11 in 1981; not seen in the pits on the other side of the road since 1990.

Hieracium rionii One plant by the side of School Lane, Histon, TL441630, P.D. Sell, 4.6.2004, **CGE** (PDS 04/142). First v.c. and probably first British record for an alien hawkweed grown in gardens for its blue-green, purple-spotted leaves. This Swiss species is also known to be a weed in the University Botanic Garden.

Hydrocotyle ranunculoides (a) Soham Lode, Soham, first seen 5.2003 and by 31.8.2004 it was dominating the mill pond (TL589730) and extending downstream at least to the railway line (TL585730), R. Torrens (b) a large quantity floating in ditch, Grunty Fen Drain, Witchford, TL507788, J.J. Graham, M.O. Hill & C.R. Stevenson, conf. C.D. Preston, 17.1.2004. First and second v.c. records for the North American alien Floating Pennywort, which has subsequently been recorded in abundance along the Grunty Fen Drain near Coveney and in Coldham's Brook on Coldham's Common in Cambridge.

Hypericum olympicum One self sown plant in paving crack by car park, The Maltings, Ely, TL54478000, ACL, 3.7.2005, **CGE**. Second v.c. record of this dwarf, subshrubby, grey-leaved St John's-wort.

Iris foetidissima var. *citrina* One presumably bird sown clump on the verge of the road leading down to Chesterton Junction Engineers Sidings, Cambridge, TL470613, ACL, 25.5.2003, still there 6.2005. First v.c. record for this yellow-flowered variant.

Juncus ambiguus A small population in a dense roadside strip of *Puccinellia distans*, Lawn Lane, Little Downham, TL53058447, ACL, 7.8.2005, **CGE**, conf. T.A. Cope. Second v.c. record for this usually coastal relative of Toad Rush and perhaps the first British record for this species as a component of inland 'maritime' roadside communities.

Lythrum hyssopifolia In gravel scrape by Elney Lake, Fen Drayton gravel pits, TL33606931, S. Brown, 6.2005, det. N.P. Millar; NPM visited the site on 16.8.2005 and found plants in several other scrapes and also along the western shore of the spit on which the scrapes are situated. This is a new site for Grass Poly in an area much visited by migrating/over-wintering wildfowl; it may be significant that this species is now abundant at the famous wildfowl wetland site at Slimbridge in Gloucestershire.

Lysimachia thyrsiflora Many stems in ditch connecting two balancing ponds in the 'Ecopark', Cambourne, TL316596, N.P. Millar, 7.6.2005. First v.c. record for Tufted Loosestrife, a rare native in northern England and Scotland, but here presumably deliberately introduced and already well established and likely to spread further.

Medicago minima Many fine plants on a dry, open, south-west facing bank above pond, Cambridge Science Park, Milton, TL46446172, ACL, 6.6.2005, **CGE**; David Barden has subsequently found Bur Medick in four other sites there in 2005. This rare native of the Breckland fringe in the county is presumed to have been introduced here with soil.

Mimulus guttatus (a) Margin of pond, Cambridge Science Park, Milton, TL46636173, D. Barden, 2004 (b) Scattered along the shore of Lake Lambert, Cambourne, TL318598, N.P. Millar, 6.2005. First and second records for Monkeyflower which was probably deliberately introduced in both cases but already seems to be well established.

Nicotiana sylvestris One flowering plant on ledge of river wall, Magdalene College, Cambridge, TL477591, ACL, 16.8.2005. Second v.c. record for this large, white-flowered tobacco plant, a popular component of recent bedding schemes in Cambridge.

Parentucellia viscosa Two plants on disturbed ground near Fen Causeway, Coe Fen, Cambridge, TL448574, J. Shanklin, 30.7.2005. First v.c. record for Yellow Bartsia, a native of usually damp, grassy places on sandy soils in southern and western Britain and recently recorded as an alien in other parts of the country. Recorded as a probable introduction with grass seed in Norfolk and Suffolk.

Pilosella flagellaris subsp. *flagellaris* Occurs as a lawn weed (sometimes in great abundance) in the front gardens of 540, 544, 546, 554, 551, 553, 557 and 561 Newmarket Road, Cambridge, TL4759, ACL, 7 & 8.6.2005, **CGE**. Previously recorded only from number 540 and then only once in 1971; this alien mouse-ear-hawkweed has several, well-spaced heads on each stem unlike the solitary heads of the native *P. officinarum.*

Potamogeton compressus (a) One plant immediately west of the sluice on north side of Moreton's Leam, Stanground Sluice, just east of Peterborough, TL209974, P. Kirby, 1.8.2004 (b) a fairly large clump in Moreton's Leam, just east of bridge on south side of Wash Northey, TL237981, P. Kirby, 3.7.2005. First recent records for this species, last seen in the county in 1912 and never before in this part of Cambridgeshire. In 2005 it was also seen independently by P. Kirby and ACL in several places in the R. Nene on the eastern outskirts of Peterborough (but in v.c.29) and has also been reported recently further up the Nene, just over the county boundary.

Pteris nipponica (*P. cretica* var. *albolineata*) A single plant near base of wall, Essex Building, Queens College, Silver Street, Cambridge, TL44675810, P.H. Oswald, 18.10.2000. First v.c. record for this alien fern, which has a broad silver stripe down the centre of each pinna; a second plant was found by PHO at this site on 15.1.2003. By 2005 both had gone but a third, large plant, with fertile fronds, was found by ACL higher up the wall from which a specimen was confirmed by Prof. J. Edgington (**CGE**).

Ribes alpinum One large shrub on an old earth tip beside field hedge, Oakington Road, Cottenham, TL43136612, J.L. Sharman, 2004. Second v.c. record, the only previous one being a nineteenth century report by R.B. Smart from near Balsham, noted by Babington in the manuscript of his Flora.

Rosa brunonii At least four large plants, some climbing 30-40 ft into trees and shrubs, southern end of Coe Fen, Cambridge, TL45025719, ACL, first one noticed 27.6.2005, others found 31.7.2005 and 25.10.2005, **CGE**. First v.c. record for the Himalayan Musk Rose and a good match for the plant so labelled in the University Botanic Garden, where it has been cultivated for over a century and which is possibly the bird sown source of these plants. Further records of what seem to be the same taxon have also been reported in 2005 from Kings College Backs and near Papworth Everard.

Rubus britannicus Abundant in overgrown woodland ride and adjoining woodland, Leys Wood, West Wickham, TL627491, ACL, 26.7.2005, **CGE**, conf. A.L. Bull. Previously only known from a few sites close to Newmarket.

Rumex acetosella subsp. *acetosella* var. *tenuifolius* Three large patches, on dry, open, south-west-facing bank above pond, Cambridge Science Park, Milton, TL46376177-46446171, D. Barden, 6.2005. The same recorder has also found this very narrow-leaved variant of Sheep's Sorrel on roadbanks in two other places in the Science Park in 2005. First records since 1961; previously known from the Hildersham Furze Hills and the Breckland fringe of the county.

Sambucus nigra f. *laciniata* One large bush on a streambank on the north margin of Papworth Wood, Papworth Everard, TL29076311, ACL, 29.5.2005. An ornamental variant with deeply cut and lobed leaves, last recorded in 1973 on the edge of the University Botanic Garden.

Silene armeria One plant on disturbed ground, south of the new Cutter Ferry Bridge, Midsummer Common, Cambridge, TL45935902, ACL, 19.9.2005. First v.c. record of a pretty pink-flowered annual catchfly sometimes grown in gardens.

Sinacalia tangutica Apparently self sown at base of wall in narrow, concreted basement area beside Emmanuel College, Parker Street, Cambridge, TL454583, ACL, 24.5.2003. First v.c. record for Chinese Ragwort, a vigorous rhizomatous perennial occasionally grown in gardens, where it is still better known as *Senecio tanguticus.*

Stachys sylvatica var. *subsericea* (a) Pit, Great Chishill, TL424393 (v.c.19, in Cambs), Tony Balbi, 9.10.1997, **CGE** (b) a patch on verge of slip road down to eastbound carriageway of A14, Girton, TL419614, ACL, 4.8.2002. First records for a much more densely hairy variant of Hedge Woundwort, almost silky in some cases and usually with shorter stems and smaller leaves.

Veronica peregrina One plant as a weed on Monksilver Nursery, Oakington Road, Cottenham, TL436663, J.L. Sharman, 18.6.2005, **CGE**. Third v.c. record and the first since 1958.

Vicia lathyroides (a) About 30 small plants on a dry, open, south-west facing bank above pond, Cambridge Science Park, Milton, TL46376177-46446171, D. Barden, 4.2005 (b) About 40 larger plants on verge north west of entrance to car park for number 314, Cambridge Science Park, Milton, TL46126165, D.Barden, 4.2005, conf. N.P. Millar. Another startling discovery on this outwardly unpromising site. Spring Vetch has always been a rare Cambridgeshire plant restricted to the Breckland fringe of the county and last reported in 1982.

Viola odorata var. *sulfurea* Self sown at base of wall, Church Street, Wilburton, TL47967502, ACL & P.R. Green, 13.3.2005. First v.c. record for this variant of Sweet Violet which has pale apricot flowers with a purple spur.

Bryophyte records

C.D. Preston and M.O. Hill

This year we report the most notable addition to the bryophytes of the vice-county for many years, *Antitrichia curtipendula*, and a very pleasing rediscovery, *Pterygoneurum ovatum*. Both were found in the northern, Fenland, part of the county, traditionally regarded as the epitome of bryological dullness. In addition to these and other new field records, we also continue to provide the results of the re-examination of older specimens in preparation for the proposed new bryophyte flora of the county.

The number of species found in each square since the new Flora project started is shown in Figure 1.

Mosses

Antitrichia curtipendula A single patch c. 10 cm in diameter on a Bramley apple tree in an orchard planted in 1976, White Engine Hall, Leverington, TF431103, N.G. Hodgetts, 12.2.2006, conf. G.P. Rothero, BBSUK. This species has never been recorded in Cambridgeshire, and it was apparently lost from most of its rather few recorded sites in central and eastern England by the end of the 19th century. This is the most remarkable example yet of the increase in epiphytic species following the reduction in SO_2 pollution in recent decades.

Bryum imbricatum Disturbed sand W. of Halfmoon Plantation, Kennett, TL688689, R.A. Finch, M.O.H. & C.D.P., 12.6.2005. The fourth vice-county record of this weedy *Bryum* species, previously recorded from Cambridge, Cherry Hinton and Sawston Hall.

Dicranum montanum In small quantity on a tree trunk in an abandoned garden, Jeavons, Cambourne, TL324595, M.O.H., 10.12.2005. This species was first found in v.c. 29 in 1955 and has now been recorded from six localities, three of them discovered since 2000.

Ditrichum flexicaule In Cambridgeshire *D. flexicaule sens. lat.* is a rare species of long-established chalk grassland. When A.J.E. Smith divided the British material into two segregates he identified all the Cambs. material (from Devil's Ditch, Fleam Dyke and the Roman Road) as the rarer of the two segregates, *D. flexicaule sens. str.* (*N. in C.* 35: 85, 1993). Subsequently the other plant, *D. gracile*, has been recorded from both the Devil's Ditch and the Fleam Dyke (*N. in C.* 40: 86, 1998 & 44: 55, 2002). As it seemed unlikely that both segregates of this apparently relict species would be present in both sites, we compared the old and recent specimens. They are clearly referable to a single taxon. We, and G.P. Rothero, consider that it is *D. gracile*, although G.P.R. comments that material from S.E. England is more difficult to identify than that from further north and west. *D. flexicaule sens. str.* should therefore be deleted from the vice-county list.

Grimmia dissimulata On brick and mortar of brick walls, Babraham village opposite House Farm, TL509501, and in quantity N. of War Memorial, TL513502, C.D.P., 24.4.2005, conf. E. Maier & R.D. Porley. The presence of this newly recognised species in the county was described in *N. in C.* 46: 72-76 (2004); all other extant populations are on limestone in churchyards.

Hennediella macrophylla Shaded footpath on S. side of R. Granta, Little Abington, TL532489, C.D.P., 24.4.2005. A further record of this alien species in Cambridgeshire.

Polytrichum longisetum On a rotting stump in *Frangula* carr, Wicken Fen, TL5.6. or 5.7., J.M. Lock, 11.5.1963, CGE. Block A, St Edmunds Fen, Wicken, TL5.7., J.M. Lock, 5.8.1972, CGE. On peat, Godwin Plots, Wicken Fen, TL55.70., S.M. Walters & H.L.K. Whitehouse, 22.3.1974, CGE. On ground by side of main ride not far from entrance, Ditton Park Wood, TL66.57., P.W. Richards, 16.3.1991, CGE. The key character given to separate *P. longisetum* from *P. formosum* in Dixon's *Student's Handbook* is unreliable, and these species were confused by British bryologists until the publication of Smith's *Moss Flora* in 1978. Juvenile shoots are particularly likely to be misidentified. The cited specimens have been confirmed by M.O.H. as *P. longisetum*. Other specimens in CGE are *P. formosum*, including the voucher for the "first certain record" of *P. longisetum* cited in the 1964 *Flora of Cambridgeshire* (Heath Wood, Gamlingay, 1934) and later material from White Wood, Gamlingay (1955), Buff Wood (1961) and Copley Hill, Gogs (1955). There is no voucher material to support records from the Beech Wood, Wort's Causeway (1949, 1951) but *P. formosum* has been seen here in recent years. The specimen from Cracknow Hill near Orwell (1965, herb. M.O.H.) is unidentifiable and the record of a single shoot on a rotten log at the Bird Sanctuary, Adams Road, Cambridge (1958) is not supported by a voucher but was almost certainly juvenile material of *P. formosum*.

Pseudotaxiphyllum elegans Shaded soil in leached zone at base of coppice stool, Out Wood, TL657549, M.O.H., 25.3.2006. This calcifuge has previously been recorded in the vice-county only in woods in the Gamlingay area.

Pterygoneurum ovatum One clump with 4 immature capsules seen on open clay slope, Kings Dyke Nature Reserve, Whittlesey, TL250974, K.J. Walker, 27.11.2005, det. M.O.H. This species is declining nationally. There were quite a few records in v.c. 29 in the 1950s and 1960s, almost all from sites on chalk, but it was last seen at Fleam Dyke in 1977. Its rediscovery was reported in an article in the Peterborough *Evening Telegraph*, 16 December 2005.

Rhytidiadelphus triquetrus One patch c. 10cm wide, clay slope, Kings Dyke Nature Reserve, Whittlesey, TL250974, W.R. Meek, 27.11.2005. It is most unusual to find this species as a colonist of recent habitats in our area.

Syntrichia virescens Frequent on base of ash tree E. of Mausoleum, Odsey Park, TL293379, C.D.P., 21.1.2006. This population not only had immature sporophytes but also few-celled gemmae on the ventral side of the midrib of some plants, and a few small plantlets on the leaves. This is the first time that the vegetative propagules have been discovered in Britain, though they are known from mainland Europe.

Tortula lanceola Mixture of soil and brick rubble at edge of concrete standing at top of clay pit, Star Pit, Whittlesey, TL248969, J.J. Graham, 27.11.2005, det. M.O.H. Open clay slope, Kings Dyke Nature Reserve, Whittlesey, TL250974, J.J. Graham, 27.11.2005. These are the first records from the north of the vice-county of this species, which has hitherto been recorded on chalky substrates and appears to be declining.

Weissia longifolia var. *angustifolia* × *Weissia ?controversa* S.W.-facing bank in chalk grassland, Devil's Ditch, TL630604, M. Ghullam, 28.1.2006, conf. D.T. Holyoak. This plant had a hybrid sporophyte with a moderately short seta growing intimately mixed with *W. longifolia* var. *angustifolia*, which has almost sessile capsules, and a plant with immature capsules on a full-length seta, either *W. controversa* or *W. brachycarpa*. Hybrid bryophytes have attracted little attention and this is apparently the first record of a hybrid from the vice-county.

Liverworts

Riccia cavernosa Many small plants near top of winter-wet depression in disused gravel workings, W. of Halfmoon Plantation, Kennett, TL688689, M.O.H., 12.6.2005. Abundant over hundreds of square metres of the most heavily winter-flooded grassland, Compartment 106, Baker's Fen,

TL560694, and in much smaller quantity in draw-down zone by The Mere, TL555698-558700, Wicken Fen N.N.R., C.M. Cheffings, C.D.P. & C.R. Stevenson, 15.10.2005. New records for this uncommon liverwort. Neither *R. cavernosa* nor *Aphanorhegma patens*, which grew with it at both Wicken localities, have previously been reported from Wicken Fen.

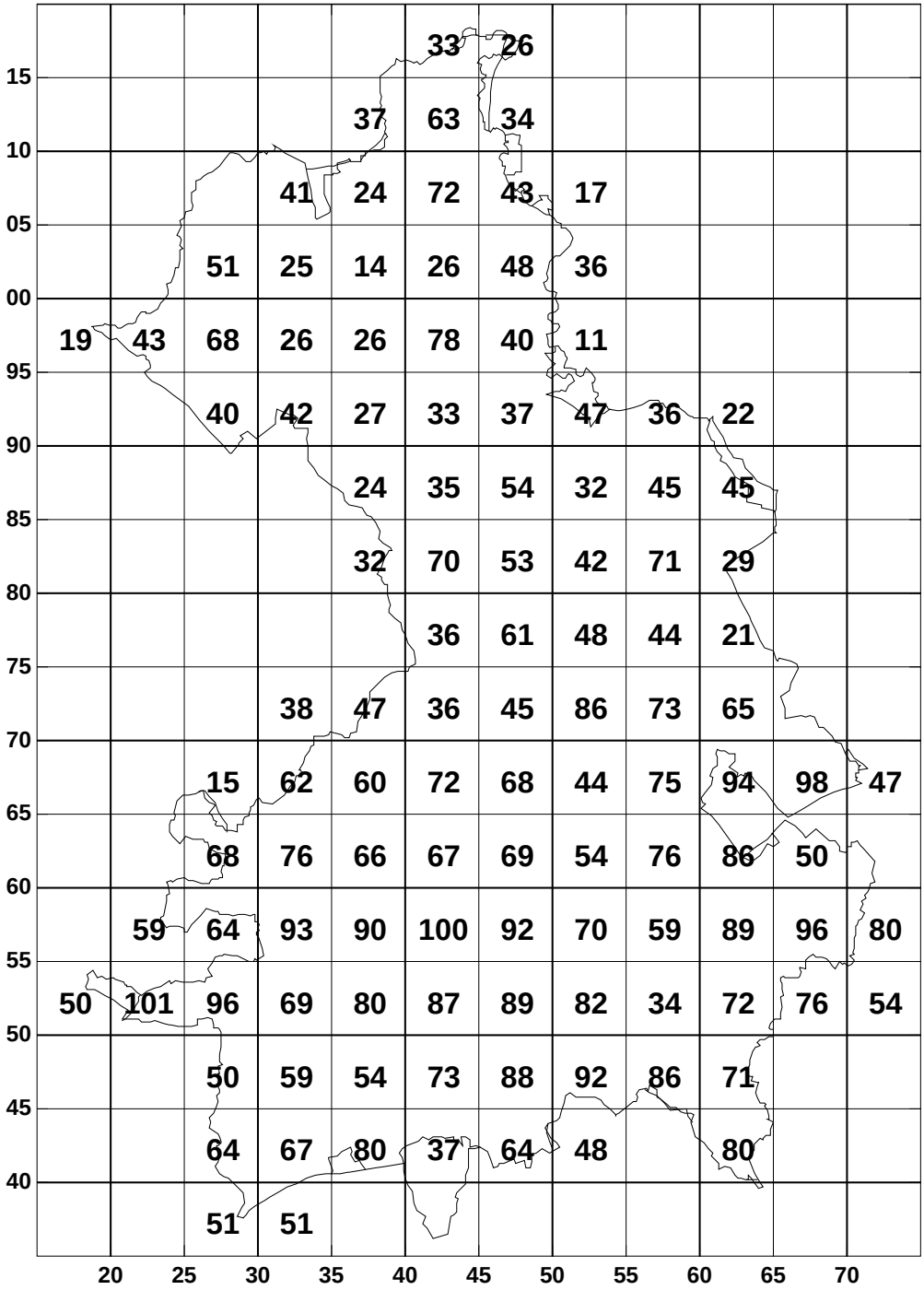


Figure 1.
Number of bryophyte taxa recorded in each 5 × 5km square, 1 January 2000 – 31 March 2006.

BOOK REVIEWS

Cambridgeshire and Peterborough Provisional Mammal Atlas. Bacon, L (2005) Cambridgeshire & Peterborough Biological Records Centre, The Manor House, Broad Street, Cambourne, Cambridge, CB3 6DH. 44 pp. Available free (but please send an A5 SAE and 37 pence postage).

A very informative and useful book for naturalists in Cambridgeshire. Covering the vice counties of Cambridgeshire (29) and Huntingdonshire (31) and also the Soke of Peterborough (part of Northamptonshire v.c. 32) the mammal surveys were carried out by volunteers and expert groups between 1998 and 2003. Also included are earlier records from the national Biological Records Centre. The information is more recent and detailed than from other sources such as the National Biodiversity Network database (NBN, 2004). It is good to note that Cambridgeshire boasts evidence of 45 species of mammal, even if Whiskered Bats, Leisler's Bats, the Parti-coloured Bat and Nathusius' Pipistrelles have very few records, as do the Dormouse, Polecat and Sika Deer. Each species has a short descriptive passage containing some useful information, such as the Grey Squirrel page mentioning the melanistic form which can be found in the county (see Pankhurst & Thomas, 2004) and the fact that it is many years since the last record of the native Red Squirrel (*Sciurus vulgaris*). Which leads on to what is missing from Cambridgeshire, in terms of the native mammals of mainland Britain. The Red Squirrel hasn't been officially recorded since 1969 (NBN, 2004), the Pine Marten (*Martes martes*) has not been recorded since about 1945 (NBN, 2004) and we are unlikely to see the Mountain Hare or Wild Cat in Cambridgeshire. Three British bat species (Greater and Lesser Horseshoe and Bechstein's Bats) are not represented in the county but again this is unsurprising based in their normal range, the south-west of the country. The inclusion of information on the legal status of the mammals is very useful. There are a few editing problems, and the pages for Rabbit and House Mouse have been transposed, but these are relatively minor errors. In a future edition it might be useful to include two extra maps, one showing the major features such as waterways and urban areas, to orient the reader, plus, and perhaps more importantly, some indication of effort and where the surveys were concentrated. There do appear to be fewer records for the north-east of the County which is acknowledged for some species such as the Rabbit, and is just a result of reduced effort in that area. Altogether this book is an excellent and important addition to the library of local naturalists and, of course, the price is just right.

References

NBN (2004). The National Biodiversity Network Gateway. CEH & JNCC. [http://www.searchnbn.net] Accessed February 2006

Pankhurst, S. & Thomas, A. (2004). The black squirrels of Cambridgeshire. *Nature in Cambridgeshire* **46**: 61-63

Toby Carter

Ten Years of Change: woodland research at Monks Wood NNR, 1993—2003. Ed. C. Gardiner and T. Sparks. Pp. 194. English Nature Research Report 613. 2005. Paperback. ISSN 0967-876X.

Brampton Wood: a natural history. Ed. T. Collins, B. Dickerson, P.E.G. Walker, T.C.E. Wells. Huntingdonshire Fauna and Flora Society. 2005. Hardback. ISBN 0-9514427-3-2.

Monks Wood and Brampton Wood are the two great woods of Huntingdonshire. Monks Wood, the largest remaining part of a great belt of woodland that once fringed the Fens, has been a National Nature Reserve since 1953. After twenty years a book was published about its ecology (Steele & Welch 1973). The present volume is the proceedings of a symposium held to commemorate the half-centenary of the National Nature Reserve. It brings the 1973 book up to date and reports some of the research done in the wood since 1993.

Brampton Wood, which seems to have got much bigger between the eleventh and the eighteenth century, was bought by Cambridgeshire Wildlife Trust in 1992 — an ambitious new acquisition. It has been intensively studied only since 1986. This book records those studies and the Trust's conservation activities, undoing the effects of long decades of neglect and coniferisation.

Much of both books consists of accounts and lists of groups of plants and animals, for example Colin Welch's contributions on beetles. A notable contributor to both is Arnold Cooke on Muntjac, the principal species in both woods. Monks Wood has long been known as a 'Muntjac slum' being eaten alive by deer. Earnest efforts at shooting them have reduced the damage, but will not eliminate it because deer move in from outside. Brampton Wood is now nearly as badly plagued by Muntjac, despite shooting. It is a pity that there is not more comparison of the two woods with each other and with other Huntingdonshire woods. Do they have the same breeding birds, and if not why? It would be better to know what it is that makes Brampton Wood special than to be told that it falls into Community W8 of the *National Vegetation Classification* — the 'dump' category into which everything goes that does not key out to something better defined!

Brampton Wood still rather lacks a historical dimension. One does not always strike lucky with the written archives, but I would have hoped for other evidence, such as a map of the wood's archaeology. Is Domesday wrong in listing it at one-quarter its present size? If not, which part of the wood is the original?

The Monks Wood volume is a workaday book production. *Brampton Wood* is comparatively sumptuous — but should this kind of book be large, heavy, and expensive, and unlikely to withstand use in the field? Why waste colour plates on, for example, portraying a Muntjac, rather than showing its effects?

The Monks Wood book was published when CEH Monks Wood was threatened with closure. This is a scandal. Now that 'ecology' has become a political force at which even Presidents shudder, the ecological science that underlies it ought to be expanding, not done away with a stroke of *Yes, Minister!'s* pen.

Reference

Steele, R.C. and Welch, R.C. (eds) (1973) *Monks Wood: a nature reserve record.* Nature Conservancy.

Oliver Rackham

Will's Shoot Revisited. Will Garfit. The Sportsman's Press 2005.
ISBN 1 904057 61 6. £19.95 156pp (info@quillerbooks.com)

In January 1970, Will Garfit, then a 25 year old student, went to an auction in Cambridge and, almost by accident it seems, bought sixty-nine acres of disused gravel pit at Hauxton.

In the subsequent thirty-six years Will has converted his purchase into what is acknowledged as a very fine sporting estate and conservation area. He first described his work in 'Will's Shoot' published in 1993 and reviewed by Frank Perring in Nature in Cambridgeshire No 36.

The current volume expands that first book and brings it up to date. With a combination of hard work, a clear vision of what he wanted to create, and a series of understanding bank managers, Will has achieved an enormous amount. He describes the early years, and the different habitats (woodland, arable and open ground, and the lakes and ponds), and how he has managed them to increase their value.

It would be a mistake to think that because this land is managed as a sporting estate that there is nothing here to interest those concerned with conservation. Will believes that country sports and conservation can go hand in hand, and there is much in this book to prove this view. One might not see eye to eye with him on every page, but he has undoubtedly made this area a wonderful place for wildlife, and it is brought to life in this book.

When he writes the next updated version I would like to see another list: wild flowers, birds and butterflies are covered, but no mention is made of the numerous other insects that must be present.

Henry Arnold

OBITUARIES

Barbara Jackson (1911–2005) and Olwyn Peacock (1915–2005)

This year has seen the loss of two founder members of the University of the Third Age (Cambridge) Botany Group started by the late Mrs Kathleen Tucker in 1990 – Mrs Barbara Agnes Jackson, who died on 26 November aged 94, and Mrs Olwyn Peacock, who died on 2 December less than a month before her 90th birthday. Both contributed significantly to the life of the Cambridgeshire villages where they spent the final decades of their lives, Little Abington and Cottenham respectively, and continued very active lives after the death of their husbands. They will be remembered by readers who have taken part in U3A Botany Group excursions for their friendliness and enthusiasm. Their funerals took place on the same day, Thursday, 8 December. A memorial service for Olwyn was also held at All Saints' Church, Cottenham, at 2 p.m. on Saturday, 28 January 2006.

Barbara was born and brought up in Yorkshire and became a physiotherapist in Warwick. Speaking at her funeral, her nephew remembered especially her integrity and her sense of fun; she was also always adventurous and travelled widely abroad. Her interest in natural history was expressed in her paintings, some of them

reproduced in her Christmas cards. Through these interests she met her husband Stanley, who already had a family, and, moving to The White House, Little Abington, she revelled in it; her nephew particularly recalled her home-made wine and her hare casserole. The Rev Jim Mynors, Vicar of Little Abington, described the Millennium window installed in the parish church at her instigation. Barbara helped Gigi Crompton significantly with botanical recording and monitoring from the early 1970s, especially in her home square, TL55; among other interesting records was her discovery of the very local Red-tipped Cudweed, *Filago lutescens*, in Little Abington Sandpit with her friend Jennifer Hirsh in 1990.

Olwyn was born on 27 December 1915. She showed her talent as an artist while a schoolgirl and then attended Cardiff Art School. Her strong aesthetic sense was also exhibited in her elegant dressing, her cake decoration and her garden, which was opened to the public. She produced a 20-foot-long pictorial history of Cottenham from 1952 to 1992 and was the author of several booklets on aspects of village life such as fruit-growing and cheese-making. Olwyn's friends will especially remember her for her friendliness and kindness; she was also greatly appreciative of others' kindness to her. With her husband Eric she was instrumental in the provision of a children's playground which won a prize in the 1985 Village Venture Scheme. She served on the Parish Council for 12 years, she was a founder member of and chaired the Cottenham Society, and she also chaired the United Charities for many years. Olwyn discovered botanical illustration and painting in the 1980s and, after Eric died eight years ago, these proved to be what she most loved, though at first she lacked the confidence to sign her works. At her memorial service her daughter Rosemary described how she had painted the flower in a favourite picture of a courgette plant in the middle of the night when it was at its peak. Most generously, her family invited friends present to choose one of Olwyn's pictures to remember her by.

The U3A Botany Group lost two other characterful members during the year. Jean Benfield died on 27 August 2005, aged 80. She was for 30 years Honorary Warden of Hardwick Wood from the time when it became one of the Wildlfe Trust's reserves; the Countryside Restoration Trust and the Woodland Trust also benefited from her energy and enthusiasm. Typically, she was buried at the woodland burial site in Barton in a cardboard coffin, and many of her friends attended the funeral.

Colin Hill (1921–2006) died at the end of February. He was much respected as Headmaster of the High School for Boys, which became Hills Road Sixth Form College under his guidance, and was latterly a Fellow Commoner of Downing College, an honour bestowed on him for his dedicated work for the College's Alumni. He was a keen gardener and a popular Guide in the University Botanic Garden. His funeral was held at Great St Mary's Church on 6 March, followed by a reception at Downing College.

Philip Oswald

Weather Notes for Cambridgeshire 2005

John Clarke

JANUARY Changeable and mild with very little frost and nosnow. Rainfall much below average. Mean minimum temperature 2° F above average. Mean maximum temperature almost 3° F above average.

FEBRUARY Mainly changeable and mild to 20th. Cold with frost at night and slight snow showers thereafter. Snow lying thinly at dawn on 21st, 22nd and 23rd. Rainfall slightly below average. Mean minimum temperature 1° F below average. Mean maximum temperature 2° F above average.

MARCH Cold weather continued to 8th with frost at night and a snowstorm on 4th. Unsettled and mild with very little rainfall thereafter. Rainfall half average. Mean minimum temperature 4° F above average. Mean maximum temperature slightly above average.

APRIL Changeable almost throughout with a warm spell 27th – 30th and 70° F on 30th. Rainfall slightly below average. Mean minimum temperature 1° F above average. Mean maximum temperature 1° F above average.

MAY Mainly changeable and cool with above average rainfall falling on only 10 days. Warm at the end of the month with 83° F on 27th – the warmest May day since 1989. Mean minimum temperature slightly above average. Mean maximum temperature 1° F below average.

JUNE Changeable to 6th. Anticyclonic thereafter, fine and very warm - 89° F on 18th and 19th - becoming close and thundery in the last week. Rainfall a little below average. Mean minimum temperature 2° F above average. Mean maximum temperature 3°F above average.

JULY Changeable and wet to 6th. Anticyclonic, fine and very warm to 22nd. Unsettled thereafter. Rainfall below average. Mean minimum temperature 2° F above average. Mean maximum temperature average.

AUGUST Mainly anticyclonic, fine and sometimes very warm to 18th. Thereafter low pressure in Europe and the North Sea gave unsettled, wet weather and very heavy rain with 0.98 inches on 19th. An anticyclone 27th – 31st brought a return to fine, very warm and sometimes humid weather with 87°F on 31st. Rainfall average. Mean minimum temperature average. Mean maximum temperature slightly above average.

SEPTEMBER Anticyclonic, fine and warm to 14th apart from several thunderstorms and 81°F on 4th. Changeable 15th and 16th. Fine to 25th. Changeable thereafter. Rainfall average. Mean minimum temperature 3° F above average. Mean maximum temperature 3°F above average.

OCTOBER Mainly anticyclonic, fine and warm to 20th. Unsettled and wet thereafter. Rainfall average. Mean minimum temperature 7° F above average. Mean maximum temperature 5° F above average.

NOVEMBER Changeable and mild to 13th. Anticyclonic, fine and cold with night frosts and snow flurries on 25th. Rainfall slightly below average. Mean minimum temperature average. Mean maximum temperature average.

DECEMBER Changeable to 8th. Thereafter anticyclonic, fine and dry, but sometimes very cold (maximum temperature 32° F on 28th) and snow lying on 27th, 28th and 29th. Rainfall less trhan a third of average. Mean minimum temperature 1° F below average. Mean maximum temperature slightly below average.

Weather records at Swaffham Prior 2005

	Mean Max	Mean Min	Highest	Lowest	Rain (Inches)	Rain days	Thunder days
January	47.83	36.74	57 on 6th	27 on 23rd	0.88	15	-
February	43.97	34.40	54 on 12th	23 on 28th	1.09	15	-
March	51.26	38.03	65 on 18th	24 on 4th	0.65	10	-
April	57.93	39.40	70 on 30th	27 on 9th	1.04	9	1
May	62.13	45.22	83 on 27th	33 on 12th	2.06	10	1
June	71.83	50.63	89 on 19th	38 on 8th	1.78	9	4
July	71.10	54.84	86 on 14th	50 on 5th	1.63	10	1
August	71.80	52.03	87 on 31st	46 on 26th	2.31	10	3
September	69.40	51.56	81 on 4th	38 on 17th	1.59	7	2
October	63.29	50.87	73 on 11th	41 on 5th	2.45	11	1
November	48.93	37.07	63 on 2nd	27 on 18th & 19th	1.52	9	-
December	44.77	33.78	52 on 15th	24 on 28th	0.62	10	-
Annual Means	58.87	43.82	Totals		17.62	125	13

Number of days over 80º F	15
Number of days over 70º F	76
Number of days with a maximum under 32º F	1
Number of days with a minimum under 32º F	51
Last air frost of the spring	22nd April
First air frost of the autumn	14th November
Days with snow lying	4
Days with fog persisting all day	none
Warmest day	(89° F) 19th June
Coldest night	(23° F) 28th February

The Masked Assassin Bug (*Reduvius personatus*). See the article by Tim Sparks.

Purple Toothwort (*Lathraea clandestina*) on Robinson Crusoe Island. See the article by Jonathan Shanklin and Steve Hartley.

One of the many colour forms of the Harlequin Ladybird (*Harmonia axyridis*)

The Adonis' Ladybird (*Adonia variegata*), uncommon in Cambridgeshire.

See the article by Peter Brown, Helen Roy and Michael Majerus