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THE LONDON NATURALIST

The journal of the
LONDON NATURAL HISTORY SOCIETY

No 64

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LONDON NATURAL HISTORY SOCIETY

The Society welcomes new members, both beginners and experts. Its Area lies within a 20-mile (32 km) radius of St Paul's Cathedral and here most of its activities take place. Although much covered with bricks and mortar, it is an exciting region with an astonishing variety of flora and fauna. The Society comprises sections whose meetings are open to all members without formality. For those interested in arachnology, archaeology, botany, conchology, conservation, ecology, entomology, geology, herpetology, mammalogy, ornithology, palaeontology or rambling, there is a section ready to help.

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THE LONDON NATURALIST

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**THE
LONDON
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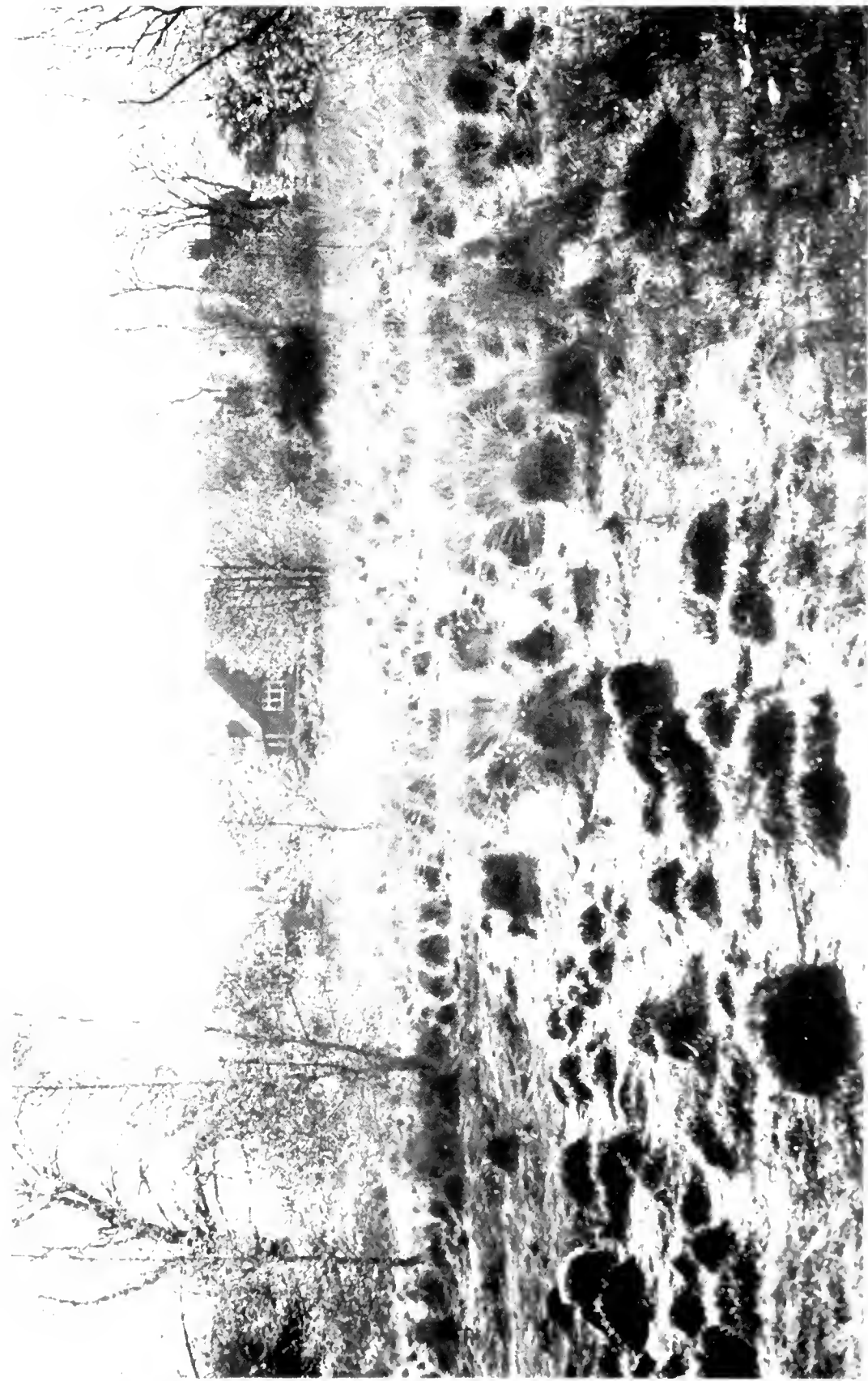
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WANDSWORTH COMMON. Most open spaces in London now consist of tidy lawns poor in wildlife, but at Wandsworth Common this small area of semi-natural grassland, dominated by tussocks of purple moor-grass *Molinia caerulea*, remains in front of Lyford Road. Photograph: J. R. Laundon. April 1984.

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Recording forms are available from John Bennett (s.a.c. please). Records may be sent to the appropriate recorder or to Colin Plant who will distribute to each recorder the relevant data from a mixed set of records.

Requests for information should be made to the appropriate recorder or to John Bennett.

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Report of the Society for 1984*

The Society has had another active year. Under the President's leadership, considerable efforts have been made to improve publicity of the Society's activities. This has taken the form of mail shots to those who might be interested and establishing links with radio and television networks and the local press, as well as participation in open days. This will be developed further during the coming year, when the outgoing President, Keith Betton, will take on the job of Press and Public Relations Officer. He has also taken over from Miss Rosalind Hadden as Editor of the *Newsletter* and Andrew Moon succeeded Peter Clement as Editor of the *London Bird Report*. At the end of this year also we lost the services of Miss Joan Hardy who has done so much work for the Society's Library over the years. Our thanks go to these and all other of the Society's officers who have resigned this year.

On the recording side, efforts have been made to continue to encourage recording by members, especially in the groups which have hitherto been less well covered. A butterfly atlas is in course of preparation and the recording facilities have been widened to include Odonata, Syrphidae and Mollusca. Work on the Bookham Common Survey also continues. The Records Committee is considering whether the Society's records might be computerised so that they might be more readily accessible.

The programme of meetings has been full and varied, with minority interests being catered for as well as the more popular subjects. In some cases attendance has been disappointing, but in others attendance has been well maintained or has even risen. Reports, and advance publicity for meetings, now appear regularly in the *Newsletter*. Our thanks to all those who have arranged and led meetings. On the conservation front, close co-operation has been maintained with the various Trusts which work in the Society's area.

Thanks partly to the publicity campaign, we enrolled 230 new members during the year, compared with 180 the previous year. Six deaths have been reported including those of Mr H. A. Craw, a former senior officer of the Society, and of Mr G. Waller, a member of very long standing. These losses, other resignations and removals due to non-payment, reduced the net increase to 97, which is still an extraordinary uplift over previous years.

The membership figures at 31 October 1984 are:

	1984	1983
Ordinary	992	900
Affiliated	21	22
Family	126	114
Junior	29	28
Senior	77	84
Honorary	16	16
Life	8	8
Total	1,269	1,172

Our thanks, as usual, go to Imperial College for the use of their rooms and to Mr Whitworth and his Staff for the custody of the Society's library.

*Presented at the Annual General Meeting, 13 December 1984.

Dating a Hedgerow Landscape in Middlesex: Fryent Country Park

by L. R. WILLIAMS* and WIN CUNNINGTON**

Summary

Comparison of fieldwork survey results from Fryent Country Park in 1983 with historical records showed that two main types of hedge patterns were present, divided by a parish boundary hedge. In the former Kingsbury parish the landscape was one of medieval woodland assart hedges. The Harrow parish side included hedges of various origins and enclosure processes, with some of the Barn Hill hedges utilised by Humphry Repton in a 1793 landscaping scheme. As many hedges were of woodland origin and as their management had varied greatly, there was little relationship between shrub diversity and hedge age. The use of indicator shrub species was found to be a more reliable method for determining hedge origin. Standard trees and other hedgerow features were discussed.

Introduction

Very little work has been undertaken on dating hedges in the London and Middlesex area, although studies in other counties have indicated that approximate planting dates can often be estimated by an analysis of hedge shrub diversity and composition. Such hedgerow evidence can be used to construct local landscape histories, when compared with documentary evidence.

Pollard, Hooper and Moore (1974) found, from a survey of 227 hedges dated by documentary means in five counties, that there was a relationship between the age of a hedge and the diversity of its constituent shrubs. They suggested that the average number of shrub species per 27m (30 yard) sample, equalled the age of the hedge in centuries. The basis for this age/diversity relationship was the observation that the colonisation of planted single-species hedges by additional species was proportional to hedge age. There was some regional variation in the estimate due to climate, soil, hedge management and other differences. As the formula was only a guide to hedge age, it could be used to distinguish hedges of different historical periods, but not those planted within about a century of each other. Hedges which had been planted with more than one species presented an estimation difficulty and for similar reasons it was not really appropriate to date hedges of woodland origin, such as assart (woodland clearance for agriculture) hedges.

Hewlett (1973) studied 250 hedges at Otford, Kent and found that the general relationship between shrub diversity and hedge age did hold, although the notion of one hundred years for each species only held when old man's beard *Clematis vitalba* and bramble *Rubus fruticosus* were included, climbing species which have not been counted by Pollard *et al.* (1974), and in most other hedgerow studies. Cameron and Pannett (1980), however, found that for samples from both lowland and upland Shropshire the relationship did not appear to hold, as diversity was only weakly related to age. Many of the Shropshire hedges were of woodland assart origin with various other hedgerow types. Shropshire, like Kent, lies in the ancient countryside of Rackham (1976), with a predominately irregular hedge and field pattern, as compared with the planned countryside of the Midlands and some other counties with a characteristic regular post-1700 enclosure hedge pattern.

The shrub species present may also give information on the origin of a hedge, especially if they indicate hedges of woodland origin (Pollard *et al.* 1974).

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Cameron and Pannett (1980) considered the frequency of shrub species in relation to known hedgerow origin. These studies again suggested regional variations, but dogwood, field maple, hazel and wild service appear to be indicators of woodland relic hedges over much of the country. Rackham (1976) stated that elms, other than wych elm *Ulmus glabra*, were associated with man, being of planted origin. Woodland hawthorn *Crataegus laevigata* is another shrub characteristic of woodland hedges, while the common hawthorn *C. monogyna* is the hawthorn of planted hedges (Pollard *et al.* 1974). Allen (1976) discussed the possibility of using bramble *Rubus* spp. to help date hedges. The ground flora has been used by Pollard *et al.* (1974) and Rackham (1976), with emphasis on woodland indicator flora.

Hedge and field patterns are invariably related to the agricultural systems in operation at the time of their formation and much research has been summarised by Taylor (1975), who also discussed various earthworks associated with field boundaries. Hewlett (1973) used the evolved bank to help date hedges, while Rackham (1976) detailed various woodland boundary earthworks and hence those of some hedges.

A number of methods are therefore available to help date individual hedges or hedgerow landscapes. While the results from any one method should not be considered too reliable, the combination of results provides valuable evidence for describing hedgerow history and management.

Fryent Country Park (Barn Hill/Fryent Way Open Space) is an area of 103 hectares of former farmland with some woodland, managed for public recreation and nature conservation by the London Borough of Brent. It is the only remaining area of traditional countryside in Brent and one of the few areas within London where the hedgerow landscape has survived largely intact. It lies about 15km north-west of central London, is surrounded by suburbia and dissected by the A4140 (Fryent Way). The soil is of London Clay, with pebble gravel capping the summit of Barn Hill, the highest point of the country park at 86m ordnance datum.

The terms 'hedge' and 'hedgerow' are used somewhat interchangeably in this paper, as are 'tree' and 'shrub'.

History

This brief history was compiled from Bolton (1971), Cunnington (1975, 1983) and Hewlett (1979) for the Harrow side of the country park, and from Bolton (1976) and Cunnington (1977) for the Kingsbury side. The present hedgerow pattern is given in Figs 1-2. Some of the field boundaries may at various times have been ditches, fences, drainage streams, woodland boundaries or combinations of these. The parish boundary itself is probably of Saxon origin and incorporated a trackway from Kingsbury to Stanmore along much of its length known as Hell Lane, which appears to have fallen into disuse by 1693. It diverged from the parish boundary where Summers Croft and Short Down meet, and then followed the Long Down/Summers Croft hedge to Salmon Street, a medieval road.

The history of the Harrow parish side of the country park (west of the parish boundary), is closely related to that of the Uxendon estate which was first mentioned in 1257. During Elizabethan times Uxendon was the seat of the Bellamy family whose religious persecution has been considered by Bushell (1914). By the time of the manorial survey of 1547, 58 hectares of the Uxendon land had already been enclosed. Hedges 8, 12-14, 16 and 36 were probably already in existence, with hedges 58 and 59 being part of Bushy Down Wood. The remaining area of Bushy Down Field was one of the five common fields of Uxendon. Hedge 16 followed the course of the Gaderbrook tributary, on the north side of which was Preston Eastfield, one of the common fields of Preston hamlet. Most of the open field land in Uxendon was enclosed during the 16th and 17th centuries and here the Inclosure Award of 1817 was largely a legal

consolidation of existing field boundaries. Elsewhere in the Harrow parish enclosure was a controversial issue and Preston Eastfield was enclosed at this time.

Great Hyde which was possibly an open field in medieval times was divided by hedge 7 into Great Upper Hydes and Great Lower Hydes between 1547 and 1609. Upper Hydes was further divided by hedge 6 between 1699 and 1724. Lower Hydes was divided into two by about 1862 and into three by 1947, by which time it had been severed by railway and housing developments.

It is not known when the original woodland on Barn Hill (the three fields of Bardonhill, Coneyvale and Saltcroft in 1547) was cleared, although much of the area around Barn Hill was still wooded in 1469. Hedge 36 appears to have been a boundary between the copyhold land of Saltcroft and the freehold land of Coneybury Wood in medieval times. For some time these fields were farmed as part of the Uxendon estate. By the early 1790s these fields were part of the Barnhills Park of Richard Page. This stretched down the southern slopes of Barn Hill to Forty Lane, the other side of which was Wembley Park (where the stadium stands now), which was also owned by Page, who employed Humphry Repton

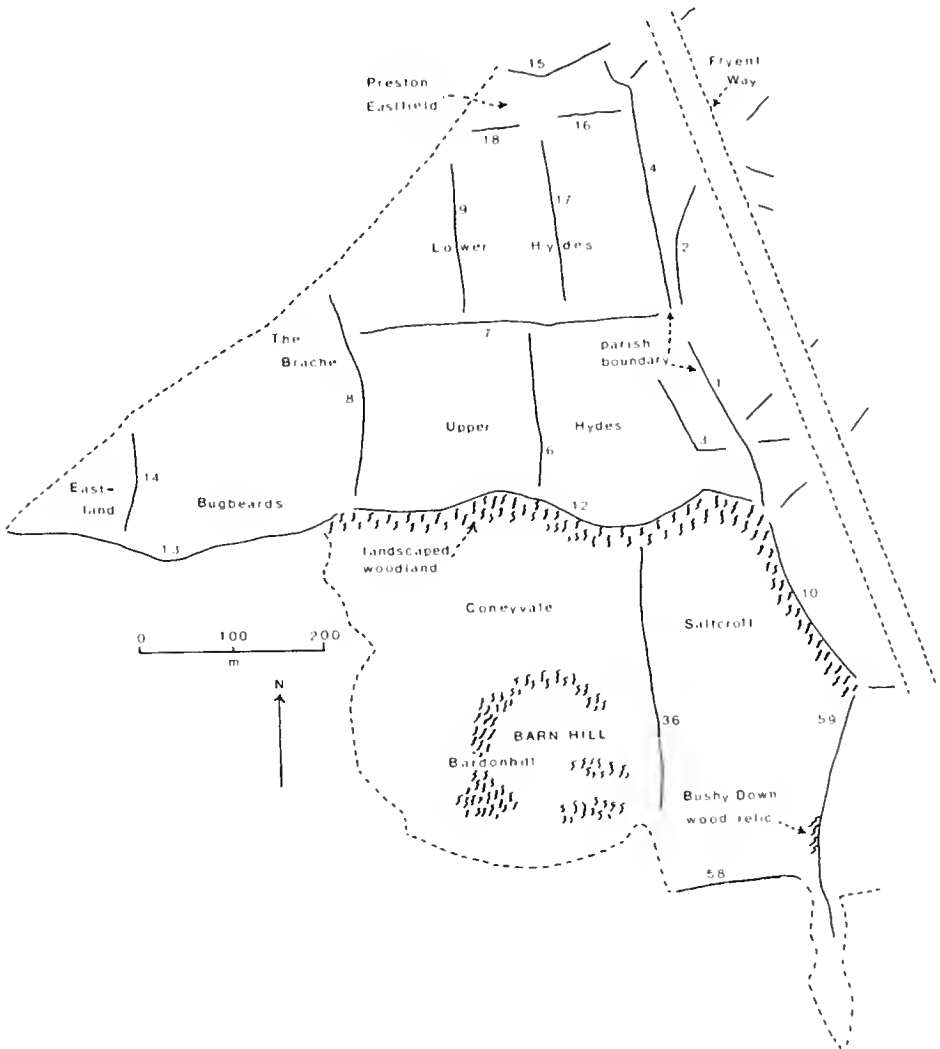


FIG. 1. Harrow parish side of Fryent Country Park, 1983, with hedge reference numbers (in chronological survey order). (Based on the 1897 Ordnance Survey map). In Figs 1 and 2 gaps have been left to distinguish hedges, even where they interlock.

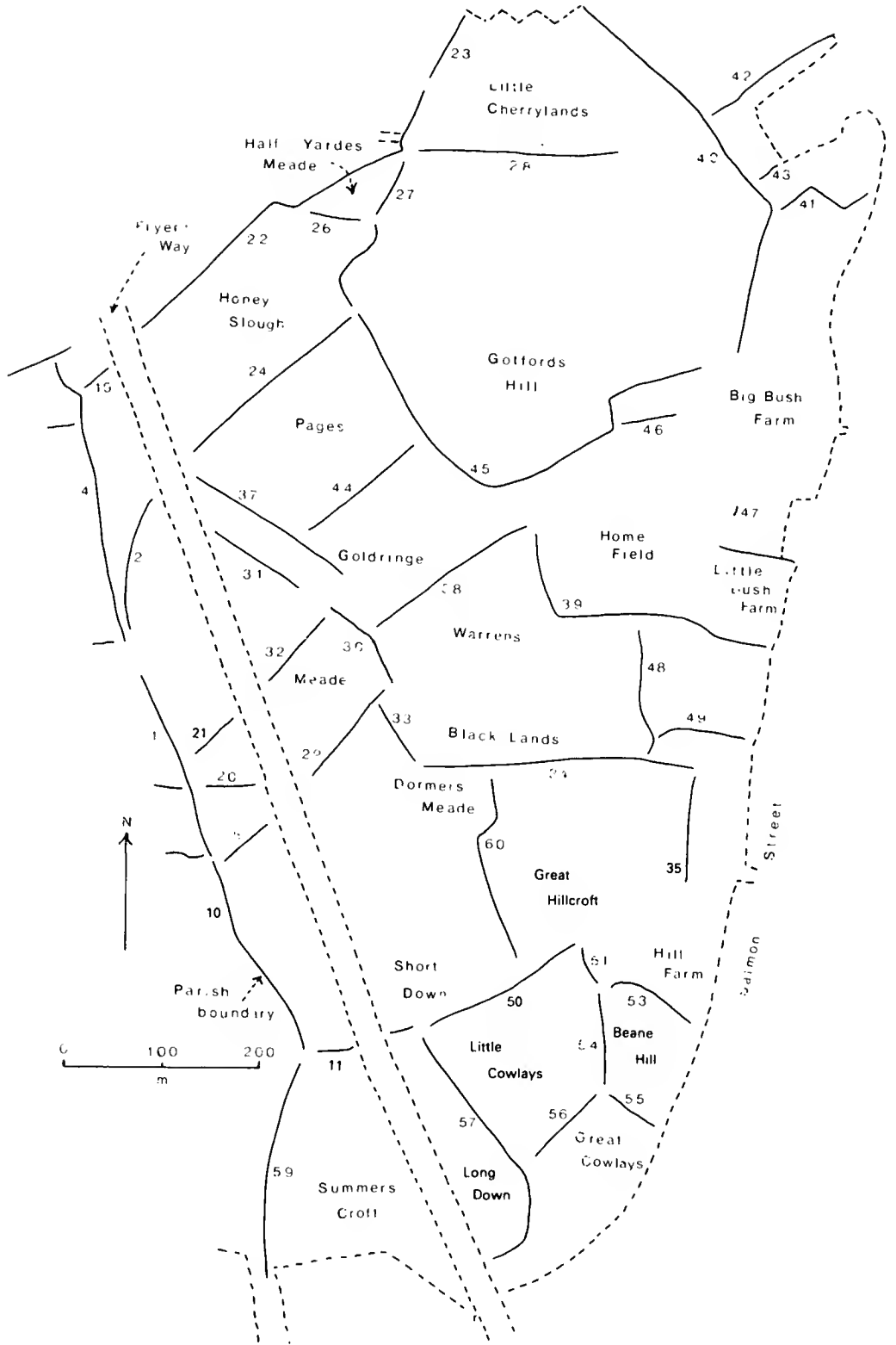


FIG. 2. Kingsbury parish side of Fryent Country Park, 1983, with hedge reference numbers. (Based on the 1897 Ordnance Survey map).

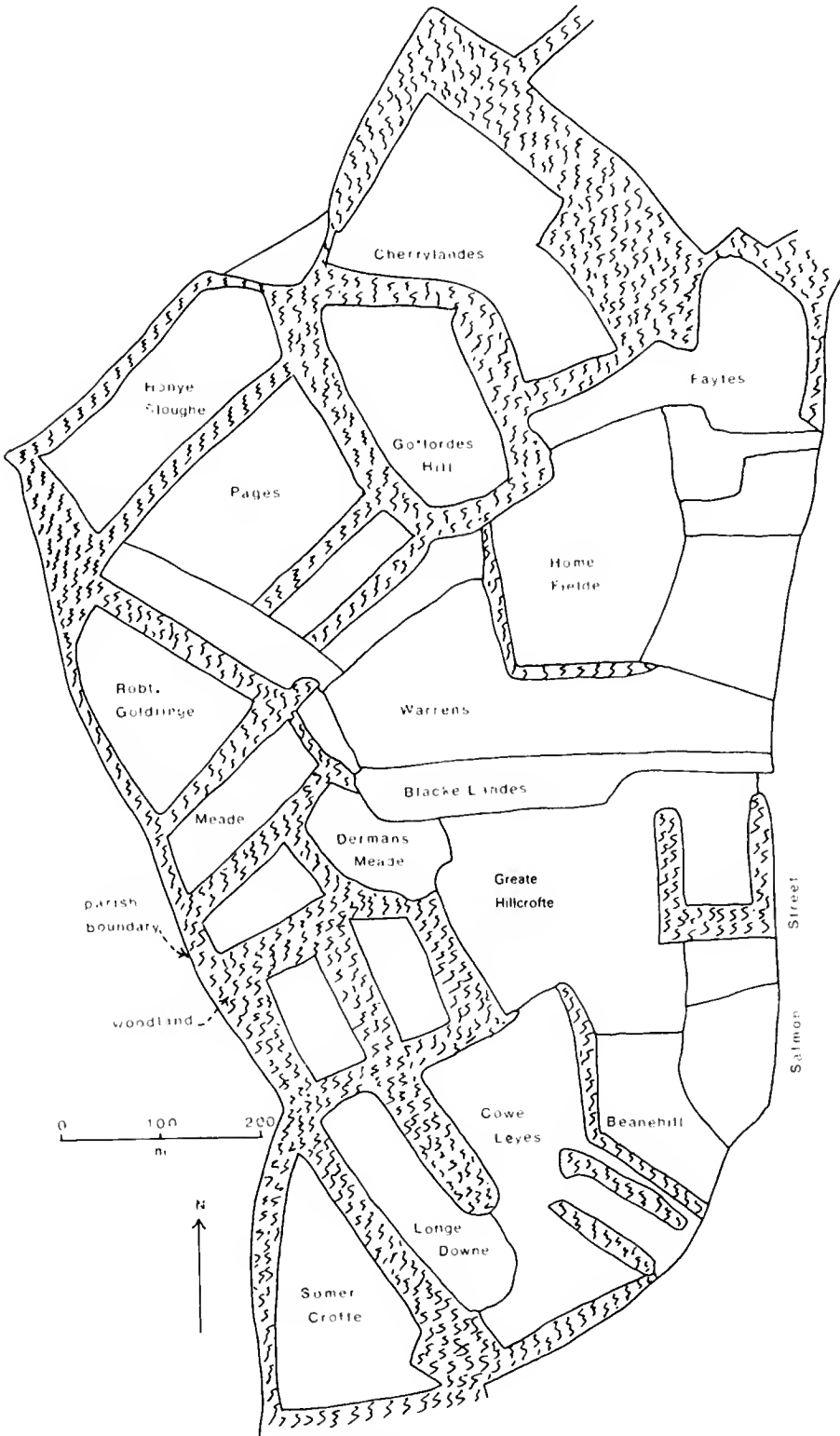


FIG. 3. The Kingsbury parish side of the Fryent Country Park area as it was in 1597. Based on the Hovenden Maps of Kingsbury with permission of The Warden and Fellows of All Souls College, Oxford. Note that even the thinner hedges were probably still woodland strips. The Country Park is now separated from Salmon Street by a single row of residential housing.

(1752-1818) to landscape both parks. At Barn Hill, Repton landscaped the summit with woodland and planted a belt of trees around the hedges (59, 10, 12 and 13) at the foot of the hill. From about 1895 until the early 1920s Barn Hill was a golf course, before being purchased as an open space by Wembley Urban District Council in 1927.

The agricultural scene of the Harrow side, therefore, was one of common, open and other fields, with most enclosure taking place centuries before the Parliamentary enclosure act period. While a few hedges are relics of the original woodland, most of the existing woodland hedges are the product of the landscaping era.

The Kingsbury agricultural history by contrast, was one of assarted woodland giving rise to an irregular field pattern, with very few hedges of planted origin. The existing hedges represent the woodland relics of a field and hedge pattern that has remained basically unaltered since at least 1597 (Figs 2-3) and probably since medieval times. The early English kings had parted with their manor at Kingsbury long before the Norman Conquest and by 1086 Kingsbury was divided into two holdings with a large area of uncultivated, probably wooded land. During the 13th-15th centuries a number of tenements were created including Dermans, Richards and Warrens to the west of Salmon Street. During late medieval and Tudor times there were many changes in manorial ownership. In 1441-2 the Archdeacon of Canterbury and another person granted Kingsbury Manor, via Henry VI, to All Souls College, Oxford, who then retained the land for centuries. Hill Farm was the home farm of the manor and when leased to the Duke of Chandos in the 18th century it included Summers Croft, Little and Great Hill Croft, Dormers Mead, Little and Great Cowlays and Short Down. The other two farms of the Kingsbury side were Little Bush Farm which included Long Down, and Big Bush Farm, once a copyhold tenement called Richards.

Wembley and Kingsbury were still largely rural until the early 1920s, when there was a rapid suburban expansion during the following decade. By 1935 Fryent Way was constructed and cut through the fields about 70m to the east of the parish boundary. Middlesex County Council acquired the land east of Fryent Way in about 1938 and farming continued until the early 1970s, when the fences were removed and it was opened to the public, with the fields cropped annually for hay. The whole open space was renamed Fryent Country Park in 1984, Fryent being the name of a former farm in a nearby part of Kingsbury.

Methods

A hedge survey form was used to record field data, including the survey starting point for each hedge. Measurements were paced, as the accuracy of the method did not justify precision (Pollard *et al.* 1974). The flora in the first 10m was recorded, but not used as a sample as the hedge terminals may not have been typical of the rest of the hedge. Successive thirty-metre samples were then paced and the shrub flora rooted in each sample recorded. The sample used one side of the hedge only, although the flora of the other side was recorded and usually both sides were virtually identical. Notes were also made of the number of standard trees, seedlings, recently planted trees (since about 1970), the hawthorn species or hybrid types present, the dominant shrubs, interesting flora, management condition, adjacent land uses, and of bank and ditch systems. Transect profiles were made of some earthworks, using a level string under tension with measurements at 0.2m horizontal intervals.

For the calculation of estimated age, the wild roses were counted as one, as were all hawthorns. Seedlings and recently planted trees were excluded, as were climbers such as honeysuckle and brambles. The fieldwork was largely undertaken during May to July 1983. A copy of the data (Williams 1983) has been deposited at The Grange Museum, Neasden Lane, London NW10 1QB.

Results

Scientific names of species present in the Country Park hedges, mentioned in the text, are given in Table 4.

A. Hedge age/diversity relationship

Although the method for dating hedges by their shrub diversity worked well in the East Midlands and Devon, Pollard *et al.* (1974) did caution that their method could be up to 200 years out on either side. They further advised that the local calculation used should be calibrated using results from at least twelve hedges that could be dated by documents, preferably with a wide age variation. This was not possible for the Country Park hedges as only five 20th century hedges and two others (dating from 1547-1724) could be dated from documents. Furthermore, as Cameron and Pannett (1980) have found, the regression statistics used to estimate age do not apply in all areas of the country, especially ancient countryside areas such as Shropshire with a high proportion of woodland assarts and early hedges. Most of the Country Park hedges were also of woodland origin and Pollard *et al.* (1974) reasoned that although the dating method would group woodland relic hedges as old hedges, it would not be appropriate to date them to a particular age, as their shrub complement would depend, in part, on what they originally consisted of, whereas the method was based on the principle of colonisation of planted hedges. For the Shropshire hedges, neither of the two possible regression lines produced a significant species/age relationship for the enclosure hedges alone; it was the contrast between the assart and the enclosure hedges that appeared to contribute most to the relationship. As a further complication, very early planted hedges may have been planted with more than one species including some woodland indicators. Most recent hedges were usually planted with a single species.

The lack of documentary dated hedges was a problem encountered by other hedgerow studies (Cameron and Pannett 1980, Hewlett 1973 and Rowe 1976). With no prominent groupings of hedge diversity values, it was instructive to divide the hedges into broad categories. These may be of a subjective nature and are seldom comparable with those of other hedge studies, each of which has had to devise its own system of hedgerow categories to accommodate the regional history. The system used in this study was based on the hedge age, mode of origin and management. Hedges which could be placed in more than one category were placed in the most appropriate one.

Harrow woodland hedges: Hedges on the Harrow side of the parish boundary and associated with existing woodland (ancient woodland relic, eighteenth century landscaping or well developed oak shrub), or having been incorporated into a landscaped woodland belt. Hedges 10, 12, 13, 36, 58 and 59.

Harrow field hedgerows: A variously aged group of Harrow parish field hedgerows. Hedges 6 and 7 date from the period of piecemeal enclosure (c. 1550-1725), with the others being of earlier origin. Hedges 6-8, 14 and 16.

Parish boundary field hedgerows: Parish boundary field hedgerows not associated with the eighteenth century landscaping or the Bushy Down Wood relic. Hedges 1 and 4.

Kingsbury assart hedges: Kingsbury parish hedges known to have existed since at least 1597 and almost certainly of woodland assart origin. Divided into two categories:

- i. **Entire:** Hedgerows not cut to the base in 1967 and/or with a prominent standard tree cover. Hedges 2, 5, 19, 21, 23, 24, 40, 55 and 57.
- ii. **Reduced:** Hedgerows in which the shrubs were cut to the base by a farmer in 1967 (Batten 1972) and now dominated by blackthorn, often with gaps and without a prominent cover of standard trees. Those hedges which contained

elm may now be dominated by elm suckers. Hedges 22, 25-27, 29-35, 37-39, 41, 44, 45, 49, 50-52 and 54.

Post-1597 Kingsbury hedges: Kingsbury hedges planted or formed between 1597 and 1899. Some were cut to the base in 1967. Hedges 28, 42, 46, 48 and 56.

Twentieth century hedges: Hedges on both sides of the parish boundary of twentieth century origin. Hedges 3, 15, 18 and 20.

For various reasons it was not possible to incorporate results from hedges 9, 11, 17, 43, 47 and 53. In addition there were too many gaps in some of the sections from the hedges in the categories above for diversity calculation, especially in the reduced assart hedges.

The age/species diversity results are given in Table 1, with the average and range of species diversity for each hedge category. On consideration of the problems inherent in the method, it would be inappropriate to subject the results to statistical analysis and with such a variety of hedge types it was unwise to place too much reliance on the age estimates on the basis of one shrub per hundred years. The documentary age estimate for the woodland origin hedges is largely academic, for any hedges having originated from primary woodland in medieval times could be considered to have been woodland for thousands of years. The few obvious garden escapes and other recent plantings were not included in the calculations for Tables 1 and 2.

It is apparent from Table 1 that there is only a very slight, if any, relationship between hedge age and shrub diversity. The relationship of one species per hundred years did not hold. The age of the woodland assart hedges, as estimated from their diversities, was far short of their actual age; while the twentieth century hedges had an average diversity suggesting an age of 240 years, a result that could be due to quick colonisers. Woodland hedges, as expected, had the highest diversities. The Kingsbury assart entire hedges had higher diversities than the reduced assart hedges. Generally the results tend to confirm that the Country Park hedges were too varied in origin, management and association with woodland, to be dated by an age/shrub diversity relationship.

B. Indicator species

The frequency of hedgerow shrubs by hedge category is given in Table 2, which excludes a few species which were only present in non-sample hedge sections and wild privet which was recorded in the parish boundary hedge 1 in December 1984. Eleven species appear to be of some use as indicators of the age, origin or management of the hedges. Most of these species have been used as indicators in hedgerow studies in other parts of the country. The three Country Park exceptions which may only have local significance are ash which was associated with scrubby field hedgerows and especially with the landscaped woodland hedges, hornbeam which was confined to the landscaped woodland hedges, and oak which was relatively infrequent in twentieth century hedges and those cut in 1967.

The Country Park distribution of the woodland indicator species, dogwood, field maple, hazel and wild service, did show their presence to be associated with hedges of woodland origin. Dogwood only occurred in one hedge (7) of known planted origin, as did field maple (hedge 42), while hazel and wild service only occurred in woodland or woodland origin hedges. None of the woodland indicator species was present in twentieth century hedges. Other studies tend to agree that hazel and wild service are the best indicators of woodland origin; wild service in particular has a very strong affinity with ancient woodland in eastern England and is rarely planted (Rackham 1980). Blackthorn was a shrub of the old field hedges, although less common in woodland hedges and relatively infrequent in twentieth century hedges. Cameron and Pannett (1980) found it to be associated with woodland relic hedges in lowland Shropshire.

The distribution and abundance of the common, woodland and hybrid hawthorns were difficult to quantify, as the fertile hybrids formed a gradation in characteristics between the parent species. As many individuals were hybrids a note was made of the relative frequency of common and woodland type hawthorns. The results were not conclusive and most hedges appeared to contain both hawthorn types, with common hawthorn type present in all hedges. Woodland hawthorn types were more frequent in woodland origin hedges than in planted hedges and completely absent from twentieth century hedges. Rackham (1976) noted that woodland hawthorn was a shrub of ancient woodland, and hence often present in woodland origin hedges. Common hawthorn (quickthorn) was a shrub of woodland edges and well suited for planted enclosure and later hedges. Bradshaw (1976) considered that by the start of the enclosure acts period man was deliberately selecting common hawthorn.

The frequency of elm *Ulmus procera* did not conform to a pattern on the basis of hedge age, having for example a high frequency in the Harrow woodland and the post-1597 Kingsbury hedges, and yet being absent from both the parish boundary field and the twentieth century hedges. Although all the standards were killed by Dutch elm disease *Ceratocystis ulmi* in the mid-70s, the suckers continue to thrive. The elm's planted origin was confirmed by mapping the distribution of the suckering clones. On the summit of Barn Hill, the distribution of elm corresponded exactly to that of the Humphry Repton landscaping. However, on the landscaped hedgerow belt around the base of the hill, elm tended to occur only on the eastern side, corresponding to the parish boundary. Elm was absent from the parish boundary field hedges, as would be expected of woodland origin hedges, yet the Kingsbury assart category hedges did have some elm, mostly in hedges along the boundary of Hill Farm (hedges 29, 33, 34, part of 48, 49, 52 and 54). Elm was also present in most of the internal Hill Farm hedges, except those around Long Down which was part of another farm, but almost completely absent from the Big Bush Farm area (other than where it shared a boundary with Hill Farm). This evidence suggests that the elms on the eastern side of Barn Hill originated from Hill Farm boundary planting, rather than as part of Repton's landscaping. The absence of elm in the Hill Farm boundary hedge 5, could be explained by suggesting that the elm planting was undertaken before about 1838 when this hedge was still a spinney, in which it would have been unsuitable to plant elm. In the Harrow field hedges elm was confined to the known planted hedges (6 and 7) and to hedge 16, the boundary of the common Preston Eastfield.

C. Standard trees

Standard trees are those woodland or hedgerow trees grown for, or having grown to a size suitable for timber (Rackham 1976). In a hedgerow sense such trees are mature and, unless damaged, rise well above the shrub layer of the hedge including mature shrub trees such as hawthorn. Although Mitchell (1978) has explained how the ages of trees can be estimated from their girth, the growth rate may vary depending on local conditions, especially whether a tree is in the open or in woodland. Young oak may have a more rapid growth than most British species. It was estimated that the oldest tree in the Country Park, an oak in hedge 56, was unlikely to be older than 218 years and therefore the age of the trees was of little use in dating the hedges, although their frequencies provided some information about hedgerow management.

The results in Table 3 give the frequencies of standard trees by hedge category, but using the entire hedge lengths, rather than just the sample lengths used for the diversity estimates and indicator species frequencies, although there was little additional difference in length. The few hedges not in a category were again excluded. The total of 249 trees included the vast majority of the hedgerow trees in the Country Park, including some of the landscape plantings around Barn Hill.

However most of the landscape belt trees and all those in the summit landscaping which approximates to the outline of Bardonhill field have not been considered as hedge standards. As expected there was a close correlation between the frequency of standard trees and the frequency of those species when considered as indicator shrubs. No standard trees were found in the twentieth century hedges, a reflection on the youth of these hedges and an economy that no longer uses the hedgerow timber. It was estimated from aerial photographs that in 1974 there were about sixty hedgerow elm standards within the Country Park area and these may have been abundant along the now remnant section of hedge 59. The high frequency of trees in the Kingsbury assart entire hedges could be considered as typical of old field hedgerows in good condition, with some of the trees originally grown for timber. Oak was the most frequent standard in all categories.

D. Herbaceous flora

The herbaceous flora is of less use in hedgerow dating than the shrub flora. The most useful indicators are those of woodland relic hedges such as bluebell, dog's mercury and wood anemone. In the Country Park these were only present in woodland origin hedges, but wood anemone was only recorded (1982) in one hedge and dog's mercury in two. Some of the Kingsbury assart hedges contained great burnet and this was of interest where it was absent from the adjacent fields, for it may confirm that some of the fields were ploughed up during recent decades.

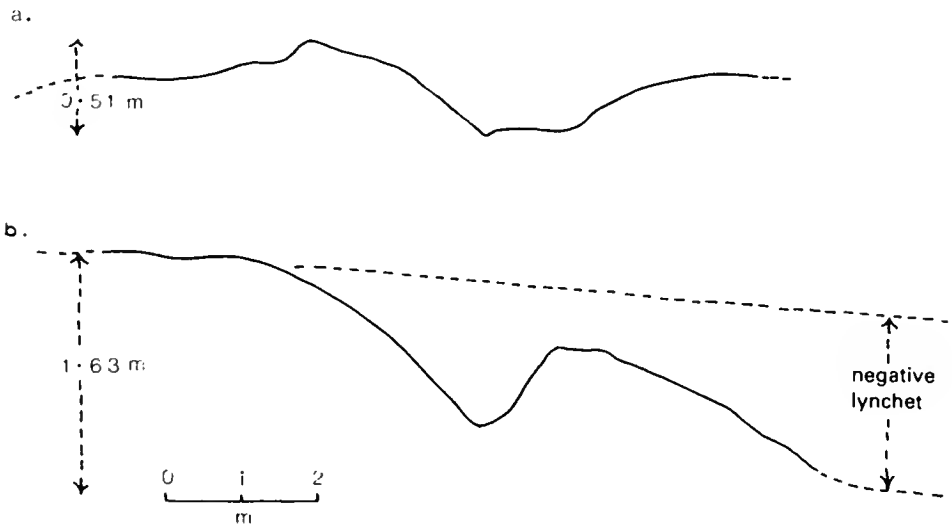


FIG. 4. Transect profiles of hedgerow earthworks, Fryent Country Park, 1983. (a) Typical bank and ditch (hedge 38), (b) Bank and ditch with evolved bank, hedge 45, Gotfords Hill. Note that the vertical scale is exaggerated twofold for both profiles.

E. Hedge earthworks

Most hedges were situated upon some form of earthwork, usually a simple bank and ditch, a typical example of which was hedge 38 (Fig. 4a). The most pronounced ditch was that of the parish boundary (hedge 1), which had a maximum depth of 2m and a width of 14m. This was typical of parish boundary hedges, especially those that served as a trackway. Hedge 12 had an earthwork that resembled some of the woodland boundary earthworks discussed by Rackham (1976). Hedge 45 also had a marked earthwork (Fig. 4b), with features of both a bank and ditch and of an evolved bank. Hewlett (1973) defined an evolved bank as one that developed with time, where a field boundary crossed a slope. Ploughing in the uphill field will cause soil to accumulate against the hedge

forming a bank, while on the downslope side soil will tend to move away from the hedge. With time a discontinuity develops in the level of the slope, due to these soil movements. Rackham (1976) called this a negative lynchet. As the height of the bank will depend on factors such as the initial slope steepness, intensity and type of agriculture on each side, the size of the bank cannot be used as a direct measure of hedge age, but can provide more evidence to consider. Hedge 45 was still wooded on the uphill side until at least 1838 and this may help to account for this feature.

Some twentieth century hedges had no bank and ditch systems, while hedges 3 and 20 had banks that did not conform to any pattern and were probably created by recent earthmoving operations.

Discussion

By the combined use of ecological and documentary evidence it was possible to understand much of the hedge history of the Country Park. This was closely related to the field and agricultural history. Documentary evidence was the most detailed source of information, while the most useful ecological method was the analysis of indicator species, especially those characteristic of woodland origin and of planted hedges. The age/diversity relationship was of limited use, partly because of the woodland origin of many hedges, but also because hedgerow management practices had differed widely. The results suggested that for the Country Park hedges at least, the effect of hedge management had a much greater influence on shrub diversity than the age of the hedge. In such a landscape, it was unlikely that a county calibration of the age/diversity relationship would be of any use, even if there were sufficient data to formulate one.

Nationally, Pollard *et al.* (1974) found that unmanaged hedges had the highest mean diversities and it was unlikely that the relationship would have given reliable results for the scrubby Harrow field hedgerows, or for the very discontinuous and reduced Kingsbury assart hedges. A comparison of the reduced Kingsbury assart hedges 29 and 32 after 16 years of regrowth with their former continuations, hedges 5 and 21 respectively, on the west side of Fryent Way, which were not cut in 1967, gave a diversity of 4.5 for hedge 5 compared with 3.0 for hedge 29, and 3.5 for hedge 21 compared with hedge 32 which still had too many gaps for a diversity estimate. Woodland indicator species were either absent or infrequent in the reduced hedges. Generally blackthorn regenerated well after the 1967 cutting and was frequently the dominant shrub.

There was little difference between the diversities of the Harrow piecemeal enclosure hedges 6 and 7 and the older hedges surrounding Great Hyde, but woodland indicators were much more frequent in the older hedges. Field maple and hazel in hedge 8 suggested that it was a woodland origin hedge and the high proportion of elm in hedges 6 and 7 confirmed their planted origin. Twentieth-century hedges were indicated by the absence of elm, standard trees and woodland indicators, and by low diversities and hedge patterns that did not conform to those of their respective parishes. Introduced species such as *Pyracantha*, absent in pre-twentieth-century hedges, were often present.

The map evidence for assarting in Kingsbury was well documented (Figs 2-3) and suggested an area of ancient countryside. The All Souls College (Hovenden) map of 1597 depicts a landscape where most fields had already been cleared from the forest, but in which many hedges were still woodland belts and some small woods had yet to be cleared. Bolton (1976) estimated, on the basis of population increases, that the forest was gradually cleared from isolated farms, mainly between 1086 and 1436. After further forest clearance and field enlargement, the woodland formed only four per cent of Kingsbury parish in 1729-38, although even in the 1838 Tithe Award map, some woodland remained within the Country Park area. By 1862 this too had been cleared and the hedgerow landscape was further reduced during the twentieth century.

Some of the Harrow parish hedges were also of woodland origin and the sinuous shape of hedge 12 suggested an ancient woodland boundary (Rackham 1976). Some of the Harrow fields had already been enclosed by 1547 and this piecemeal enclosure continued during Tudor and later periods with the internal enclosure of Great Hyde. Preston Eastfield was subjected to Parliamentary enclosure after 1817. This side of the Country Park had characteristics of both the ancient and the planned countryside. Darby (1936) described how much of lowland England had an open-field system during the period 1000-1250, with Kent and East Anglia having a system based on hamlets, and with Middlesex, Hertfordshire and the Chilterns being a borderland region with additional assarted areas. The Country Park evidence does suggest that there were a number of agricultural systems in operation within the area and more details are given in Bolton (1971, 1976). The Country Park hedge systems were probably representative of those of the two parishes, although elsewhere in Harrow many common fields were not enclosed until the Parliamentary Award.

The total length of the hedges was about 10,360m, of which about 21 per cent was of remnant sections. It was estimated that the hedges, often in an overgrown condition and including the herbaceous edge, had an average width of 7m and therefore the area that they covered was about 7.2 hectares. In addition there were 850m of remnant former hedges, marked by bank and ditch systems or by lines of standard trees. One of these, hedge 60, was only of recent removal, for it was marked on Ordnance Survey maps until at least 1914 and still had some trees and shrubs as late as 1974. It is now marked by one standard oak and a bank/ditch. In spring, hedgerow and woodland plants such as bluebell, cow parsley, lesser celandine and lords-and-ladies are visible with a low growth of blackthorn, bramble, elm and wild rose, before being cut with the annual hay crop. The former hedge between Warrens and Blacklandes had been removed by 1838, but the 1862 Ordnance Survey map shows two standard trees in the enlarged field on the line of the former hedge. Other former hedges are still marked by 22 oak and three ash standards (e.g. the former west side of Long Down and around a former field to the north-east of Gotfords Hill).

The 10km of hedges provide, in addition to their flora, a valuable wildlife habitat. The fields adjacent to most of the field hedgerows are devoted to an annual hay crop, without any fertiliser or pesticide applications. A rich insect fauna is present and many of the 21 species of butterfly recorded were dependent on hedgerow food plants for part of their life-cycle. During the summer thousands of meadow browns *Maniola jurtina* are present in the hedges. Batten (1972) recorded an average of 394 bird territories per square kilometre over the Country Park area for the years 1968-71, after excluding house sparrow *Passer domesticus* and woodpigeon *Columba palumbus*. For the farmland east of Fryent Way the density was 254 territories per square kilometre and both densities were nationally high. The wildlife interest is further enhanced by some old farm ponds in the hedges and the hedgerow ditches still serving as functional drains.

With such a historically interesting landscape, the management aim is to conserve the hedgerow pattern. Gaps in the hedges, especially those of the reduced Kingsbury assart hedges are being replanted. It is hoped to replant the remnant hedge 60 and also the parish boundary section hedge 59. Replacement standard trees should be encouraged, as there are now probably fewer standards than at any time in the historical past. A wide variety of hedgerows in good condition should greatly encourage the wildlife diversity of the Country Park.

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TABLE 1. Shrub species diversity for hedges at Fryent Country Park, 1983.

	Hedge category				Totals
	Harrow woodland	Harrow field	Parish boundary field	Kingsbury assart (entire)	
No. of samples	48	27	17	24	212
No. of hedges from which samples taken	6	5	2	7	47
Species diversity (sample average)	4.75	4.59	4.24	3.88	—
Range of hedge diversities	3.6-6.0	4.0-5.0	3.5-5.3	3.5-4.8	1.0-6.0
Estimated age from diversity (years)	475	460	425	390	—
Estimated age from documents (years)	≥680	≥260	≥1,000	≥580	—
				Kingsbury assart (reduced)	—
				18	—
				3.23	—
				1.7-5.0	—
				320	—
				≥580	—
				19	—
				5	—
				3.15	—
				2.0-5.0	—
				315	—
				121-486	—
				12	—
				4	—
				2.42	—
				1.0-3.0	—
				240	—
				0-43	—

TABLE 2. Percentage frequency (%) of shrub species in samples of hedge categories, Fryent Country Park, 1983. (Note that the frequencies themselves were, to an extent, related to the species diversity of each category - Table 1).

	Hedge category				Average
	Harrow woodland	Harrow field	Parish boundary field	Kingsbury assart (reduced)	
Ash	49	37	18	3	20
Blackthorn	40	89	88	88	69
Broom	2	—	—	—	0.5
Crab apple	4	15	6	9	7
Dogwood	8	4	4	8	6
Elder	43	48	4	32	39
Elm	50	44	13	28	31
Field maple	25	4	17	5	11
Hawthorns	83	96	100	77	88
Hazel	6	4	4	—	2
Hornbeam	13	—	—	—	3
				Kingsbury post-1597	—
				58	—
				—	—
				—	—
				8	—
				17	—
				—	—
				8	—
				—	—
				47	—
				47	—
				5	—
				74	—
				100	—
				—	—
				—	—

Oak	71	78	65	79	29	47	17	54
Pear	—	—	—	13	—	5	—	2
Silver birch	6	4	—	—	2	—	—	2
Sycamore	6	—	—	—	—	—	—	1
Whitebeam	2	—	—	—	—	—	—	0.5
Wild cherry	6	—	—	—	2	—	—	2
Wild rose	50	22	76	33	40	32	58	42
Willows	10	15	—	—	2	—	—	5
Wild service	2	—	—	4	—	—	—	1

TABLE 3. Frequency of standard trees per 100m in hedges, Fryent Country Park, 1983.

	Category and total lengths of hedges				Kingsbury post-1597 716m	Twentieth century 453m	Average	Total number of trees 9,434m
	Harrow woodland 1,824m	Harrow field 1,120m	Parish boundary field 539m	Kingsbury assart (entire) 1,257m				
Oak	2.96	2.86	2.59	4.45	1.54	—	2.05	193
Ash	1.37	0.53	0.56	0.32	—	—	0.43	41
Field maple	0.17	—	—	0.16	—	—	0.05	5
Hornbeam	0.22	—	—	—	—	—	0.04	4
Black Italian poplar	—	—	—	—	—	—	0.02	2
Pear	—	—	—	—	0.14	—	0.01	1
Crack willow	—	0.09	—	—	—	—	0.01	1
Wild cherry	0.05	—	—	—	—	—	0.01	1
Wild service	—	—	—	0.08	—	—	0.01	1
Total frequency	4.77	3.48	3.15	5.01	1.68	0.00	2.63	—
Total no. of trees	87	39	17	63	12	0	—	249

TABLE 4. Scientific names of species mentioned in the text that were present in the Country Park hedges. The list is based on Clapham, Tutin and Warburg (1962). Not all of the hedgerow flora was mentioned in the text.

wood anemone	<i>Anemone nemorosa</i>
lesser celandine	<i>Ranunculus ficaria</i>
sycamore	<i>Acer pseudoplatanus</i>
field maple	<i>A. campestre</i>
broom	<i>Cytisus scoparius</i>
bramble	<i>Rubus fruticosus</i>
great burnet	<i>Sanguisorba officinalis</i>
wild rose	<i>Rosa arvensis</i> field rose or <i>R. canina</i> agg. dog rose
blackthorn	<i>Prunus spinosa</i>
wild cherry	<i>P. avium</i>
pyracantha	<i>Pyracantha coccinea</i>
woodland hawthorn	<i>Crataegus laevigata</i>
common hawthorn	<i>C. monogyna</i>
hybrid hawthorns	<i>C. × media</i>
whitebeam	<i>Sorbus aria</i>
wild service	<i>S. torminalis</i>
pear	<i>Pyrus communis</i>
crab apple	<i>Malus sylvestris</i>
dogwood	<i>Cornus sanguinea</i>
cow parsley	<i>Anthriscus sylvestris</i>
dog's mercury	<i>Mercurialis perennis</i>
English elm	<i>Ulmus procera</i>
silver birch	<i>Betula pendula</i>
hornbeam	<i>Carpinus betulus</i>
hazel	<i>Corylus avellana</i>
English oak	<i>Quercus robur</i>
black Italian poplar	<i>Populus canadensis</i> var. <i>serotina</i>
crack willow	<i>Salix fragilis</i>
willows	<i>S. fragilis</i> or <i>S. cinerea</i> agg. or hybrids with other <i>Salix</i> spp.
wild privet	<i>Ligustrum vulgare</i>
ash	<i>Fraxinus excelsior</i>
elder	<i>Sambucus nigra</i>
honeysuckle	<i>Lonicera periclymenum</i>
bluebell	<i>Endymion non-scriptus</i>
lords-and-ladies	<i>Arum maculatum</i>

Wilks's Wilderness Garden and the Shirley Poppy

by DEIRDRE CLENET*

The Rev William Wilks (1843-1923) was in 1880 appointed vicar of St John's Church, Shirley, which was then a rural hamlet on the outskirts of Croydon, at the foot of the Addington Hills. He was a keen horticulturist and in 1888 became secretary to the Royal Horticultural Society when it was on the edge of bankruptcy and had a very low membership. He held this position for the next thirty-two years during which time the Society's finances rapidly improved, its membership thrived, the Chelsea Flower Show started and the gardens at Wisley were established. One of his main contributions to horticulture began in his first year at Shirley Vicarage when he noticed in a patch of common wild field poppy *Papaver rhoeas* 'one solitary flower which had a very narrow edge of white' (Anon 1900) and which he carefully marked and saved the seed. By selective breeding he developed a single white-based poppy with yellow or white stamens and 'never the smallest particle of black.' He called it the Shirley Poppy.

Although his main achievements were in horticulture, Wilks was an enthusiastic botanist and adopted the informal approach to gardening being advocated at the time by William Robinson in his book *The Wild Garden* which was published in 1870. Robinson made a plea for the use of native wild flowers in the garden.

In 1904 Wilks purchased a six to seven acre plot of land in the field adjoining the Vicarage. The Ordnance Survey maps show that it was partly wooded and had a path leading across it directly from the Vicarage garden. Seven years later, having resigned as vicar, he built his new house there and called it The Wilderness. The following year he moved in and set about creating a garden befitting the name.

A narrow formal lawn surrounded the house and from there the ground sloped gently upwards towards the base of the Addington Hills. He neither dug nor cultivated the ground, but randomly planted favourite calcifuge plants so that the *Gardener's Chronicle* (Anon 1913) described it as looking like a 'cultivated common'. Two years later an article on 'Informal and Wild Gardening' (Hudson 1915) described the garden as looking older than the house. In it Wilks gives a full account of the plant species and his management of The Wilderness. Some of the plants were exotics, but the majority were native wild plants carefully selected for the dry heathy area, the woodland and the wet areas (bog myrtle *Myrica gale* was one of the plants he brought from Scotland where he frequently spent his annual holiday). Narrow grassy paths wound 'in a more or less natural direction such as anyone would take', or as he later described 'very much as one would find on any Surrey common'. The grass was allowed to grow all over 'the field' as Wilks sometimes called his garden, being cut once in late autumn using a bagging hook. He encouraged the growth of moss and ivy on the woodland floor which was planted out with native ferns, his favourite plants.

Reviewing the garden in 1920 the *Gardener's Chronicle* reported 'True to our expectations we found a most beautiful pleasaunce laid out and planted on unorthodox lines, but embodying the true features of a natural garden' (Anon 1920). Wilks died three years later.

Today Shirley is a busy suburb on the outskirts of Croydon. Drainage and culverting have destroyed most of the ponds, streams and wet areas on the lower slopes of the hills. Prime (1948), in his Presidential address to the Croydon Natural History and Scientific Society said 'There is very definite evidence as to the gradual drying up of the area. Most of the damper spots have disappeared and coincident with this there has been a disappearance of the damper loving species.' Hidden behind its high walls The Wilderness garden with its dry heath, woodland

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and 'wet' areas has remained intact. A great number of Wilks's 'finds' are still growing there today.

Early in 1984 Mrs Lucy Rogers, a member of the Croydon Natural History and Scientific Society drew the attention of Dr Jean Byatt to the plants in The Wilderness and together they compiled a species list.

The upper slopes of the garden are dominated by ancient stands of heather *Calluna vulgaris* interspersed with cross-leaved heath *Erica tetralix* and tree ericas planted by Wilks. The following plant association, *Deschampsia flexuosa*, *Agrostis* spp., *Festuca* spp., *Rumex acetosella*, *Dicranum* and *Polytrichum* spp. comprises the grassy area and is similar to the vegetational type overlying the Blackheath Beds on the plateau of the Addington Hills (Prime 1948). The grassland species include sneezewort *Achillea ptarmica*, field scabious *Knautia arvensis*, small scabious *Scabiosa columbaria*, petty spurge *Euphorbia peplus*, mugwort *Artemisia vulgaris*, bird's-foot trefoil *Lotus corniculatus*, marsh bird's-foot trefoil *L. uliginosus* in wet places, heath bedstraw *Galium saxatile*, oxeye daisy *Chrysanthemum leucanthemum*, harebell *Campanula rotundifolia*, musk mallow *Malva moschata* and perforate St John's wort *Hypericum perforatum*. The last four species were introduced by Wilks. *A. ptarmica* and the two trefoils were recorded on the Addington Hills by Parsons (1911) but only *L. corniculatus* was found there in 1948 (Prime 1948). The May lily *Maianthemum bifolium* was introduced by Wilks and with the lily of the valley *Convallaria majalis* has become naturalised in the woodland. Lousley (1976) in his *Flora of Surrey* describes the latter as a rarity found on the Blackheath Beds at Shirley. It is quite possible that it also was introduced by Wilks, but it is equally possible that it occurred already in the wooded area of the field which he owned for seven years before building his house.

Prime (1948) points to the wet areas in the Addington Hills occurring at the junction of the Blackheath Beds and the clay of the less permeable Woolwich Beds. An extensive marshy bog area in The Wilderness stretches from the upper extremity down to the lawns and adjacent to the Vicarage garden.

Rivulets of clear water run downhill into small pools edged with rushes and sedges and gradually merge into a *Sphagnum* bog which is the largest acid bog left in Greater London today. Four species of *Sphagnum* have been identified, namely *S. fimbriatum*, *S. palustre*, *S. recurvum* and *S. subnitens*. Watson (1955) describes the last mentioned as typical of Wales and Scotland but less common on wet heaths in the south. Was it accidentally introduced with the bog myrtle he brought from Scotland?

In his account of The Wilderness, Wilks did not specifically mention a *Sphagnum*-bog area and it has been suggested that it developed subsequently and that he would be astonished to find it in The Wilderness today. The evidence would seem to demonstrate that the lower slopes of the Addington Hills had a number of patches of *Sphagnum* bog. Parsons (1911) lists three species for the Shirley/Addington Hills, *S. rigidum*, *S. subsecundum* and *S. acutifolium*. He also lists sundew *Drosera rotundifolia*, but does not indicate where the boggy area was found. The appendix to his paper lists thirteen species which were then thought to have been extinct from Croydon commons at that time. These include marsh clubmoss *Lycopodium inundatum* — Shirley common near Croydon (W. Pamplin, in Parsons 1911) and *Scirpus caespitosus* — bog at foot of Addington Hills near Coombe Lane (Irvine 1838, in Parsons 1911).

De Crespigny (1877) says 'The bog is on the road to Wickham: on enquiry could hear of no other on or about the common'. Today the only one to remain intact is the bog in The Wilderness garden.

The sedges found here include *Carex hirta*, *C. nigra* and the two rarities *C. demissa* and *C. ovalis*, which were last recorded on the Addington Hills by Parsons (1911). The rushes so far identified are *Juncus articulatus*, *J. bufonius*, *J. effusus* and *J. subuliflorus*.

Many of the plants Wilks selected for the wet area are found in or around the bog: snake's head fritillary *Fritillaria meleagris*, yellow flag *Iris pseudacorus*, purple loosestrife *Lythrum salicaria* (this has been found on the Addington Hills in 1981 (Byatt 1982*b*)), cuckoo-flower *Cardamine pratensis* (double-flowered variety), yellow loosestrife *Lysimachia vulgaris* and tall spikes of the common spotted orchid *Dactylorhiza fuchsii*. Note: The second orchid species has not yet been positively identified but is thought to be southern marsh orchid. *D. praetermissa*. Wilks listed 'all species of British orchid' for the wild garden.

The first record of the marsh violet *Viola palustris* occurring on the Addington Hills was in the second half of the seventeenth century 'In the bogs about a mile from Joan Coles' (Salmon 1931). The Coleses were a well known family living in Addington around the 1650s. Parsons (1911) saw it and Lousley (1976) also records it as occurring 'near Addington'. Recent records (Byatt 1982*a*) show that this is now a very rare plant in this locality. It too is found in the Wilderness bog, but it is not mentioned in Wilks's list. Did Wilks introduce it or had he discovered it growing there before creating his Wilderness garden?

This unusual garden fulfills many of the criteria required for notification as a Site of Special Scientific Interest, but the Nature Conservancy Council has rejected it as being artificially created. The criteria for listing Historic Gardens neither embrace endangered species nor habitats.

Wilks's Wilderness garden is a testament to his foresight and understanding of plant ecology and is an example of the part wild flower gardening can play in conserving endangered habitats and species.

Acknowledgements

I would like to thank the following people for their assistance in producing this paper: Mr Rodney Burton (L.N.H.S.), Dr Jean Byatt (C.N.H.S.S.), Miss Barbara Collecot (The Lindley Library), Mr Martin Hayes (Croydon Reference Library), Mr Keith Hyatt (L.N.H.S.), Mrs Lucy Rogers (C.N.H.S.S.) and Mr Paul Sowan (C.N.H.S.S.).

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Post Scriptum. The Vicarage is a Grade II listed building. The Department of the Environment has recently rejected a planning application made by the Church Commissioners to build eleven detached houses on the vicarage garden. The application met with strong opposition from the gardening societies, residents' associations, and conservation societies. There is particular concern about the effects building will have on the perched water table on which the survival of the *Sphagnum* bog depends.

While rejecting the original plan the D.o.E. have agreed that a more limited development 'might be feasible'. Conservationists are asking the Bishop of Southwark to intervene. Note: There is no public access to either of these gardens.

Book Review

Britain's Railway Vegetation. By Caroline Sargent. Institute of Terrestrial Ecology, Cambridge. 1984. 34 pp., 8 pp. col. pls. £3.50. ISBN 0 904282 76 7.

This work is a summary of the results of a five-year survey which was designed ('structured') to produce answers to questions about the sorts of habitats which occur by railways in Britain, how they are affected by management and disturbance, the kinds of vegetation which occur and the extent to which these are peculiar to railways, the importance of the railway as a refuge for certain species and the possible need for action to prevent irreversible changes, or to protect particular areas. The survey was conducted by describing the vegetation of 721 sites in rural surroundings, 480 of them chosen randomly, the remainder from 'areas of known, or likely' interest, in terms suitable for statistical comparison, then repeatedly submitting these descriptions to a refined process of identification of similarities, with the result that the vegetation of our railways was shown to fall into 32 different types ('*noda*'). The largest part of the publication gives a brief account of each type and relates it to plant communities already described. Five pages of maps locate the sampling sites, but the scope of the publication is insufficient to show which types of vegetation were at which site. From the maps it is possible to work out that a few sites in the Herts. part of the L.N.H.S. area were sampled, but not the cutting at the mouth of Polhill tunnel in Kent illustrated in Plate 5.1, the caption to which makes the vegetation there an instance of 'Trifolio-Agrimonietaum, *Arrhenatherum elatius* subcommunity.' It is only from the maps that one can see that none of the sites was in the Isle of Wight, specifically mentioned as an area where *Convolvulus arvensis* is abundant and spraying from trains is not carried out; it would have been interesting to see whether Dr Sargent's method would have highlighted other apparent effects of spraying.

This mention is in a chapter on 'railway plants', in which the concept that certain species are especially characteristic of railways is checked by comparing past records with the findings of the survey. The result of the comparison is that the species associated with railways in fact are mostly not those which might have been expected, but it is hard to feel confident about the validity of this result on the basis of the data presented in this publication. We are told enough about the statistical criteria adopted, but virtually nothing about the literature searched to produce past records. Were railway records from urban sites excluded, as in the survey? Were the proportions of literature records from the verges and the cess in the literature records weighted to match the admitted bias against the cess in the survey? I would guess not, for the older literature records are likely to be very uninformative about the habitat, and some of their railway plants may even have come from between the tracks, a situation not surveyed at all but known to be very unproductive under modern railway working conditions. In the terms of Dr Sargent's team, a 'railway plant' would be one which occurs much more abundantly on the track verges than in the adjacent vegetation outside the fence. This comparison has not been made.

The final chapter, on conservation, includes a section on changes in railway vegetation, in which another surprising conclusion is reached. In an attempt to assess changes, 283 identical quadrats at 30 randomly chosen sites were re-sampled after an interval of four years. This resulted in a net increase of eight in the number which could be allotted to vegetation types characterised by fine-leaved grassland, contrary to the expectations suggested by Gulliver (1980). This is regarded as an improvement by Dr Sargent who repeats the assertion that fine-leaved grasslands (*noda* 6-11 in her treatment) equal herb-rich grassland in the sense of Way and Sheail (1977). Not all these *noda* are herb-rich, indeed no. 11 is described as 'species-poor'. I wonder if there would have been a net gain in the number of sites allotted to *nodum* 10 alone. This is the extremely species-rich Trifolio-Agrimonietaum, *Arrhenatherum elatius* subcommunity already mentioned.

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R. M. BURTON

Biological Recording in Metropolitan Essex — a Review of Progress

by C. W. PLANT, G. J. HARRIS, P. KIRBY, P. S. HYMAN and
S. J. LAMBERT*

Summary

The establishment in recent years of museum-based County Biological Records Centres has allowed for considerable advances to be made in the field of natural history and, in particular, has resulted in a greater emphasis being placed on recording the overall flora and fauna of discrete sites, as opposed to simple distribution data. In Essex, the Biological Records Centre at the Passmore Edwards Museum has a considerable degree of overlap with the recording area of the London Natural History Society, and it is appropriate therefore that the results of the researches by the Essex centre in this area should be made available to the attention of the readership of *The London Naturalist*.

During 1984 the degree of coverage of the five London boroughs of Newham, Barking and Dagenham, Redbridge, Waltham Forest and Havering — that part of the Greater London Council's administrative area which falls within the old geographical county of Essex — was considerably boosted as a result of a G.L.C. grant-aided project. Four biologists were appointed on temporary contracts commencing in June 1984 to assist the full-time staff in adding to the existing data-base and to computerise the storage of records for this area. The specialist zoological and botanical knowledge of the resultant team has enabled a major part of the flora and fauna to be surveyed. Where specialist knowledge has not been available within the team, we have been most fortunate in having much material critically examined by the expert Recorders of the Essex Field Club.

Two aspects of the project are dealt with in this preliminary report. Firstly, a selection of the more noteworthy sites so far studied within the five boroughs is presented, principally in the interests of stimulating discussion and further studies; secondly, we give a list of particularly interesting species recorded during the survey, including species new to the county, vice-county or, in two cases, new to Britain.

Site Selection

A map of the sites in the present study area for which ecological information is held at the Passmore Edwards Museum Biological Records Centre is presented in Fig. 1. The centre points of the sites are indicated by crosses, but for clarity, where a number of crosses coincide due to the scale used, several have been omitted. In selecting the short list of sites worthy of mention here, we have also taken into consideration the parallel but less detailed surveys carried out by the London Wildlife Trust's habitat survey team, whose work was also commissioned by the Greater London Council. There are few areas where we disagree with the findings of the L.W.T. team, even though not all of their sites appear in our short-list.

The selection of criteria for use in site evaluation is always difficult. Most natural historians active in the field for any length of time will be aware that it is possible to 'get the feel' of a site in the absence of concrete evidence to substantiate this assertion. In the present list however, we have only included sites where objective evidence of site quality is available. The criteria used are as follows:

1. Species content

- (a) Sites possessing a wide selection of uncommon species or a shorter list of rarer ones.
- (b) Sites rich in species typical of the represented habitats and/or indicative of the long historical continuity.
- (c) Sites containing species restricted to specific threatened habitats in the London area.

*Passmore Edwards Museum, Romford Road, Stratford, London E15 4LZ.

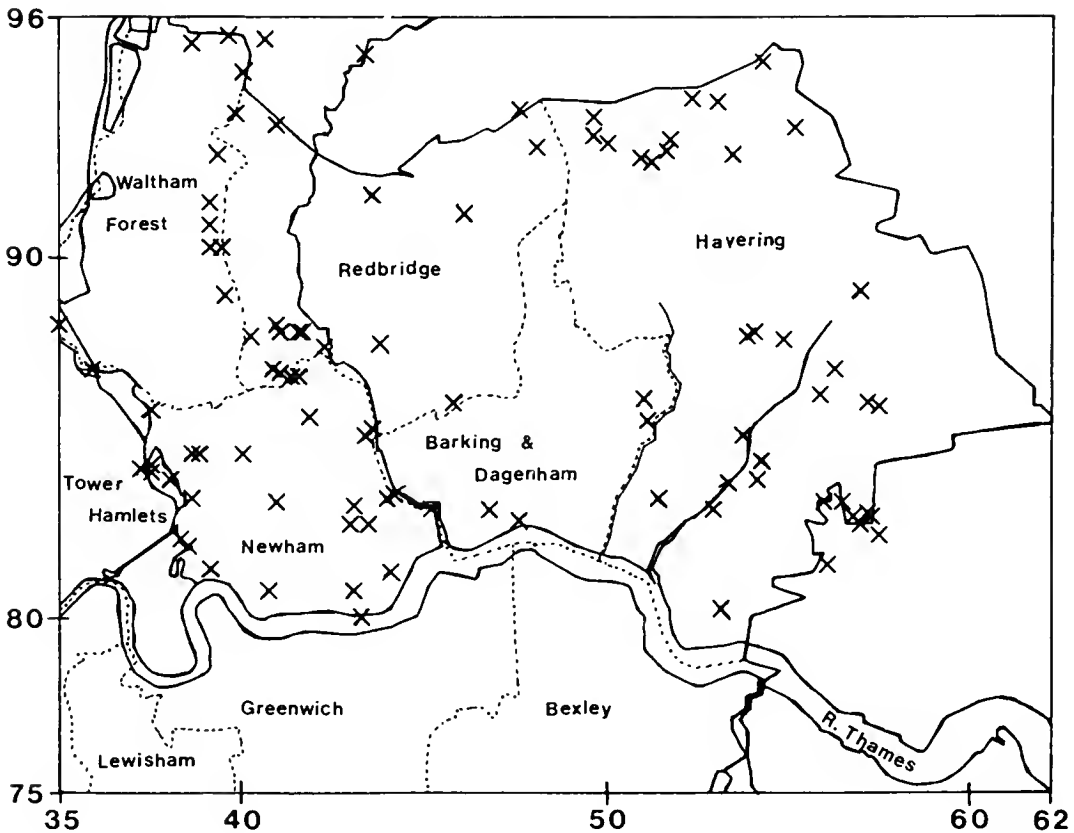


FIG. 1. Distribution of Sites within Metropolitan Essex surveyed during the course of the study. The positions of the sites are denoted by crosses at their centre point six-figure grid reference. Main water courses and the G.L.C. boundary are shown as solid lines. Borough boundaries are denoted by dotted lines. The Ordnance Survey's National Grid numbers are shown at the margins and should be prefixed with the letters TQ.

2. Habitat content

Sites consisting, partly or in whole, of a habitat or habitats which are scarce or under threat in the London area.

3. Representativeness

Sites which are good examples of particular habitat types, especially if these are typical of the area. Here we include ruderal communities.

The 20 sites selected were chosen from the total of 111 held on file for the metropolitan portion of Essex. Whilst we do not wish to comment at this stage on what the future should be for these sites, it may be assumed that we would not be keen to see any of them drastically altered or destroyed. We would particularly wish to emphasise that the survey work is not yet complete and that coverage of the sites currently on file is not uniform. As a result, the absence of a site from the list below does not necessarily indicate that we regard it as being of lower wildlife interest than the sites which are included, merely that we currently have no data suggestive of high habitat quality.

A Short List of the more Noteworthy Sites Surveyed

1. LONDON BOROUGH OF HAVERING

Warwick Wood, TQ 558829

An ancient woodland, with both standing and fallen dead wood. Management is needed to control sycamore invasion in the northern part. There are notable beetles, moths and hoverflies, including a number of species associated with dead wood. An impressive breeding-bird list includes all three woodpecker species, nuthatch and treecreeper. Corn buntings nest around the margins.

Running Water and Brick Kiln Woods, TQ 566825

Actively managed ancient woodland. Hazel is coppiced on a seven-year rotation beneath oak and ash standards. Significant trees include aspen, wild cherry and wild service. The rich ground flora includes two species of orchid and the insect fauna includes uncommon moths. Ponds within the woods are breeding sites for great crested newt and contain an interesting insect fauna together with a very rich wetland flora.

Ingrebourne Marsh and Berwick Pond, TQ 532834

An important wetland site, probably worthy of Grade 1 S.S.S.I. status. Ingrebourne Marsh has the largest reedbed in the G.L.C. area. An extensive fauna of wetland invertebrates has been recorded, including an extremely rare caddis fly and several beetles of very restricted distribution. Willows and poplars at the southern end of the site may well mark an area of carr of long standing, and support a characteristic insect fauna.

Rainham Marshes, TQ 520810

The principal interest lies in the sludge lagoons, in which the dredgings from the River Thames are settled. An important site for many bird species in winter, and an important breeding site for yellow wagtails and skylarks. The land is entirely within the M.O.D. rifle range and access is by permit only.

Dagnam Park, TQ 550930

Old parkland with areas of ancient woodland, species-rich grassland and a number of ponds. Many rare and local insects have been recorded. The Diptera predominate in these records, but there are also a number of notable species amongst the Coleoptera, including ancient woodland indicator species.

Bower Wood, TQ 516927

An excellent ancient woodland flora includes several species found nowhere else on the survey to date. Wetland habitat adds variety and dead wood is present in quantity and supports a number of uncommon and characteristic insects.

Cranham Marsh Nature Reserve, TQ 567856

The last surviving area of marsh on fen peat in Essex and with three small areas of ancient woodland, this site supports a rich wetland flora and fauna. Examination of old records shows that the site has declined in interest in the recent past, but active management by the Essex Naturalists' Trust will hopefully improve the situation.

2. LONDON BOROUGH OF BARKING AND DAGENHAM

Eastbrookend (The Chase, Dagenham), TQ 514858

An extensive open area comprising a major part of the 'Dagenham Corridor'. There are a number of habitat types within the site, the two most important being a series of large pools, their margins and associated marshland and sallow scrub on periodically damp sparse grassland. Uncommon wetland Diptera have been recorded, and breeding birds include little ringed plover, lapwing and redshank.

Thames-Side Park, TQ 467827

Ex-industrial land now partly managed for nature conservation. One of the few orchid sites so close to the City of London. A rare lichen formerly thought to have a north-western distribution has been recorded. There is an important winter roost of fieldfares.

3. LONDON BOROUGH OF REDBRIDGE**Claybury Hospital Woods, TQ 435912**

An extensive area of ancient woodland dominated by hornbeam and oak, with a diverse ground flora including *Luzula forsteri*. There is a rich avifauna and a number of uncommon and rare species. An old badger sett was 'dug out' in 1980.

Wanstead Park, TQ 416875

Although most of the woodland areas are now destroyed, the Park is important for two particularly rare fungi, *Psilocybe cyanescens* and *Agaricus variegans*, and still supports a range of habitats including dry grassland, rough damp grassland with scrub invasion and a series of large pools.

4. LONDON BOROUGH OF WALTHAM FOREST

This borough contains a number of fragments of old Epping Forest. Most contain ancient woodland of at least moderate quality, and are of considerable conservation interest. To avoid weighting down the list with a series of Epping Forest localities, and since the better parts of the southern Forest fall within the boundaries of the proposed S.S.S.I. and their value is thereby already recognised in a broad sense, we have omitted mention of these areas, except for Leyton Flats which has certain unique features.

Walthamstow Marshes, TQ 350877

A relict area of the formerly extensive marshes in the Hackney/Walthamstow district. Despite a period of neglect, the marshes have retained their character very well, with minimal scrub invasion.

Leyton Flats, TQ 395885

Relict heathland with birch scrub and an important wetland area with *Salix*-dominated margins, in which grows the rare fungus *Russula laccata*.

5. LONDON BOROUGH OF NEWHAM**Cuckold's Haven and Barking Creek, TQ 441831 and TQ 451827**

Two sites on the west bank of the River Roding, separated by the A13 road running from east to west. Both contain large reed-beds, relics of the formerly extensive areas of this habitat along the Thames and its tributaries, bordered by old covered tipping sites supporting interesting ruderal communities. The reed-beds support elements of the now very restricted associated invertebrate fauna and some local plants. Cuckold's Haven, the more northerly of the two sites, is currently proposed for a nature reserve by the London Borough of Newham; south of the A13, Barking Creek is entirely within the Beckton Sewage Treatment Works under the ownership of the Thames Water Authority.

Thames Wharf and the Limmo Peninsula, TQ 391811

An area of former British Rail land at the mouth of the River Lea, in the extreme west of the borough. An extensive ruderal plant community with areas of scrub, bordered by tidal mud with halophytes, together with a small creek.

Gallions Hotel Area, TQ 440810

A very extensive area on the site of the old Beckton Gasworks. The varied and unusual character of the substrate supports a diverse ruderal flora including calcicoles, sizeable areas dominated by the lichen *Cladonia*, and areas of birch/sallow scrub. Wetland is provided by shallow lagoons and a disused canal.

Species Selection

It will be immediately apparent from the list that some groups of organisms are less well represented than others. Higher plants, for example, have received the attentions of the recorders of the London Natural History Society and the Essex Field Club over many years, and it is consequently relatively rare to obtain new and interesting records. Invertebrate groups, with the exception of the Lepidoptera, are particularly poorly recorded however. The Coleoptera, for example, contain approximately 4,000 British species many of which are difficult to identify. In the present work, we list seven species new to vice-county 18 (South Essex), of which three are new to vice-county 19 (North Essex) also. A further two species listed here are new to Britain, though one of these was captured three years before the current survey began, and was brought to us for identification. Amongst the invertebrates as a whole, we list 18 new to the southern vice-county, of which 12 are new to the northern vice-county also, as well as a number of second and third county records.

List of Particularly Noteworthy Species Recorded During the Study Period

All records relate to 1984 unless otherwise stated.

THE FLORA

Lichens

Hypogymnia physodes (L.) Nyl.

Leyton Flats, TQ 395885, 9 March. On a dead *Salix* log. Apparently a rare lichen in the urban area.

Stereocaulon vesuvianum Pers.

Thames-side Park, TQ 467827, 20 October 1983. On charcoal of old bonfire site. **New to Essex**, although now recognised as probably having been overlooked in the past, with more recent records from Canvey Island and Westcliffe-on-Sea.

Mosses

Aulacomnium palustre (Hedw.) Schwaegr.

Eastbrookend, TQ 514858. A declining species now rare in Essex. Usually characteristic of acid wetlands.

Higher Plants

Geranium rotundifolium L.

Victoria Dock, TQ 410808, 31 July. Burton (1983) lists only 35 tetrads in the London area. This species has increased considerably since the hot summer of 1976.

Chenopodium ambrosioides L.

Bromley-by-Bow Gas Works, TQ 383819, 21 September. A well established colony of this normally rare alien.

Cynodon dactylon (L.) Pers.

Bromley-by-Bow Gas Works, 21 September. Listed as rare in the British Red Data Book (Perring and Farrell, 1983).

Atropa belladonna L.

Limmo Peninsula, TQ 391811, 15 August; Ingrebourne Marsh scrub area, 2 July. An uncommon plant in Essex. In London, Burton (1983) shows it predominantly on the chalk in Kent and Surrey, with casual records elsewhere.

Apium graveolens L.

East Ham, (OS 2 on the East Ham District Plan), TQ 435849, 4 July; Cuckold's Haven, River Roding, TQ 441831, 26 October; Thames Wharf and Limmo Peninsula, 15 August. An uncommon species, characteristic of the tidal creeks of the area.

Oenanthe crocata L.

Eastbrookend, TQ 514858, 10 July; Cuckold's Haven, 22 June; Limmo Peninsula/Thames Wharf, 15 August. A predominantly south-western species, rare in the London area.

Bidens connata Muhl. ex Willd.

City Mill Area, TQ 380835, 10 September. **New to Essex.** A spreading species, found in a canal near the border with Middlesex.

Ononis spinosa L.

Eastbrookend, 28 August. A new ten-kilometre square record.

Trifolium subterraneum L.

Long Pond, Belhus Park, Aveley, TQ 574819, 12 June. On sandy soil at the edge of the pond, adjacent to the M25 motorway. The only recent Essex record in the London area. This site has now been bulldozed.

Trifolium striatum L.

Growing with *T. subterraneum* above. An uncommon plant in the London area.

Astragalus glycyphyllos L.

Warren Farm Chalk Pit, TQ 600790, 2 December. West Thurrock Chalk Pit, TQ 570787, 16 August. In the London area this plant appears to be generally uncommon. The only previous published South Essex records would appear to relate to observations in the Thurrock area in 1964 (Burton 1983).

THE FAUNA

Mollusca

GASTROPODA — snails

HYDROBIIDAE

Pseudamnicola confusa (Frauenfeld)

Cuckold's Haven, River Roding, TQ 441831, 3 July (Harris, in press). An extremely rare snail of brackish water, known only from six other ten-kilometre squares nationally since 1950. Prior to that year there are records from ten other ten-kilometre squares, of which five relate to the Thames estuary. None of these refers to this site. It had been thought extinct in the Thames since about 1899. All other sites nationally are threatened (Kerney, pers. comm).

Crustacea

ISOPODA — woodlice

PORCELLIONIDAE

Trachelipus rathkei (Brandt)

Ingrebourne Marsh, TQ 532834, 15 November. Found under dead wood on waterlogged field; Waterworks Wood, TQ 391910, 26 February 1985, in damp situation. Only noted from 21 ten-kilometre squares nationally since 1960, (Harding 1976). **New to Essex.**

LIGIDAE

Ligidium hypnorum (Cuvier)

Ingrebourne Marsh, TQ 532834, 14 November. Living in a damp situation

among leaves. **New to South Essex**, this is only the second record for the county as a whole, and the first post-1960 observation (Harding 1976).

ARMADILLIDIDAE

Armadillidium nasatum Budde-Lund

Ingrebourne Marsh, TQ 532834, 2 July. A relatively uncommon woodlouse, noted nationally from only 27 other ten kilometre squares (Harding 1976). This would appear to be **New to South Essex**.

Insecta

DIPTERA

TIPULIDAE — crane-flies

Tipula helvola Loew.

Warwick Wood, Aveley, TQ 558829, 18 July. A rare crane-fly of dry woodland in southern England, also reported from the Dolgellau area of Wales (A. E. Stubbs, pers. comm.).

Erioptera hybrida (Mg.)

Eastbrookend, TQ 514858, 18 July. An uncommon wetland crane-fly.

CECIDOMYIDAE — gall midges

Oligotrophus annulipes (Hartig)

Wanstead Park, TQ 416875, September. Galls of this normally uncommon fly were found abundantly on *Fagus* during the autumn.

STRATIOMYIDAE — soldier flies

Vanoyia tenuicornis Macquart

Ingrebourne Marsh, TQ 540835, 26 July; Berwick Pond, TQ 540835, 28 June. A rare wetland species.

Nemotelus nigrinus Fallen

Eastbrookend, TQ 514858, 6 July. An uncommon wetland species.

Oplodontha viridula (Fabricius)

Eastbrookend, TQ 514858, 6 July. An uncommon wetland fly.

MUSCIDAE

Ophyra capensis (Wied.)

Royal Albert Dock, TQ 430805, 1 August. Four individuals were taken out of doors in the dock. This species is normally associated with chicken-houses, and is rarely found in the open.

CERATOPOGONIDAE

Sphaeromyias pictus det. prov.

Eastbrookend, TQ 514858, 11 July. A specimen from this site keys to this species and is **New to Essex**. However, the only key to this group of flies is now over eighty years old and several new species not included therein have been added to the British list since publication. Accordingly, judgement is reserved until the insect has been critically examined.

MYCETOPHILIDAE — fungus flies

Sciophila nigronitida Landrock

Thameside Park, TQ 467827, 17 April (coll. A. R. Plant). **New to Essex**.

SYRPHIDAE — hoverflies

Platycheirus fulviventris (Macquart)

Eastbrookend, TQ 514858, 23 September; Wanstead Park, TQ 416875, 16 July. Widespread but apparently only locally common in Essex.

Neoascia geniculata (Meigen)

Hornchurch airfield, TQ 536847, 25 July. **New to Essex.**

Eristalis abusivus Collin

Eastbrookend, TQ 514858, 6 July. Second published Essex record (*vide* Payne 1984). Swept from vegetation. We understand however, that D. A. Smith has some unpublished Essex records of this hoverfly from coastal areas of the county.

Triglyphus primus Loew

Thameside Park, TQ 467827, 25 September (coll. I. Wynne). Second Essex record. Taken at umbellifer flowers amongst rank grasses.

Syrphus vitripennis/ribesii

St Mary's N.R. East Ham, TQ 429823, 8 October. This specimen, a female, has characters of both species, resembling *vitripennis* more closely than *ribesii*. The femora are narrowly tipped yellow and adorned with numerous black hairs. The microtrichia on the basal cells of the wings do not however conform to the published descriptions.

NEUROPTERA — lacewings

HEMEROBIIDAE

Micromus paganus (L.)

Warwick Wood, TQ 558829, 4 June; (also in Wanstead Park, TQ 416875, 31 May 1983). Apparently uncommon in Essex, although this is probably due to under-recording. It is usually found in association with elder *Sambucus* in old hedgerows.

Sympherobius pygmaeus (Rambur)

Cranham N.R., TQ 573855, 27 June. Like *M. paganus* no doubt under recorded, this brown lacewing appears most uncommon in Essex. It is allegedly confined to oak trees, but is certainly absent from a number of apparently suitable areas in Essex.

Psectra diptera (Burmeister)

Aveley Clay Pit, TQ 559812, 27 June. Apparently **New to Essex**. This peculiar lacewing, with its vestigial hind wings, is probably poorly recorded rather than rare. This individual was taken amongst mosses and low vegetation whilst the captor was employing the time-honoured collecting technique of 'grovelling' — lying on one's belly, systematically searching through vegetation. It is of interest that examples of this species captured during 1984 at Monks Wood and Arundel were also taken by 'grovelling' on the ground. It could well be that the species is overlooked by neuropterists for this reason!

CHRYSOPIDAE

Chrysopa commata Kis and Ujhelyi

Thameside Park, TQ 467827, 3 July, (coll. A. R. Plant). **New to Essex**, although this insect has only been recognised as a distinct species in this country in recent years.

RAPHIDIIDAE

Raphidia notata Fabricius

Cranham N.R., TQ 573855, 27 June. Apparently quite scarce, although in practice it is probably a resident of the tops of oak trees, coming down only after a high wind.

ORTHOPTERA — grasshoppers and crickets

TETTIGONIIDAE

Metrioptera roeselii (Hagenbach) — Roesel's bush cricket

This distinctive bush cricket is typically restricted to areas of lush grass in moist

locations. It is geographically restricted to northern Kent, southern Essex, parts of Middlesex along the Thames and along the coast of Suffolk. There are isolated records from Spurn Point, mid-Wales (on the coast) and the Isle of Wight, with a single record in Eire. During 1984 an inordinately large proportion of the population was comprised of the normally rare macropterous form *diluta* (Charpentier), and the species as a whole was widely reported from new areas and in dry habitats.

ODONATA — dragonflies

LIBELLULIDAE

Sympetrum nigrescens/striolatum?

Warley Hall Wood, TQ 601889, 25 June. A nymph from the pond in this wood runs to *S. nigrescens* using A. E. Gardner's key in Hammond (1983), on the basis of a distinct straight spine on the mid-line of tergite 4. *S. nigrescens* however, if indeed this is a distinct species and not a form of *S. striolatum*, is confined to the western highlands of Scotland, Mid-west coastal Ireland and the west coast of Norway. This nymph is therefore presumably *striolatum*, and Gardner's key, which, for the purpose of this particular couplet, was based on the examination of five individuals from one pond, must be regarded as unreliable in separating the nymphs of these two species.

HETEROPTERA — true bugs

RHOPALIDAE

Rhopalus subrufus (Gmelin)

Brick Kiln Wood, Aveley, TQ 571822, 16 August. Few previous county records.

LYGAEIDAE

Drymus latus (Douglas and Scott)

Dog Kennel Hill, TQ 480925, 13 September; Bully Fen, TQ 375854, 25 July; Beckton — Gallions Hotel Area, TQ 440810, 4 October. A rarely recorded species of the southern counties. Two of the sites from which it has been recorded during the survey are on derelict land.

BERYTINIDAE

Berytinus hirticornis (Brulle)

Berwick Gravel Pits, TQ 560837, 29 June. First recorded in Essex earlier during 1984, this species is spreading rapidly throughout the south-east of the country.

MIRIDAE

Deraeocoris olivaceus (Fabricius)

Bird Lane, TQ 568888, 25 June. A rarely recorded species beaten from Hawthorn. Second Essex record.

LEPIDOPTERA — butterflies and moths

We have not included any notes on butterflies or moths in this work since a review by one of us of the Lepidoptera of the whole of the London area during 1983/1984 appears elsewhere in this volume of *The London Naturalist*.

HYMENOPTERA

FORMICIDAE — ants

Ponera coarctata (Latr.)

Aveley Clay Pit, TQ 559812, 30 August; Hackney Sewage Works, (precisely on the Essex/Middlesex boundary), TQ 359865, 23 October. **New to Essex.** A rather locally distributed ant known only from southern Britain, where it is recorded from 23 ten-kilometre squares (Barrett 1979).

COLEOPTERA — beetles

CARABIDAE

Demetrius imperialis (Germar)

Cuckold's Haven, TQ 441831, 22 June; Berwick Pond, TQ 540835, 28 June; Ingrebourne Marsh, TQ 532834, 25 October. Formerly widespread in the fens and marshes of East Anglia and the Thames basin, this species then declined dramatically but is now increasing and expanding its range (M. L. Luff, pers. comm.).

LEIODIDAE

Leiodes flavicornis (Brisout)

Ingrebourne Marsh, TQ 532834, 2 July. A rare beetle with extremely few records. Like other members of the genus it is probably associated with underground fungi.

TROGIDAE

Trox scaber (Linnaeus)

Warwick Wood, TQ 558829, 18 July. Very local though possibly under-recorded. Associated with animal remains and birds' nests.

ELATERIDAE

Stenagostus villosus (Fourcroy)

Warwick Wood, TQ 558829, 18 July. A very local click beetle.

CANTHARIDAE

Cantharis pallida Goeze

Berwick Pond, TQ 540835, 28 June. Very local though possibly under-recorded. This species was formerly confused with another cantharid, *C. cryptica*, described new to science in 1947 (Ashe 1946 and 1947), which is abundant and widely distributed.

Rhagonycha lutea (O. F. Muller)

Bonus Wood, Cranham, TQ 577854, 27 June; Berwick Pond, TQ 540835, 28 June; Debden Garden, TQ 438982, 3 July. An uncommon species though widely distributed in England, found mainly in woodland and wetland habitats.

Rhagonycha translucida (Krynicky)

Foreberry Wood South, TQ 495928, 20 June. Second Essex record. A rare species with very few records though widely distributed in Britain. Generally associated with woods and wood margins.

Silis ruficollis (Fabricius)

Berwick Pond, TQ 540835, 28 June. A very restricted species but not uncommon where it occurs. Characteristic of wetland habitats.

ANOBIIDAE

Dorcatoma flavicornis (Fabricius)

Leyton Flats, TQ 395885, 24 July. An extremely local and rarely recorded beetle, associated with dead wood.

CLERIDAE

Opilo mollis (Linnaeus)

Ingrebourne Marsh, TQ 532834, 25 October. A particularly uncommon beetle with extremely few records. Taken in its typical habitat under willow bark.

MELYRIDAE

Axinotarsus marginalis (Laporte de Castelnau)

Bird Lane Wood, TQ 568888, 25 June. **New to Essex**, and at sixteen other localities. First discovered in Britain in 1966 (Allen 1971) this species is expanding its range rapidly.

Axinotarsus ruficollis (Olivier)

Dagnam Park, TQ 550930, 3 August. A very local species occurring in similar habitats to *A. marginalis*. However, only recorded from this one site in South Essex during 1984.

NITIDULIDAE

Pria dulcamarae (Scopoli)

Royal Albert Dock, TQ 430805, 1 August. Appears to be very restricted, though possibly under recorded. Associated with Solanaceae.

SPHINDIDAE

Sphindus dubius (Gyllenhal)

Running Water Wood, TQ 566825, 22 August. Very local and rarely recorded. Occurs in fungi on trees.

CRYPTOPHAGIDAE

Henoticus serratus (Gyllenhal)

Tomkyns Lane, TQ 567896, 25 June; Knighton Wood, TQ 409931, 29 August; Pole Hill, Chingford, TQ 386953, 10 November. An extremely restricted species occurring in fungi, under bark and along woodland margins. Formerly regarded as a great rarity, this species appears to have increased somewhat in recent years.

COCCINELLIDAE

Coccidula scutellata (Herbst)

Berwick Pond, TQ 540835, 29 June; Eastbrookend, Dagenham, TQ 514858, 6 July; Belhus Park Gravel Pits, TQ 571825, 22 August. Associated with wetland habitats particularly lake margins and ditches. Its centre of distribution in Britain appears to be the East London Basin, outside of which records are few.

Stethorus punctillum (Weise)

Manor Park, TQ 429851, 1 July; St Mary's Nature Reserve, East Ham, TQ 429823, 8 August; Limmo Peninsula, TQ 391811, 25 September; Gallions Hotel, TQ 440810, 4 October. A very small and probably easily overlooked coccinellid. Uncommon but probably under recorded. Fowler (1891) associates this species with *Humulus lupulus* (hop), from which it was taken in numbers at St Mary's Nature Reserve, East Ham. At other sites the species was swept or taken at m.v. (mercury vapour) light.

Adonia variegata (Goeze)

Eastbrookend, Dagenham, TQ 514858, 6 July, and at 14 other sites. Restricted mainly to the London basin, this species is generally regarded as extremely scarce elsewhere. It is well established in metropolitan Essex and the recorded sites include a number containing derelict land.

TENEBRIONIDAE

Prionynchus ater (Fabricius)

Bower Wood, Havering, TQ 515924, 14 August. A large and conspicuous beetle of very local occurrence in southern and central England. Associated with dead wood, particularly crumbling wood and leaf-mould in rotten hollows.

SALPINGIDAE

Lissodema cursor (Gyllenhal)

Dagnam Park, TQ 550930, 3 August. An extremely rarely recorded beetle, associated with dead wood at the tops of trees, particularly ash.

ADERIDAE

Aderus oculatus (Paykull)

Upminster Wood, TQ 568886, 25 June, (second Essex Record); Dagnam Park, TQ 550930, 3 August; Hainault Forest, TQ 475935, 9 August. An extremely

uncommon beetle, formerly regarded as a great rarity but with more records in recent years. Larvae develop in dead wood.

Aderus populneus (Creutzer)

Aveley Clay Pit, TQ 559812, 30 August. Occurs in similar habitats to *A. oculatus* but appears to be less common.

CERAMBYCIDAE

Arhopalus rusticus (Linnaeus)

Bower Wood, Havering, TQ 515924, 14 August. Second Essex record. Although largely a northern species, this longhorn is being recorded increasingly from more southern parts of Britain. Associated with a variety of trees, although chiefly found on pine stumps.

Phytoecia cylindrica (Linnaeus)

Cranham Marsh Nature Reserve, TQ 573855, 27 June. A very uncommon longhorn of southern and central England.

CHRYSOMELIDAE

Phyllotreta aerea Allard

Limmo Peninsula, TQ 391811, 15 August. A very uncommon flea-beetle associated with crucifers.

Epitrix pubescens (J. D. W. Koch)

Warley Hall Wood, TQ 601889, 25 June, and at ten other sites. Usually regarded as very local, this beetle appears to have increased during the last three years. Associated with Solanaceae.

Cassida prasina Illiger

Eastbrookend, Dagenham, TQ 514858, 6 July. An extremely local tortoise-beetle with very few records. Associated with *Cirsium* spp.

Cassida vibex Linnaeus

Havering-Atte-Bower, TQ 499926, 20 June; Warley Hall Wood, TQ 601889, 25 June; Hornchurch Airfield, TQ 536847, 20 July. Although widely distributed in central and southern England, this is a very local species, associated with *Cirsium* spp. (Cox 1976).

ANTHRIBIDAE

Bruchella rufipes (Olivier)

Gallions Hotel Area, TQ 440810, 2 October, **New to Britain** (Hyman in press). Larvae and adults on *Reseda lutea*.

APIONIDAE

Apion semivittatum Gyllenhal

Bully Fen, TQ 375854, 29 August, Second Essex record; garden at East Ham, TQ 430828, 30 September; Gallions Hotel, TQ 440810, 4 October. A very local weevil, on *Mercurialis annua*.

Apion urticarium (Herbst)

Ingrebourne Marsh, TQ 532834, 2 July, **New to South Essex**; Eastbrookend, Dagenham, TQ 514858, 28 August. On *Urtica dioica* and possibly also *U. urens*. A widespread species, but local and infrequently recorded.

Apion confluens W. Kirby

Hornchurch Airfield, TQ 536847, 26 August; Royal Victoria Docks, TQ 407805, 31 July; Limmo Peninsula, TQ 391811, 15 August; Eastbrookend, Dagenham, TQ 514858, 28 August; Gallions Hotel, TQ 440810, 4 October. **New to Essex**. A local species which may be common where it occurs. Associated with *Tripleurospermum inodorum* and *Matricaria* spp.

CURCULIONIDAE

Otiorhynchus aurifer Bowman

Harold Hill, TQ 533923, 12 September 1978 (in captor's living room), 19 June 1981 and 28 August 1981; Dagnam Park, TQ 550930, 19 April 1980, **New to Britain** (Hyman, in prep.). Resembles the common vine weevil *O. sulcatus*, except for the absence of the femoral teeth on the mid and hind legs. All the specimens were collected by D. A. Smith, and identified for us during 1985 by R. T. Thompson at the British Museum (Natural History). Clearly there exists an established population in this area, presumably arising from an introduction. The species is native to Italy, Algeria and Turkey.

Otiorhynchus raucus (Fabricius)

Berwick Gravel Pits, TQ 541840, 29 June. An extremely scarce weevil, rarely recorded. Here taken by grubbing at the roots of plants in a dry, sandy area, probably the typical habitat for the species.

Hypera fuscocinerea (Marsham)

Berwick Pond, TQ 540835, 29 June. A very local species, which according to Fowler (1891) is associated with Leguminosae.

Ceuthorhynchidius barnevillei Brisout

Hornchurch Airfield, TQ 536847, 20 July. **New to South Essex**, Second Essex record. Extremely local and rarely recorded. Occurs on *Achillea millefolium*.

Ceutorhynchus resedae (Marsham)

Hornchurch Airfield, TQ 536847, 20 July, **New to South Essex**. Very local and rarely recorded. Occurs on *Reseda luteola*.

Ceutorhynchus turbatus Schultze

Ingrebourne Marsh, TQ 532834, 2 July. This weevil was added to the British list in 1951 (Henderson 1951) from a short series taken at Mucking, Essex on 30 June (one specimen subsequently determined as *C. turbatus* was taken prior to this at Benfleet, Essex by R. D. Weal on 17 April 1949). Since its discovery, the weevil has spread rapidly in conjunction with its sole host-plant, *Cardaria draba*, a species thought to have been introduced into this country in 1809 in the bedding of sick troops from the Walcheren expedition.

Rhinoncus inconspicuous (Herbst)

Debden Garden, TQ 438982, 3 July. **New to South Essex**. (6 other records). Local but may be common where it occurs. Associated with *Polygonum* spp.

Drupenatus nasturtii (Germar)

Ingrebourne Marsh, TQ 532834, 28 July. A very local weevil occurring on *Nasturtium officinale* in slow-flowing streams.

Baris picicornis (Marsham)

Limmo Peninsula, TQ 391811, 25 September; Gallions Hotel, TQ 440810, 2 October. Very local though may be common where it occurs. Associated with *Reseda lutea*.

Sibinia arenariae Stephens

Royal Victoria Dock, TQ 407805, 31 July; Royal Albert and King George V Docks, TQ 430805, 1 August. Very local though often abundant where it occurs. Associated with Caryophyllaceae.

Mecinus janthinus Germar

Berwick Pond, TQ 540835, 29 June; Northern Outfall Sewer, TQ 372838, 2 August; Eastbrookend, Dagenham, 514858, 28 August; Gallions Hotel, TQ 440810, 4 October. Described new to Britain from Dartford, North-West Kent (Allen 1948), this distinctive species has rarely been recorded since. Its

occurrence at four localities within the G.L.C. area, plus an additional site outside this area near Grays (TQ 566787), suggests that it may be expanding its range. It is associated with *Linaria* spp.

Gymnetron collinum (Gyllenhal)

Limmo Peninsula, TQ 391811, 25 September. **New to Essex.** Rare. There are very few records for this extremely uncommon weevil. It may have a very short duration in the adult state or be almost totally confined to the roots of its host-plants *Linaria* spp.

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Lice of the Grey Squirrel *Sciurus carolinensis* Gmelin in Epping Forest

by K. R. SNOW*

No previous study has been made to determine the lice (Insecta: Anoplura) parasitising grey squirrels in Epping Forest, Essex. A survey was therefore carried out to gather information on the species of lice present on Epping Forest grey squirrels and their prevalence.

During September 1982 to January 1983 and November 1983 to March 1984, 30 grey squirrels were examined for ectoparasites. They were obtained from five areas in Epping Forest: Ambersbury Banks, Leyton Flats, Pole Hill, Sewardstonebury and Woodbury Hollow. Within minutes of collection by shooting, individual squirrels were placed in numbered polythene bags together with a large swab of cotton wool soaked in chloroform. In the laboratory the squirrels were sexed and examined for ectoparasites using a modification of Hopkins' technique (Hopkins, 1949). This entailed skinning the squirrels, cutting the skins into portions and dissolving these in 5% potassium hydroxide solution overnight. After neutralisation of the medium with 10% acetic acid, the ectoparasites were recovered by filtration and visual examination of the maceration fluid under a dissecting microscope. Ectoparasites were transferred to 70% alcohol, identified and their numbers recorded. Specimens requiring examination under higher magnification were dehydrated in graded alcohols, cleared in clove oil and mounted in Canada balsam.

Three species of louse were recorded from all sites: *Enderleinellus longiceps* Kellogg and Ferris 1915, *Hoplopleura sciuricola* Ferris 1921 and *Neohaematopinus sciuri* Jancke 1931. Of the 30 squirrels examined (15 males and 15 females), a total of 3,554 lice were recovered, a mean of 118.5 per squirrel. Of these 1,758 were *N. sciuri*, 932 *E. longiceps* and 864 *H. sciuricola*. All hosts were infested with *N. sciuri*, while 26 squirrels (86.7%) were parasitised by *E. longiceps* and 25 (83.3%) by *H. sciuricola*. Slightly higher densities of all three species of lice were recorded from males compared with females, but this was not considered to be significant. Although heavily infested with lice no pathological conditions were apparent.

In a survey of the grey squirrel parasites in the Reading area, Jawdat (1975) recorded *N. sciuri* on 15.5% of the hosts examined with the highest infestation in the winter (42%) and the lowest in the spring (4.75%). This survey revealed no other species of lice. More recently, grey squirrels from the Delamere Forest, Cheshire were examined by Britt and Molyneux (1979). Lice recorded included *N. sciuri* and *E. longiceps*. However, *H. sciuricola* has subsequently been recorded from the area, although in low densities (D. P. Britt, personal communication). General accounts of grey squirrel parasites report no other species of louse on this host. Thus Blackmore and Owen (1968) list the three species found in the present study while Keymer (1983) reports only *N. sciuri* in his investigations of squirrel diseases.

The following key has been constructed to aid the identification of the three species of louse recorded on grey squirrels in Britain. Drawings illustrating specific characters used in the key are shown in Figures 1 and 2.

For detailed descriptions of these species and further taxonomic features, reference should be made to Ferris (1919, 1921) and Jancke (1932).

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Key to the lice of the grey squirrel

1. Setae from posterior abdominal segments about half body length (Fig. 1b). Third abdominal segment with a pair of characteristic ventral plates. Four pairs of pleural plates (on abdominal segments 2-5); 3 pairs of spiracles (on pleural plates 2-4). Body length of adult approximately 0.8mm *Enderleinellus longiceps*
 - Setae from posterior abdominal segments approximately one sixth body length (Fig. 1a). Third abdominal segment lacking ventral plates. Seven pairs of pleural plates (on abdominal segments 2-8); 6 pairs of spiracles (on pleural plates 2-7). Body length of adult greater than 1mm 2
2. Third pair of legs much larger than second pair (Fig. 1c). 6th (last) abdominal spiracles either absent or very much smaller than first 5 pairs. Sternal sclerites on abdominal segments 2 and 3 extend to meet the corresponding pleural plates. Second abdominal tergum of male lacking posterior projections. Abdominal setae lanceolate (Fig. 2a)...
 - *Hoplopleura sciuricola*
 - Third pair of legs either slightly larger than second pair or of a similar size (Fig. 1a). All 6 pairs of abdominal spiracles small and of similar size. Sternal sclerites on abdominal segments 2 and 3 not extended to meet corresponding pleural plates. Second abdominal tergum of male with a pair of posterior projections. Abdominal setae simple (Fig. 2b)...
 - *Neohaematopinus sciuri*

FIG. 1. Characters of squirrel lice used in their identification.

- (a) *Neohaematopinus sciuri* male, dorsal view showing the 7 pairs of pleural plates (P), the short trailing setae (S) and the posterior projections on abdominal tergum II (T).
- (b) *Enderleinellus longiceps* male, dorsal view with position of paired ventral plates indicated (V). The long trailing setae (S) and 4 pairs of pleural plates (P) are also indicated.
- (c) *Hoplopleura sciuricola* ventral, showing enlarged third pair of legs and extended sternal sclerites of abdominal segments II and III (SC).

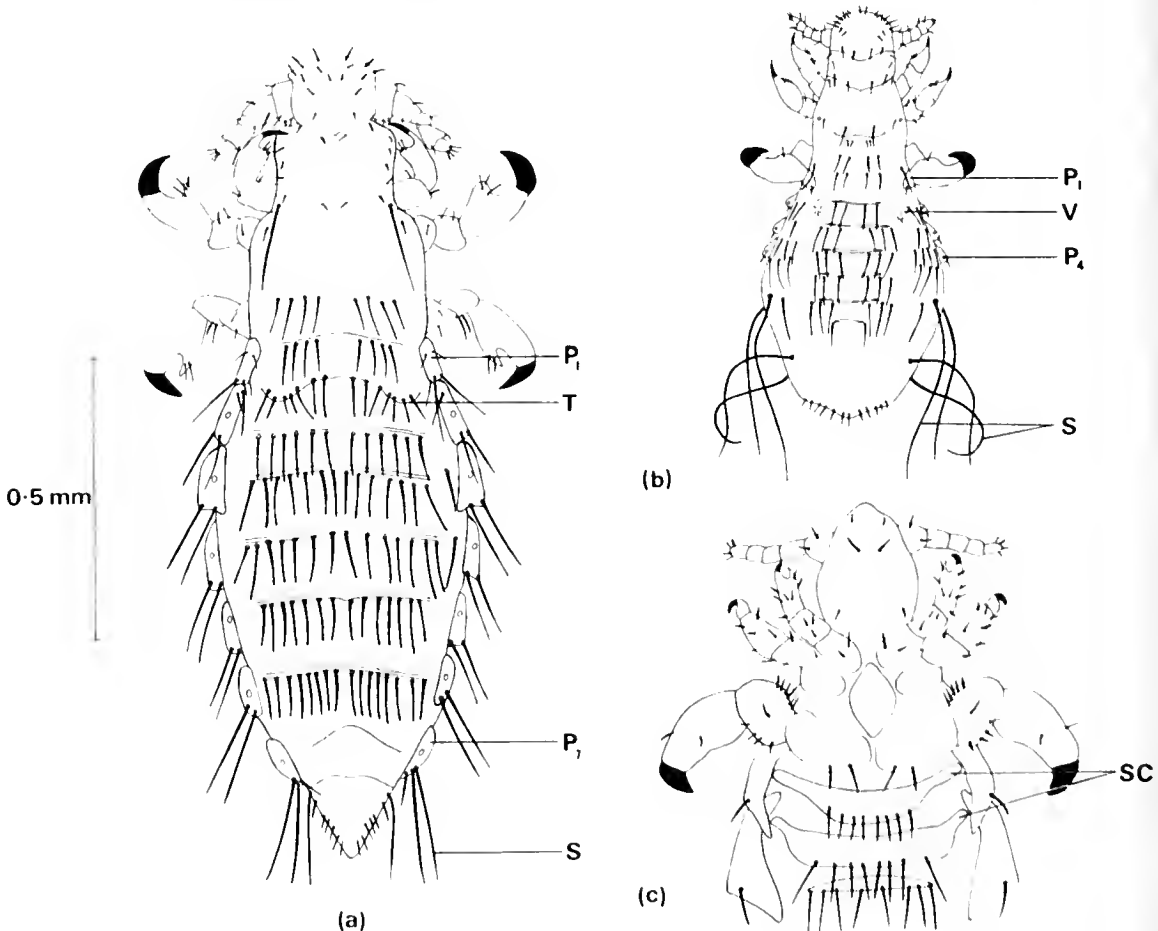
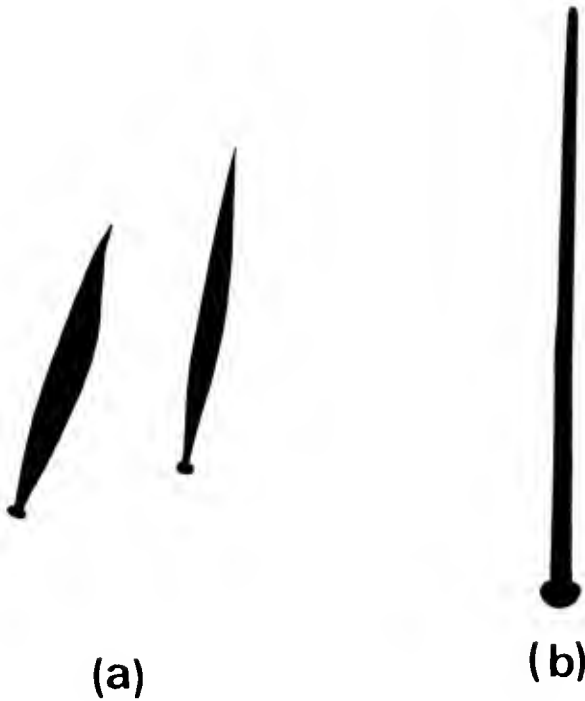


FIG. 2. Abdominal setae. (a) *H. sciuricola*. (b) *N. sciuri*.

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Book Review

Grasshoppers and Crickets of Essex. A Provisional Atlas. Essex Biological Records Centres Publication No. 3. Colchester and Essex Museum. 1984. 26 pp. A4. Not priced. ISBN 0 9501 781 4 4, ISSN 0265 5926.

As a group to record, grasshoppers and crickets have the great advantages of being large, often conspicuous, reasonably easy to identify, and few in number. As such they are ideally suited to a mapping scheme, which should be able to produce a meaningful picture of a county distribution in a short time with relatively few recorders.

To judge from the maps, the production of this preliminary atlas is timely: the maps give a good indication of the relative status and distribution of the species, but make apparent the gaps in the knowledge of the group. Hopefully the appearance of this publication will stimulate further recording work in the neglected areas.

One of the advantages of working with a small group is that it has been possible to include explanatory notes and comments alongside the maps, within the confines of a small volume. Particularly useful is the inclusion of Roger Payne's key to the Essex species. This, together with brief introductory sections on biology and recording techniques, enables the atlas to be used as a complete guide for the recorder of grasshoppers and crickets in the county. Though loath to offer criticism of such a conceptually excellent volume, I feel a few comments are worth making.

The key has been designed to cover only species already recorded in Essex. This simplifies keying, but its wisdom is open to doubt. The groundhopper *Tetrix ceperoi*, for example, is a coastal species recorded from the southern counties round to Kent. It is not beyond the bounds of possibility that this species will eventually be found in Essex, but using the key in the atlas it would be overlooked as *T. subulata*. The number of species of British grasshoppers and crickets not recorded from Essex is not large and their inclusion, with appropriate annotation, would avoid the danger of potentially exciting species being overlooked.

In keying groundhoppers, it might be viewed as somewhat perverse to split groundhoppers from the majority of grasshoppers in an early couplet on the basis of wing length and to relegate their most obvious character, the enormously elongate pronotum, to a later couplet.

The illustrations to the key are very helpful, but I feel that some at least would benefit from reduction in size; this would also leave space for more of them. The use of insects in life-like poses against natural backgrounds in the line drawings of whole animals enhances the aesthetic appeal of the guide, but detracts from their usefulness for identification purposes and is expensive of space: a greater number of species illustrated in standardised positions would have been more useful.

In the description of the meadow grasshopper on page 24, the words 'male' and 'female' have been transposed in the sentence on wing length.

The greenhouse camel cricket *Tachycines asymorus* is omitted from both the key and text, though it is recorded from Essex in Ragge (1965).

Further information on the age of some of the records would have been helpful, especially for such species as the mole cricket which lack recent records.

These criticisms are not intended to imply that the faults they consider detract in any serious way from the value of the publication. Its compiler, Mr Wake, and all others involved in its production are to be congratulated on producing an informative guide with a pleasing format. It is to be hoped that the extra recording effort it will no doubt stimulate will quickly lead to a more definitive volume with more detailed information.

Reference

RAGGE, D. R. 1965. *Grasshoppers, Crickets and Cockroaches of the British Isles*. Warne, London.

P. KIRBY

Also received:— *The Neuroptera [and Mecoptera] of Essex*. Essex Biological Records Centre, Passmore Edwards Museum, London E15 4LZ. 1985. 9 pp. A4. [Ed.]

A Review of the Lepidoptera of the London Area for 1983 and 1984

by C. W. PLANT*

Introduction

As with my review of 1981 and 1982 I have separated out the records into three groupings: butterflies, Microlepidoptera and Macrolepidoptera. These are purely artificial divisions of course, intended to make the records more easily accessible to the reader. I have treated the more noteworthy butterfly records in systematic order, whilst under each of the two moth headings records are grouped under the usual vice-county headings. It should be pointed out that in my earlier review (Plant 1983), records from Potters Bar were erroneously placed under the Hertfordshire heading. The boundaries we use for recording are of course the Watsonian Vice-Counties, and bear no relation to the current administrative boundaries. Accordingly, the records from Potters Bar should be correctly placed under the Middlesex heading.

By far the most outstanding event of the period under review here was the immigration of Lepidoptera which took place into Britain during the first year. Huge numbers of the regular migrants such as painted ladies *Cynthia cardui* and red admirals *Vanessa atalanta* were supplemented by sightings of normally less common species. Clouded yellows *Colias croceus* were abundant from June to October and included a handful of f. *helice* of the female, and there were sightings of Camberwell beauties *Nymphalis antiopa* and large tortoiseshells *N. polychloros*, the latter normally being extremely rare in our area. A large number of migrant moths included the cosmopolitan *Mythimna loreyi* at Reigate, apparently new to the London area. A death's head hawk *Acherontia atropos* was noted in the Inner London area, as also was the convolvulus hawk *Agrius convolvuli*, also noted in Surrey, and there were at least six humming-bird hawks *Macroglossum stellatarum*. Other migrants of note included the great brocade *Eurois occulta* and the Clifden nonpareil *Catocala fraxini* representing the noctuids, the gem *Orthonama obstipata*, Blair's mocha *Cyclophora puppillaria* and the vestal *Rhodometra sacraria* representing the Geometridae, and *Daraba laisalis* (second British record) and *Maruca testulalis* representing the pyralids.

By contrast however, the following year was an extremely poor one for migrants. There was only a single sighting of the painted lady for the entire area, and I am informed that there were no more than about thirty reported for the whole country during the year. A single vestal appeared at Hampstead Heath in September, in a week when others were seen elsewhere in Britain. No records of red admirals were received. As if to make up for this particular lack of interest, some of the resident species made some spectacular appearances. Blair's shoulder knot *Lithophane leautieri* for instance, was abundant in a wide number of localities in Surrey, West Kent and South Essex, although surprisingly it was not reported from the other vice-county areas. The insect was only recognised as British as recently as 1951 (Owen 1981). Two of its congeners, the grey shoulder knot *L. ornitopus lactipennis* and the tawny pinion *L. semibrunnea*, were also widely reported. Two species which continue their range expansion in our area are the black rustic *Aporophylla nigra* and the dotted rustic *Rhyacia simulans* both well reported.

It is always pleasing to record new species to the area, and in 1983 there were two. The migrant cosmopolitan has already been mentioned; the second is a resident in the form of the brown hairstreak butterfly *Thecla betulae*, found at Epping Forest in Essex and Bricketwood Common in Hertfordshire. Another

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new species was noted just outside our recording area on the Essex saltmarshes at Canvey Point and various sites east of here, and is perhaps worthy of mention in this review since it is always possible that the insect may appear within the boundary, perhaps on the Kent side of the river. This is the sand-hill rustic *Luperina nickerlii*, and it is apparent that the Essex moth is a quite distinct subspecies from those already known from elsewhere in Britain. Prior to the current records, this subspecies was known only from two specimens taken at Bradwell, Essex, one each in 1963 and 1964. It is strikingly similar to the common flounced rustic *L. testacea* but in a series stands out well.

Equally important was the discovery in Russia that our common rustic *Mesapamea secalis* was comprised of two species with quite different genitalia. The new species has been called *Mesapamea secalella*, and in general is a little smaller than *secalis* and frequently darker. Although it is not considered possible to separate the two without recourse to genitalia examination, all of the small very black specimens with well-defined white reniform stigma that I have personally examined have been *secalella*, although not all of the others have been *secalis*.

An important publication on the British Macrolepidoptera appeared during 1984 which deserves mention here. Entitled *The Moths of the British Isles*, and published by Viking, it is written by Bernard Skinner who regularly contributes to the Lepidoptera reviews in this journal. A review appears elsewhere in this volume, but I hope I may be forgiven for commending this book to the reader here, since it is the only book available which accurately illustrates by colour photographs the entire British Macrolepidoptera. Other notable publications during the two-year period have included volume 10 in the series *The Moths and Butterflies of Great Britain and Ireland*, completing the noctuids, and *The Larger Moths and Butterflies of Essex*, by A. M. Emmet and G. A. Pyman, published by the Essex Field Club. This latter work is particularly important in relation to the London area. Following similar lines to the Field Club's exceptionally good publication in 1981 *The Smaller Moths of Essex*, this latest local list provides a computer-drawn ten-kilometre distribution map and a short but comprehensive summary of the status of every species occurring, or ever having occurred, in the county. Each family is introduced by a photograph of a representative member, and there is a very complete bibliography. This is by far the best local list for any area bordering the London area and is particularly important since such a large portion of the L.N.H.S. recording circle is included.

In the records which now follow, I have, as before, adopted the nomenclature found in *A Recorder's Log Book or Label List of British Butterflies and Moths* by J. D. Bradley and D. S. Fletcher, published in 1979 by Curwen (now by Harley Books, Colchester).

BUTTERFLIES

A selection of the more noteworthy records received is given.

In excess of one hundred Essex skippers *Thymelicus lineola* were noted at Perry Oaks Sewage Farm on 16 July 1984 by R. B. Hastings, who also observed three silver-spotted skippers *Hesperia comma* at Juniper Top, Surrey on 30 July 1983. This rare insect was also noted at Headley Heath during August 1984 (A. B. Petrie). Several new sites were noted for the dingy skipper *Erynnis tages*, including Salt Box Hill, Biggin Hill (G. Dickerson), and Banstead and Park Downs (A. P. Merritt). The grizzled skipper *Pyrgus malvae* was also noted at Salt Box Hill (Dickerson) and Banstead and Park Downs (Merritt), as well as at Ashstead Common and Juniper Top (R. B. Hastings), and at Bricketwood Common, Herts. (A. Humble and T. Wildridge).

Representing the Papilionidae, a single swallowtail *Papilio machaon* was reported at Wood Street Railway Station, Walthamstow in early July 1984. The race was not noted (perhaps the observer was too surprised) and there must be

considerable suspicion concerning the origin of this individual in a year which was not noted for its migratory Lepidoptera.

The Pieridae are well reported for both years. The invasion of clouded yellows *Colias croceus* was probably the most notable feature of 1983, and my comments on the records have already been published in this journal (Plant 1984). Observations of small/green veined whites *Pieris rapae/napi* at Kew Gardens on 3 October and at Rainham Marsh on 10 November 1984 probably related to *rapae*. This species, in exceptional years, has a late brood in September/October, whilst the partial second brood of *napi* is usually finished by early September.

Lycaenids of note include a very late small copper *Lycaena phlaeas* on 7 December 1984, at Young's Farm near Hainault Forest in Essex (T. Wild); and three new sites for the green hairstreak *Callophrys rubi*. The most important discovery however was of two sites for the brown hairstreak *Thecla betulae*. De Worms (1950) notes that this species was present in the Farnborough district in 1946, and in Epping Forest during the latter part of the nineteenth century. There appears to be no other record of it in the L.N.H.S. recording area, and therefore it was particularly pleasing to learn that Mr M. Catt had discovered a small colony at a locality in Epping Forest during 1983. The colony is small but stable, and eggs were seen again in the winter of 1984/1985 by another observer. This record also constitutes the first for Essex for a number of years. Firmin and Pyman (1975) state that the insects used to be common in Epping Forest in some seasons, the only other Essex sites being much further east and noted only in the *Victoria County History* list. Epping Forest is a Site of Special Scientific Interest and as such, the fauna resident within has legal protection from collectors in the absence of proper permits.

The second site for this attractive but uncommon butterfly is at Bricketwood Common in Hertfordshire, where Mr T. Wildridge tells me that there is an old established colony which is widely spread over the blackthorn thickets. However, nowhere on the Common is the insect present in any numbers. One of the more encouraging aspects of the period being reviewed is the sudden spread of the white letter hairstreak *Strymonidia w-album*. A number of new localities were reported, amongst which were Park Street, Hertfordshire, where larvae were feeding on the leaves of elm suckers (A. Humble, T. Wildridge), Trent Park, Hertfordshire where a singleton was seen at the edge of the wood by Mr A. P. Gosling, High Elms, Orpington, Kent, where the species virtually vanished between 1968 and 1981 (P. A. Sokoloff), and most surprisingly at Battersea Park, London (B. Mist, R. B. Hastings and others). In this last locality the larvae appear to thrive on Exeter elm *Ulmus glabra* var. *exoniensis*. The colony, which is very small, is alleged to have been in existence for at least forty years, although it may now be in danger since it is reported that the trees appear to be ill.

The brown argus *Aricia agestis* was noted at three localities in Surrey, namely Happy Valley, Juniper Top and Headley Heath (A. Merritt, R. B. Hastings, A. B. Petrie), and at one in Kent when 12 were seen at Biggin Hill in 1983, including a pair in copula (G. Dickerson). Four sites in Surrey produced small blues *Cupido minimus* in 1983: Banstead Downs (G. A. Collins), Headley Warren (A. Merritt), Farthing Down (C. Peck) and Epsom Downs (M. Symes). In 1984 up to 50 were seen at Banstead Downs on 18 June whilst two here on the late date of 11 August were probably a second brood. In Middlesex, Mrs J. Reidy reported a single specimen on the canal bank south-west of Harefield village on 2 June, whilst in Hertfordshire one was seen at Cole Green in 1984 (G. Eve).

Turning to the Nymphalidae, white admirals *Ladoga camilla* were noted at Bookham Common and Headley Heath in Surrey (R. B. Hastings, G. S. Collins), at Bricketwood Common in Hertfordshire, the first since the early 1970s here (T. Wildridge), Broxbourne Woods (N. Bowman; J. King), Kenley, Surrey (K. H. Hyatt), and in Kent at Shoreham where Paul Sokoloff found it in Meenfield Woods after an absence of thirty years. All records, apart from the sighting at

Kenley during 1984, relate to 1983. The purple emperor *Apatura iris* was again noted at Great Bookham Common in Surrey, a male on 30 July 1983 (R. B. Hastings), and was also noted at Epsom Common, where Mrs P. Dawe had a female sitting on her hand on 11 August in the same year. In Essex, a singleton was seen in the car park of the 'Volunteer' Public House in Epping Forest by M. Catt, also in 1983, the first for the Forest for many years. Red admirals *Vanessa atalanta* were recorded on the rather late dates of 8 November at Vicarage Road, S.W. 14, (E. Oxford), and 10 November at Rainham Marsh (R. B. Hastings), both in 1983. In 1984 however, the situation was rather different, since very few were seen at all as a result of the poor immigration. This was also the case for the painted lady *Cynthia cardui*, of which less than thirty were reported in the whole of Britain during the year. A particularly pleasing record is one of the large tortoiseshell *Nymphalis polychloros*. B. Wildridge was astonished to see a perfect specimen on *Buddleia* at Radlett, Hertfordshire in May 1983. Five Camberwell beauties *N. antiopa* were reliably reported — three in the former year and two in the latter. In the first year one was seen outside the Town Council offices at Epping, Essex on 14 July by B. W. Castle, one was observed in a field of ragwort in the Roding Valley near Loughton in late July by Mrs M. Chalk, and the third was one flying along the Euston Road at midday on 27 October seen by D. P. Crossland. In 1984, R. Dyke noted an example in his garden at Enfield, Middlesex on 25 September, whilst F. Earle saw another four days later at Hailey Lane, Hertfordshire (via South Herts. Biological Records Centre).

Two records of very common nymphalids herald from rather strange localities. A peacock *Inachis io* was reported on the Northern Line platform of Leicester Square Underground Station on 22 August 1983 (Larsen 1984), and earlier that year on 15 April, a single comma *Polygonia c-album* was noted at Holborn Underground Station by J. W. Mitchell. Doubtless these individuals had travelled in to these locations from more rural areas trapped within the carriages of the trains. A high count of at least 101 small tortoiseshells was obtained by R. B. Hastings at Barn Elms Reservoir on 5 July 1984, and in the same year he noted a late individual at Rainham Marsh, Essex on 10 November. The rare ab. *seminigra* Frohawk of the small tortoiseshell was recorded during 1983 at Bookham Station, Surrey, when D. Clement nearly trod on an example on the platform!

Fritillaries are such a rare sight in the London area today that all records tend to be regarded with a certain degree of suspicion. It is nice therefore to receive the following wholly reliable records: Miss E. M. Hillman saw a pearl bordered *Boloria euphrosyne* at Banstead Downs on 16 April 1983, whilst at Biggin Hill in Kent, J. M. Chalmers-Hunt captured and released a worn male silver-washed *Argynnis paphia* on 10 August 1983.

Finally to the Satyridae, and a worn speckled wood *Pararge aegeria* was noted at Rye Meads by A. Harris in late autumn 1984, the first for this site. A gatekeeper *Pyronia tithonus* was observed by Messrs T. Lyle and D. Murdoch at the unlikely locality of Cable Street, E.1 on 23 July 1984, whilst others of the same species were noted in the same month at Streatham by F. R. Lockwood. The meadow brown *Maniola jurtina* was seen at Fulham, with two singletons in the garden of J. Bruge in July, the first sighting of the species here, and finally the marbled white *Melanargia galathea* was recorded at Box Hill, Surrey (A. Merritt), Colley Hill, Surrey (R. B. Hastings), and Downe, Kent (B. Wheeler-Holohan) in 1983, and at Poorsfield, Ruislip, Middlesex (D. Seth-Smith) and Hoddesdon Lodge, Hertfordshire in 1984.

The total number of butterflies recorded in the Society's area of operations since 1 January 1980 is now therefore, 46 species, or 68.6% of the total British fauna of 67, excluding extinct species and those of doubtful British status.

MICROLEPIDOPTERA

Inner London

The only Microlepidoptera records of significance recorded from this artificially created area of London during the period under review are those of Mr Jeremy Burge, who runs an m.v. light trap in his tiny back garden in Bradbourne Street, Fulham. In spite of having to surround his trap with boards to prevent the light from penetrating his neighbours windows, with the result that his garden appears at night to be the source of something similar to a wartime searchlight, he has made an impressive collection from which I have identified seventy-four species. Given the location of the trap site, a number of the records are particularly interesting. The pyralid *Pyla fusca* is a heather feeder in the larval stage which is becoming increasingly common in London, presumably feeding on garden varieties or imported native heathers (The heather-feeding macro *Paradiarsia glareosa* was also noted here). A number of oak-feeding species are represented in the list, including, for example, *Phycita roborella*. Other interesting pyrales include *Aglossa caprealis*, whose larvae feed on general vegetable refuse, *Achroia grisella*, whose larvae reside in bees' nests, and *Eurhodope suavella*, which is a blackthorn *Prunus spinosa* feeder.

Several tortricoids also deserve mention, including *Eucosma pupillana* whose larvae are confined to *Artemisia absinthium*. This is a moth which is established on the Essex side of the Thames estuary and which appears to be spreading northwards along river valleys, and westwards, presumably keeping fairly close to the Thames. An even better record is that of *Epiphyas postvittana* taken on 26 June 1983. This is a native of Australia and New Zealand, occurring in Britain as an adventitious species, mainly in the west country. Records for south-east England are rare: one was taken at Westcliffe-on-Sea, Essex on 17 October 1962 (*vide* Emmet 1981), David Agassiz had one at Grays, Essex on 17 August 1983, whilst A. A. Allen had one on 1 June 1983 and another a few weeks later on 7 July at Charlton, Kent. I can find no other records for the south-east, and all those mentioned, other than Westcliffe, represent the first records for the L.N.H.S. area. In its country of origin the species is a serious pest of apple orchards, although in Britain it will probably only eat this food in captivity. Its preferred pabulum here appears to be *Euonymus japonicus*, and it is interesting to note that other *Euonymus*-feeding Microlepidoptera such as *Yponomeuta cagnagella* were also recorded at this trap site.

V.C.16, West Kent

As already mentioned under the Inner London Heading, Dr A. A. Allen had the tortricoid *Epiphyas postvittana* in his garden at Charlton, S.E.7 (Allen 1983).

N. F. Heal recorded *Eucosma pupillana* at Dartford on 3 August 1983, whilst on the very edge of our area at Sevenoaks, he captured *Apotomis sauciana* on 18 June 1982 (received too late for inclusion in the review of 1981/1982 (Heal 1983). This is an extremely local and uncommon tortricoid, new to the L.N.H.S. area.

Mr Paul Sokoloff has reported a number of interesting observations and captures. A very dark female *Ptycholoma lecheana* from Shooter's Hill on 6 July 1983 had the normal ochreous yellow colouration absent from the forewings, and represented by only a few yellowish hairs on the thorax. This specimen was exhibited at a meeting of the British Entomological and Natural History Society (*vide Proc. Trans. Br. ent. nat. Hist. Soc.* 17: 25). From Dartford Heath, he bred out *Alispa angustella* Hb. from spindle berries, whilst from the familiar fungus *Daldinia concentrica* on Keston Common he bred *Apomyelois bistriatella neophanes* during 1984. An unusual find was *Alucita hexadactyla* larvae feeding on the cultivated ornamental *Lonicera xylosteum*.

Mr J. M. Chalmers-Hunt's records divide into three areas. From his garden at West Wickham, he records *Ypsolopha mucronella* on 5 April 1984, whilst later in

the year, in August, he had *Clavigesta perdeyi*, *Roeslerstammia erxlebella*, *Acentria nivea* and *Rhyacionia pinicolana*. At Dartford the larvae of *Ptheochroa rugosana* were found on white bryony *Bryonia dioica*. This species is well established just across the Thames in South Essex, where it was noted from East Ham in both of the years under review. At the same locality in 1984, Mr Chalmers-Hunt also noted larvae of *Apomyelois bistriatella neophanes* in the fungus *Daldinia concentrica* and of *Enicostoma lobella* on *Prunus spinosa*. Finally, a little further south at Biggin Hill, he noted *Nemophora metallica* (= *scabiosella*) on 30 July, larvae of *Coleophora silenella* on *Silene vulgaris* on 19 September and larvae of *Cochylis flaviciliana* Westwood on the previous day.

V.C.17, Surrey

Amongst several records received from this species-rich vice-county area of London, two made by Professor Sir John Dacie at his Wimbledon garden are of particular note. On 15 July 1983 he captured the pyralid *Daraba laisalis* in his m. v. trap. This is only the second British record of this rare African moth, the first having been obtained by E. W. Classey during 1973. It is of note that another example of this species, the third British specimen, was taken at Luton, Bedfordshire, outside the L.N.H.S. recording area, by the late Keith Webb on 30 July 1983. These two individuals were beyond doubt genuine migrants. The larvae feed on *Solanum*. Sir John's second notable record was also of a pyralid, this time *Maruca testulalis* on 29 July in the same year. The capture of this specimen, and of another in Cornwall on 15 August, coincide with sightings of other normally rare immigrant Lepidoptera in Britain and give credence to the suggestion that the species is not only artificially introduced into Britain as was previously thought to be the case. It is of interest that the first capture in Britain of an adult of this species was made in the L.N.H.S. area at Wanstead Park, South Essex, on 23 June 1979. Previous records all relate to imported larvae or pupae.

Amongst the twenty-three pyralids reported from North Cheam by R. F. McCormick were *Orthopygia glaucinalis*, a little-reported species in our area, and *Ostrinia nubilalis* which is spreading in London. A previously unreported record of *Palpita unionalis* was made here in 1982. A seldom-reported plume moth *Pselnophorus heterodactyla* was also noted.

Other records of note from Surrey include *Cochylis flaviciliana* larvae at Selsdon on 18 September, and larvae of *Acrocercops brongniardella* on *Quercus* at Ashted on 12 June 1983, the first record of this species in the London area for the present century.

V.C.18, South Essex

Amongst the large number of micros noted by the Rev. David Agassiz at Grays were several of note. The tortricoid *Epiphyas postvittana* has already been mentioned under the Inner London heading. The cochylid *Aethes tesserana* was quite numerous at Grays Chalk Quarry S.S.S.I., and also recorded here was the local gelechiid *Syncopacma cincetella* and the much rarer plume moth *Leioptilus carphodactyla*. This latter species is new to both the L.N.H.S. area and the South Essex vice-county. Also in the Grays area the Rev. Agassiz recorded a number of other interesting species, including *Caryocolum proximum* and *Coleophora conyzae*, both in 1983. Elsewhere in the vice-county, he had *Glyphipteryx lineella*, new to Essex, on the trunks of lime trees at Bush Wood in southern Epping Forest, whilst further north in the Forest proper, J. M. Chalmers-Hunt recorded *Pammene obscurana* on 7 June 1983, as well as numerous *P. herrichiana*. Both are quite local species in Britain.

Col. A. M. Emmet found galls of the incurvariid *Lampronia fuscata* at Bedfords Park, Romford and at Hainault Forest on 9 April 1983. This species was added to the Essex list in 1982 by Mr N. Nash who took two adults at light in Bedfords Park.

At Mucking, just outside the L.N.H.S. area, Dr P. A. Sokoloff noted an example of the pyralid *Calamotropha paludella* with pure white forewings on 12 August 1983, when he also had both dark and typical forms of *Ancylosis obitella*, new to Essex.

Dr G. S. Robinson bred out a new Essex record of the tineid *Nemapogon ruricolella* from a cherry stick collected by his son at Warwick Wood, Aveley in 1984. This is also new to the L.N.H.S. area. The same wood also produced *Ptycholomoides aeriferanus*, although the larch *Larix* trees which fed their larvae were felled in late 1984 to provide bases for Christmas trees! The incurvariid *Nemophora fasciella* was also recorded by him in this wood.

My own wanderings about my adopted county provided a few records deemed suitable for inclusion. At Running Water Wood, just to the east of Warwick Wood mentioned above, a night's trapping on 19 August 1983 saw the fourth Essex record of the grass moth *Agriphila latistria*. Other visitors to the sheet included *Agonopteryx subpropinquella*, *Ypsolopha alpella*, the migrants *Plutella xylostella* and *Nomophila noctuella* in numbers, and *Ancylosis oblitella*. At Thameside Park, Barking, where a project is under way to create an 'ecology park' and a city farm, cases of *Coleophora argentula* were abundant on *Achillea millefolium* as were the silken spinnings of *Bucculatrix cristatella*. Here too, every head of teasel *Dipsacus fullonum* contained either larvae or pupae of the tortricoid *Endothenia gentianaeana* which is now quite abundant in this area along the Thames. *Eucosma pupillana* was noted as abundant here in both years as was *Mompha nodicolella*, in spite of there being little in the way of rose bay willow herb *Epilobium angustifolium*.

E. pupillana was also present at Rumsey's Reserve, Sewardstone in 1983, where the owner, Peter Rumsey has created a wetland bird sanctuary. Aquatic insects abound, and one definitely needs insect repellent to operate on a sheet here! Species of particular abundance were *Acentria nivea* (literally thousands swarming in 1983), *Parapoynx stratiotata* and *Cataclysta lemnata*, with *Nymphula nymphaeata* present in more moderate quantity.

At East Ham, the presence of a tenanted mine of *Phyllonorycter corylifoliella* f. *betulae* was a total surprise, since this form, considered by some a separate species, is normally confined to the north-west of Britain. The tree upon which the mine was found was at St Mary's Churchyard Nature Reserve (Plant 1984a). A few minutes' walk away at my garden the rare pyrale *Eurrhynx perlucidalis* entered the m.v. trap on 15 July 1983. This is typically a species of the Fens, although it appears to be spreading out from this focus. It was first noted in Britain at Woodwalton Fen in June 1951 (Mere and Bradley, 1957).

V.C. 19, North Essex

Baron de Worms, when he occupied my seat as Recorder, called this vice-county the Cinderella of the L.N.H.S. area: Regrettably nothing has changed. The only records noted are my own from Galleyhill Wood, Waltham Abbey, where amongst a lot of common micros, a pupa of the yponomeutid *Prays fraxinella* was found rolled in a leaf of field maple *Acer campestre*. The normal food is ash *Fraxinus*, and it remains uncertain whether this insect thrived on the maple, or merely wind drifted here from a nearby ash tree and, in the absence of suitable food, pupated.

V.C. 20, Hertfordshire

R. W. J. Uffen noted a female *Metzneria aprilella* at actinic light at Welwyn on 22 June 1983, (*Proc. Trans. Br. ent. nat. Hist. Soc.* 16: 116).

No other micro records of note have been received for this area.

V.C. 21, Middlesex

On 24 September 1983, a field trip of the British Entomological and Natural History Society to Hampstead Heath produced a most impressive list of micros, mostly leaf-miners, determined in the main by Col A. M. Emmet. Birch-feeders were particularly well represented, including *Parornix betulae*, *Caloptilia robustella*, *Stigmella luteella* and *S. lapponica*. Mines of *S. microtheriella* were located on *Carpinus* leaves, whilst *Phyllonorycter froelichiella* mines were found on *Alnus*.

Elsewhere in Middlesex, W. E. Minnion reports the pyrale *Ostrinia nubilalis* at Pinner in 1983, an indication of the way in which this species is spreading in the London area.

MACROLEPIDOPTERA

Inner London

Amongst the more notable Inner London migrants of 1983 was a single humming-bird hawk moth *Macroglossum stellatarum* in the Beit Quadrangle at Imperial College. R. K. Buisson watched the insect feeding on the flowers of a small unidentified alpine plant growing in one of the tubs in the quadrangle on 10 June. Still with hawk moths, a death's head *Acherontia atropos* was taken by S. Grant in Islington on 15 August 1983 (Bretherton and Chalmers-Hunt 1984).

The only Inner London record of the migrant vestal moth *Rhodometra saccharia* appears to be the one taken by D. L. F. Sealey at Putney on 1 October 1983.

Dr J. D. Bradley recorded a total in excess of thirty brown tails *Euproctis chrysorrhoea* at the m.v. trap in the garden of Buckingham Palace during 1983, most of which appear to have been on 13 of that month when twenty-four were counted in the trap with others settled nearby. Dr Bradley notes that all the specimens examined proved to be males: this conforms with my own observations at East Ham, Essex, in my own somewhat smaller garden where the species is still present in plague proportions. The first *E. chrysorrhoea* reported from the Palace garden were four individuals in 1967, with no more being recorded thereafter until four in 1976. Other records were made in 1978 (three), 1981 (one) and 1982 (four or five). On 13 July 1983, the trap also contained a single white satin *Leucoma salicis* (Bradley 1984).

M. J. Hammerson also recorded the troublesome brown-tail at Tower Bridge Road, S.E.1, and near to London Bridge, both during 1984. He also saw a pale tussock *Dasychira pudibunda* on the southbound underground train at London Bridge Station, presumably having entered the carriage some distance from here on the Northern Line.

J. Burge's trap at Fulham has already been described under the Microlepidoptera heading. A total of 176 species of macro was recorded at this site during the two-year period under review, and several species are rather noteworthy in view of the Inner London location, a stone's throw from the King's Road. The earlier year produced the figure of eighty *Tethea ocularis* on 17 June, whilst three weeks before on 1st of that month he had an orange footman *Eilema sororcula*. Typically woodland species noted here included the July highflyer *Hydriomena furcata* and yellow-barred brindle *Acasis viretata*, so clearly there must be some interesting habitat nearby, presumably also the source of the oak-feeding micros mentioned earlier from this site. The oak nycteoline *Nycteola revayana* was also noted, and apparently puts in an appearance two or three times every year. The buttoned snout *Hypena rostralis* is likely to prove a much under-recorded insect in the London area, and is perhaps most easily located in the winter, since it hibernates as an adult. An example turned up in the Fulham trap on 8 May.

During the second year, sixteen species were added to the list for his garden, prominent amongst which were small elephant hawk moth *Deilephila porcellus*,

the tawny barred angle *Semiothisa liturata*, including ab. *nigrofulvata*, the brown silver line *Petrophora chlorosata* (whose larvae presumably survive on potted ferns), the varied coronet *Hadena compta* (a spreading species taken on the same night that others were captured elsewhere in our area), the broad barred white *Hecatera bicolorata*, and the autumnal rustic *Paradiarsia glareosa*, another species widely reported during 1984.

V.C. 16, West Kent

Depressingly few records from this species-rich and well-recorded vice-county area have been received for this particular two-year period. The extreme south-east of our recording area is one from which records would be particularly welcome, particularly from regions such as Swanley, West Kingsdown, Shoreham and around the north-west of Sevenoaks.

Dr P. A. Sokoloff noted three new species in his trap at Orpington during 1983. These were the broom tip *Chesias rufata*, apparently a rarity in our area, the peacock moth *Seiothisa notata* and the inevitable vestal *R. sacraria*. A further three species which have extended their ranges recently into north-west Kent were recorded again by Dr Sokoloff in the Orpington area. The black rustic *Aporophyla nigra* was very numerous, with over 100 seen. This is particularly remarkable in view of the fact that this insect was first seen in the Orpington area as recently as 1979. Blair's shoulder-knot *Lithophane leautieri* was also first seen here in the same year and turned up regularly in the trap during 1983, suggesting that it has become established on cultivated *Cupressus* in the area. Finally, the dotted rustic *Rhyacia simulans*, which is spreading into Kent from South Essex also occurred. In 1984, a further three 'new' species were noted: the white satin *Leucoma salicis* on 12 July, the mullein wave *Scopula marginepunctata* on 29 June and the bordered sallow *Pyrrhia umbra* on 21 July. *L. leautieri* again turned up in 1984, as did the centre barred sallow *Atethmia centrago*, another species which has spread in recent years and is now quite common in that area.

R. M. Burton saw a herald *Scoliopteryx libatrix* at his home in Eynsford in October 1983, whilst Cdr W. A. E. Hall had the silver-y *Autographa gamma* at Bromley on 5 September in the same year.

P. Jupp saw a single humming-bird hawk moth *M. stellatarum* at *Lonicera* in his garden at West Wickham on 14 August 1983, and informs me that Mr R. F. Birchenough took a male vestal *R. sacraria* on Bromley Common on 26 August, and a further two males at West Wickham on 25 September in the same year.

Dr A. A. Allen had the gem *Orthonama obstipata* on two occasions at his home in Charlton, S.E.7 in 1983. The first was a female at a wall lamp on 4 June, and the second a male at m.v. light on 17th of that month (Allen 1984). It seems that there was a considerable invasion of this species during 1982, and these 1983 records may be the progeny of that immigration. Dr Allen also had *R. sacraria* in 1983 at Charlton: a female on 4 June and a male on 17 June.

J. M. Chalmers-Hunt noted the lesser treble bar *Aplocera efformata* at West Wickham on 14 August 1984, where he also had several *Mesapamea* sp. which he presumes to be *secalella*. The common rustic *M. secalis* is also recorded here.

Miss R. W. Davis sent me a list of 51 species recorded by Mr Birchenough in a garden at Beckenham, including the dingy shears *Enargia ypsilon*, the worm-wood pug *Eupithecia absinthiata* and the scarce silver lines *Bena prasinana*, all captured on 27 July 1984. Another list of commoner species sent by Miss Davis related to Sydenham Hill Wood, and included the mullein wave *Scopula marginepunctata* on 9 June 1983 and the old lady *Mormo maura* on 29 August 1984.

Mr J. Maskray brought me several moths for identification from the area around Thames Polytechnic at Dartford in 1984. Amongst these was the tawny shears *Hadena perplexa* on 6 July and the streak *Chesias legatella* on 31 October.

Finally for West Kent, B. K. West has made some interesting observations in the *Entomologist's Record* (West 1984b). At his home in Bexley he noted the dingy footman *Eilema griseola* at m.v. light on 21 August 1984. He had previously recorded this insect here on 25 July 1972. Chalmers-Hunt (*The Lepidoptera of Kent* 1962-1981) states that this species is extinct in north-west Kent. These records suggest however, that the species in fact persists precariously, perhaps in nearby Joyden's Wood where also occurs the common footman *E. lurideola*, the scarce footman *E. complana* and the rosy footman *Mitlochrista miniata*, which are increasing in numbers. It is noteworthy that Mr West also took the round winged muslin *Thumatha senex* in his garden on 3 August 1971, also noted as extinct in north-west Kent by Chalmers-Hunt.

Other observations by Mr West (West 1984a) include the grey shoulder-knot *Lithophane ornitopus lactipennis* of which more than three dozen were seen from 30 September to 2 November 1983, mainly on tree trunks in a limited area of parkland at Dartford, and others seen in nearby residential areas. Five came to his light trap at Bexley, and one was seen at night at ivy blossom. Also noted on the tree trunks here were single examples of the large ranunculus *Polymixis flavicincta*, Svensson's copper underwing *Amphipyra berbera* and the garden carpet *Xanthorhoe fluctuata*.

V.C. 17, Surrey

R. McCormick had a total of twelve Blair's shoulder knot *L. leautieri* in his trap at North Cheam between 29 September and 11 November 1984. Eleven were males, with a single female on 29 October which laid about 200 eggs in early November on *Cupressus* provided for the purpose. Other species taken at light by him in the last couple of years in his garden include the vestal in 1983, and in 1984 the minor shoulder-knot *Brachylomia viminalis* on 18 July, the olive *Ipimorpha subtusa* on 2 August and best of all the four spotted *Tyta luctuosa* on 18 July. This last species is now very rare in Britain as a whole and in great danger from certain aspects of modern farming methods. This is only the fifth record for the London area since 1960, the previous being in the same general area of Surrey. The most recent was at Selsdon in 1977.

R. B. Hastings noted the burnet companion *Euclidia glyphica*, mother shipton *Callistege mi* and latticed heath *Semiothisa clathrata* at Ham Lands in 1984, whilst at Kew Gardens on 22 August he discovered a lunar hornet moth *Sesia bembeciformis*. The oak eggar *Lasiocampa quercus* and the ghost swift *Hepialus humuli* were noted at Magpie Bottom, Shoreham on 28 July 1984.

B. Skinner, whose new identification guide is mentioned in the introduction to this review, noted a number of interesting species in his garden at Addington during 1984. On 17 June he took a halved gynandromorph of the heart and dart *Agrotis exclamationis*, whilst three days earlier he captured a rare melanic form of a male shuttle-shaped dart *Agrotis puta*. The inevitable *L. leautieri* appeared first on 2 October, a male, and last on 12 November, two females, with the maximum total on any one night being twelve on 15 October. New species noted to his garden during the year were the yellow horned *Achyla flavicornis* on 10 April, the clay triple lines *Cyclophora linearia* on 27 June, the narrow-winged pug *Eupithecia nanata angusta*, the pine hawk *Hyloicus pinastri* on 20 June, the beautiful yellow underwing *Anarta myrtilli* on 19 July, the chamomile shark *Cucullia chamomillae* on 10 May and the grey shoulder knot *Lithophane ornitopus* ssp. *lactipennis* on 12 and 14 October.

In the previous year, a halved gynandromorph of *Agrotis puta* was taken on 21 July, whilst on 17 of that month he had an aberrant garden tiger *Arctia caja* in which the forewings had extremely reduced brown markings and the hind wings and abdomen entirely red. This latter insect is illustrated in *Proceedings and Transactions of the British Entomological and Natural History Society* 17 plate 3, published April 1984. Fourteen vestals *R. sacrararia* were taken between 23 and 30

September, whilst during the year seven new additions were made to the garden list in the form of dotted rustic *Rhyacia simulans*, fen wainscot *Arenostola phragmitidis*, the antler *Cerapteryx graminis*, the crescent *Celaena leucostigma*, the oak nycteoline *Nycteola revayana*, the beautiful carpet *Mesoleuca albicillata* and the scarce footman *E. complana*.

J. H. Bratton noted a humming-bird hawk moth *M. stellatarum* at Bookham Common on 14 August 1983, as well as the scarce silver lines *Bena prasinana* and beautiful yellow underwing *A. myrtilli* at Streatham on 10 and 28 July respectively.

Miss E. M. Hillman saw a poplar hawk moth *Laothoe populi* on Wimbledon Common on 30 May 1983.

Mr Fairclough captured a single female cosmopolitan *Mythimna loreyi* at Reigate on 30 August 1983, at the very edge of our recording area (*vide Proc. Trans. Br. ent. nat. Hist. Soc.* 17: 23). This is apparently an addition to the species list for the L.N.H.S. area, since I am unable to trace any previous record of this scarce migrant. In the same area C. Hart took the great brocade *Eurois occulta* during the same year. This is apparently only the eighth noted in the London area during the present century, previous localities being West Wickham in 1926, Northwood in 1932, Kensington in 1937, Esher in 1945, Mill Hill in 1948, Wembley in 1964 and Bexley in 1973.

Sir John Dacie's garden trap at Wimbledon raised his macro species list to over 350 (since 1955) during the period under review. One newcomer during the first year was the grey shoulder knot *L. ornitopus lactipennis* taken on 8 October, on which night he also had the dusky lemon sawfly *Xanthia gilvago*. Other species recorded during the year included the poplar kitten *Harpyia bifida* on 30 May and the lunar marbled brown *Drymonia ruficornis* on 26 April. The streak *Chesias legatella* was noted on 18 October, whilst the vestal *R. sacraria* was captured on 26 August, 27 September and 1 October. In 1984 there were a further four additions as follows: the white pinion spotted *Lomographa bimaculata* was present as single specimens on 17 and 18 June; the scorched carpet *Ligdia adustata* was noted on 19 August; a single mallow *Larentia clavaria* presented itself on the night of 13 October; whilst on 30 October a specimen of *Dryobotes eremita* was noted. As in earlier years, Professor Dacie also took the varied coronet *Hadena compta* (a single on 19 June), and the least wave *Idaea vulpinaria* (one on 12 August). He also comments that the year was good one for the centre-barred sawfly *Atethmia centrago* (three on 26 August), the pale lemon sawfly *Xanthia ocellaris* (one each on 7 and 14 October), and, as elsewhere, Blair's shoulder knot *Lithophane leautieri*, with eight between 9 and 28 October.

R. F. Bretherton, who maintains the lists of migratory Lepidoptera in the British Isles and is the acknowledged expert in this field, has kindly sent me a list of 1983 immigrants affecting the L.N.H.S. recording area. Those not noted elsewhere in this review are as follows:

The gem *O. obstipata* was captured at Mitcham on 31 July (a poor male), whilst *R. sacraria* was recorded here on 26 September (four males including one f. *sanguinea*), 27 September (two males), and 29 September (one male) all by R. A. K. Morris.

The convolvulus hawk *Agrius convolvuli* was noted at Tolworth on 27 September by J. Porter, whilst a single specimen of this species was found dead in a street in Putney on 1 October by D. F. L. Sealey.

At South Croydon the great brocade *E. occulta* was taken by G. A. Collins on 31 August (a pale form of this normally dark moth), and *R. sacraria* was also taken here on 1 August, 9 September and then seven from 24 to 29 September.

That magnificent insect the Clifden nonpareil *Catocala fraxini* was seen by A. Pearson flying to a lighted window at South Croydon on 21 September, whilst finally P. J. Baker had a female vestal *R. sacraria* at Thorpe in April. Mr

Bretherton informs me that this latter record is the only record from 1983 prior to June.

V.C. 18, South Essex

The Rev D. Agassiz recorded a number of interesting species from Grays during the 1983/1984 period, both at his garden and at the nearby Grays Chalk Quarry S.S.S.I. The red-belted clearwing *Synanthedon myopaeformis* was noted in the former locality, and the orange tailed-clearwing *S. anthraciniformis* at the latter. The chalk carpet *Scotopteryx bipunctaria* was present in numbers in the quarry as it is in most of the disused chalk pits in the Grays Thurrock area. Blair's shoulder knot *L. leautieri* was noted in the garden as was the third Essex record of the black rustic *A. nigra* (the second was also at Grays, in 1972). Also noted here was the light brocade *Lacanobia w-latinum*, the large ranunculus *Polymixis flavicineta*, the pale lemon sallow *Xanthia ocellaris*, the silky wainscot *Chilodes maritimus* and the spruce carpet *Thera britannica*. A dark-banded form of the common moth the short cloaked *Nola cuculatella* was taken during 1983, as was an aberrant garden tiger *Arctia caja* with yellow hind wings. Both of these insects were exhibited at the annual exhibition of the British Entomological and Natural History Society during 1983. The autumnal rustic *Paradiarsia glareosa* was noted in both years at Grays and also at Purfleet in 1983, where the maiden's blush *Cyclophora punctaria* was also taken in the earlier year. Elsewhere, the Rev Agassiz had the oblique carpet *Orthonama vittata* at Linford, on the extreme edge of our area, and at Stanford Warren a number of reed dagger *Simyra albovenosa* as well as a silky wainscot *Chilodes maritima* ab. *wismariensis*.

G. A. Pyman, the Essex Recorder for Macrolepidoptera, tells me that Dr K. J. Adams ran a trap in his garden at Baldwins Hill, Loughton during the two-year period under review. As a reward for his apparent conversion from botany to entomology he took two particularly noteworthy beasts: the great oak beauty *Boarmia roboraria*, the first in Essex since 1958, and a rosy marbled *Elaphria venustula*, probably the second Epping Forest record for the present century.

Mr Pyman is also the source of the following information:

P. J. Wanstall took a specimen of the spruce carpet *Thera britannica* and a black arches *Lymantria monacha* during 1983 at Coxtie Green, Brentwood, whilst during 1984 at the same locality he had a waved black *Parascotia fuliginaria*, a locally common species suspected of being an immigrant on occasions. C. Harding had the migrant Blair's mocha *Cyclophora puppillaria* at Tilbury in 1983, whilst A. J. Dewick noted larvae of the larch pug *Eupithecia lariciata* at Warley in 1982, not previously reported here. The bordered gothic *Heliophobus reticulata* was taken at Ingrave during 1983 by K. W. Grimwood. J. M. Chalmers-Hunt and B. Skinner visited Epping Forest during 1983 and took a number of the grey Epping Forest ab. *columbina* of the least black arches *Nola confusalis* as well as a few typical forms. They also took the first Essex *Elaphria venustula* this century (see the record by Dr Adams above).

An important discovery in Epping Forest during 1984 was that the emperor moth *Saturnia pavonia* is present in Wanstead Park. A virgin female taken to that locality on 22 April by myself very quickly assembled two males from a dense thicket of brambles. This is only the third record of this striking day-flying insect in Epping Forest since 1903, both the earlier records heralding further north from the forest proper, (*vide* Plant 1984b).

A number of other sites trapped in by myself during the two-year period produced some interesting records. Lights were run in two of the woods in the Belhus Country Park complex near Aveley. The main interest in Running Water Wood was with the micros, but macros did include a single cloaked carpet *Euphyia biangulata* on 19 August 1983. Other macros here included the maple prominent *Ptilodontella cucullina* and yellow-barred brindle *Acasis viretata*. The

nearby Warwick Wood however was far more interesting. *E. biangulata* was present in small numbers and is clearly breeding here. However, the area where the foodplant grows may be under threat at the time of writing and collectors are urged not to take this species at this site for the present (a permit is required in any case). Also present in reasonable quantity were the water carpet *Lampropteryx suffumata*, the sloe carpet *Aleucis distinctata*, pretty chalk carpet *Melanthia procellata*, white-line dart *Euxoa tritici*, chamomile shark *Cucullia chamomillae* and the dotted rustic *Rhyacia simulans*. Here also two specimens of the grey shoulder knot *Lithophane ornitopus lactipennis* were taken in October 1984 by Dr G. S. Robinson, who lives nearby.

L. ornitopus was also taken at rest on a barkless tree trunk at Curtis Mill Green S.S.S.I. on 8 November 1984.

At Thameside Park, Barking, where a project is under way to establish an ecology park in conjunction with a city farm, larvae of the starwort *Cucullia asteris* were fairly numerous in 1984, as were larvae of the wormwood shark *C. absinthii* and the chamomile shark *C. chamomillae*. A little further west on the River Roding at Cuckold's Haven, large numbers of the obscure wainscot *Mythimna obsoleta* and lesser numbers of the southern wainscot *M. straminea* were taken in both years. The bullrush wainscot *Nonagria typhae* was also present in quantity here.

On the River Lea at Sewardstone the Epping Forest Group of the R.S.P.B. created, some years ago, a wetland nature reserve from an overgrown water-meadow. An insect fauna typical of such a habitat has developed along with the flora. Large numbers of macro moths included the bullrush wainscot *N. typhae*, the fen wainscot *Arenostola phragmitidis*, the small rufous *Coenobia rufa* and the southern wainscot *Mythimna straminea*. The willow kitten *Furcula furcula* was also present, and breeds on the large number of *Salix* to be found here.

In Epping Forest ab. *columbina* of the least black arches *Nola confusalis* was abundant in Bury Wood, although none of the typical form was seen. Further south in the Forest the discovery of *Saturnia pavonia* has already been mentioned. Other additions to the list for Wanstead Park include the barred hook tip *Drepana cultraria* and the small rufous *Coenobia rufa*. All of the peppered moths were f. *carbonaria*. The antler *Cerapteryx graminis* is still present in low numbers, but sadly the bird's wing *Dypterygia scabriuscula* has not been seen since 1981.

At Bully Fen, Stratford, the least wave *Idaea vulpinaria* was numerous in 1984 in an area where the macrolepidopterous fauna generally seemed rather poor.

At Dagenham Chase, more correctly called Eastbrook End, the red-tipped clearwing *Synanthedon formicaeformis* was taken at rest on a flower by my colleague Miss S. J. Lambert during 1984. There appear to be extremely few records of this species in the county this century, although like all clearwings it has probably been overlooked.

The species list for my garden at East Ham has now risen to 308 after two and a half seasons trapping here. The obscure wainscot *M. obsoleta* and the southern wainscot *M. straminea* made repeat appearances whilst a number of new species included the varied coronet *Hadena compta*, the cream-bordered green-pea *Earias clorana*, the deep brown dart *Aporophylla lutulenta*, the vestal *R. sacra* and the dark chestnut *Conistra ligula* in 1983, with the plain wave *Idaea straminata*, grass emerald *Pseudoterpna pruinata*, small engrailed *Ectropis crepuscularia*, broad-barred white *Hecatera bicolorata*, the shark *C. umbratica*, Blair's shoulder knot *L. leautieri* and the crescent *Celaena leucostigma* in 1984. *Mesapamea secalella* has been present here in more or less equal proportions to *M. secalis*, according to the few specimens whose genitalia I have dissected.

V.C. 19, North Essex

The only records available for this small part of the L.N.H.S. recording area are

my own from Galleyhill Wood near Waltham Abbey. The species recorded in this mature oak/hornbeam woodland area were fairly typical of those expected and included in excess of fifty lobsters *Stauropus fagi* together on the sheet on 1 July 1983. Other records from here include the white satin *Leucoma salicis*, the figure of eighty *Tethea ocellaris*, the lesser spotted pinion *Cosmia affinis* and the drinker *Philudoria potatoaria*. Larvae recorded included the scarce umber *Agriopsis aurantiaria*, mottled umber *Erannis defoliaria*, waved umber *Menophra abruptaria* willow beauty *Peribatodes rhomboidaria* and winter moth *Operophtera brumata*. Early in 1984 the alate females of the early moth *Theria primaria* were observed by torch light at the tips of hawthorn twigs awaiting passing males.

V.C. 20, Hertfordshire

Dr A. M. George, Recorder for the Ruislip and District Natural History Society, has sent me a list of captures made at Maple Cross (Lodge) Nature Reserve, where 149 species were noted in the 1983/1984 period. Of these, two, the white-spotted pug *Eupithecia tripunctaria* and the juniper pug *E. pusillata* were new to the site in 1983, both being recorded on 30 July. In the following twelve-month period no fewer than eleven species were added to the list including the March moth *Alsophila aescularia*, the early thorn *Selenia dentaria*, the early moth *Theria primaria*, the shoulder stripe *Anticlea badiata*, the dwarf cream wave *Idaea fuscovenosa* and the dingy footman *Eilema griseola*.

N. Bowman reports seeing the Mother Shipton *Callistege mi* at Home Farm on 15 June 1984, whilst Miss H. Baker found a swallowtail *Ourapteryx sambucaria* in her kitchen at Rickmansworth. In the previous year *R. sacraria* was also recorded at Broxbourne Wood on 28 September by D. E. Wilson.

J. King also had *R. sacraria* at his garden in Potters Bar in 1983, whilst other species noted by him here in that year included the drinker *Philudoria potatoaria*, the beautiful hook tip *Laspeyria flexula* and the rosy footman *Miltochrista miniata*. In 1984 he records the small blood vein *Scopula imitaria* and the small dusty wave *Idaea seriata* here, while at Broxbourne Woods on 16 June he saw the speckled yellow *Pseudopanthera macularia* and the rosy footman.

J. Newton, the Conservation Officer of the London Wildlife Trust, has kindly sent me details of 39 common species reliably recorded from Coppets Wood during 1984. His list includes the orange swift *Hepialus sylvina*, the sprawler *Brachionycta sphinx*, the old lady *Mormo maura*, the grey shoulder knot *Lithophane ornitopus lactipennis* and two clearwings, the currant *Synanthedon tipuliformis* and the large red belted *S. culiciformis*.

V.C. 21, Middlesex

R. V. Goulding noted the six-spot burnet *Zygaena filipendulae*, the cinnabar *Tyria jacobaeae*, the magpie *Abraxas grossulariata*, the buff-tip *Phalera bucephala* and the swallowtail *Ourapteryx sambucaria* at Northolt during 1983.

R. Lovell-Pank took a single vestal *R. sacraria* at his window in Potters Bar on 29 September 1983.

J. Cresswell had a humming-bird hawk *M. stellatarum* at Belsize Park during 1983, whilst P. R. Greenwood located the larva of an emperor *Saturnia pavonia* on 19 July at Grange Park. Other moths at this latter locality included the barred yellow *Cidaria fulvata* and the winter moth *Operophtera brunata*.

Amongst the insects recorded by J. B. Latham at Kensal Green Cemetery during the same year were three moths: the silver Y. *A. gamma*, the six-spot burnet and the yellow shell *Camptogramma bilineata*.

At Alexandra Park N. Bowman also recorded *A. gamma* and *C. bilineata* as well as the burnet companion *Euclidia glyphica* which he also recorded at Parkland Walk. At Hornsey he also found a specimen of the old lady *Mormo maura* on 13 August 1983.

Before his untimely death, Mr R. D. Hilliard was able to report that he regularly trapped in the order of 160 species of macro in his garden at Stanmore each year, with a remarkable consistency of species composition, in that about 95% of his captures are the same species each year. He also noted three regular visitors for the last two or three years which had not been previously noted at the site, these being the double lobed *Apamea ophiogramma*, the muslin *Diaphora mendica* and the maiden's blush *Cyclophora punctaria*.

Two major contributions to our knowledge of the lepidopterous fauna of north London herald from Hampstead Garden Suburb where two separate collectors living within two kilometres of each other have made impressive lists.

The first of these, R. T. Lowe, had 163 species of macro in his garden during 1983, selected highlights of which include a humming-bird hawk *Macroglossum stellatarum* on 18 August and another on 24 September at flowers of *Nicotiana*. At light he had two examples of the neglected rustic *Xestia castanea* on 14 August, beyond doubt strays from Hampstead Heath. The seraphim *Lobophora halterata* was noted on 5 June, the northern drab *Orthosia populeti* on 6 May and the tawny pinion *Lithophane semibrunnea* on 1 April, with several in the following week. The last species was also recorded here in 1979, 1980 and 1981. The black rustic *Aporophylla nigra* was also noted, with two on 2 September, supplementing the captures made here of this species in 1981 and 1982. The following year 1984, saw a tally of 160 species. The year began with a pale brindled beauty *Apocheima pilosaria* on 27 February during a period of the year sadly neglected by most of us if the records are anything to go by. A particularly pleasing capture was that of the sharp angled carpet *Euphyia unangulata* on 11 June. There appears to be only four previous records of this species in our area — at Bedfont, Middlesex in 1952, Oxshott, Surrey in 1957, Camberwell, Surrey in 1967 and one in Buckingham Palace Garden during 1970. Another geometer of note was the great oak beauty *Boarmia roboraria* on 17 June, quite a rarity in the L.N.H.S. recording area. The clouded brindle *Apamea epomidion* was noted on 24 June, the bird's wing *Dypterygia scabriuscula* on 5 July and the migrant bordered straw *Heliothis peltigera* on 9 July. Another stray from Hampstead Heath no doubt was the light feathered rustic *Agrotis cinerea* which arrived in the trap on 11 July. The black rustic made a repeat performance in this year, on 25 September, whilst other moths of note included the treble bar *Aplocera plagiata* on 30 August, the orange sawfly *Xanthia citrigo* on 30 September, the streak *Chesias legatella* on 14 October and the dark chestnut *Conistra ligula* on 2 November. As a postscript Mr Lowe notes that it is now several years since he last recorded either the ruby tiger *Phragmatobia fuliginosa* or the miller *Acrionicta leporina* in his garden trap.

The second contributor from this area is P. R. Hall, who lists to me 145 species taken at light in his garden from 1980 to 1983, of which 119 were on his 1983 list. In the following year 157 species were recorded. One of his more noteworthy species was the barred red *Hylacea fasciaria* which was taken on 15 July in the earlier year. This appears to be quite a rare moth in the London area. There is a small colony on Hampstead Heath but the species is suspected of being an immigrant on occasions, and 1983 was a good year for creatures disposed towards this habit. The bird's wing *D. scabriuscula* was noted on two occasions, whilst others in his 1983 list include the blue-bordered carpet *Plemyria rubiginata*, another apparently uncommon, or at least local, species within the L.N.H.S. area, the double lobed *Apamea ophiogramma*, the uncommon ab. *salicis* of the otherwise common knot-grass *Acrionicta rumicis* f. *carbonaria* and f. *insularia* of the peppered moth *Biston betularia* (but not the typical form), and the migrant species the gem *Orthonama obstipata* on 25 July. During 1984, the barred red appeared again on 18 July, whilst also noted were the lesser treble bar *Aplocera efformata* on 1 September, the poplar kitten *Furcula bifida* on 3 July, the tawny pinion *Lithophane semibrunnea* on 7 April and Blair's shoulder knot on 28 September with two more on 15 October.

Remaining for a while in the Hampstead area, R. A. Softly continues to run his actinic trap on the balcony of his flat near the heath, as well as engaging in much field-work in the area, and during 1983 his already most impressive list for the area was boosted by seven species as follows: the currant clearwing *Synanthedon tipuliformis* has colonised the black-currants on his allotment, the blue bordered carpet *Plemyria rubiginata* was netted on Hampstead Heath at dusk on 3 July, the barred red *H. fasciaria* was taken at actinic light on 30 June, the annulet *Gnophos obscuratus* was captured in a similar manner on 20 August — a typical heathland species, the sandy carpet *Perizoma flavofasciata* was netted on the heath, pupal cases of the frosted orange *Gortyna flavago* were found in dead stems of *Arctium*, and the beautiful golden Y. *Autographa pulchrina* was taken at light. In the second year an impressive fifteen additional species records were made by Mr Softly for the area. The grass emerald *Pseudoterpna pruinata* was taken in Ken Wood during July, whilst the treble brown spot *Idaea trigeminata* was noted both here and in the balcony trap. A surprising record is one of the vestal *R. sacra*, not that the species was uncommon during 1983, but this one was seen at his allotment on 3 September in 1984. It is interesting to note that over Britain as a whole, whilst as few as fifty vestals were noted during the year, at least fifteen of them occurred in the same week of September as Mr Softly's sighting. Amongst the other additions were the white line dart *Euxoa tritici* at the balcony trap, the marbled white spot *Lithacodia pygarga* netted on the heath and the oak nycteoline *Nycteola revayana*.

M. J. Hammerson has sent me a number of macro records from a wide area of Middlesex during 1984. A larva of the emperor *Saturnia pavonia* was found by a work colleague of his and brought to him for identification. This was from Oakleigh Park Station, in East Barnet. A number of more widespread species noted from his garden at Highgate included the mottled pug *Eupithecia exigua*, the blood vein *Timandra griseata* and both forms of the riband wave *Idaea aversata* ab. *aversata* and ab. *remutata*.

Several common species recorded by Mrs E. Chacksfield included the ruby tiger *Phragmatobia fuliginosa* at Neasden, and the vapourer *Orgyia antiqua* in the same area.

M. J. Hough has sent me an impressive list of 113 macros taken in his garden at Uxbridge during 1983. Amongst his more notable species stand out the heart and club *Agrotis clavis* which appears to be quite local in the L.N.H.S. area. This example appeared on 5 July. The six striped rustic *Xestia sextrigata* was noted on 16 August and the black rustic *A. nigra* on 27 September. It is always of interest to note the relative abundance of the more common species within a given area, as well as examining the less prevalent ones, and I am intrigued to see that Mr Hough recorded only a single nutmeg *Dicestra trifolii* during 1983. In my own garden in East Ham, South Essex, I recorded in excess of 300 during the same year. Other species for which his low total contrasts with higher figures for East Ham for the same period include the lychnis *Hadena bicurris*, the Hebrew character *Orthosia gothica*, the common quaker *O. stabilis* and the early grey *Xylocampa areola*. Mr Hough's garden is apparently some eighty feet long bordered with hazel *Corylus avellana* and hawthorn *Crataegus* trees, with the River Frays running along one side. However, he comments that the presence of large gas-holders and an industrial estate along the other side make the moth records less numerous than might be expected. His trap was run on a weekly basis throughout the season.

From his garden at Pinner, W. E. Minnion listed 149 species at light in 1983, and then 122 during the following year, making his overall macro total for this site up to 217 species. In the earlier year several moths of interest were noted, including the small elephant hawk *Deilephila porcellus* on 22 June (the last one here was in 1971), the pine hawk *Hyloicus pinastri* with a pair on 3 July and a male on 11th of that month, the double lobed *Apamea ophiogramma*, the white satin

Leucoma salicis, Haworth's pug *Eupithecia haworthiata*, with one each on 8 and 14 July (only one having been previously recorded — on 11 July 1980) and the fern *Horisme tersata* on 19 August. These last two species are somewhat unusual on the London clay, being principally insects of more chalky soils, their larvae feeding on travellers joy *Clematis*. It is of interest that Mr Minnion has this plant established in his garden, and it seems likely that these species breed here. The nearest chalk is about two miles away at Harefield. His other new species during 1983 were the orange swift *Hepialus sylvina*, the small yellow wave *Hydrelia flammeolaria*, the brick *Agrochola circellaris* and the straw dot *Rivula sericealis*. During 1984 the lunar marbled brown *Drymonia ruficornis* was noted for the first time since 1980, and there were eight new additions to his list including the feathered gothic *Tholera decimalis*, the lunar-spotted pinion *Cosmia pyralina*, the oak nycteoline *Nycteola revayana*, the broken barred carpet *Electrophaes corylata*, the oak beauty *Biston strataria* and the barred red *Hylaea fasciaria*.

D. Seth-Smith had a female small emerald *Hemistola chrysoprasaria* at his window in Northwood on 18 July. This is a widespread species but rather localised in our area, and on chalky soils generally.

N. Bowman recorded burnet companions *Euclidia glyphica* at Islington Cemetery and Alexandra Park as well as adjacent to the A1 trunk road at Highgate during 1984.

Finally from this large vice-county area of London Dr A. M. George, the recorder for the Ruislip and District Natural History Society, has sent me a large number of records from that area. At Old Park Wood Nature Reserve, Harefield, 97 species of macro were noted during 1984, including several worthy of mention. The map-winged swift *Hepialus fusconebulosa* is one which appears to be distinctly local in its distribution in the London area, and Dr George tells me it is a new record for the Ruislip N.H.S. region. The day-flying orange underwing *Archiearis parthenias* was noted here too. The birch mocha *Cyclophora albipunctata* was noted on 3 August, and its congener the maiden's blush *C. punctaria* on 15 June and 6 July. The shoulder stripe *Anticlea badiata* was noted on 6 April; the larvae occur on wild rose during the summer. A single northern winter moth *Operophtera fagata* was captured on 10 November, a single dingy shell *Euchoeca nebulata* on 3 August and a single small seraphim *Pterapherapteryx sexalata* on 15 June. Ten pale oak beauties *Serraca punctinalis* were also noted on 15 June, an impressive total. Finally at this site a single example of the pink-barred sawfly *Xanthia togata* was taken on 28 September, and the uncommon but spreading slender brindle *Apamea scolopacina* on 3 August.

Elsewhere in the Ruislip recording area, Dr George reports a single tawny pinion *L. semibrunnea* taken at sawfly on 8 April at Alder glade Nature Reserve, Uxbridge; the northern drab *Orthosia populeti* at sawfly on 15 April in Bishop's Wood, the first record for this wood, although the species occurs in Park Wood, Ruislip; a male great oak beauty *Boarmia roboraria* at a lighted window in Northwood, (also known to occur at Ruislip Woods S.S.S.I.); the first ever black rustic *A. nigra* in the Ruislip recording area on 29 September; a very late riband wave *Idaea aversata* to light at Northwood on 10 November; a flounced chestnut also at Northwood, being the first for Dr George's garden albeit a common moth in the local woods; a brindled green *Dryobotes eremita*, also new to his garden; and a brown scallop *Philereme vetulata* at the Alder glade Nature Reserve, from where a colony of the dark umber *P. transversata* is also known.

To complete this review of Middlesex, it is of note that the still very rare balsam carpet *Xanthorhoe biriviata* is still present at the site mentioned in my last review, and has now been recorded in low numbers at three others in the Colne Valley. The precise localities of all four sites are withheld for the time being for conservation reasons. One of the four sites is apparently under a serious threat from gravel extraction. A possible fifth site exists nearby.

V.C. 24, Buckinghamshire

Dr A. M. George and M. Albertini led a moth trapping trip of the Ruislip society to Oakland Wood near Denham during 1983. This site is on the very western edge of the L.N.H.S. area and it is particularly pleasing to receive records from here. The single night's visit produced 71 species of macro moths including the barred hook tip *Drepana cultraria* which is by no means common in the London area. Also noted was the large twin-spot carpet *Xanthorhoe quadrifasiata*, the dotted clay *Xestia baja* and the orange swift *Hepialus sylvina*. The two best species however, were the dark marbled carpet *Chloroclysta citrata* and the rosy marbled *Elaphria venustula*. The former is quite local in its distribution in our area, nor is it common where it occurs. The latter is quite an exceptional record; this species was also noted on two occasions in South Essex (see above).

No other records have been received for this small part of Buckinghamshire for the period under review.

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Hemiptera — Heteroptera of the London Area

PART XV

by ERIC W. GROVES*

(Previous parts of this paper have appeared in *The London Naturalist* as follows: Pt. I (43: 34-66, 1964); Pt. II (44: 82-110, 1965); Pt. III (45: 60-88, 1966); Pt. IV (46: 82-104, 1967); Pt. V (47: 50-80, 1968); Pt. VI (48: 86-120, 1969); Pt. VII (50: 87-94, 1972); Pt. VIII (52: 31-59, 1973); Pt. IX (54: 21-34, 1975); Pt. X (55: 6-15, 1976); Pt. XI (56: 32-43, 1977); Pt. XII (61: 72-87, 1982); Pt. XIII (62: 69-86, 1983); Pt. XIV (63: 97-120).

New sources of records and recorder names have been given whenever additions were necessary. As these are somewhat scattered throughout the series it has been felt useful to now bring them together in the following consolidated lists.

CONSOLIDATED LIST OF SOURCES OF RECORDS

(a) Published and Manuscript

(N.B.—This list is in no order other than that which the items were worked through to extract records).

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62. COULSON, F. J. *The Hemiptera of Surrey*. A manuscript distribution list (compiled from the author's records and those of others) now deposited in the library of the South London Entomological & Natural History Society.²
63. Personal records of P. J. Chandler (from W. Kent).
64. Records from the private collection of L. Christie containing Heteroptera of his own gathering and those of J. Christie (all Surrey), together with some material of H. D. Swain and also of F. J. Coulson³ (mostly Surrey).
65. Records from the private collection of the late H. G. Denvil, the Heteroptera of which (all Surrey) are now in the possession of L. Christie.

1 This collection consists almost exclusively of the W. West (of Greenwich) collection, all well identified to which a few only have been later added by Syms of his own collecting. Fortunately West's field-notebooks survived and Mr Christie has kindly allowed me to go through these for London Area records. The information thus obtained and incorporated in this present paper supplements the bare records of West's given in published sources (4), (39) and (22).

2 Now the British Entomological & Natural History Society.

3 The main collection of F. J. Coulson (mostly Surrey) is in the care of the British Entomological & Natural History Society (formerly the South London Entomological & Natural History Society) abbreviated throughout this paper to SL.

66. Records from the private collection R. R. Fowell.
67. *Trans. Soc. Br. Ent.* **1-19**, 1934-1971.
- (a) BROWN, E. S. 1948. A contribution towards an ecological survey of the aquatic and semi-aquatic Hemiptera-Heteroptera (water-bugs) of the British Isles, dealing chiefly with the Scottish Highlands, and east and south England, **9**: 151-195.
- (b) PEARCE, E. J. and WALTON, G. A. 1939. A contribution towards an ecological survey of the aquatic and semi-aquatic Hemiptera-Heteroptera (water-bugs) of the British Isles. **6**: 149-180.
- (c) WALTON, G. A. 1943. The water-bugs (Rhynchotha-Hemiptera) of north Somerset. **8**: 231-290.
- (d) WALTON, G. A. 1938. The British species of *Micronecta* (Corixidae, Hemipt.) **5**(7): 259-270.
68. *J. Soc. Br. Ent.* **1-6**: 1934-1959
- (a) WALTON, G. A. 1939. Two water-bugs new to Great Britain: *Microvelia pygmaea* Duf. and *Microvelia umbricola* Wrob. (Hemipt.), **2**: 26-33.
- (b) POPHAM, E. J. 1950. Water-bugs (Hemiptera-Heteroptera) of north Surrey, **3**: 158-173.
- (c) BRINKHURST, R. O. 1959. The habitats of British *Gerris* and *Velia* species, **6**: 37-44.
69. ANON. 1964. Fauna and Flora of the River Darent (First Report). *Journal of Field Studies, New Cross Evening Institute for 1963*.
70. Record book of A. M. Masee now in the Entomology Dept., British Museum (Natural History), London.
71. LANSBURY, I. 1956. Some Notes on the ecology of the aquatic and semi-aquatic Hemiptera-Heteroptera and their associated fauna and flora in southern Hertfordshire and north-eastern Middlesex. *Entomologist's Gaz.* **7**: 97-111, 157-166, and 213-223.
72. BROWN, E. S. 1941. Some aquatic Hemiptera-Heteroptera new to Hertfordshire with notes on others found in the Hertford area. *Trans. Herts. nat. Hist. Soc. Fld Club* **21**(4): 266-271.
73. BROWN, E. S. 1943. A further addition to the list of Hertfordshire aquatic Hemiptera. *Trans. Herts. nat. Hist. Soc. Fld Club* **22**(3): 108.
74. LANSBURY, I. 1956. A list of the aquatic and semi-aquatic Hemiptera-Heteroptera recorded for Hertfordshire, with notes on species found in the Barnet area, *Trans. Herts. nat. Hist. Soc. Fld Club* **24**(5): 192-196.
75. NAU, B. S. 1974. A distribution study of aquatic Heteroptera in Hertfordshire. *Trans. Herts. nat. Hist. Soc. Fld Club* **26**(7): 307-320.
76. LESTON, D. and GARDINER, A. E. 1953. Corixidae (Hemiptera) at mercury vapour light: some records from Surrey, England. *Entomologist's Gaz.* **4**: 269-272.
77. Personal records of L. Jessop (from Essex).
78. Personal records of P. A. Nicholson (from Herts.).
79. JOHNSON, W. 1912. *Wimbledon Common*. London.
80. HARRISON, J. L. 1933. Pond life on Wimbledon Common. *J. Wimbledon nat. Hist. Soc.* **1**: 30-31.
81. HARRISON, J. L. 1937. Scio Pond: its natural history, drainage and recolonisation. *J. Wimbledon nat. Hist. Soc.* **5**: 14-16.
82. Manuscript field notebooks of C. P. Castell (on Bookham Common, Surrey).
83. JOHNSON, W. 1910. *Battersea Park as a Centre for Nature Study*. London.
84. BROWN, E. S. 1954. Report on Corixidae (Hemiptera) taken in light traps at Rothamsted Experimental Station. *Proc. R. ent. Soc. Lond.* (A) **29**: 17-22.

85. Personal records of J. H. Bratton (from Middx., Herts., Essex and Surrey).
 86. Records from I. Lansbury collection¹ (from Middx., Herts., Essex, Kent and Surrey).
 87. Personal records of J. H. Davidson communicated March 1976.
 88. Records of B. N. K. Davies made in Chelsea Physic Garden, London, 2.vii.80 (see his paper *Habitat Diversity and invertebrates in Urban Areas*, pp. 49-63 in Bornkamm, R., Lee, J. A. and Seaward, M. R. D. (eds.), 1982. *Urban Ecology*, Oxford), and on 4.viii.81 (pers. comm.).
 89. Personal records of D. A. Smith (mainly S. Essex).
 90. Records from Darlands Lake Nature Reserve, Totteridge (v.-c. 20) noted by J. H. Bratton and P. Kirby (list communicated by J. H. Bratton, 1985).
 91. Records of J. A. Hollier from Mitcham Common, Surrey, 1983.
 92. Records from the report *The Wildlife of Scrubs Wood* prepared by the Hammersmith and Fulham group of the London Wildlife Trust, 1984.

(b) Museum and Society Collections

Records obtained from Museum and Society collections are indicated by the following abbreviations:—

- BM = British Museum
 WBM = Woolwich Borough Museum
 MM = Maidstone Museum
 HD = Hope Dept. of Entomology, University Museum, Oxford.
 NM = Norwich Museum
 SL = South London Entomological and Natural History Society's collection.
 RSM = Royal Scottish Museum.
 C = British Heteroptera in the Dept. of Zoology, The University, Cambridge (containing the E. J. Newbery collection, etc.).
 BDK = North Hertfordshire Museums (Natural History Dept.). High Street, Baldock, Herts.
 LSR = Leicester Museum & Art Gallery.

(c) Other abbreviations:

- Slough (ICBFS) = Imperial College Biological Station (now the Pest Infestation Laboratory, *see below*)
 Slough (PILG) = In the grounds of the Pest Infestation Laboratory, Slough.²
 n.c. = no collector
 n.d. = no date.

¹ Lansbury's collection (from which London Area records have been extracted for this paper) consists of European and British Hydrocorisae, mostly his own material, but also some from other collectors. Up to November 1983 it had been housed in a separate cabinet in the Hope Dept, Oxford but after that date it was put into store boxes ready for dispatch to the Australian National Insect Collection, Division of Entomology, CSIRO, Canberra, A.C.T., Australia.

² Now the Slough Laboratory, Ministry of Agriculture, Fisheries and Food.

CONSOLIDATED INDEX TO RECORDERS' NAMES

M. Ackland	(MA)	C. W. Dale	(CWD)
R. G. Adams	(RGA)	J. H. Davidson	(JHD)
Robert Adkin	(RA)	B. N. K. Davies	(BNKD)
A. A. Allen	(AAA)	J. C. Deeming	(JCD)
A. H. G. Alston	(AHGA)	H. G. Denvil	(HGD)
C. H. Andrewes	(CHA)	G. H. L. Dicker	(GHLD)
J. C. Armstrong	(JCA)	J. Disney	(JD)
W. J. Ashdown	(WJA)	F. A. Dixey	(FAD)
R. W. Attwood	(RWA)	W. R. Dolling	(WRD)
E. E. Austen	(EEA)	H. St. J. K. Donsithorpe	(HSJKD)
M. E. Bacchus	(MEB)	J. W. Douglas	(JWD)
F. Bancroft	(FB)	J. W. Douglas & J. Scott	(D&S)
H. F. Barnes	(HFB)	J. E. Downes	(JED)
C. G. Barrett	(CGB)	T. R. Eagles	(TRE)
A. Beaumont	(AB)	A. M. Easton	(AME)
E. C. Bedwell	(ECB)	V. F. Eastop	(VFE)
C. J. F. Bensley	(CJFB)	F. W. Edwards	(FWE)
M. Bewley	(MB)	James Edwards	(JE)
C. R. Billups	(CRB)	S. Edwards	(SE)
T. R. Billups	(TRB)	J. H. Flint	(JHF)
K. G. Blair	(KGB)	H. W. Forster	(HWF)
W. Blatch	(WB)	R. R. Fowell	(RRF)
J. A. Boyer	(JABo)	A. E. Gardner	(AEG)
J. H. Bratton	(JHB)	J. L. Gilbert	(JLG)
J. A. Brewer	(JAB)	W. H. Goddard	(WHG)
H. Britten	(HB)	W. O. Grant	(WOG)
R. O. Brinkhurst	(ROB)	E. E. Green	(EEG)
P. S. Broomfield	(PSB)	A. E. LeGros	(AELeG)
E. S. Brown	(ESB)	E. W. Groves	(EWG)
G. E. Brown	(GEB)	K. M. Guichard	(KMG)
F. R. Browning	(FRB)	C. G. Hall	(CGH)
G. Bruce	(GB)	D. G. Hall	(DGH)
F. D. Buck	(FDB)	J. L. Harrison	(JLHa)
L. C. Bushby	(LCB)	P. Harwood	(PH)
E. A. Butler	(EAB)	A. Hayward	(AH)
P. A. Buxton	(PAB)	O. G. Heath	(OGH)
A. W. Pickard-Cambridge	(AWP-C)	J. L. Henderson	(JLH)
E. Capron	(EC)	N. E. Hickin	(NEH)
C. P. Castell	(CPC)	J. D. Hillaby	(JDH)
G. C. Champion	(GCC)	J. A. Hollier	(JAH)
H. C. Champion	(HCC)	G. E. Hutchinson	(GEH)
P. J. Chandler	(PJC)	D. J. Jackson	(DJJ)
W. E. China	(WEC)	D. A. James	(DAJ)
A. J. Chitty	(AJC)	E. W. Janson	(EWJ)
J. Christie	(JC)	H. W. Janson	(HWJ)
L. Christie	(LC)	F. B. Jennings	(FBJ)
D. J. Clark	(DJC)	P. Jerrard	(PJ)
J. A. Clark	(JAC)	L. Jessop	(LJ)
T. F. Clarke	(TFC)	C. Johnson	(CJ)
E. W. Classey	(EWC)	Walter Johnson	(WJ)
E. C. Pelham-Clinton	(ECP-C)	A. W. Jones	(AWJ)
D. Collins	(DC)	E. & B. Jarzembowski	(E&BJ)
J. J. Collins	(JJC)	M. W. Joyce	(MWJ)
F. G. Cuerdon	(FGC)		

L. J. Winter-Joyner	(LJW-J)	G. Samouelle	(GS)
D. Kelly	(DK)	W. A. Sands	(WAS)
H. K. Kenward	(HKK)	J. H. P. Sankey	(JHPS)
S. W. Kemp	(SWK)	E. Saunders	(ES)
P. Kirby	(PK)	F. S. Saunders	(FSS)
G. W. Kirkaldy	(GWK)	H. A. Saunders	(HASa)
I. Lansbury	(IL)	H. A. Sauzé	(HAS)
R. M. Leake	(RML)	E. Gowing-Scopes	(EG-S)
D. Leston	(DL)	J. Scott	(JS)
E. Lewis	(EL)	G. G. E. Scudder	(GGES)
George Lewis	(GL)	D. Sharp	(DS)
J. & T. Linnell	(J&TL)	W. E. Sharp	(WES)
W. J. Lucas	(WJL)	H. K. Airy Shaw	(HKAS)
J. Lukins	(JL)	J. F. Shillito	(JFS)
T. T. Macan	(TTM)	K. C. Side	(KCS)
R. A. Preston-Mafham	(RAPM)	A. Smith	(AS)
Hugh Main	(HM)	D. A. Smith	(DAS)
T. A. Marshall	(TAM)	W. F. Snow	(WFS)
E. L. Martin	(ELM)	B. J. Southgate	(BJS)
A. M. Masee	(AMM)	South London Entom. & N.H. Soc. excursions	
B. P. Moore	(BPM)	(Where no collector is specifically mentioned)	(SL)
Harry Moore	(HM)	T. R. E. Southwood	(TRES)
M. G. Morris	(MGM)	E. R. Speyer	(ERS)
C. Morley	(CM)	W. H. Spreadbury	(WHS)
B. S. Nau	(BSN)	H. T. Stainton	(HTS)
O. G. Neath	(OGN)	Edward Step	(ES)
E. A. Newbery	(EAN)	A. E. Stubbs	(AES)
E. Newman	(EN)	C. H. Stokes	(CHS)
C. Nicholson	(CN)	C. E. Stott	(CES)
P. A. Nicholson	(PAN)	H. D. Swain	(HDS)
D. Ollevant	(DO)	R. C. H. Sweeney	(RCHS)
R. Palmer	(RP)	E. E. Syms	(EES)
M. A. Park	(MAP)	F. W. Terry	(FWT)
S. Parker	(SP)	J. E. Thomas (Miss)	(JET)
L. Parmenter	(LP)	D. C. Thomas	(DCT)
F. P. Pascoe	(FPP)	A. A. Thorp	(AAT)
E. J. Pearce	(EJPe)	C. H. Tottenham	(CHT)
W. E. Phillips	(WEP)	D. Tozer	(DT)
E. Philp	(EPH)	H. J. Turner	(HJT)
A. Piffard	(AP)	R. W. J. Uffen	(RWJU)
C. J. Pool	(CJP)	B. Verdcourt	(BV)
E. J. Popham	(EJP)	G. V. Vredenberg	(GVV)
J. A. Power	(JAP)	S. Wakely	(SW)
E. Prince	(EP)	F. A. Walker	(FAW)
W. J. LeQuesne	(WJLeQ)	J. J. Walker	(JJW)
E. Milne-Redhead	(EMR)	G. A. Walton	(GAW)
O. W. Richards	(OWR)	P. H. Ward	(PHW)
R. G. Rigden	(RGR)	C. O. Waterhouse	(COW)
J. E. H. Roberts	(JEHR)	A. R. Waterston	(ARW)
P. J. L. Roche	(PJLR)	J. Waterston	(JW)
C. D. Routh	(CDR)	W. J. Watts	(WJW)
D. W. Royffe	(DWR)	R. D. Weal	(RDW)
F. Rumsey	(FR)	W. West	(WW)
E. C. Rye	(ECR)	L. S. Whicher	(LSW)
G. B. Ryle	(GBR)		

K. P. Whitethorne	(KPW)	T. E. Woodward	(TEW)
T. Wilkinson	(TW)	Baron C. de Worms	(CdeW)
B. S. Williams	(BSW)		
C. L. Withycombe	(CLW)	I. H. Yarrow	(IHY)
G. E. Woodroffe	(GEW)	J. W. Yerbury	(JWY)

CORRIGENDA

A general correction note applicable throughout Parts I-XIV is as follows:

- (a) Records attributed to *IFL* should read *IL*; and for *MBB* read *MEB*.
 (b) Records attributed to *PJLR* and as being at (MM) should have the (MM) deleted and substituted with (20). This is because it is now known that Dr Roche's specimens had been on temporary loan only to the Maidstone Museum and were removed by him a short while before the disastrous fire that occurred at that institution in 1977.

(N.B. The running pagination given at the foot of the pages in each part is that listed below. Changes in nomenclature since Southwood & Leston's book, other than those already altered in this present series of papers, are indicated below in bold typeface).

Part I. (LN 43)

- p. 2 In footnote under 2 the author's initials should be 'Bedwell. E.C.'.
 p. 3 Dates in brackets after E. A. Butler should read '1845-1925'; and Bedwell's initials should read 'E. C. Bedwell'.
 p. 4 In Sources of Records an arrow → should follow the date '1885'; and item (22) should be followed by '& (52)'.
 In source 12 the pagination of the paper should read '314-327'.
 p. 6 In Source 33(b) the volume number should read '86'.
 p. 9 In *Aradus aterrimus* under KENT in line 2, insert '(38)' between '(28)' and the full stop.
 p. 10 In *Aneurus laevis* under KENT in line 2 insert '(SL)' between 'WW' and '(1/1904-5, 74)'.
 p. 11 In *Cyphostethus tristriatus* (now *Elasmostethus tristriatus*). Under HERTS in line 1 insert '30.iv.22' between 'district' and 'BSW', and insert '(60)' between 'BSW' and '(1/1922-23, 115)'; under KENT, in line 3 for 'WTW' read 'WJW'; and under SURREY substitute the record 'Riddlesdown, SW (1/1951-52, 43-44)' with 'Riddlesdown, 11.xi.51, on juniper, WJW in SW coll. (SL) (1/1951-52, 43-44)'.
 p. 12 In *Elasmostethus interstinctus* under SURREY, in line 2 the locality 'Walton-on-the-Hill' should not be italicized; in line 6 insert '(SL)' between 'FJC' and '(1/1949-50, 75)'.
 p. 13 In *Legnotus limbosus* under SURREY in line 2 insert '(RSM)' between '(HD)' and 'and'.
 p. 14 In *Sehirus bicolor* under SURREY, in the penultimate line, for '(2/37, 57)' read '(2/38, 57)'.
 p. 16 In *Eurygaster maura* under SURREY in line 10 delete 'EAB' after 'Gomshall' and substitute 'viii.1892, EAB (RSM)'.
 p. 17 The first sentence in the paragraph under PENTATOMIDAE (Shield Bugs) should read 'Nineteen native and two alien species recorded in Britain of which 18 native and one alien species are known from the London area.'
 p. 18 In *Podops inuncta* under HERTS in line 4 insert '(Northchurch)' after 'Berkhampsted'.
 In *Aelia acuminata* under KENT the initials 'FBJ' after the Bickley record should be italicized; and under SURREY in line 5 in the Albury record insert 'by sweeping on a hot day in some long dry grass on a mound in a wood' between 'viii.1899' and 'EAB', and insert '(38)' after '(BM)'.
 p. 19 In *Neottiglossa pusilla* under SURREY in line 6 insert '(38)' between '(BM)' and the semi-colon.
 In *Eysarcoris fabricii* under SURREY in line 13 insert '(38)' between '(16 and 81)' and the semi-colon.
 p. 20 In *Palomina prasina* under SURREY in the bottom line delete the first 'SL' and substitute 'FJC (60)'.

- p. 21 *Pitedia juniperina* is now *Chlorochroa juniperina*.
In *Dolycoris baccarum* under MIDDX in line 2 '*occinea*' should read '*coccinea*'.
- p. 22 In *Pentamona rufipes* under ESSEX in line 1 add '15' before 'vi.12' and in line 2 insert '(38)' between '(BM)' and the semi-colon.
- p. 23 In *Eurydema oleracea*, line 2 of the first paragraph, for '*Rhaphanus*' read '*Raphanus*'.
- p. 24 In line 3 from the top for 'caterpillats' read 'caterpillars'.
- p. 25 In *Troilus luridus* under BUCKS for 'Slough, GEW (40)' read 'On the boundary at Slough (PILG), ix.50, a single larva on birch, BJS & GEW (31d); and beyond at Amersham, 22.x.50 & 22.vii.56, WJLeQ (21)'.
- p. 28 In *Syromastus rhombeus* under SURREY in line 4 in the Gomshall record insert 'nymph, in a sandpit' after 'viii.1890', and after '(BM)' add '(EMM 26, 296)'. In *Spathocera dahlmannii* delete the final 'i'; and under SURREY in the Farley Heath record insert 'in dead leaves and vegetable debris in a bare area' between '1896' and 'EAB', and add '(38)' after '(BM)'.
- p. 29 In *Ceraleptus lividus* delete brackets and full-stop of the author '(Stein.)'; and under SURREY in line 2 delete 'by sweeping, TRB (37)' and substitute '8 specimens taken at roots of *Festuca pratensis* on the railway bank, TRB (EMM 21, 277) (37) (38)'.
In *Coriomerus denticulatus* the generic name should read *Coriomeris*.
- p. 31 *Aeschyntelus maculatus* is now *Rhopalus maculatus*.
- p. 32 In *Rhopalus rufus* under BUCKS in line 2 delete 'H' and substitute 'PH'.
In *Rhopalus subrufus* under KENT in line 4 delete 'SL' and substitute 'DL' (60); and under SURREY in line 2 delete 'SL' and substitute 'SW' (44).
- p. 33 In *Myrmus miriformis* under BUCKS in line 4 add '(38)' after '(BM)'.
In *Dicranocephalus medius* under KENT in line 2 delete 'and' before (EMM 47, 134) and substitute '(38)'.

Part II. (LN 44)

- p. 34 In SOURCES OF RECORDS 33 the volume number should read '88'.
- p. 36 In INDEX TO RECORDERS' NAMES 'R. A. Preston-Mafam' should read 'R. A. Preston-Mafham'.
- p. 37 In *Heterogaster artemisiae*, in paragraph 1, insert 'on thyme (*Thymus* spp.)' between 'occurs' and 'on chalky slopes'; and under SURREY in line 4 substitute the Abinger record with 'Abinger Hammer, viii.1899, in a chalk pit on the Downs, EAB (BM) (38)'.
- p. 38 In *Henestaris halophilus* under KENT insert 'Just beyond the boundary at' before 'Gravesend'.
In *Ischnodemus sabuleti* under MIDDX in line 6 insert '(RSM)' between '(33a)' and the semi-colon; and in the last line insert '(60)' between '(SL)' and the full-stop.
- p. 40 In *Kleidocerys resedae* under SURREY in line 5 insert 'and 12.x.1900' between 'vii.1870' and 'AB', and in line 8 delete 'AAA' and substitute '15.ix.63, adults and nymphs, the latter more numerous, off catkins of birch, and 7.v.59, a single adult off birch, both records of 'AAA'; and in line 9 delete 'AAA' and substitute '27.vi.64 & 22.vii.64, a few swept off birch, 'AAA'.
- p. 40 In *Kleidocerys truncatulus* subsp. *ericae* under SURREY in line 7 delete '(50)' after 'AAA' and substitute '(51)'; and insert 'Oxshott Heath, 17.ix.58 and vii.64, amongst heather, frequent and gregarious, AAA (51)' between 'EWG (24)' and 'Horsell Common'.
- p. 42 In *Megalonotus dilatatus* under KENT in line 1 delete '1900' and substitute '28.iv.1900, amongst dry leaves under broom'; and in line 2 insert '(60)' between 'WW' and '(4)'.
- p. 43 In *Rhyparachromus pini* under KENT for 'end' read 'and'; and under SURREY in line 2 delete 'AAA' and substitute '17.ix.58, two examples found beneath mat of heather, AAA'.
- p. 44 In *Trapezonotus dispar* delete the words 'The true *arenarius* is unlikely to be found in the London area but' and begin the sentence with the word 'Authenticated'; and remove the following records from SURREY 'Reigate Heath, 4.viii.55, GEW (40)', 'and beyond the boundary at Chobham Common, 18.iv.58, GEW (40); Ash Vale, GEW (40)', and from under BUCKS remove 'Slough (PLG), 1.vii.60, GEW (60)'. These records, according to the late Mr G. E. Woodroffe, should be referred to *T. arenarius* (sensu stricto).
- p. 45 In *Tropistethus holosericeus* under SURREY in line 7 insert '(60)' between 'WW' and '(1/1903, 47)'.

- p. 48 In *Plinthisus brevipennis* in line 1, for 'p. 212 (*P. bidentulatus*)' read 'p. 212 (*P. bidentatus*)'.
- p. 49 In *Ischnocoris angustulatus* under SURREY in line 10 insert 'EAB in EAN coll. (C)' between '(BM)' and the semi-colon.
- p. 50 In *Drymus pilicornis* (Muls.) under SURREY in line 1 delete '4.ix.95' and substitute '4.ix.1895'.
In *Drymus sylvaticus* under KENT in bottom line insert a comma after 'Blackheath' and change the 'C' of 'Common' to lower case.
- p. 51 In *Drymus ryei* at top right for 'Sp.1 14p108' read 'Sp.114 p.108'.
- p. 53 In *Scolopostethus affinis* the ESSEX record should be between the HERTS and the KENT records.
- p. 54 In *Scolopostethus grandis* remove the brackets from around '(Horv.)'.
In *Scolopostethus puberulus* remove brackets from around '(Horv.)'.
In *Scolopostethus thomsoni* remove the brackets from around '(Reut.)'.
- p. 55 In *Scolopostethus decoratus* line 2 of the introduction for 'Heath' read 'heath'; under MIDDX line 1 for '15.ix.79' read '15.ix.1879', and insert '(BM)' after 'EAB'.
- p. 58 In *Gastrodes abietum* remove brackets from around '(Berg.)'.
- p. 60 In *Cymus claviculus* under KENT in line 1-2 delete 'Plumstead Marshes, 1901, WW' and substitute 'Plumstead & Abbey Wood marshes, 6.vi.1900, WW (60)'.
In *Cymus melanocephalus* remove brackets from around '(Fieb.)'.
- p. 61 In *Cymus obliquus* remove brackets from around '(Horv.)'.

Part III. (LN 45)

- p. 65 In *Berytinus minor* under KENT for '(Heather Green Lane)' read '(Hither Green Lane)'.
- p. 66 In *Berytinus minor* under SURREY in line 4 from the top insert '(RSM)' between the second '(BM)' and the semi-colon.
- p. 69 In *Piesma quadratum* (Fieb.) under KENT line 4 delete 'Plumstead Marsh, 1900, WW' and substitute 'Plumstead & Abbey Wood marshes, 6.vi.1900, sweeping along the river bank, WW (60)'.
- p. 71 In *Dictyonota strichnocera* remove brackets from around '(Fieb.)'.
In *Dictyonota strichnocera* remove brackets from around '(Costa)'; under KENT delete lines 1 & 2 and substitute 'Plumstead (Wickham Lane), 15.viii.1896, on broom, WW (60) (39) (1/1897, 141)'; under SURREY line 1 insert '18' before 'ix.03' and insert '(60)' between 'WW' and '(1/1903, 60)'.
- p. 72 *Dictyonota tricornis* is now *Kalama tricornis*.
In *Derephysia foliacea* under KENT in line 1 delete '1900' and substitute '13.viii.1900'; in line 2 insert '(60)' between '(1/1900, 85)' and '(4)', and at end of the same line substitute 'n.d' for 'n.c.'.
- p. 73 In *Stephanitis rhododendri* in SURREY in line 2 delete 'viii.54 HB' and substitute '6.viii.54, HB in DGH coll. (BDK)'; and insert 'KGB (60)' between '28.vii.37' at the end of line 3 and '(SL)' at the beginning of line 4.
- p. 74 In *Tingis ampliata* in KENT in line 7 insert 'ix.1893, on thistles' between 'Brook' and 'WW', and insert '(60)' between 'WW' and '(4)'.
- p. 75 In *Tingis ampliata* under BUCKS end of line should read 'at roots of'.
In *Tingis cardui* in line 3 of paragraph 1 for '(*Carduus nutans*)' read '(*Carduus nutans*)'; under KENT in line 2 insert 'ix.1893, on thistles' between 'Kidbrooke' and 'WW', and insert '(60)' between 'WW' and '(4)'.
- p. 77 *Physatocheila costata* subsp. *smreczynskii* is now *Physatocheila smreczynskii*.
- p. 78 In *Dictyla convergens* under SURREY in line 5 insert '(RSM)' between the second '(HD)' and 'and'.
In *Agramma laeta* under SURREY in line 1 insert '60' between 'WW' and '(1/1899)'; and in line 5 insert '(RSM)' between '(HD)' and 'and'.
In *Empicoris vagabundus* under KENT in line 2 insert 'viii.1900' between 'heath' and 'WW', and insert '(60)' between 'WW' and '(39)'.
- p. 80 In *Empicoris baerensprungi* under SURREY in line 2 insert '(HD)' between '(38)' and the semi-colon.
- p. 81 In *Coranus subapterus* under SURREY in line 8 (from top) for 'viii.84 and viii.82' read 'viii.1884 and viii.1892'.
Nabis flavimarginatus is now *Nabicula flavomarginatus*.
- p. 86 In footnote insert '1927' between author's initials and the title of the book.
- p. 87 In *Himacerus apterus* under ESSEX in line 5 for 'Buckhurst Hall' read 'Buckhurst Hill'.

- p. 88 In *Stalia major* (now *Anaptus major*) in line 2 for (*N. flavomarginus*) read (*N. flavomarginatus*).
- p. 89 *Dolichonabis limbatus* is now *Nabis limbatus*
- p. 90 In *Dolichonabis limbatus* under KENT delete record after the semi-colon in line 5 and before semi-colon in line 6.
- p. 91 *Dolichonabis lineatus* is now *Nabis lineatus*
In *Dolichonabis lineatus* under KENT in line 2 delete 'n.d.' and substitute 'ix.10' and insert '(60)' between 'WW' and '(1/1911-12, 52)'.

Part IV (LN 46)

- p. 95 All the records given under *Anthocoris minki* should be referred to *A. simulans* Reut. (fide Jessop in EMM 119, 221-3, 1983).
- p. 98 In *Anthocoris nemorum* under MIDDX line 4 insert '(BDK)' between '(57)' and the semi-colon.
- p. 99 In *Anthocoris nemorum* under SURREY in line 4 for 'Vompositae' read 'Compositae'; and in line 8 for 'Old Cuulsdon' read 'Old Coulsdon'.
- p. 100 In *Anthocoris limbatus* under HERTS insert 'Beyond the boundary' before 'Harpenden'; and in SURREY insert 'On the boundary at' before 'Byfleet'.
- p. 102 All records given under *Orius minutus* should be referred to *Orius vicinus* Rib. (pers. comm. G. E. Woodroffe and EMM 104; 258-9, 1971).
- p. 104 For '*Lasiochilus sladeri*' read '*Lasiochilus sladeni*'.
- p. 106 In *Xylocoris cursitans* and SURREY in line 7 for '(2/37, 57)' read '(2/38, 57)'.
- p. 107 In *Xylocoris formicetorum* in line 1 of the introductory paragraph for '(*Formica ruba*)' read '(*Formica rubra*)'.
In *Xylocoris flavipes*, in line 4 of introductory paragraph for p. 95' read 'p. 94'.
- p. 108 In *Xylocoridea brevipennis* remove the brackets from around '(Reut.)'.
In *Dufouriellus ater* under KENT in line 4 for 'brocket' read 'bracket'.
- p. 109 In *Oeciacus hirundinus* under KENT in line 2 insert 'v.35, ARW (RSM);' between the last semi-colon and 'vi.35'.
- p. 111 In *Loricula pselaphiformis* under HERTS, in line 2 '*Aesculus*' should be italicized.
- p. 112 In *Loricula elegantula* under HERTS at end of line 5 delete '♀' and substitute '♂'.
- p. 113 *Myrmedobia tenella* now *Myrmedobia exilis*.
In *Myrmedobia tenella* under SURREY in line 2 insert 'vii.1888' between 'Woking,' and 'ES', and insert '(HD)' between 'ES' and '(3)'.
In *Myrmedobia distinguenda* remove brackets from around '(Reut.)'
In *Myrmedobia coleoptrata* under MIDDX in line 3 for 'West-Hope coll.' read 'Westwood Hope coll.'

Part V (LN 47)

- p. 116 For '*Bryocoris pteridos*' read '*Bryocoris pteridis*'.
- p. 118 In *Deraeocoris lutescens* under KENT line 8 'HM' should be italicized.
- p. 119 In *Deraeocoris ruber* under SURREY in line 8 for 'Walington' read 'Warlingham'.
- p. 120 In *Deraeocoris scutellaris* in line 2 for 'D&S p.443 (*C. scutellaris*)' read 'D&S p.443 (*Capsus scutellaris*)'.
- p. 122 In *Oncotylus viridiflavus* in line 2 for '(*Ahoterops setulosus*)' read '(*Anoterops senulosus*)'.
In *Oncotylus viridiflavus* under SURREY in line 4 insert '15.vii.49' between 'Common' and 'FJC', and insert '(64)' between 'FJC' and '(62)'. In line 7-8 delete 'and Effingham, FJC (62)' and substitute 'and beyond the boundary at Effingham, 22.vii.49, FJC (64) and Gomshall, 19.vii.36, FJC (64)'.
- p. 123 In *Conostethus roseus* under MIDDX in line 2 insert 'DCT' between 'grass' and '(33a)'.
- p. 124 In *Hoplomachus thunbergi* under MIDDX in line 4 for 'bark' read 'bank'.
In *Tinicephalus hortulanus* in line 2 '*tanceti*' should read '*tanacetii*', and under SURREY in line 5 '*Onosis*' should read '*Ononis*'.
- p. 126 In *Megalocolleus pilosus* under SURREY in line 1 for 'Bexhill' read 'Boxhill', and in line 7 insert '(RSM)' between '(HD)' and '(36)'.
In *Amblytylus brevicollis* under KENT insert 'WW' between 'shrubby' and '(60)'.
- p. 128 In *Macrotylus solitarius* under HERTS in line 4 delete '(ST)' at the end of the line and substitute '(57) (BDK)' and under SURREY in line 2 substitute 'on' for 'a' before '*Stachys*'.
- p. 129 In *Orthonotus rufifrons* under KENT in line 2 insert '(BM)' between 'PH' and the semi-colon.
- p. 131 For *Brachyarthrion limitatu* read *Brachyarthrion limitatum*; and under ESSIX in line 2 insert '(JJC coll. in HD)' between '(BM)' and '(60)'.

- p. 132 In *Phylus melanocephalus* under MIDDX in line 4 for 'on' read 'an'.
- p. 137 In line 2 from the top for '*P. quercus*' read '*P. quercus*'.
In *Psallus perrisi* under KENT in line 1 remove inner bracket and comma that follow '22', and in line 2 insert a closing bracket between the first 'AMM' and the semi-colon.
In *Psallus wagneri* add a full-stop after 'Ossian'.
- p. 138 In *Psallus assimilis* in line 2 for '(*Apocremus simillimus*)' read '(*Apocremus simillimus*)'.
- p. 139 *Psallus roseus* is now *Psallus haematodes* (Gmel.).
In *Psallus roseus* in lines 1 & 3 substitute the 'q' with a 'g' in (*P. sanguineus*).
In *Psallus flavellus* under SURREY in line 1 for 'AA' read 'AAA'.
- p. 141 *Psallus alnicola* is now *Psallus scholtzii* Fieb.
In *Psallus alnicola* under MIDDX in line 1 for '1962' read '1961'.
- p. 142 In *Psallus albicinctus* under SURREY in line 3 insert '(HD)' between 'ES' and '(37)'.
In *Psallus varian* add a final 's' on the end of this name in both lines 1 and 2.
- p. 144 *Comiortodes salicellus* is now *Compsidolen salicellus*.
In *Comiortodes salicellus* under ESSEX at end of line 1 for '(4)' read '(5)'.

Part VI (LN 48)

- p. 153 In *Chlamydatus salitans* under SURREY in line 4 insert '(HD)' between '(BM)' and '(3)'.
Monosynamma bohemani of British authors seems to be a complex of three species, *M. maritima* Wagner, *M. sabulicola* Wagner and *M. bohemani* (Fall.) *sensu stricto*, and may be found on *Salix* spp. other than *S. repens* (see Woodroffe in *Entom.* 100, 217-222, 1967, and EMM 98, 272, 1962 publ. 1963).
- p. 155 In *Sthenarus rotermundi* in the introductory paragraph for 'Occurs on white and grey poplars (*Populus alba* and *Populus canescens*)' read 'Occurs on white, grey and black poplars (*Populus alba*, *P. canescens* and *P. nigra*)'.
- p. 156 *Asciodema fieberi* is now *Psallodema fieberi*.
In *Asciodema fieberi* under HERTS in line 2 insert '(HD)' between '(BM)' and the full-stop.
- p. 157 In *Systellonotus triguttatus* in line 2 delete the second 'D' and substitute 'B'.
- p. 161 In *Dicyphus errans* under SURREY in line 3 insert 'on Restharrow (*Ononis* sp.)' between '21.ix.68' and 'KCS'.
In *Dicyphus stachydis* under HERTS in line 7 insert '7.ix.54' between '28.vi.55' and 'and 20.ix.54'.
- p. 163 In *Dicyphus annulatus* under SURREY in line 3 insert 'on Restharrow (*Ononis* sp.), in great numbers' between '21.ix.68' and 'KCS'.
- p. 164 In *Campyloneura virgula* under HERTS in line 4 insert 'and 22.viii.54' between '1.viii.54' and 'GGES'.
- p. 174 In *Dryophilocoris flavoquadrimaculatus* under SURREY in line 1 delete '(60)' and substitute '(64)'.
- p. 179 In *Blepharidopterus angulatus* under SURREY in line 10 (from the top) insert 'on shrubs at edge of woodland' between '21.x.68' and 'KCS'.
- p. 180 In *Pachylops bicolor* under SURREY in line 5 (from the top) insert '(HD)' between 'ES' and '(37)'.

Part VII (LN 50)

- p. 184 In *Orthotylus flavinervis* under KENT in line 4 delete '(MD)' and substitute '(HD)'; under SURREY in line 5 insert 'vii.1890' between 'Woking.' and 'ES', and insert '(HD)' between 'ES' and '(3)'.
- p. 185 In *Orthotylus nassutus* under KENT in line 3 insert semi-colon between 'common' and 'to'.
- p. 186 In *Orthotylus prasinus* under KENT in line 2 insert '(HD)' between '(BM)' and '(4)'.

Part VIII (LN 52)

- p. 191 In *Orthotylus flavosparsus* in line 8 of the introductory paragraph for 'good' read 'Good'.
- p. 195 *Neomecomma bilineatus* is now *Orthotylus bilineatus*.
- p. 196 In *Neomecomma bilineatus* under MIDDX in line 3 delete '5.vii.58' and substitute '5.viii.58'.
- p. 198 *Mecomma dispar* is now *Globiceps dispar*.
- p. 203 In *Lygus rugulipennis* under SURREY in line 1 delete '11' in the first date given and substitute 'ii'.

- p. 208 In *Orthops campestris* in line 2 for '(*Orthops pastinaceae*)' read '(*Orthops pastinaceae*)'.
- p. 213 In *Lygocoris viridis* under BUCKS in line 2 insert '28.vi.55, GEW (HD)' between '(40)' and the semi-colon.
- p. 214 In *Lygocoris populi* under BUCKS in line 3 insert, 'one paratype in HD' between 'SL' and the closing bracket.
In *Lygocoris contaminatus* under KENT in line 4 for '(*Solidago vergaurea*)' read '(*Solidago virgaurea*)'.
- p. 216 In *Lygocoris limbatus* under SURREY in line 1 insert '14' between 'Common' and 'viii.'; in line 2 insert '(HD)' between 'Saunders' and '(37)'; and delete the full-stop after '(38)' and substitute 'vii.1879 and vii.1880, ES (HD)'.
In *Lygocoris spinolai* under SURREY in line 4 for '(2/37: 57, 1959)' read '(2/38: 57, 1959)'; and in line 5 remove the record 'Horsell, JAP (BM)' and insert it into line 9 between '(37)' and 'Peaslake'.

Part IX (LN 54)

- p. 218 *Camptozygum pinastris* is now *Camptozygum aequale*.
- p. 219 In *Polymerus unifasciatus* under HERTS insert 'Beyond the boundary at' before 'Harpenden'. [Two forms of *P. unifasciatus* are now recognized in Britain (*vide* Crossley, R. in EMM 108, 23, 1973; *ibid* 112, 238, 1977; and *ibid* 116, 155, 1980) the northern form var. *lateralis* (Scotland as far south as N. Yorks.) and the southern form var. *unifasciatus*. All the London area records relate to the latter.]
- p. 222 In *Dichroscytus rufipennis* under SURREY in line 6 insert 'vii.1880', between 'Chobham' and 'ES', and also insert '(HD)' between 'ES' and '(3)'.
In *Dichroscytus valesianus* under BUCKS in line 2 for '86' read '87'.
- p. 224 *Calocoris sexguttatus* is now *Calocoris stysi* Wagner.
- p. 230 In *Megacoelum infusum* under KENT in line 2 insert 'and 20.viii.1893' before the 'AJC'.
In *Phytocoris populi* under KENT in line 1 insert 'and 3.viii.1895' between '22.vii.1895' and 'AJC'.

Part X (LN 55)

- p. 232 In *Phytocoris tiliae* under MIDDX in line 5 remove the semi-colon between 'Adalia' sp.' and 'DL'.
- p. 233 In *Phytocoris populi* under MIDDX in line 1 for '*Populus niger*' read '*Populus nigra*'.
- p. 241 In *Capsodes flavomarginatus* under KENT in line 2 insert '(HD)' between 'WW' and '(60)'.

Part XI (LN 56)

- p. 248 In *Megaloceroea recticornis* under HERTS in line 4 insert 'and 1.viii.54' between '29.vii.55' and 'GGES'.
- p. 250 In *Trigonoiylus ruficornis* under SURREY line 2 for 'Surbiton, vii.92' read 'Surbiton, vii.1892'.

Part XII (LN 61)

- p. 256 For '*Pachycoleus wallii*' read '*Pachycoleus walli*'.
- p. 257 In *Saldula saltatoria* under MIDDX in line 1 delete '1949' and substitute '21.viii.49' and between 'DL' at the end of the same line and '(1/1949-50, 36-38)' of the next line insert '(SL)'.
- p. 258 In *Micranthia marginalis* under SURREY in line 2 insert '(HD)' between 'ES' and '(10)', and in the same line insert 'vi.06, ES (HD)'; between '(3)'; and 'viii.EAB'.
- p. 259 In *Chartoscirta elegantula* add after the MIDDX record the following; [There is a specimen in the Hope Entomological Collections, Oxford in the Heteroptera Reference Collection drawers under this species bearing a label 'Douglas & Scott, vi.1893 (ex E. Sauders coll.)'. Although it is unlocalized it is probably further material from this same old Hammersmith locality.]
- p. 260 In *Hebrus ruficeps* under SURREY in line 6 insert '(HD)' between '(BM)' and the semi-colon.
- p. 264 Add '(Latreille)' after '*Limnoporus rufoscutellatus*'.
In *Gerris agentatus* at end of line 1 for 'Sp.359' read 'Sp.459'.
- p. 265 In *Gerris thoracicus* under SURREY in line 3 transfer the record 'Westerham, 28.iv.23, PH (BM)'; to KENT line 5 and insert it between '(22)'; and 'and beyond'.

- p. 268 In *Gerris odontogaster* under SURREY line 7 insert '(BDK)' between '(57)' and the semi-colon.
- p. 269 In *Aquarius paludum* under SURREY line 4 insert 'vi.1892' between 'Chobham' and 'ES', and insert '(HD)' between 'ES' and '(37)'.

Part XIII (LN 62)

- [p. 270] In the introductory paragraph 4 lines from the top '87-94, 1972' should not be in bold-face but in Roman type; and in 'SOURCES OF RECORDS' '32' should read '33'.
- [p. 271] In *Nepa cinerea* under MIDDX in line 7 for 'EJP (67b)' read 'EJPe (67b)'.
- [p. 274] In *Ilyocoris cimicoides* under SURREY in line 12 insert '(BDK)' between '(57)' and the semi-colon; and under BUCKS for 'Grand Junction Canal, EJP (67b)' read 'Grand Junction Canal, EJPe (67b)'.
- [p. 277] In *Notonecta glauca* under SURREY in line 16 insert '(BDK)', between '(57)' and the semi-colon; and under BUCKS in line 1 delete 'GAW' and substitute 'EJPe'.
- [p. 278] In *Notonecta obliqua* under MIDDX in lines 1-2 transfer the whole of the Epping Forest record to ESSEX records below; under SURREY in line 8 insert '(BDK)' between '(57)' and the semi-colon.
- [p. 280] In *Notonecta maculata* under HERTS remove the opening bracket before '(Radlett'.
- In *Plea atomaria* at the end of the first line change 'Sp. 467' to 'Sp. 476'.
- [p. 281] In *Plea atomaria* under ESSEX in line 4 remove the semi-colon between '(BM)' and '(33f)'; and under SURREY in line 10 insert '(SL)' between 'FJC' and '(1/1931-32, 55)'.
- [p. 285] In *Corixa praeusta* under SURREY in line 9 insert '(BDK)' between '(57)' and the semi-colon.
- [p. 287] In *Corixa punctata* under KENT in line 2 for 'speices' read 'species'.

Part XIV (LN 63)

- p. 293 In *Hesperocorixa linnei* under SURREY in line 7 insert '(BDK)' between '(57)' and the semi-colon.
- p. 294 In *Hesperocorixa castanea* under KENT insert 'Beyond the boundary at' before 'Ightham'.
- p. 301 In *Sigara (Subsigara) falleni* in line 2 of the introductory paragraph for 'stream' read 'streams'.
- p. 307 In *Sigara (Vermicorixa) nigrolineata* under SURREY in the penultimate line delete the first bracket around '(55)'.
- p. 309 In *Sigara (Retrocorixa) venusta* in line 9 from the top of the page, for 'Stream' read 'streams'.
- p. 311 In *Sigara (Halicorixa) selecta* in line 5 of the introductory paragraph for 'aid' read 'said'.

INDEX TO PLANTS

This is an index to the plant species mentioned throughout the text in Parts I-XIV. Except for the Bryophyta the sequence of families follows that in Clapham, A. R., Tutin, T. G. and Warburg, E. F. *Excursion Flora of the British Isles*, Ed. 3, Cambridge University Press, 1981, but the genera and species within them are arranged alphabetically. There has been some adjustment to bring the scientific names of the plants into line with the current nomenclature used in that flora but synonyms are given where necessary to relate names in the text with their modern equivalents. In most cases the link of a plant with a particular bug is likely to be a real one either because the insect is directly phytophagous on it, or it is the host of other insects (or their larvae) on which the bug may prey. But there are some examples where the link is less direct as in the case where a plant (or its remains) have been used for hibernation or, as, in a few instances, when the purpose of the visit may be fortuitous or even unknown. However, all references to plants, whatever the association, have been listed in this index.

The first number is the running number as given at the foot of the page followed in the brackets by *The London Naturalist* volume number and the top pagination within that issue.

(N.B. When using this index it must be borne in mind that an entry may in some cases represent more than one reference to that particular plant on the page given).

BRYOPHYTA

SPHAGNACEAE

Sphagnum spp. — 259 (61: 77); 260 (61: 78); 263 (61: 81); 266 (61: 84); 274 (62: 73); 291 (63: 100); 309 (63: 118).

PTERIDOPHYTA

EQUISETACEAE

Equisetum sp. horsetail — 61 (44: 109).

HYPOLEPIDACEAE

Pteridium aquilinum bracken — 115 (47: 50).

ATHYRIACEAE

Athyrium filix-femina lady fern — 116 (47: 51).

ASPIDIACEAE

Dryopteris filix-mas male fern — 116 (47: 51).

SPERMATOPHYTA

GYMNOSPERMAE

PINACEAE

Abies sp. fir — 24 (43: 57); 39 (44: 87); 78 (45: 75); 95 (46: 85); 101 (46: 91); 108 (46: 98); 113 (46: 103); 147 (48: 87); 151 (48: 91).

Larix decidua European larch — 100 (46: 90); 101 (46: 91); 108 (46: 98); 113 (46: 103); 144 (47: 79); 147 (48: 87); 151 (48: 91).

Picea abies Norway spruce — 58 (44: 106); 59 (44: 107); 218 (54: 21).

Picea sp. 107 (46: 97); 134 (47: 69); 143 (47: 77); 151 (48: 91); 205 & 206 (52: 47 & 48); 212 (52: 54).

Pinus nigra var. *maritima* Corsican pine — 59 (44: 107).

P. nigra var. *nigra* Austrian pine — 59 (44: 107).

P. pinaster maritime pine — 59 (44: 107).

P. sylvestris Scots pine — 9 & 10 (43: 42 & 43); 59 (44: 107); 78 (45: 75); 85 (45: 82); 93 (46: 83); 100 (46: 90); 101 (46: 91); 107 (46: 97); 113 (46: 103); 118 (47: 53); 119 (47: 54); 121 (47: 56); 134 (47: 69); 143 (47: 78); 147 (48: 87); 151 (48: 91); 165 (48: 105); 166 (48: 106); 167 (48: 107); 205 & 206 (52: 47 & 48); 218 (54: 21); 222 (54: 25); 230 (54: 33); 232 & 233 (55: 5 & 6).

Pinus sp. — 100 (46: 90); 108 (46: 98).

CUPRESSACEAE

Juniperus communis juniper — 11 (43: 44); 21 (43: 54); 24 (43: 57); 26 (43: 59); 56 (44: 104); 87 (45: 84); 222 (54: 25); 241 (55: 15).

Thuja plicata Western red cedar — 11 (43: 44); 221 (54: 24).

TAXACEAE

Taxus baccata yew — 207 (52: 49); 209 (52: 51).

ANGIOSPERMAE

RANUNCULACEAE

Caltha palustris marsh marigold — 256 (61: 74).

Ranunculus aquatilis water crowfoot — 280 (62: 79).

NYMPHAEACEAE

Nuphar lutea yellow water-lily — 259 (61: 77).

Nymphaea alba white water-lily — 259 (61: 77).

Nymphaea sp. — 273 (62: 71).

CERATOPHYLLACEAE

Ceratophyllum demersum hornwort — 280 (62: 79); 289 (63: 98); 306 (63: 115).

Ceratophyllum sp. — 273 (62: 72).

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Papaver sp. poppy — 104 (46: 94).

CRUCIFERAE

Alliaria petiolata hedge garlic — 14 (43: 47); 23 (43: 56).

Armoracia rusticana horse-radish — 9 (43: 42); 23 (43: 56); 24 (43: 57).

Brassica oleracea var. *capitata* cabbage — 108 (46: 98).

B. tenuifolia see under *Diplotaxis tenuifolia*.

Cakile maritima sea rocket — 200 (52: 42).

Cardamine pratensis lady's smock — 23 (43: 56).

Cardaria draba hoary pepperwort — 23 (43: 56).

- Diplotaxis tenuifolia* perennial wall rocket — 228 (54: 31).
Nasturtium sp. — 211 (52: 53).
Raphanus raphanistrum wild radish — 23 (43: 56).
Sisymbrium officinale hedge mustard — 23 (43: 56); 104 (46: 93).

HYPERICACEAE

- Hypericum perforatum* common St John's wort — 32 (43: 65).
H. pulchrum slender St John's wort — 20 (43: 53).
Hypericum sp. — 31 (43: 64).

CISTACEAE

- Helianthemum nummularium* common rock rose — 124 (47: 59); 151 (48: 91); 168 & 169 (48: 108 & 109).

CARYOPHYLLACEAE

- Arenaria* sp. — 27 (43: 60); 66 (45: 63).
Cerastium arvense field mouse-ear chickweed — 63 (45: 60).
C. fontanum subsp. *glabrescens* common mouse-ear chickweed — 31 (43: 64); 63 & 64 (45: 60 & 61).
C. semidecandrum little mouse-ear chickweed — 27 (43: 60).
Cerastium sp. 66 (45: 63).
Lychnis dioica see under *Silene dioica*.
Lychnis sp., probably *L. flos-cuculi* ragged robin — 27 (43: 60).
Minuartia sp. sandwort — 27 (43: 60).
Moehringia trinervia three-nerved sandwort — 66 (45: 63).
Silene alba (*Melandrium album*) white campion — 159 (48: 99); 163 (48: 103).
S. dioica (*Melandrium rubrum*) red campion — 159 (48: 99); 163 (48: 103).
S. vulgaris bladder campion — 27 (43: 60).
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Stellaria media common chickweed — 14 (43: 47); 30 (43: 63); 46 (44: 94).

CHENOPODIACEAE

- Atriplex patula* common orache — 256 (61: 74).
Atriplex sp. — 191 (52: 33); 201 (52: 43); 249 (56: 39).
Beta vulgaris subsp. *maritima* sea bect — 69 (45: 66); 200 (52: 42).
Chenopodium album fat-hen — 68 (45: 65); 191 & 192 (52: 33 & 34); 200 (52: 42); 210 (52: 52); 228 (54: 31).
C. bonus-henricus good King Henry — 191 (52: 33).
C. polyspermum all-seed — 191 (52: 33).
C. (rubrum or ficifolium) goosefoot — 144 (47: 79); 191 & 192 (52: 33 & 34); 201 (52: 43).
Chenopodium sp. 211 (52: 53).
Halimione portulacoides sea purslane — 38 (44: 86); 192 (52: 34).
Salicornia perennis (*S. radicans*) perennial glasswort — 192 (52: 34).
Salicornia sp. — 192 (52: 34).

TILIACEAE

- Tilia* sp. lime — 20 (43: 53); 97 (46: 87); 106 (46: 96); 108 (46: 98); 111 (46: 101); 112 (46: 102); 117 (47: 52); 134 (47: 69); 170 (48: 110); 178 & 179 (48: 118 & 119); 182 (50: 88); 183 (50: 89); 184 & 185 (50: 90 & 91); 185 (50: 91); 206 & 207 (52: 48 & 49); 207 & 208 (52: 49 & 50); 210 (52: 52); 212 & 213 (52: 54 & 55); 232 (55: 6); 233 & 234 (55: 7 & 8); 236 (55: 10).

MALVACEAE

- Althaea rosea* hollyhock — 153 (48: 93).

GERANIACEAE

- Erodium* sp. storksbill — 16 (43: 49); 18 (43: 51); 28 (43: 61).
Geranium robertianum herb robert — 160 (48: 100).
Geranium sp. — 31 (43: 64).

ACERACEAE

- Acer campestre* field maple — 94 (46: 84); 95 (46: 85); 103 (46: 93); 117 (47: 52); 138 (47: 73); 144 (47: 79); 233 (55: 7); 240 (55: 14).
A. pseudoplatanus sycamore — 94 (46: 84); 99 (46: 89); 108 (46: 98); 117 (47: 73); 140 (47: 75); 183 (50: 89); 213 (52: 55).

HIPPOCASTANACEAE

- Aesculus hippocastaneum* horse chestnut — 111 (46: 101); 112 (46: 102).

AQUIFOLIACEAE

- Ilex aquifolia* holly — 117 (47: 52); 164 (48: 104); 208 (52: 50); 232 (55: 6).

BUXACEAE

Buxus sempervirens box — 26 (43: 59); 95 (46: 85); 96 (46: 86); 112 (46: 102); 206 & 207 (52: 48 & 49).

RHAMNACEAE

Frangula alnus alder buckthorn — 212 & 213 (52: 54 & 55).

Rhamnus catharticus buckthorn — 117 (47: 52); 178 (48: 118); 234 (55: 8).

LEGUMINOSAE

Anthyllis vulneraria kidney-vetch — 225 (54: 28).

Cytisus scoparius (*Sarothamnus scoparius*) broom — 22 (43: 55); 71 (45: 68); 96 & 97 (46: 86 & 87); 119 (47: 54); 151 (48: 91); 155 & 156 (48: 95 & 96); 175 (48: 115); 175 & 176 (48: 115 & 116); 177 (48: 117); 179 (48: 119); 188 (50: 94); 189 (52: 31); 190 & 191 (52: 32 & 33); 221 (54: 24); 233 (55: 7); 235 (55: 9); 237 (55: 11).

Genista tinctoria dyer's greenweed — 175 (48: 115).

Hippocrepis comosa horseshoe vetch — 64 (45: 61).

Lotus corniculatus birdsfoot-trefoil — 64 (45: 61); 179 (48: 119); 225 (54: 28).

Lotus sp. — 228 & 229 (54: 31 & 32).

Medicago lupulina black medick — 28 & 29 (43: 61 & 62); 29 (43: 62); 29 & 30 (43: 62 & 63); 64 (45: 61); 152 (48: 92); 153 (48: 93); 170 (48: 110); 199 (52: 41); 200 (52: 42); 256 (61: 74).

Medicago sp. — 228 & 229 (54: 31 & 32).

Melilotus sp. — 29 (43: 62).

Ononis repens (*O. arvensis*) common restharrow — 66 (45: 63); 67 (45: 64); 128 (47: 63); 228 (54: 31).

O. spinosa spiny restharrow — 66 (45: 63); 67 (45: 64); 128 (47: 63); 168 (48: 108).

Ononis sp. — 65 (45: 62); 122 (47: 57); 123 (47: 58); 124 (47: 59); 160 (48: 100); 163 (48: 103); 169 (48: 109); 221 (54: 24); 226 (54: 29); 237 (55: 11).

Robinia pseudacacia false acacia — 176 (48: 116).

Spartium junceum Spanish broom — 188 (50: 94).

Trifolium arvense hare's-foot — 28 (43: 61); 29 (43: 62); 29 & 30 (43: 62 & 63); 123 (47: 58).

T. campestre hop trefoil — 29 (43: 62).

T. dubium lesser yellow trefoil — 65 (45: 62).

T. pratense red clover — 29 (43: 62).

T. repens white or Dutch clover — 65 (45: 62); 152 (48: 92).

Trifolium sp. — 83 (45: 80); 123 (47: 58); 201 (52: 43); 226 (54: 29); 228 & 229 (54: 31 & 32); 237 (55: 11).

Ulex europaeus furze or gorse — 71 (45: 68); 155 & 156 (48: 95 & 96).

U. minor (*U. nanus*) dwarf furze — 71 (45: 68); 104 (46: 94).

Ulex sp. — 19 (43: 52); 21 & 22 (43: 54 & 55); 179 & 180 (48: 119 & 120); 200 (52: 42); 221 (52: 43).

Vicia sp. vetch — 119 (47: 54).

ROSACEAE

Cotoneaster sp. — 206 (52: 48).

Crataegus monogyna common hawthorn — 167 (48: 107).

C. oxyacanthoides Midland hawthorn — 96 (46: 86); 99 (46: 89); 165 (48: 105).

Crataegus sp. — 10 (43: 43); 23 (43: 56); 76 (45: 73); 79 (45: 76); 87 (45: 84); 95 & 96 (46: 85 & 86); 97 (46: 87); 107 (46: 97); 108 (46: 98); 111 (46: 101); 117 (47: 52); 120 (47: 55); 130 (47: 55); 136 (47: 71); 137 (47: 72); 138 (47: 73); 146 (48: 86); 164 (48: 104); 177 (48: 117); 178 (48: 118); 210 (52: 52); 223 (54: 26); 232 (55: 6); 234 (55: 8); 235 (55: 9); 236 & 237 (55: 10 & 11).

Filipendula ulmaria meadowsweet — 212 (52: 54); 216 (52: 58); 225 (54: 28).

Malus pumila apple — 77 (45: 74); 94 (46: 84); 95 (46: 85); 98 (46: 88); 99 (46: 89); 102 (46: 92); 103 (46: 93); 106 (46: 96); 108 (46: 98); 111 (46: 101); 112 (46: 102); 117 (47: 52); 118 (47: 53); 136 (47: 71); 139 (47: 74); 143 (47: 8); 144 (47: 79); 146 (48: 86); 150 (48: 90); 153 (48: 93); 154 (48: 94); 164 & 165 (48: 104 & 105); 167 (48: 107); 170 & 171 (48: 110 & 111); 176 & 178 (48: 116 & 118); 178 & 179 (48: 118); 182 (50: 88); 182 & 183 (50: 88 & 89); 185 (50: 91); 207 (52: 49); 210 (52: 52); 213 (52: 55); 219 (54: 22); 232 & 233 (55: 6 & 7); 233 (55: 7); 234 (55: 8); 235 (55: 9); 235 & 236 (55: 9 & 10).

M. sylvestris crab apple — 77 (45: 74); 219 (54: 22); 235 (55: 9).

Potentilla paulstris marsh cinquefoil — 31 (43: 64).

Prunus avium cultivar. cultivated cherry — 210 (52: 52).

P. domestica plum — 164 (48: 104); 167 (48: 107); 170 (48: 110); 213 (52: 55); 232 (55: 6); 234 (55: 8).

P. spinosa blackthorn — 76 (45: 73); 79 (45: 76); 95 (46: 85); 98 (46: 87); 107 (46: 97); 225 (54: 28); 236 (55: 10).

Prunus sp. — 146 (48: 86); 237 (55: 11).

Pyrus communis cultivated pear — 73 (45: 70); 108 (46: 98); 233 (55: 7); 236 (55: 10); 237 (55: 11).

Rosa sp. wild rose — 225 (54: 28); 241 (55: 15).

Rubus idaeus raspberry — 99 (46: 89); 212 (52: 54); 213 (52: 55).

R. fruticosus agg. blackberry — 119 (47: 54); 120 (47: 55); 144 & 145 (47: 79 & 80); 146 (48: 86); 149 & 150 (48: 89 & 90); 158 (48: 98); 177 (48: 117); 178 (48: 118); 185 (50: 91); 197 (52: 39); 215 (52: 57); 216 (52: 59); 233 (55: 7); 237 (55: 11); 241 (55: 15).

Sanguisorba minor subsp. *minor* (*Poterium sanguisorba*) salad burnet — 225 & 226 (54: 28 & 29).

× *Sorbaronia alpina* (hybrid) — 179 (48: 119).

Sorbus aria whitebeam — 10 (43: 43); 97 (46: 87).

GROSSULARIACEAE

Ribes nigrum blackcurrant — 211 & 212 (52: 53 & 54); 217 (52: 59); 225 (54: 28); 236 (55: 10); 237 (55: 11).

ONAGRACEAE

Chamerion angustifolium (*Chamaenerion angustifolium*) rosebay willowherb — 187 (50: 93); 210 (52: 52).

Circaea lutetiana enchanter's nightshade — 67 (45: 64); 161 (48: 101).

Epilobium hirsutum hairy willowherb — 159 & 160 (48: 99 & 100).

E. montanum broad-leaved willowherb — 161 (48: 101).

Epilobium sp. — 150 (48: 90).

HALORAGACEAE

Mriophyllum sp. water milfoil — 273 (62: 72); 280 (62: 79); 289 (63: 98); 295 (63: 104).

CALLITRICHACEAE

Callitriche sp. water starwort — 286 (62: 85); 302 (63: 111).

LORANTHACEAE

Viscum album mistletoe — 97 (46: 87); 207 & 208 (52: 49 & 50).

SANTALACEAE

Thesium humifusum bastard toadflax — 15 (43: 48).

CORNACEAE

Cornus sanguinea (*Swida sanguinea*; *Thelycrania sanguinea*) dogwood — 213 (52: 55).

ARALIACEAE

Hedera helix common ivy — 20 (43: 53); 27 (43: 60); 41 (44: 89); 72 (45: 69); 78 (45: 75); 206 & 207 (52: 48 & 49).

H. helix var. *arborescens* — 178 (48: 118).

UMBELLIFERAE

Conium maculatum hemlock — 209 (52: 51).

Daucus carota wild carrot — 208 (52: 50); 210 (52: 52).

D. carota cultivated carrot — 226 (54: 29).

Heracleum sphondylium hogweed or cow parsnip — 21 (43: 54); 75 (45: 72); 134 (47: 69); 150 (48: 90); 151 (48: 91); 208 & 209 (52: 50 & 51); 224 (54: 27); 226 & 227 (54: 29 & 30).

Pastinaca sativa wild parsnip — 208 (52: 50).

CUCURBITACEAE

Bryonia dioica white bryony — 224 (54: 27).

Euphorbia amygdaloides wood spurge — 33 (43: 66); 77 (45: 74); 241 (55: 15).

E. esula leafy spurge — 33 (43: 66).

Mercurialis perennis dog's mercury — 130 (47: 65).

POLYGONACEAE

Polygonum amphibium amphibious bistort — 259 (61: 77); 268 (61: 86); 308 (63: 117).

P. aviculare agg. knotgrass — 38 (44: 86); 59 (44: 107); 62 (44: 110); 102 (46: 92); 103 (46: 93); 152 (48: 92).

P. persicaria redshank or common persicaria — 227 (54: 30).

Polygonum sp. 15 (43: 48).

Rumex acetosella sheep's sorrel — 27 (43: 60); 28 (43: 61); 59 (44: 107); 65 (45: 62); 237 (55: 11); 256 (61: 74).

Rumex sp. — 27 (43: 60); 72 (45: 69); 86 (45: 83); 89 (45: 86); 201 (52: 43).

URTICACEAE

Humulus lupulus hop — 225 (54: 28).

Parietaria judaica (*P. officinalis*) pellitory-of-the-wall — 203 (52: 45).

Urtica dioica stinging nettle — 14 (43: 47); 20 (43: 53); 21 (43: 54); 36 (44: 84); 53 (44: 101); 54 (44: 102); 86 (45: 83); 102 (46: 92); 118, 119 & 120 (47: 53, 54 & 55); 129 & 130 (47: 64 &

65); 134 (47: 69); 147 (48: 87); 149 & 150 (48: 89 & 90); 150 (48: 90); 155 (48: 95); 160 & 161 (48: 100 & 101); 165 (48: 105); 176 & 177 (48: 116 & 117); 182 (50: 88); 185 & 186 (50: 91 & 92); 201 (52: 43); 203, 204 & 205 (52: 45, 46 & 47); 209 (52: 51); 210 & 211 (52: 52 & 53); 216 & 217 (52: 58 & 59); 224 (54: 27); 225 (54: 28); 226 & 227 (54: 29 & 30); 236 & 237 (55: 10 & 11); 240 (55: 14).

ULMACEAE

Ulmus glabra wych elm — 95 (46: 85); 97 (46: 87); 117 (47: 52); 156 (48: 96); 178 (48: 118); 181 & 182 (50: 87 & 88); 235 (55: 9); 240 (55: 14).

U. glabra subsp. *montana* (*U. montana*) narrow-leaved elm — 97 (46: 87).

U. procera (*U. campestris*) English elm — 183 (50: 89); 185 (50: 91).

Ulmus sp. — 95 (46: 85); 96 (46: 86); 97 (46: 87); 98 (46: 88); 106 (46: 96); 156 (48: 96); 170 (48: 110); 176 (48: 116); 178 (48: 118); 181 (50: 87); 182 (50: 88); 185 & 186 (50: 91 & 92); 204 (52: 46); 227 (54: 30); 229 (54: 32); 232 & 233 (55: 6 & 7); 235 & 236 (55: 9 & 10); 237 (55: 11).

JUGLANDACEAE

Juglans regia walnut — 99 (46: 89); 111 (46: 101).

BETULACEAE

Alnus glutinosa elder — 24 (43: 57); 39 & 40 (44: 87 & 88); 87 (45: 84); 94 (46: 84); 117 (47: 52); 135 (47: 70); 136 (47: 71); 141 (47: 76); 144 (47: 79); 178 & 179 (48: 118 & 119); 181 (50: 87); 183 (50: 89); 209 (52: 51); 212 (52: 54); 214 (52: 56); 233 (55: 7); 235 (55: 9); 240 & 241 (55: 14 & 15).

Betula verrucosa (*B. pendula*; *B. alba* auct.) silver or common birch — 12 (43: 45); 215 (52: 57).

Betula sp. — 10 & 11 (43: 43 & 44); 12 (43: 45); 20 (43: 53); 22 (43: 55); 32 (43: 65); 39 & 40 (44: 87 & 88); 87 (45: 84); 111 (46: 101); 112 (46: 102); 117 (47: 52); 119 (47: 54); 135 (47: 70); 137 & 138 (47: 72 & 73); 140 & 141 (47: 75 & 76); 143 (47: 78); 164 (48: 104); 178 & 179 (48: 118 & 119); 206 (52: 48); 214 & 215 (52: 56 & 57); 225 (54: 28); 232 (55: 6); 234 (55: 8); 240 & 241 (55: 14 & 15).

CORYLACEAE

Carpinus betulus hornbeam — 78 (45: 75); 136 (47: 71); 164 (48: 104); 184 (50: 90); 235 (55: 9).

Corylus avellanae hazel — 20 (43: 53); 24 (43: 57); 78 (45: 75); 88 (45: 85); 96 (46: 86); 117 (47: 52); 119 (47: 54); 120 (47: 55); 132 (47: 67); 133 (47: 68); 134 (47: 69); 136 (47: 71); 139 (47: 74); 143 (47: 78); 144 & 145 (47: 79 & 80); 147 (48: 95); 164 & 165 (48: 104 & 105); 166 (48: 106); 170 & 171 (48: 110 & 111); 178 (48: 118); 179 (48: 119); 181 (50: 87); 184 & 185 (50: 90 & 91); 186 (50: 92); 204 (52: 46); 206 & 207 (52: 48 & 49); 211 (52: 53); 213 (52: 55); 214 & 215 (52: 56 & 57); 235 (55: 9); 236 (55: 10); 239 (55: 13); 241 (55: 15).

FAGACEAE

Castanea sativa sweet or Spanish chestnut — 9 (43: 42); 52 (44: 100).

Fagus sylvatica beech — 86 (45: 83); 94 & 95 (46: 84 & 85); 106 (46: 96); 111 (46: 101); 117 (47: 52); 164 (48: 104); 178 (48: 118); 213 (52: 55); 232 & 233 (55: 6 & 7); 236 (55: 10); 237 (55: 11).

Quercus lusitanicus Portugese oak — 230 (54: 3).

Q. petraea sessile or durmast oak — 142 (47: 35).

Quercus sp. — 9 (43: 42); 10 (43: 43); 20 (43: 53); 22 & 23 (43: 55 & 56); 24 (43: 57); 25 (43: 58); 78 (45: 75); 86 (45: 83); 87 & 88 (45: 84 & 85); 93 (46: 83); 94 (46: 84); 95 (46: 85); 98 (46: 88); 101 (46: 91); 106 (46: 96); 108 (46: 98); 112 (46: 102); 117 (47: 52); 119 (47: 54); 129 & 130 (47: 64 & 65); 132 (47: 67); 132 & 133 (47: 67 & 68); 134 (47: 69); 136 (47: 71); 137 (47: 72); 138 & 139 (47: 73 & 74); 141 & 142 (47: 76 & 77); 143 (47: 78); 153 (48: 93); 164 & 165 (48: 104 & 105); 166 (48: 106); 167 & 168 (48: 107 & 108); 172 (48: 112); 178 (48: 118); 181 (50: 87); 184 (50: 90); 186 (50: 92); 193 (52: 35); 201 (52: 43); 207 (52: 49); 212 (52: 54); 222 & 223 (54: 25 & 26); 224 (54: 27); 225 (54: 28); 229 & 230 (54: 32 & 33); 232 & 233 (55: 6 & 7); 234 (55: 8); 235 (55: 9); 236 (55: 10); 237 (55: 11).

SALICACEAE

Populus alba white poplar — 117 (47: 52); 155 (48: 95); 196 (52: 38); 197 (52: 39); 213 & 214 (52: 55 & 56); 234 (55: 8).

P. canescens grey poplar — 142 (47: 77); 155 (48: 95); 196 (52: 38); 213 (52: 55).

P. nigra black poplar — 155 (48: 95); 233 (55: 7); 234 (55: 8); 236 (55: 10).

P. nigra 'Italica' Lombardy poplar — 167 (48: 107); 185 (50: 91).

P. tremula aspen — 20 (43: 53); 99 (46: 89); 117 (47: 52); 118 (47: 53); 131 (47: 66); 138 (47: 73); 141 (47: 76); 166 (48: 06); 185 (50: 91); 195 & 196 (52: 37 & 38); 233 (55: 7); 236 (55: 10).

Populus sp. — 97 (46: 87); 99 (46: 89); 117 (47: 52); 141 (47: 76); 142 (47: 77); 178 (48: 118); 184 (50: 90); 186 (50: 92); 234 (55: 8); 235 (55: 9).

- Salix alba* white willow — 96 (46: 86); 103 (46: 92); 154 & 155 (48: 94 & 95); 193 (52: 35); 198 (52: 40); 215 (52: 57).
S. caprea goat willow or great willow — 154 (48: 94).
S. fragilis crack willow — 154 (48: 94); 193 (52: 35); 235 (55: 9).
S. purpurea purple osier — 96 (46: 86); 139 (47: 74); 209 (52: 51).
S. repens creeping willow — 153 (48: 93); 166 (48: 106); 174 (48: 114).
Salix sp. sallow — 136 (47: 71); 138 (47: 73); 139 (47: 74); 142 (47: 77); 144 (47: 79); 166 (48: 106); 167 (48: 107); 171 (48: 111); 178 (48: 118); 182 & 183 (50: 88 & 89); 184 (50: 90); 193 (52: 35); 207 (52: 49); 235 (55: 9).
Salix sp. willow — 24 (43: 57); 60 (44: 108); 94 & 95 (46: 84 & 85); 96 (46: 86); 117 (47: 52); 152 (48: 92); 154 (48: 94); 155 (48: 95); 171 (48: 111); 178 (48: 118); 182 & 183 (50: 88 & 89); 184 & 185 (50: 90 & 91); 186 (50: 92); 193 (52: 35); 214 (52: 56); 219 (54: 22); 234 (55: 8); 236 (55: 10); 239 (55: 13).
Salix sp. (unspecified) — 99 (46: 89); 100 (46: 90); 103 (46: 93); 181 (50: 87); 182 (50: 88); 185 (50: 91); 193 (52: 35); 206 (52: 48); 211 (52: 53); 215 (52: 57); 216 (52: 58); 217 (52: 59); 219 (54: 22).

ERICACEAE

- Calluna vulgaris* ling or heather — 22 (43: 55); 25 (43: 58); 27 (43: 60); 29 (43: 62); 30 (43: 63); 39 (44: 87); 40 (44: 88); 43 (44: 91); 44 & 45 (44: 92 & 93); 47 (44: 95); 49 (44: 97); 52 (44: 100); 54 (44: 102); 55 & 56 (44: 103 & 104); 60 (44: 108); 67 (45: 64); 80 (45: 77); 81 & 82 (45: 78 & 79); 85 (45: 82); 88 & 89 (45: 85 & 86); 103 (46: 93); 120; (47: 55); 157 (48: 97); 174 (48: 114); 187 (50: 93); 199 (52: 41); 200 (52: 42); 239 (55: 13).
Erica cinera common heath or bell-heather — 157 (48: 97); 256 (61: 74).
E. tetralix cross-leaved heath — 187 (50: 93).
Erica sp. — 40 (44: 88); 49 (44: 97); 55 (44: 103); 84 (45: 81); 103 (46: 93).
Rhododendron ponticum common rhododendron — 39 & 40 (44: 87 & 88); 73 (45: 70); 144 (47: 79); 178 (48: 118).
Vaccinium myrtillus bilberry — 174 (48: 114).

PLUMBAGINACEAE

- Armeria maritima* thrift — 123 (47: 58) (*Arenaria maritima* is given in the original reference but probably it is this species that was intended.)
Limonium vulgare (*Statice limonium*) sea lavender — 17 (43: 50).

PRIMULACEAE

- Lysimachia nemorum* yellow pimpernel — 228 (54: 31).

OLEACEAE

- Fraxinus excelsior* ash — 24 (43: 57); 94 (46: 84); 95 (46: 85); 99 (46: 89); 102 (46: 92); 139 (47: 74); 140 (47: 75); 141 (47: 76); 142 (47: 77); 164 (48: 104); 178 (48: 118); 181 (50: 87); 182 (50: 88); 183 (50: 89); 184 & 185 (50: 90 & 91); 194 (52: 36); 206 & 207 (52: 48 & 49); 212 (52: 54); 213 (52: 55); 232 (55: 6); 234 (55: 8); 236 & 237 (55: 10 & 11).

BORAGINACEAE

- Echium vulgare* viper's bugloss — 15 (43: 48).
Lithospermum officinale gromwell — 123 (47: 58).
Myosotis arvensis common forget-me-not — 15 (43: 48).
M. laxa subsp. *caespitosa* (*M. caespitosa*) tufted forget-me-not — 77 (45: 74).
M. discolor yellow and blue forget-me-not — 15 (43: 48).
M. ramosissima early forget-me-not — 15 (43: 48); 41 (44: 89).
M. scorpioides water forget-me-not — 77 (45: 74).
Myosotis sp. — 56 (44: 104); 61 (44: 109); 103 (46: 93).
Symphytum sp. comfrey — 205 (52: 47).

CONVOLVULACEAE

- Calystegia sepium* hedge or hooded bindweed — 24 (43: 57); 104 (46: 94).
Cuscuta epithymum common dodder — 104 (46: 94).

SOLANACEAE

- Solanum dulcamara* bitter-sweet or woody nightshade — 19 (43: 52); 160 (48: 100); 171 (48: 111); 177 (48: 117); 210 (52: 52).
S. nigrum black nightshade — 161 (48: 101).
S. tuberosum potato — 153 (48: 93); 177 (48: 117); 226 (54: 29).

SCROPHULARIACEAE

- Digitalis purpurea* foxglove — 162 & 163 (48: 102 & 103); 211 (52: 53).
Melampyrum pratense common cow-wheat — 15 (43: 48); 33 (43: 66); 241 (55: 15).
Linaria vulgaris yellow toadflax — 203 (52: 45); 241 (55: 15).
Scrophularia sp. figwort — 12 (43: 45).

- Verbascum nigrum* dark mullein — 74 (45: 71); 162 (48: 102).
V. thapsus great mullein or Aaron's rod — 153 (48: 93).
Verbascum sp. — 13 (43: 46); 104 (46: 94); 149 (48: 89); 150 (48: 90); 153 (48: 93); 160 & 161 (48: 100 & 101).
Veronica beccabunga brooklime — 308 (50: 117).

LABIATAE

- Ajuga reptans* bugle — 74 (45: 71).
Ballota nigra black horehound — 14 (43: 47); 50 (44: 98); 127 & 128 (47: 62).
Galeopsis sp. hemp nettle — 159 (48: 99); 160 (48: 100).
Lamium album white dead-nettle — 14 (43: 47); 119 (47: 54).
L. purpureum red dead-nettle — 19 (43: 52).
Mentha aquatica water mint — 228 (54: 31).
M. spicata spearmint — 51 (44: 99).
Mentha sp. cultivated mints — 203 & 204 (52: 45 & 46); 211 (52: 53).
Mentha sp. (unspecified) — 61 (44: 109).
Prunella vulgaris self-heal — 46 (44: 94); 51 (44: 99).
Stachys sylvatica hedge woundwort — 19 (43: 52); 127 & 128 (47: 62 & 63); 145 (47: 80); 158 & 159 (48: 98 & 99); 160 & 161 (48: 100 & 101).
Stachys sp. — 149 (48: 89); 160 (48: 100); 220 (54: 23); 237 (55: 11).
Teucrium botrys cut-leaved germander — 32 (43: 65).
T. scorodonia wood sage or wood germander — 64 (45: 61).
Thymus sp. — 65 (45: 62).

PLANTAGINACEAE

- Plantago lanceolata* ribwort plantain — 253 (56: 43).

CAMPANULACEAE

- Campanula rotundifolia* harebell — 168 (48: 108).
Jasione montana sheep's bit — 169 (48: 109).

RUBIACEAE

- Galium album* (*G. erectum*) upright hedge bedstraw — 219 (54: 22).
G. aparine goosegrass or cleavers — 69 (45: 66); 220 (54: 23).
G. cruciata crosswort — 220 (54: 23); 221 (54: 24).
G. mollugo common hedge bedstraw — 219 (54: 22); 220 (54: 23); 221 (54: 24).
G. palustre agg. marsh bedstraw — 131 (47: 66); 220 (54: 23).
G. saxatile heath bedstraw — 13 (43: 46); 219 (54: 22); 221 (54: 23).
G. verum lady's bedstraw — 13 (43: 46); 168 (48: 108); 169 (48: 109); 219 & 220 (54: 22 & 23); 221 (54: 24).
Galium sp. — 13 (43: 46); 89 (45: 86); 168 (48: 108); 169 (48: 109); 220 (54: 23); 221 (54: 24).

CAPRIFOLIACEAE

- Sambucus nigra* elderberry — 11 (43: 44); 106 (46: 96); 112 (46: 102); 185 (50: 91); 206 (52: 48); 235 (55: 9).
Viburnum opulus guelder rose — 187 (50: 92).

DIPSACACEAE

- Succisa pratensis* devil's-bit scabious — 241 (55: 15).
Valeriana dioica marsh valerian — 46 (44: 94).

COMPOSITAE

- Achillea filipendula* 'Gold Plate' yellow garden yarrow — 119 (47: 54).
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Achillea sp. garden yarrow — 227 (54: 30).
Anthemis cotula stinking mayweed — 104 (46: 94).
Artemisia arbotanum southernwood or old man — 148 (48: 88).
A. absinthium wormwood — 148 (48: 88).
A. maritima sea wormwood — 238 (55: 12).
A. vulgaris mugwort — 103 (46: 93); 148 (48: 88); 149 (48: 89); 216 (52: 58); 217 (52: 59); 226 (54: 29); 228 (54: 31); 238 (55: 12).
Artemisia sp. — 69 (45: 66); 228 (54: 31).
Aster novae-angliae or *A. novi-belgii* Michaelmas daisy — 82 (45: 79); 201 (52: 43).
Calendula officinalis pot marigold — 161 (48: 101).
Carduus nutans musk thistle — 75 (45: 72).
Carduus sp. thistle — 119 & 120 (47: 54 & 55); 149 (48: 89).
Centaurea nigra lesser knapweed or hardheads — 122 & 123 (47: 57 & 58); 169 (48: 109); 237 (55: 11).
C. scabiosa greater knapweed — 169 (48: 109); 238 (55: 12).

- Chrysanthemum vulgare* (*Tanacetum vulgare*) tansy — 125 (47: 60); 148 (48: 88); 151 (48: 91); 169 (48: 109); 212 (52: 54); 216 (52: 58); 238 (55: 12).
- C. leucanthemum* oxeye daisy — 76 (45: 73); 225 (54: 28).
- Chrysanthemum* sp. garden chrysanthemum — 148 (48: 88); 226 (54: 29).
- Cirsium arvense* creeping thistle — 74 (45: 71); 119 (47: 54); 210 (52: 52); 216 (52: 58); 226 & 227 (54: 29 & 30); 237 (55: 11).
- C. dissectum* meadow thistle — 75 (45: 72).
- C. palustre* marsh thistle — 31 (43: 64); 75 (45: 72).
- C. vulgare* spear thistle — 75 (45: 72).
- Cirsium* sp. — 21 (43: 54); 60 (44: 108); 226 (54: 29).
- Erigeron* sp. fleabane — 103 (46: 93).
- Eupatorium cannabinum* hemp agrimony — 216 (52: 58).
- Filago vulgaris* (*F. germanica*) common cudweed — 126 (47: 61).
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- H. pilosella* mouse-ear hawkweed — 123 & 124 (47: 58 & 59); 170 (48: 110).
- Hieracium* sp. hawkweed — 29 (43: 62); 64 (45: 61); 170 (48: 110); 225 (54: 28).
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- Picris* sp. ox-tongue — 170 (48: 110).
- Senecio jacobaea* common ragwort — 31 (43: 64); 151 (48: 91); 226 (54: 29).
- S. vulgaris* groundsel — 210 (52: 52).
- S. viscosus* sticky groundsel — 160 (48: 100).
- Solidago canadensis* garden golden-rod — 235 (55: 9).
- S. virgaurea* golden-rod — 201 (52: 43); 207 (52: 49); 214 (52: 56).
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- Tripleurospermum inodorum* scentless mayweed — 226 (54: 29); 237 (55: 11).

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POTAMOGETONACEAE

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- P. pectinatus* fennel-leaved pondweed — 295 (63: 104).
- Potamogeton* sp. — 281 (62: 80).

LILIACEAE

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- Arum maculatum* wild arum, cuckoo pint, or lords and ladies — 94 (46: 84).

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End of Part XV

The Addenda and Summary have been held over and should appear in the next issue of *The London Naturalist*.

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Book Review

Hoverflies of Essex: Provisional Maps. By R. G. Payne, Southend Museum, Essex, 1984. 8 pp., 152 maps. Not priced.

This is not a publication intended for general interest to a general readership. It combines a bare minimum of introductory text with acknowledgements and an address for further records onto the first page and then presents, in alphabetical order, the ten-kilometre distribution maps of the 152 species of hoverfly recorded in Essex, including historical records. Two sizes of solid dot are used on the maps to distinguish the date bands pre-1960 and 1960 to 1984. The aim is to provide the interested reader with a short summary of the status of the records to date, and to stimulate the same reader to submit further records in order to fill in the many blank squares. A definitive work is planned for publication in two or three years time.

This is the second edition of the maps, and in the twelve-month interim between editions five new species have been added to the county list, namely *Chrysotoxum octomaculatum*, (a pre-1960 record), *Mallota cimbiciformis*, *Paragus albifrons*, *Sphaerophoria batava* and *Xylota abiens*. A quick skim through the literature reveals that Roger Payne has picked up on most, possibly all, published data.

Whilst it is inevitably difficult to review a set of provisional maps which were not in the first place intended to have accompanying text, it is possible to make a number of observations:

An important typing error appears on page 8, where *Lejops vittata* is erroneously referred to as *Helophilus vittatus*. The nomenclature professes to follow that of Stubbs and Falk (1983), and whilst in general this is true, there are a number of errors, such as the use of *Neoascia tenur* rather than *N. meticulosa*, *Myiatropa florea* instead of *Myathropa florea* and *Helophilus parallelus* in place of *H. trivittatus*. There is a lack of consistency in the use of subgeneric names, thus whilst *Epistrophella* is used for *E. euchroma*, *Meligramma* is not used for *Melangyna cincta* and *M. triangulifera*. An important error is the inclusion of a map showing *Cheilosia proxima* in seven ten-kilometre squares. This species is not yet recorded in Essex, all records being referable to *Cheilosia species E or D sensu* Stubbs and Falk. Other minor criticisms include the lack of distinction between the colour forms of *Merodon equestris* and *Volucella bombylans*, for example, which may be ecologically significant, and the absence of a separate map for bare-eyed *Cheilosia bergenstammi* which may be a distinct species and has been recorded in the county at least once.

However, these are only provisional maps and the author, who is a friend of the reviewer, makes no false claims about the work. The publication will be supplied for postage to any dipterists who care to write for one, on the understanding that there will be a return flow of additional records.

Reference

STUBBS, A. E. and FALK, S. J. 1983. *British Hoverflies: an Illustrated Identification Guide*. British Entomological and Natural History Society, London.

COLIN W. PLANT

An Index to the Transactions of the City of London Entomological and Natural History Society, 1892-1914

by COLIN W. PLANT*

On 1 January 1914 the London Natural History Society was formed by the amalgamation of the City of London Entomological and Natural History Society (founded 1858), and the North London Natural History Society (founded 1892). In the summer of 1915, volume one of the *Transactions of the London Natural History Society* was published, and this was continued until 1922 in which year the title was altered to *The London Naturalist*. Each volume of both titles included the proceedings of the Society for the preceding year, a practice maintained to this day. In the 1930s, a report on the Birds of the London Area was included in the pages of *The London Naturalist*, but by 1937 this had become such a major venture that a separate publication, the *London Bird Report*, was launched and this continues to appear on an annual basis.

All three of these publications by the Society have been indexed (Fitter, 1953, for the years 1915 to 1952, and Burton and Hillman, 1973, *The London Naturalist* only, for the years 1953 to 1972).

However, our two founder organisations also had their own annual publications. From its inception, the North London Natural History Society produced its *Annual Report*, whilst in 1892, the City of London Entomological and Natural History Society published volume one of its *Transactions* (covering the year 1891). Both publications were produced annually up to the amalgamation, and, as far as I can ascertain, they have never been properly indexed.

Whilst the *Annual Report of the North London Natural History Society* makes most interesting and enjoyable reading, it contains nothing more than the annual reports of Officers and others, contributing little or nothing to any branch of science, and in view of this I have felt justified in omitting this publication altogether from the index presented here. Similarly I have omitted the annual reports of Officers and others in the *Transactions* of the City of London Entomological and Natural History Society, since these are easily traceable by reference to the volume for the appropriate year.

In compiling an index to the *Transactions* I have endeavoured to follow the format adopted by Fitter (1953) and later copied by Burton and Hillman (1973), since I have found both these indexes quite satisfactory. I have included all papers read to the Society and printed in the journal, and all papers abstracted into the journal, as well as many of the short notes and communications where I have felt this worthwhile for the scientific content of the entry. However, I have in general not included reports of members' exhibits presented at meetings, nor a considerable proportion of the notes and communications presented at meetings of the Society. My reasoning for this omission is simply that there is no point, for most contain little more than statements such as, for example, 'Mr Tutt exhibited a series of 123 Large Blues taken in the West County'. Such a typical entry contains no locality data, no dates of capture, no contributions to our knowledge of the insect, nor any other component worthy of indexing here.

The author index is presented first. The name of the author appears on the left, followed by the year of publication, the title of the work and then the page numbers, in that order. The authors are given in alphabetical order.

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The subject index follows, and this is cross-referenced to the author index in order that a particular article may be located. The subject index is presented strictly alphabetically, and it will be apparent at a glance that the bulk of the entries relate to Lepidoptera. In order to make the index easier to use, scientific names of species of Lepidoptera in the index have been updated to conform with Bradley and Fletcher (1979); it has not proved possible to update the names of genera appearing in the index, however, in view of the great amount of 'splitting' and 'lumping' that has taken place over the years.

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 BOTANY Bouskell 1900; Chapman 1905; Riches 1899.
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 COLEOPTERA
 1. SPECIES/GENERA Burrows 1897; Donisthorpe 1910; Johnson 1894; Lewcock 1892, 1893.
 2. OF LOCALITIES Donisthorpe 1899; Jennings 1900; Lewcock 1894.
 3. MISCELLANEOUS Donisthorpe 1910; Heasler 1899, 1901.
 COLOUR OF ANIMALS Gillo 1892; Heasler 1899; May 1897.
 GENTICS Prout 1899; Tutt 1898a.
 GENERAL NATURAL HISTORY Bacot 1905a; Tutt 1899.
 HEMIPTERA Quail 1899.
 HYMENOPTERA
 1. APIDAE Battley 1892.
 2. FORMICIDAE Sauze 1898.

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1. ASSEMBLING Bacot 1895.
2. BREEDING Bacot 1897; Bate 1898; Hamling 1904; Newman 1912.
3. BUTTERFLIES see alphabetical section.
4. CLASSIFICATION Bacot 1903; Buckell 1894, 1894a; Chapman 1895, 1914; Kaye 1901; Tutt 1906.
5. FAMILIES (names as published at the date indicated)
 - Acidaliinae Prout 1911;
 - Artiidae Bacot 1905.
 - Cosmiidae Tautz 1912.
 - Lasiocampidae Bacot 1898.
 - Lycaenidae Chapman 1914.
 - Pterophoridae Chapman 1906; Tutt 1893.
 - Sphingidae Bacot 1893.
 - 'wainscots' Edelsten 1908.
 - Zygacnidae Tutt 1898a.
6. GENERA OF (names as published at the date indicated)
 - Cidaria* Prout 1902; 1905a.
 - Hepialus* Robson 1893.
 - Luffia* Chapman 1902.
 - Melanthia* Tutt 1892.
 - Melanippe* Tutt 1892.
 - Noctua* Tutt 1892a.
 - Perizoma* Prout 1906.
 - Xanthia* Tutt 1894.
7. GENETICS Prout 1899.
8. HYBRIDIZATION Tutt 1898a.
9. LARVAE Bacot 1898, 1904, 1905; Chapman 1905; Quail 1893; Sich 1905.
10. LEAF-MINERS Sich 1905.
11. MELANISM Clark 1893; Robson 1894; Tutt 1894a.
12. NOMENCLATURE see CLASSIFICATION
13. OVA Bacot 1895a; Tutt 1898.
14. POPULATIONS Chapman 1910.
15. PUPAE Bacot 1904; Chapman 1895; May 1897; Miller 1897.
16. SPECIES OF (nomenclature revised to conform with Bradley and Fletcher, 1979).

Phyllocnistidae

unipunctella Steph., *Phyllocnistis* Sich 1903.

Sesiidae

anthraciniformis Esp., *Synanthedon* Cockayne 1910.

Pyrilidae

sociella L., *Aphomia*: Miller 1897.
kuehniella Zell., *Ephestia*: Bate 1897a.

Pterophoridae

graphodactyla Treit., *Stenoptilia*: Willsdon 1909.

Papilionidae

polytes, *Papilio*: Edwards 1898.

Pieridae

croceus Geoffr., *Colias*: Battley 1894.

Lycaenidae

bellargus Rott., *Lysandra*: Hodgson 1908.
coridon Pod., *Lysandra*: Pickett 1906.
rubi L., *Callophrys*: Chapman 1910a.

Nymphalidae

c-album L., *Polygonia*: Newman 1909.
urticae L., *Aglais*: Rosevear 1897.

Satyridae

pamphilus L., *Coenonympha*: Williams 1914.

Lasiocampidae

castrensis L., *Malacosoma*: Bacot 1900.

Saturniidae

pavonia L., *Saturnia*: May 1897.

Geometridae

autumnata Borkh., *Epirrita*: Prout 1900.
bajularie D. & S., *Comibaena*: Burrows 1904.
bidentata Cl., *Odontopera*: Hamling 1904.
histortata Goeze, *Ectropis*: Tutt 1898.
caesiata D. & S., *Entephria*: Prout 1908.
cambrica Curt., *Venusia*: Prout 1905.
citrata L., *Chloroclysta*: Prout 1909.
crepuscularia D. & S. (?) *Ectropis*: Tutt 1898.
ferrugata Cl., *Xanthorhoe*: Prout 1895; 1899.
hastata L., *Rheumaptera*: Prout 1907.
hirtaria Cl., *Lycia*: Buckell 1892.
hispidaria D. & S., *Apocheima*: Bayne 1895.
immutata L., *Scopula*: Buckell 1893.
obeliscata Hb., *Thera*: Prout 1914.
obscuratus D. & S., *Gnophos*: Prout 1904.
papilionaria L., *Geometra*: Burrows 1905.
pinaria L., *Bupalus*: Cockayne 1914.
prunaria L., *Angerona*: Pickett 1904; 1906a.
smaragdaria Fab., *Thetidea*: Burrows 1901.
spadicearia D. & S., *Xanthorhoe*: Prout 1895.
tetralunaria Hufn., *Selenia*: Bacot 1895; 1895a; 1895b; Bate 1897.
truncata Hufn., *Chloroclysta*: Prout 1909.
variata D. & S., *Thera*: Prout 1914.
v-ata Haw., *Chloroclystis*: Prout 1900a.

Notodontidae

fagi L., *Stauropus*: Bayne 1894; Mera 1903.

Lymantriidae

dispar L., *Lymantria*: Nicholson 1895.
monacha L., *Lymantria*: Bacot 1897; Clark 1893.
recens Hb., *Orgyia*: Burrows 1906.

Arctiidae

luteum Hufn., *Spilosoma*: Mera 1900.
fuliginosa L., *Phragmatobia*: Bacot 1904; Tutt 1904.
urticae Esp., *Spilosoma*: Bacot 1900.
caja L., *Arctia*: Bate 1898.

Noctuidae

ambigua D. & S., *Hoplodrina*: Prout 1895a.
lucens Frey., *Amphipoea*: Tutt 1897.
mendica Fabr., *Diarsia*: Tutt 1892a.
moneta Fabr., *Polychrysia*: Nicholson 1913.
ophiogramma Esp., *Apamea*: Battley 1892a.
orbona Hufn., *Noctua*: Clark 1892.
psi L., *Acrionicta*: Chapman 1907.
putris L., *Axylia*: Bacot 1900.
rufa Haw., *Coenobia*: Edelsten 1910.
tridens D. & S., *Acrionicta*: Chapman 1907.
umbratica L., *Cucullia*: Bacot 1900.

17. TAXONOMY see CLASSIFICATION.

18. VARIATION Bacot 1900; Edwards 1898; Hodgson 1909; Pickett 1906; Prout 1904, 1908; Tutt 1904.

MAN — RELATIONSHIP OF INSECTS TO Bacot 1900a.

OBITUARIES of John Adolphus Clark Anon 1909.

PLACES (mainly concerning the Lepidoptera of)

1. L.N.H.S. AREA Epping Forest Bayne 1893.
 Isle of Dogs Wooley 1898.
 Lea Valley Jennings 1900.
 London Buckell and Prout 1899, 1900, 1901 and 1902; Sich 1907.
 Pinner Tautz 1913.
 Rainham (Essex) Burrows 1895.

2. OTHER BRITISH 'coasts' Chapman 1900.
 Folkestone Pickett 1902.
 Hunstanton Bell 1902.
 New Forest Bouskell 1902.
 Norfolk Broads Fuller 1899.
 Ripley Bacot 1900.
 Sutherland Cockayne 1908.
 Weymouth Donisthorpe 1899.
 Wicken Fen Sequira 1911; Tutt 1893a.
3. FOREIGN British Guiana Kaye 1903.
 Fusio Chapman 1901.
 Mont Blanc Tutt 1895.
 South America Bayne 1903.
 Spain Chapman 1904.
 Tacuarembo Bayne 1904.

PRONUNCIATION OF NAMES Thompson 1895.

PUBLICATION OF PAPERS Anon 1900.

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Book Review

British Hoverflies: an Illustrated Identification Guide. By Alan E. Stubbs and Steven J. Falk. British Entomological and Natural History Society, London, 1983. 253 pp., 12 col. pls. Hardbound, £21.00 (ISBN 0 9502891 3 2), softbound £18.00 (ISBN 0 9502891 4 0). Reduced prices to B.E.N.H.S. members.

Of all the families of Diptera worldwide, the hoverflies (Syrphidae) are probably the widest known and easiest recognised. In spite of this however, the available literature is somewhat sparse when it comes to identification guides and keys. The earliest British work on the family appears to be the publication in 1901 of G. H. Verrall's *British Flies* 8 *Syrphidae* etc. Then, a long gap until the Royal Entomological Society produced in 1953 the *Handbook for the Identification of British Insects* 10(1): 1-98. *Diptera, family Syrphidae*, under the authorship of R. L. Coe. This volume, with its numerous errors and unreliabilities, and its dated nomenclature, has remained the standard work on this subject for thirty years. The Dutch publication *De zweefvliegen van Noordwest-Europa en Europees Rusland, in het bijzonder van de Benelux* by Dr Van Der Goot, the authoritative work on the continental fauna, was published in 1981, but there is no English translation of this excellent work available at present. (Dutch speaking dipterists note!). Finally, in 1983, the British Entomological and Natural History Society published Stubbs and Falk under review here.

This long and eagerly awaited book has more than lived up to expectations, and Alan Stubbs is to be thoroughly congratulated for a comprehensive and accurate text which is written and presented in such a manner that the book is quite useable by layman and experienced entomologist alike. Indeed, the book is actually aimed at the amateur with no previous experience of hoverflies, and the keys are designed not only to be easy to use, avoiding some of the totally unnecessary characters used in other works, but also to be workable with nothing more than a $\times 10$ hand lens. Inevitably, certain characters of what may be termed 'critical' species can only be seen with a higher powered microscope, but when this situation arises, the character in the key is clearly labelled with the letter 'M' so that confusion does not arise.

Following the instructions given at the start of chapter seven, the unknown hoverfly is first run through a key to tribes. Having obtained an answer we progress to the key to genera in the appropriate tribe, and thence to the key to species. One of the best things about this book is that the keys are illustrated with line drawings, so that one does not have to have an honours degree in the names of the different parts of insects to understand which bit is being referred to. Having arrived at an answer, there are then twelve colour plates illustrating most of the species (where a species is not illustrated it is because it is superficially similar to one which is) to which the reader then refers to see if the fly he has identified actually looks like the fly he thinks it is. This in itself has to be an improvement on most identification guides in the entomological field. Finally, the reader is referred to the concise but comprehensive text on each species as a final check. Here further characters are given to confirm the identification, including some of the more difficult ones requiring use of a microscope. Similar species are named and points to separate them are given.

Inevitably in a work of this nature there are some criticisms to be made. The inclusion of an additional key to the commoner species of *Cheilosia* strikes me as a pointless exercise, and one which allows for mistakes. Surely the fact that one is a beginner does not preclude one from catching a species too rare to be included in this key: I am sure that erroneous records will creep in to the National Recording Scheme if the those in charge of the scheme are not vigilant. There are a number of errors in the keys. On page 89 the two arista drawings for *Brachyopa* are transposed; on page 93 the bridge characters for *Neoascia tenur* and *N. meticulosa* are transposed; and on page 109 the metasternum characters in couplet 9 are reversed. Within the text a number of minor errors are present, such as for example on page 156, where the third sentence under *Syrphus vitripennis* is transposed from *S. torvus* above. A printed leaflet is available from the publishers listing these and other lesser errors, as well as updating some of the text.

On the thorny subject of nomenclature, Alan Stubbs is again to be congratulated for having made a firm decision to present a new checklist using available information, rather than, as he says, waiting a further ten years whilst a revised checklist sorts itself out. His list, on pages 230 to 235, includes a number of new, as yet unnamed species, particularly amongst *Cheilosia*, and a number of new forms, some of which may prove to be new species in the fullness of time.

Complementing all this, there is an extremely well researched bibliography, and the text, plates and keys are fully cross-indexed. Steven Falk's main contribution, the colour plates, are amongst the best illustrations of insects in the modern literature, and it is unlikely that they could be bettered even by photographs. There are introductory chapters on observing and photographing, collecting, habits and seasons, the early stages and the characters of adult hoverflies (unlike other works, it does not assume that the reader already knows how to sex hoverflies, or where the *vena spuria* lies!).

Adequately bound in an open-out-flat-for-use-on-the-bench manner, the book is easy to use and thoroughly recommended to all interested in hoverflies to any degree.

COLIN W. PLANT

Survey of Bookham Common:

FORTY-THIRD YEAR Progress Report for 1984

General (G. Beven*)

On 18 November 1953 D. Longhurst, then keeper of Bookham Common, wrote that 'about 50 years ago quite a number of cows used to be grazed and looked after by a drover. Geese were very plentiful, practically everyone on or in the vicinity kept them, but no pigs were allowed. The open Common was more or less confined to cows, but I have seen sheep all over the woodland, especially during the acorn season, before the National Trust took over [in 1922 and 1924], but sheep were still grazed until about three years ago. I have seen as many as 50 gipsies horses on the Common. To the best of my knowledge, grazing on a large scale ceased about 25 years ago. Of course, there is the odd cow tethered out on the Common to date by permission of the Local Committee'.

Cdr J. M. W. Topp J.P., R.N., a keen amateur botanist, who assisted the Survey, especially that of vascular plants in 1980-1, has been appointed representative of the Commissioner of the British Indian Ocean Territories, commanding the British contingent on Diego Garcia.

The long-term study of a population of *Ruscus aculeatus* at Bookham Common (Hillman and Warren 1973, Hillman 1979) has been repeatedly quoted by Kay and Page (1985) who report some findings similar to those of the Bookham Common investigation.

References

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 KAY, Q. O. N. and PAGE, J. 1985. Dioecism and pollination in *Ruscus aculeatus*. *Watsonia* **15**: 261-264.

Water Temperature and Conductivity Readings (J. H. Bratton†)

Water temperatures and conductivities are given below for some of the aquatic habitats of Bookham Common. The conductivity readings have been corrected to the standard 25°C using the conversion table given in Golterman, Clymo and Ohnstad (1978). The units are degrees Celsius for temperature (T) and µS/cm for conductivity (Con).

	2.10.83		30.10.83		16.01.84		8.04.84		10.06.84	
	T	Con	T	Con	T	Con	T	Con	T	Con
South-east Pond	16	4.5	123	1	99	9	100	17.5	87	
Upper Eastern Pond	16	3.5	406	3	447	9	449	21	495	
Lower Eastern Pond	16	3.5	421	2.5	448	10	503	25	464	
Eastern Hollow Pond	17	3.5	397	2	428	8.5	358	26	390	
Western Hollow Pond	17	4.5	436	1.5	412	9	345	24	393	
Isle of Wight Pond	18.5	6	359	2.5	356	9	306	24	342	
Sheepbell Pond	16	5.5	292	2.5	266	9	278	25	317	
Bayfield Pond						8	193			
Central Ditch 816		4.5	562							
Isle of Wight Ditch 815		3.5	518							
Hundred Pound Bridge		3	565							

Conductivity is a measure of dissolved ions and gives some indication of trophic status of fresh water. To place the Bookham data in perspective: the conductivity

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of an oligotrophic lake, Wastwater in Cumbria, was 39 $\mu\text{S}/\text{cm}$ on 18 April 1983; that of Newport Pagnall sewage lagoons was approximately 1000 $\mu\text{S}/\text{cm}$. However, bicarbonate-rich waters such as chalk streams have high conductivities but may be obligotrophic as may brackish waters, and in acidic waters below pH 4.5 the hydrogen ions may contribute a large proportion of the conductivity. Thus conductivity values are best used to corroborate other information rather than in isolation.

Reference

GOLTERMAN, H. L., CLYMO, R. S. and OHNSTAD, M. A. M. 1978. *Methods for Physical and Chemical Analysis of Fresh Waters*. Ed.2. Blackwell Scientific Publications, Oxford.

Vegetation (Bryan Radcliffe*)

Bromus comnutatus, a grass not seen on Bookham Common for over thirty years, was found by Olive Maunder. This rare annual to biennial species was in the same division as before so it has probably been present undetected all the time. In 1954 it was listed as 'a doubtful record, requires confirmation' and its confirmation in 1984 was both welcome and long overdue.

Miss Maunder also found one plant of *Sison amomum* near the edge of the Common. The noteworthy feature in this case is that this frequent plant of the Surrey clay has never hitherto been reported from the Common, which appears to be a very suitable habitat.

It would be interesting to speculate on the provenance of three plants, apparently casual, growing cheek-by-jowl on disturbed ground in division E. These were *Viola* \times *wittrockiana*, *Oxalis europaea* and *Malva neglecta*. The pansy, always a garden escape, has been noticed with increasing frequency in recent years. The other two would hardly be considered garden-worthy although they might well be allowed to persist in a botanist's garden. The oxalis, usually a weed of cultivated areas (including gardens) on sand or gravel is more frequent in rural than suburban Surrey. The mallow can occur on most types of soil but is quite uncommon. It is thought that a considerable number of the Surrey records in the recent *Flora of the London Area* are open to doubt. In the absence of flowers, small leaved plants of *Malva sylvestris* can be misidentified.

An interesting cherry, as yet only about one metre in height, has been found by Ian Swinney in division C. Until it flowers it will not be possible to assign it to a species but leaf characters indicate that *Prunus padus* or *P. serotina* are possibilities. The former, abundant in parts of the north of England, is scarcely acceptable as a wild plant in Surrey although there have been two records of it in the far west of the county 20 years ago. The most likely candidate is *P. serotina*, the rum cherry, which is becoming naturalised on various Surrey heaths and other open spaces. This species fruits abundantly near the Leatherhead By-pass just two miles away so its advent on Bookham Common is likely.

The foregoing notes should illustrate that although Bookham Common has been the subject of a survey by botanists (and other naturalists) for more than 40 years a great deal of interest remains, to be found or re-found. It is sufficiently stable and undisturbed to retain a rare native grass while being able to accommodate a new alien cherry.

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Fungi (Pamela Goldsmith)**

The following species, new to Bookham Common, were found during 1984:
 November *Coriolellus serpens albidus* in Central Wood. This was checked by
 Derek Reid at Kew.
 December *Hygrophorus vitellena*
Mycena clavularis

Bryophytes (O. B. J. French*)

Unfortunately no bryophyte note appeared last year, but I hope it is not too late to record our very deep regret at the departure from the Survey of Rod Stern who revitalised bryophyte studies on the Common after a lapse of several years and who from 1972 onwards taught and encouraged interested beginners. We are extremely grateful to him for his past tuition and guidance and for carrying on from his Sussex home as referee in cases where specific determinations present problems.

Little work was done during 1983, but during the past year we have tried to make up for lost time. The list which follows shows one species refound for the first time since the Castell era, and twenty-one taxa recorded from areas where they had not been found before (Stern and French 1983).

HEPATICAE

<i>Metzgeria furcata</i>	O
<i>Pellia endiviifolia</i>	D – on brickwork beneath Hundred Pound Bridge, just above water level.

MUSCI

<i>Pseudephemerum nitidum</i>	C
<i>Fissidens taxifolius</i>	E
<i>Tortula muralis</i>	C
<i>Phascum cuspidatum</i>	C – on gravelly soil in woodland.
<i>Barbula convoluta</i>	C – second record from gravelly soil.
<i>B. unguiculata</i>	C
<i>B. fallax</i>	CT
<i>Orthodontium lineare</i>	FO
<i>Bryum capillare</i>	C
<i>B. argenteum</i>	C
<i>Aulacomnium androgynum</i>	C
<i>Orthotrichum lyellii</i>	O – on prone <i>Salix</i> lying over marshy ground.
<i>O. affine</i>	O
<i>O. diaphanum</i>	O
<i>Calliergon cuspidatum</i>	C
<i>Eurhynchium striatum</i>	K
<i>E. swartzii</i>	N
<i>Plagiothecium curvifolium</i>	DQ
<i>Hypnum cupressiforme</i> var. <i>resupinatum</i>	O
<i>H. jutlandicum</i>	C
<i>Rhytidiadelphus squarrosus</i>	C

Orthotrichum lyellii is probably not new to the Common since Ella Hillman tells me that after she published her paper (Hillman 1975) she found a marginal note in one of C. P. Castell's record books to the effect that he had found this species at Bookham in Hollow Wood in 1945.

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Most of the new locality records for area C come from a small car park at the northernmost tip of the Common beside Cobham Road. This was closed to vehicles a couple of years ago, but already the gravel surface is being rapidly invaded by grasses etc., and many mosses, which would not have been able to survive there previously, are now establishing themselves in a new and congenial habitat.

It is sad to have to record that current management policy on the Common of controlled tree felling and the creation of clearings to encourage new growth is having a disastrous effect upon our rarer epiphytic bryophytes. The only tree known to carry *Zygodon conoideus* has gone, and *Ulota crispa*, once known in very small tufts from three separate locations, cannot now be found. Unfortunately, *Z. conoideus* appears to be known only from one other site in Surrey — at Newlands Corner, and *Ulota crispa*, although frequent in parts of the south-west of the county, is a rare plant in this part of Surrey (Gardiner 1981).

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Odonata (G. Beven)

A female southern aeshna *Aeshna cyanea* was ovipositing in *Sparganium* at South-east Pond on 26 August and one was inserting eggs into a floating branch of a tree on 9 September. A female brown aeshna *A. grandis* was ovipositing in floating tree branches on South-east Pond on 24 August. A pair of brilliant emerald *Somatochlora metallica* was seen at Eastern Hollow Pond and a male at Lower Eastern Pond on 12 August (all D.A.B., P.C.B.). A female black-lined orthetrum *Orthetrum cancellatum* was seen in Stents Wood 283 on 18 June (R.H. per D.L.). Neither of the last two species was recorded in the surveys of 1942-4 (Payne 1945) or of 1982-3 (Bratton and Langlois 1984). The ruddy sympetrum *Sympetrum sanguineum* was again recorded from 21 July to 22 September at South-east Pond and Lower Eastern Pond, but only males were seen (D.A.B., P.C.B.).

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- BRATTON, J. and LANGLOIS, D. 1984. *Lond. Nat.* **63**: 133-136.
 PAYNE, R. M. 1945. *Lond. Nat.* **25**: 23-31.

Lepidoptera (G. Beven)

It was another fine summer and 24 species of butterflies were seen. A female purple emperor *Apatura iris* flew up from Isle of Wight Road 8458, probably from feeding on dog-dung, on 28 July (L.M.) and one was ovipositing on willow leaves on 29 July at 388 (D.A.B.). In addition to most of the species seen in 1983, there was a painted lady *Cynthia cardui* on 9 September, blues, holly *Celastrina argiolus* and common *Polyommatus icarus* were seen, and there were small coppers *Lycaena dispar*, one on 2 June at 845, one on 29 July at 572 and one on 30 September at 412 (D.A.B., P.C.B.). Two clouded yellows *Colias croceus* were noted on 29 July at 572 (I.S.).

A caterpillar of the emperor moth *Saturnia pavonia* was found at 571 on 9 September (E.W.G.).

Amphibia (G. Beven)

On 23 March there was a fire on two acres of Eastern Plain 823, 824, 826, where 37 toads *Bufo bufo*, including six large females, were found dead (I.S.). They had, no doubt, been on their way to the Isle of Wight or nearby Ponds. On 12-13 April toads were very numerous at dusk around the banks of the Isle of Wight Pond (D.A.B., P.C.B.). They were probably leaving the pond after breeding as also were large numbers of frogs *Rana temporaria* on the paths to the north and west of the Isle of Wight Pond on 22 April (L.M.).

Birds (G. Beven)

Population Studies in Oakwood

The breeding season census was repeated in the 16-hectare sample of dense pedunculate oakwood in 1984 by Leonard Manns, who made 11 visits between April and July. In 1981, 1982, 1983 and 1984 the numbers of wren *Troglodytes troglodytes* territories were 23, 33, 21 and 25, of blackbird *Turdus merula* 20, 14, 13 and 10, and of the robin *Erithacus rubecula* 28, 28, 26 and 24 respectively. The wren population has increased again, the blackbirds and robins have both decreased further. The numbers of great tits *Parus major* has remained rather low, the figures for the same years being 22, 16, 11 and 11, but the numbers of blue tits *P. caeruleus* again showed little change, the corresponding figures being 21, 16, 19 and 21.

Population Studies in Scrub and Grassland

The breeding season census was repeated in 39 hectares of scrub and grassland in 1984 by D. A. and P. C. Boyd. Seven counts were made between March and July (two more than in 1983) which may partially account for the apparent increase of the following three species. The numbers of territories for 1981, 1982, 1983 and 1984 respectively were for wrens 17, 16, 18 and 32, for robins 20, 20, 20 and 34, and for blackbirds 25, 19, 12 and 22.

Other Notes on the Birds during 1984

One pair of Canada geese *Branta canadensis* nested on the Isle of Wight Pond and between 7-13 May was seen with six small goslings on the other ponds as far as Upper Eastern Pond (I.G., L.M., A.P.). There were seven teal *Anas crecca* on Lower Eastern Pond on 18 March and six on Upper Eastern Pond on 24 August (D.A.B.). On 17 June a female mandarin *Aix galericulata* and ten small ducklings were on Eastern Hollow Pond and on 4-8 July they were on the Isle of Wight Pond (D.A.B., L.M.). Mandarins held territories in Eastern Wood in 1969-72, 1975, 1977 and 1979 (G.B.), and a female with young was seen in 1969 on Lower Eastern Pond (C.R.A.C., M.P.) and in 1977 (1978 *Lond. Bird Rep.* 42). On 27 August an adult male goshawk *Accipiter gentilis* was seen well soaring and gliding over, and diving into Central Wood and flying through the tree canopy (D.A.B., P.C.B.). This record has been accepted by the L.N.H.S. Records Committee. A hobby *Falco subbuteo* was seen on 2 September flying south-east over South-east Wood (D.A.B.). Hobbies have seldom been observed at Bookham. In 1946, one was seen flying into Hill House Wood on 12 May (A.R.W.) and one flew over Central Plain on 24 June (G.B.). On 14 May 1968 one flew from Muggerridge Wood 0.6km (3/8m) north of the Common. It seized a small bird in its talons and then perched in an oak tree and proceeded to tear pieces off it (G.B.)

A wood warbler *Phylloscopus sibilatrix* was singing in South-east Wood 833 on 3-10 June (L.M.). A firecrest *Regulus ignicapillus* was seen on Bank's Common 0.8km (1/2m) west of sq.44 on 7 May (D.A.B.). Mrs I. Wales reported 5-6 firecrests in her garden on the edge of the Common sq.66 on 12 March and one on 18 March 1972 (per W.D.M.). In addition to one territory of a nightingale *Luscinia megarhynchos* near Bayfield Pond sq.76, one partly in the census area 8457 and one singing in 459 at the end of April, there were two or more singing

males just off the Common in sq.79 and 87 (D.A.B., L.M., I.S.). Two nests of long-tailed tits *Aegithalos caudatus* were found on the north side of Western Hollow Pond 583, about ten metres apart (D.A.B.). Two redpolls *Acanthis flammea* were seen on Bayfield Plain 817 on 13 May (D.A.B.). Redpolls had territories (1-6) on the plains from 1964 to 1978. A party of 15 crossbills *Loxia curvirostra* were calling while flying east over Western Plain on 7 May (D.A.B.). Crossbills were previously noted in 1966 over Western Plain, four on 10 July (D.V.F.) and two on 9 October (F.C.R.) when two were also noted over Eastern Wood (G.B.). An adult hawfinch *Coccothraustes coccothraustes* feeding a young one was seen in Eastern Wood 3789 on 30 June (L.M.). Although there is no proof that these birds had a territory inside Eastern Wood it is interesting that they were considered to have a territory there in 1952, 1968 and 1970, each year in sq.62 or in 388 which, with 378, are just north of and adjacent to sq.62.

Little Grebe

Dabchicks or little grebes *Tachybaptus ruficollis* have been nesting on the Common for many years. They were probably there before 1914 (Spreadbury 1957), nested in 1933-4 and one was present on Upper Eastern Pond in 1942 (Carrington *et al.* 1944). There were then no further records, although birds may have been present, until 1949 and from then on birds nested on the Isle of Wight Pond each year (except 1954 and 1956) until 1972 (many observers). In December 1972 the Isle of Wight Pond was drained and partially deepened and little grebes were not recorded there in 1973. However in 1974-5 they returned and nested again, but in 1976 'the water plants completely failed to appear, except for small patches of *Myriophyllum*. In 1977 the pond appeared to be devoid of true aquatic plants....' (Beven and Radcliffe 1978). Nevertheless the little grebe did visit the pond in 1977, but there was no evidence of nesting there and no records of them on Lower Eastern Pond which was temporarily drained in April 1977. They did however nest on Lower Eastern Pond from 1978 until 1981 and again in 1984 (G.B., D.A.B., L.M., A.M.). It is important to note that little grebes also nested on Upper Eastern Pond in 1950 and on Lower Eastern Pond in 1965 as well as a pair on the Isle of Wight Pond in both years. In addition in 1950 and in 1967 two pairs nested on the Isle of Wight Pond (see below). Thus three pairs occurred on the Common in 1950, two pairs in both 1965 and 1967 (G.B., E.M.F., K.A.G., E.M.H.).

On the Isle of Wight Pond on 9 July 1967 each pair was seen with two young; the rival males fought and after a clash faced each other with breasts puffed out and heads thrown back, then they dived simultaneously (G.B.). No doubt two broods have occurred in many years but have only been recorded in 1966 and 1968 (G.B.). On 9 August 1979 an adult was with one downy young about three weeks old, which could dive quite well. The young bird waits on the surface for the submerged adult to come up with food. No doubt it sees the adult under the surface of the water as it knows where it is going to surface and swims rapidly towards the spot before the adult surfaces (G.B.). A young bird was still following parents and begging for food on 5 October 1968, the juvenile making peeping noises but was not seen to be fed. It frequently appeared to catch flies a few centimetres above the water surface (G.B.). Little grebes have usually arrived February-March but one or two were present on 14 January 1951 (G.B.) and on 29 December 1968 (C.H.). The bill of downy young at hatching is yellow with a faint red hue, darker at the base of the upper mandible (Cramp and Simmons 1977). On 11 June 1978 four very small chicks (1-2 weeks old) were seen with dark red bills (G.B.). Also on 10 July 1966 two very small young in down appeared to have some red on the forehead (G.B.) which is not mentioned by Cramp and Simmons (1977).

Scolopacidae

Since 1946 jack snipe *Lymnocyptes minima* have been recorded during the

winter on 11 occasions. On three of these they were feeding with common snipe *Gallinago gallinago*. They were disturbed from mud along Bookham Stream, especially Western Pond 7323, and also Bayfield Pond, Central and Isle of Wight Ditches (G.B., P.W.E.C., N.D., E.M.H., W.D.M., M.W., A.R.W.). Jack snipe have occurred as single birds except on 12 March 1961, when four were put up from Western Pond (G.B., W.D.M.).

L. I. Carrington *et al.* (1944) state that the common snipe 'has bred in the past...', and W. H. Spreadbury (1957) writes that they 'could often be seen drumming over Western Plain. I believe they nested in the fields west of the Common and possibly just after the 1914 war, on the Plain itself'. In the early days of the Survey the plains, especially along Bookham Stream, were more marshy and there were less tress and shrubs than there are now. It is interesting to note that snipe were drumming over the Stream and Western Pond in April and May 1944 (R.W.H., A.R.W.) and during 1947, in April a pair was noted circling over the Isle of Wight calling 'jic-jac' and in April-May was frequenting the Western Pond area and drumming was heard there, but no nest was found (P.W.E.C., P.J.H.). In the first fifteen years or so of the Survey snipe were commonly found during the winter in the marshy parts of the plains, particularly along Bookham Stream, sometimes in parties of 5-9 (G.B., P.W.E.C., E.M.H., W.D.M., D.C.P., A.R.W.). As the plains became drier snipe have become much less common, especially after Western Pond was drained into Bookham Stream through a small channel in 1962 (Melluish 1969). During the winter snipe may still be disturbed from mud, chiefly by the Stream and ponds, and flooded areas such as by the Isle of Wight Ditch 884 in January-February 1979 (G.B., D.A.B., N.D., E.M.H., W.D.M.). They may be seen at other times, e.g., one on mud by the Isle of Wight Pond on 9 August 1964 (L.M.) and one near Hundred Pound Bridge on 10 May 1970 (L.B.).

A summary of the records of the woodcock *Scolopax rusticola* was given in *The London Naturalist* (1984) 63: 128-9. In 1984 three singles and two close together were roding over Central and Bayfield Plains on 2 April (D.A.B.) and possibly four were roding over Central Wood and Eastern Hollow on 3 June (L.M.). A young chick (3 days old) was found dead in Eastern Wood 6173 on 28 April 1984 (L.M.).

On 7 August 1969 a greenshank *Tringa nebularia* was seen flying east over Little Bookham (C.H.) and one flew over Western Plain on 8 August 1971 (D.V.F.).

On 13 August 1961 a green sandpiper *T. ochropus* flew over the Clump 819 calling repeatedly and dropped down over the plains or sewage farm (G.B.) In 1979 one was seen on mud at Eastern Hollow Pond on 5 August (G.B) and one by Bayfield Pond on 9 September (W.D.M.). Two circled Lower Eastern Pond on 14 August 1983 (J.H.B.).

Four common sandpipers *T. hypoleucos* were noted by Bookham Stream on Western Plain on 14 December 1980 (W.D.M.) and one by the Isle of Wight Pond on 4 May 1984 (D.A.B., L.M.).

Rallidae

1. There are five records of the water rail *Rallus aquaticus*. One was seen on the 13 March 1955 on the Isle of Wight Plain near Bookham Stream and one on 16 February 1978 by Lower Eastern Pond (W.D.M.). Three records were during the autumn, on 8 October 1967 one by Bookham Stream 811 (W.D.M.), on 14 October 1962 one by the Isle of Wight Pond (G.B., N.G.) and one was seen well on the mud at the edge of the same pond on 8 November 1964 (C.P.C., L.M.).

2. The moorhen *Gallinula chloropus* is a common resident and has probably been inadequately recorded. However it has nested in most years from 1943 to 1981 on the Isle of Wight Pond. There were nests on Upper Eastern Pond in 1943, '44, '47,

'77 and '78, on Lower Eastern Pond in 1949, '77, '78, '79 and '84, on Bayfield Pond in 1942, '43, '49, '52, '55, '59, '68, '69, '78 and '84, on Sheepbell Pond in 1950, '52 and '70, on Kelsey's Pond in 1943, '47 and '70, on Western Pond 732 and Bookham Stream 486 in 1944, '47 and '48, and on Bookham Stream in the Hundred Pound Bridge area in 1942, '75 and '76. In 1977 the two Hollows were reconstructed as ponds and in 1978 moorhens nested on Western Hollow Pond and in 1984 on Eastern Hollow Pond. In 1978 there were at least five pairs nesting on the Common (many observers).

Of ten nests with eggs, one nest had two eggs, one had four, one had five, five had six, and two had seven eggs. No doubt pairs frequently have two broods, but they are only recorded as doing so in 1966, '67, '74, '77 and '78. On 14 July 1968 several small downy young were observed to run across the floating leaves of the broad-leaved pondweed *Potamogeton natans*, only occasionally splashing a little in the water. On 11 August 1974 similar very small young were startled and found it impossible to swim quickly across the pond, rather thickly covered with the floating leaves of *P. natans*, and when they reached within three metres of the edge of the pond they ran quickly over the floating leaves on to the land with a minimum of splash. On 19 August 1979 a tiny black downy chick walked across some floating duckweed *Lemna minor* supported by filamentous algae without sinking in at all (G.B.).

Moorhens are seen occasionally in the oakwood a hundred metres or so away from the ponds, particularly when the ground is wet or muddy, and are sometimes noted in trees, as on 12 February 1950 when two flew off a branch seven metres up to another tree nearby and after climbing about the branches they flew off among the tress still at about seven metres above the ground (G.B.). In January 1975 N. Davies saw several perched in trees. They may also perch in willows two metres above the water or climb 1.5 metres up a stem of reed mace *Typha latifolia* to feed on its fruits (G.B., M.W.). One pair nested successfully in a willow seven metres above the water (Carrington *et al.* 1944).

3. Coots *Fulica atra* have nested on the Isle of Wight Pond in most years since perhaps 1914 (Spreadbury 1957) and were present in 1942-3 (Carrington *et al.* 1944) and in 1953-4. They were not then recorded as nesting until 1958, since when they have nested every year except 1959 until 1972. By then the 'pond had become choked with scrub vegetation to the extent of losing much of its open water. During the winter of 1972-3 the pond was excavated with heavy machinery, removing large quantities of mud and some clay' (Beven and Radcliffe 1978). The area of open pond had been increased from about an acre (0.4 hectare) to 1.6 acres (0.65 ha). Coot did not nest there in 1973-4. However two pairs nested on the Isle of Wight Pond in 1975 and subsequently one pair nested there annually until 1979 (L.B., G.B., C.P.C., N.D., E.M.H., D.E.W.). The haunts of coot are 'larger ponds.... The minimum size of ponds frequented for breeding appears to be generally about one acre or a little less' (Witherby *et al.* 1941). There has been a tendency in recent years for coots to breed on smaller ponds and Cramp and Simmons (1980) state that the 'Typical territory size is 0.1-0.5 ha —' but 'many marginal territories are often less than 0.05-0.1 ha. — occupied by a single pair (e.g., on a small pond)'. On Bookham Common coots were first found nesting on the smaller ponds of less than 0.5 acre (0.2 ha.) in 1967, and have nested on Upper Eastern Pond from 1978 to 1981 and in 1983 (G.B., E.M.H., A.M.), on Lower Eastern Pond in 1967 (E.M.H.), on Eastern Hollow Pond in 1983-4 (D.A.B., E.M.H., L.M.) and on Western Hollow Pond in 1979 (G.B.). It should be remembered that Upper and Lower Eastern Ponds are about eight metres apart, but then 70 metres further down stream is Eastern Hollow Pond followed within eight metres by Western Hollow Pond (L.M.). These ponds are all connected by a stream which runs into the Isle of Wight Pond and then into Bookham Stream. Thus, in 1979 a pair nested on Upper Eastern Pond 360 metres from a second pair nesting on Western Hollow Pond, which was 130 metres from a third pair nesting

on the Isle of Wight Pond. In 1983 a pair nested on Upper Eastern Pond some 250 metres from a second pair nesting on Eastern Hollow Pond.

The coot is stated as 'double-brooded' (Witherby *et al.* 1941), but Cramp and Simmons (1980) remark that 'One brood is normal but two are attempted in some areas e.g., Britain'. There were two pairs on the Isle of Wight Pond in 1967 and 1975 but there were probably two broods on the Isle of Wight Pond in 1958 and 1966 (G.B., E.M.H.) and on Upper Eastern Pond in 1980 (A.M.).

A coot was seen standing on top of several stems of reed mace and may also be noted pulling off the leaves of reed mace and eating them; they may feed themselves with waterweed or even with worms and leeches (G.B.). On one occasion an adult was feeding bread to the young (C.P.C.). The coot's interspecific aggression was demonstrated when an adult, which had young, drove off a tufted duck *Aythya fuligula* on 23 June 1976 (N.D.). Birds usually arrive in February or March but one was present on 22 January 1967 (G.B.). They usually leave in October or November but two remained on 11 December 1966 (G.B.) and one on 1 December 1968 (P.S.).

Starling Roosts

Starlings *Sturnus vulgaris* nest in small numbers in the woodland and on the plains. In late May or early June they visit the woods with their young to feed on the defoliating caterpillars on the oaks. Sometimes also they assemble at dusk in thickets on the plains and then fly off to roost elsewhere. However on 19 May 1963 800 flew into scrub near the Clump 819 in the evening, apparently to roost (F.C.R.), and on 14 May 1977, during an all-night ramble, L. Baker and B. A. Richards found a roost of at least 100 birds in dense hawthorn 465, which they examined in the dark with a torch. It was the first time in all their 14 years of 'summer night' rambles that they had found a roost. It is also interesting that such a roost is formed so early in the year. Feare (1984) writes 'The absence of roosts for a period in April-May corresponds with the time when most starlings are breeding.' He goes on to say that the study of radar echoes from birds during their dispersal and the smaller number of birds that depart from breeding-season roosts may be inadequate to produce an echo ('angel') recognisable as a starling roost. 'It is known from field observations, however, that at least some breeding males and non-breeding birds roost communally throughout the breeding season.' Winter starling roosts have not often been recorded, but some appeared to be roosting in the bushes on Central Plain on 12 November 1961. Also between November 1978 and January 1979 small numbers, 20-60, were noted at dusk in the thickets on Central Plain and on 11 February 1979 at 4.30 p.m. they were seen assembling at a roost on the western edge of Central Wood 573. They were arriving in parties of about 100 every ¼ minute. Smaller parties met in scrub 575 before crossing over the path to the main roost. There must have been at least 2,000 birds present, with much noise of chattering, but after a sudden silence there was a loud noise of wing flapping, followed again by silence, then a sparrowhawk *Accipiter nisus* flew very fast across the Isle of Wight into the roost 573 and disappeared. At 6 p.m. it was dark and all was silent.

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Mammals (G. Beven)

At dusk (19.00 hrs) on 19 April a hedgehog *Erinaceus europaeus* was found eating a toad *Bufo bufo* just south of Eastern Hollow Pond 595 (D.A.B., P.C.B.). K. Herter (1965) indicates that frogs, toads, lizards and snakes are occasionally eaten while Frazer (1983) states that 'hedgehogs have no inhibitions about' eating toads. A long-eared bat *Plecotus auritus* was found dead in Stents Wood 293 on 1 May 1984 (I.S.). The bones of a long-eared bat were found in a pellet of a long-eared owl *Asio otus* on 13 April 1979 at 415 (G.B.). Roe deer *Capreolus capriolus* appear to be becoming more numerous; single deer were noted on 28 occasions, two were seen 17 times, three on two occasions, a group of 3-4 in July, of five in January and of six in February (D.A.B., E.M.H., L.M., A.P., I.S., J.S.).

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Book Review

The Concise Birds of Britain and Europe — an Illustrated Checklist. By Hermann Heinzel. Hodder and Stoughton, London. 1985. 64 pp. £2.95. ISBN 0 340 37213 3.

As the title implies — a very concise checklist. The information provided is brief but sufficient. The illustrations, whilst of the quality to be expected from the author, are of necessity small and do not give any indication of actual sizes. The maps are also very small. It was ironic to discover a printer's error in the very first page covering usage of the book, i.e. summer/winter plumages of spotted redshank — fortunately the main text showed the correct version.

Appreciating that the booklet covers Britain and Europe this reviewer still considers that far too much space is devoted to vagrants and very rare visitors. If these were greatly reduced more space could be available for additional information, and perhaps, larger illustrations and maps.

Price and quality illustrations, albeit small, are major points in the book's favour. However the reviewer feels that it is up to individual birdwatchers to decide whether or not they find a place in their holdall or pocket for this booklet.

J. G. KONNARIS

Botanical Records for 1984

by R. M. BURTON*

Summary

A survey commissioned by the Greater London Council was responsible for many of 1984's most remarkable botanical discoveries in the London area, including the first modern Middlesex *Oenanthe silaifolia* and naturalised *Paspalum paspalodes*. Other excellent finds reported include *Ranunculus parviflorus* in West Kent and *Galium parisiense* in Middlesex, the latter after an interval of centuries. *Hieracium liljeholmii*, a hawkweed not previously listed as British, has been recognised from recent specimens from South Essex and West Kent. The distribution of *Bidens connata* is updated and illustrated by a map. Another alien composite, *Conyza sumatrensis*, is reported as naturalised in London, with a brief account of its nomenclature and taxonomy.

Introduction

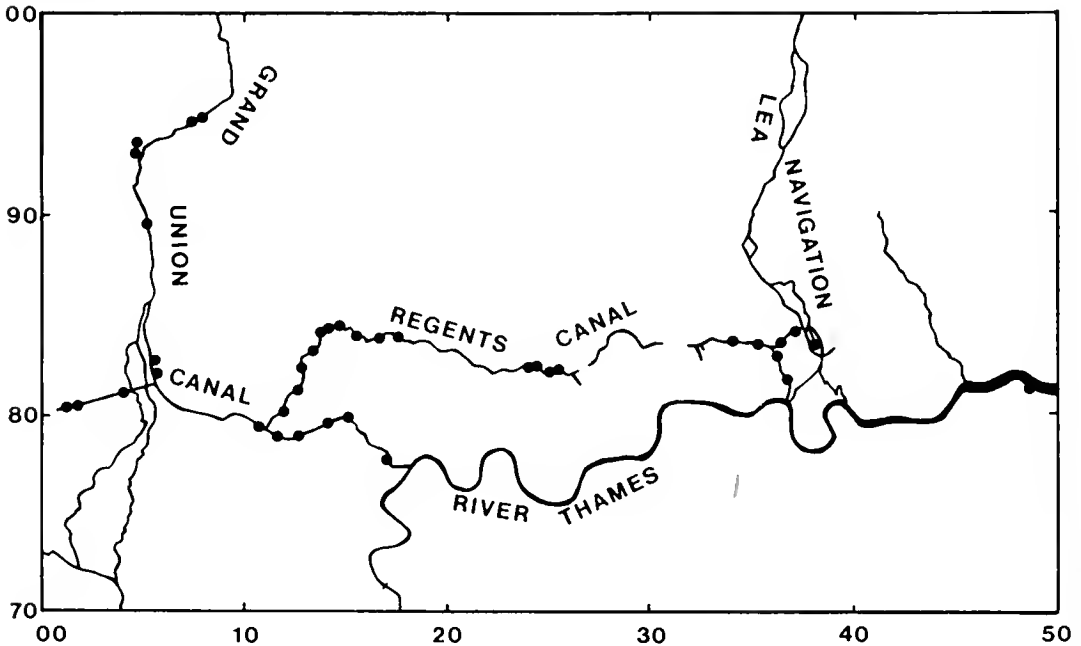
The main reason for 1984 having produced an exceptionally good crop of botanical records in the London area was the survey carried out by a team employed by the London Wildlife Trust under contract from the Greater London Council (G.L.C.). This was a strategic survey of all sites of possible significant conservation interest above a minimum size laid down. Although other aspects of natural history were allowed for, habitats were chiefly assessed on the quality of the vegetation. The instructions issued to the team by the G.L.C.'s Ecology Section included a list of 'notable' species produced by a statistical analysis of native species mapped in *Flora of the London Area* (Burton 1983a); these and any even rarer ones not mapped were to be listed as part of the report on every site where they were seen. Sites potentially worth reporting on were located from maps and aerial photographs and visited borough by borough. As a rule each site could be visited only once. In consequence the survey will inevitably be uneven in its results, boroughs (mostly Inner London ones) which were explored outside the main season getting less effective coverage than the remainder. Nevertheless some valuable sites which had previously been unknown were brought to light and two of them, both as it happens discovered by A. D. R. Hare, made the national press. A selection of the best records made by D. Stubbs and his team are mentioned below at the beginning of the sections concerned with Kent, Surrey, S. Essex, Herts. and Middlesex. All the results are being used by the G.L.C. to build up a computerised database; it is expected that arrangements will have been made for the continued existence of this database in the event of the deletion of the G.L.C. from the political map, intended by the present government.

One species a knowledge of whose range they have helped to enlarge is the alien *Bidens connata*. It is opportune to review the known distribution of this species by a map (Fig. 1) updating the one published in this journal before (Burton 1979). All recorded British populations of the species are included on this map except one from the canal at Linslade which is quite a long way to the north. It is likely to await discovery between Rickmansworth and Linslade and beyond. Most of the plants grow near the waterline in crevices of the concrete canal wall, often spaced out singly a few hundred yards apart, so that the distribution mapped is somewhat schematic. The population in v.c. 16, far right of the map, was reported by its discoverer (Palmer 1983b) and is still the only one known in Britain south of the Thames, but as the plant is evidently distributed by water it is likely to be present in similar places on the drift-line further downstream.

Another naturalised alien which has come to light in a number of localities in 1984, all north of the Thames, is *Conyza sumatrensis*. This has been present as a naturalised plant in the south of France for 50 years and more recently has spread

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FIGURE 1. Distribution of *Bidens connata* in and near London. The numbered lines are ten-km lines of the National Grid.



northward on the west side of that country (Jovet and Vilmorin 1975), reaching Guernsey and Jersey, where it is now well established, in about 1960 (McClintock 1975). Recent French works follow Guédès and Jovet (1975) in calling it *C. albida* Willd. ex Sprengel, but I follow Marshall (1973, 1974) who settles for *C. sumatrensis* (Retz.) E. Walker. The difficulty is caused by uncertainty about the identity of the plant intended by Retzius's basionym *Erigeron sumatrensis*. The few previous British records of this plant have all been of casual occurrences; the latest was a plant found in 1983 in the City of London and published, with a figure, as *C. bonariensis* (Palmer 1983a). Use of this name follows Cronquist (1976) who refers to the consequences of the study of native populations, but presumably his studies mostly concerned plants in the Americas, where *C. bonariensis*, which has been recorded as a casual in Britain, is common and variable, whereas *C. sumatrensis* is chiefly a plant of east Asia. They can be distinguished from each other and from the familiar Canadian fleabane thus:

1. Plant bright green, not obviously hairy but with spreading cilia on the leaves. Fruiting heads 3.5-5.0 mm tall *C. canadensis*
- Plant appearing greyish-green because of the obvious hairiness. Leaves not ciliate. Fruiting heads 5.5-8.0 mm tall 2
2. Bracts distinctly hairy. Surface of receptacle merely rough. Plant typically c. 50 cm tall with inflorescence branches at least as long as the main axis *C. bonariensis*
- Bracts with a single row of hairs. Receptacle honeycombed. Plant typically a metre or more tall with branches falling short of the ones above and the main axis, so that the plant has an inflorescence shaped like that of *Verbascum lychnitis* *C. sumatrensis*

The characteristic inflorescence shape of *C. sumatrensis* is well illustrated in a photograph by Bichard (Bichard and McClintock 1975).

Records

V.C. 16, West Kent

The G.L.C.-sponsored survey team made relatively few new discoveries in this part of London (the boroughs of Greenwich, Bexley, Lewisham and Bromley), probably because the first two were visited first of all, very early in the year. That is the best season for spotting the spurge laurel *Daphne laureola* which was

observed in Gatton's Wood (47T80). A single plant of *Polypodium vulgare* s.l., a fern which is hard to find in London nowadays, was on a wall at Scadbury Park (47T40). A small wood near Chislehurst (46T28) was found to be full of an alien *Rubus* which has not yet been determined, though the name *R. tricolor* Focke has been suggested for it. Bell Green Gas Works (37T60), last explored botanically many years ago by the now defunct Lewisham Natural History Society, still has *Centaureum erythraea* and hare's-foot clover *Trifolium arvense*.

While much of the G.L.C.'s own property at Thamesmead has been built on, there is still a large area of ground formerly occupied by the Royal Arsenal (mostly 48T40) which is dangerous and not on open access to the general public. I was able to visit this twice in May through the kindness of the G.L.C.'s David Hope, the first time in the company of our mammal recorder J. Cotton, local activist P. English and others, the second time on a very wet day with a party of members of the Botanical Society of the British Isles who had had their annual general meeting in London. The site has impressive quantities of *Anthriscus caucalis*, *Erigeron acer*, *Inula conyza* and *Myosotis ramosissima*, all rare plants in London. By the Thames above Tripcock Ness grow saltmarsh plants *Glaux*, *Triglochin maritima* and *Plantago maritima* at what may be the western end of their main range by London's tidal river, together with the two umbellifers *Angelica archangelica* and *Oenanthe crocata* which have recently become abundant on the shore farther down. A full account of the B.S.B.I. meeting has been published elsewhere (Burton 1985); it should be mentioned here that the first record of waterfern *Azolla filiculoides* in our part of v.c. 16 was made, but that no trace could be found of *Samolus* in its only two known sites in our area (one of which has since been accidentally destroyed). The earlier party also visited a site much farther east (48T60) though still within the original Arsenal boundary, where there were two most unexpected relics of the older alluvial meadow land, a group of eight cowslips *Primula veris* and four old clumps of the round-headed rush *Juncus compressus*. On a roadside bank somewhere near here in the previous October J. R. Palmer had collected *Amaranthus bouchonii* Thell., an alien new to our records, determined by E. J. Clement, found growing with *Ipomoea purpurea*.

Remaining records from this part of the London Area, which for the Society's purposes is taken to extend 20 miles from St Paul's Cathedral in all directions, are divided amongst those from within Greater London and those in the modern county of Kent, in the following paragraph. A similar arrangement will be adopted in the sections giving selected records from other vice-counties. New discoveries made on Hayes Common (46T04) by our meeting of 26 May were two trees of *Amelanchier lanarckii* and a large patch of *Tellina grandiflora*. Water purslane *Peplis portula*, of which small plants were seen at the edge of a pond, was last reported on this common by W. C. R. Watson about 60 years ago. Also in the borough of Bromley, Mrs J. Pitt found *Ranunculus parviflorus* at the edge of a field at Cudham (45T48) with various other field weeds. The different spraying regime called for by rape crops appears better for the weed flora of chalky fields than the usual cereal crops, in places where the rape crop fails. There is no other record this century of this rare *Ranunculus* in the Kent part of our area. Other records from Mrs Pitt include the rare small valerian *Valeriana dioica* in Scadbury Park (47T40). I learnt from her of a bee orchid *Ophrys apifera* which came up on a lawn left uncut in Orpington (46T66). Mr Palmer's records include a small quantity of *Peltiphyllum peltatum* by a streamlet on Farnborough Common (46T24), several well-established patches of the North American grass *Bromus pumpellianus* on a bank by woodland at Barnehurst (57T04) and a population of *Laburnum alpinum* (Miller) Berchtold & J. Presl between Chislehurst and Sidcup (47T40). This tree is very like the familiar laburnum and just as apt to sow itself, but differs in its glabrous green twigs and glabrous pods. In a damp hollow on Woolwich Common (47T26) Mr Palmer found *Vicia lutea*, an odd yellowish-

flowered variety of *V. sativa*, *Lathyrus aphaca* and *L. nissolia*; *V. lutea* may once have been a native plant in the area but in other places in London where it can be found now its occurrence, together with the other vetches, is certainly related to former use of the site for 'landfill' tipping, which here was carried out in the 1960s. There is no difficulty applying the term 'naturalised' to such annual plants which have maintained themselves by seed over several generations. The status of horticultural shrubs which appear in wild situations, often from a bird-sown berry, can present more of a terminological problem. It is not easy to make a distinction between first-generation plants which could be considered 'casual' and plants whose parents had also not been in cultivation, when there is no evidence by which the previous generation can be located. Some species such as *Cotoneaster microphyllus* which have become abundant on sea cliffs are undoubtedly 'naturalised' there and deserve a place in any list of British plants, but there are many more of which it can only be said that they may do. These remarks serve to introduce the 1984 records of G. D. Kitchener who lives close to the Greater London boundary. On the banks of the A21 Farnborough by-pass (46T44) he found a bush of *C. microphyllus* covering an area 12 by 6 feet, with seedlings nearby, also 21 plants of *C. bullatus* of varying age and one small plant of *Lonicera nitida*. On stretches of the A21 farther out of London (46T62) there were eight seedlings of the latter species, one of *C. salicifolius* and two of *Berberis wilsoniae* Hemsley. In a railway cutting by Chelsfield tunnel (46T62) there were at least seven bushes of *C. lacteus* W. W. Smith, some of them large. The inaccessible nature of this site underlines the point that one needs to be very confident of one's familiarity with these plants; the number of *Cotoneaster* species recorded out of gardens in the London Area now exceeds 20. Most of these have been found only in Kent but probably occur elsewhere on the fringes of London.

On the outer side of the London boundary, Mr Kitchener reported *Cotoneaster lacteus* and *C. × watereri* Exell, both of considerable size, in downland near Otford (56T20) and *C. divaricatus* Rehder & E. H. Wilson on the track of a disused railway near Springhead (67T02). Continuing his earlier examination of the halophyte vegetation of the sides of salted roads, he found abundant *Cochlearia danica* by stretches of the A21 near Bessels Green (mostly 55T04) and the A2 from the London boundary (57T02) eastward for about ten km (to 57T82). Also by the A2 (57T82) was a small mat of thrift *Armeria maritima* on the central reservation and by the A21 near the south edge of our area (55T04) were scatterings of *Parapholis strigosa* and *Spergularia marina*. In a more normal habitat Mr Kitchener and Mr Palmer together found plentiful *Puccinellia rupestris* along tracks on Swanscombe Marshes (67T04) near the Thames; this grass seems to have come near to extinction in the London Area but is now recovering. Mr Kitchener found many other good aliens in 1984. *Medicago polymorpha* may have persisted continuously in a field near Stonehill Farm (57T00) since wool waste was spread there about 35 years ago, but not I think *Abutilon theophrasti* or *Artemisia artemisiifolia*. In a field near Springhead (67T02) the *Solanum* plants in August merited special study. *S. nitidibaccatum* was very abundant, so was the native *S. nigrum*, one plant of the latter was the alien subspecies *schultesii* and there was also one plant of the hybrid between the two species, *S. × procurrens* A. C. Leslie, not previously recorded in our area. Another nice vetch occurring more or less naturalised was *Vicia bithynica* found at Crockenhill (56T06) by Mrs S. Pittman. Perhaps the best native plants found in new localities in this part of our area in 1984 were *Calamintha ascendens* which I saw happily preserved in a garden at Farningham (56T46) or the ferns *Dryopteris borrieri* and *Polystichum setiferum* Mrs Pitt and I found in Farningham Wood (56T48). Mrs Pitt found a wet meadow near Bat and Ball (55T26) with *Carex disticha*, a very isolated locality for this sedge now that the site below Shoreham has been destroyed.

V.C. 17, Surrey

Only just out of Kent, the G.L.C. survey team found a plant of hard fern *Blechnum spicant* in Threehalfpenny Wood, Addington (36T64). Nearby at Shirley the marsh violet *Violet palustris* and other unusual native plants observed may have been introduced to what was then the site of his garden by the Rev. William Wilks, originator of the Shirley poppy. The former sidings at Bricklayers Arms (37T48) had *Erigeron acer* and *Linaria repens* among commoner plants of railway properties. The lower part of Coombe Hill Golf Course (27T00) proved to be a rewarding site, with two heathers *Calluna* and *Erica cinerea* and the lesser skullcap *Scutellaria minor*. This last was among plants seen on Wimbledon Common (27T20) when I joined them for a day; we also confirmed the continued presence of two sedges rare in London, *Carex binervis* and *C. echinata* in two localities each. Two willows from which I collected material then and on a later occasion have been determined by Dr R. D. Meikle as *Salix aurita* × *S. cinerea* subsp. *oleifolia*, a hybrid of which we have no recent records. (After parting from them I found a large bush of *Rosa obtusifolia* on the common (just in 27T22) which may be the same one known to Lousley and others many years ago). Much of the old Croydon Airport site (36T02) is unrecognisable now, being in the process of development for housing, but they were there in time to see remains of a large broomrape in cut grass which was surely *Orobanche elatior* known from here for a long time. They did not, however, see the good group of plants of *Petroselinum segetum*, a great rarity in Surrey, found here by R. D. Hawkins.

An excellent list of plants, mostly from the northern half of the borough of Southwark where suitable habitats even for such species as cow-parsley *Anthriscus sylvestris* and Jack-by-the-hedge *Alliaria petiolata* are unusual, was sent to me by J. Dews. Faced with the usual difficulty of selection, I will mention *Impatiens parviflora* on the waste tip of Ruskin Park (37T24) which is just in Lambeth, bur chervil *Anthriscus caucalis* near the Heygate Estate (37T24), *Geranium pusillum* in a grassy area near Peckham Rye (37T44) and a thriving colony of *G. rotundifolium* on waste ground at Keyworth Street (37T08). The *Anthriscus* plants formed a small colony of various sizes; the original seed might have arrived there attached to a starling or gull, or in sand brought in to make a children's playground nearby. I saw a single plant of *G. rotundifolium* myself in Middle Ground (38T00) late in the year. Earlier I had been to see for myself purslane *Portulaca oleracea* and *Amaranthus lividus* reported by A. C. Leslie in a quiet corner of Battersea Park (27T66). Other finds of Dr Leslie's include *Chenopodium hybridum* under shrubs near County Hall (38T00), strawberry clover *Trifolium fragiferum* on Wandsworth Common (27T64) and a willow hybrid *Salix caprea* × *viminialis* on Barnes Common. Also on this common R. B. Hastings found *Calluna* in a tetrad (27T24) new to our records of this species. I rely on Mr Hastings for accounts of wild plants found within Kew Gardens (17T86 in these cases). A new mound of earth at the herbarium allotments sported two plants of *Atropa belladonna* and four of *Solanum luteum*, identifiable by their fruit. The ivy broomrape *Orobanche hederæ* was found in some numbers in two new sites in the gardens; outside them to the south (17T64) a somewhat similar extension of range was noted for the rarity *Barbarea stricta*. On the other hand Mr Hastings asked me to correct his earlier record of *Trifolium medium* in Battersea Park (Burton 1984: 143) which was a slip of his typewriter, *T. hybridum* being the plant intended. Up-river Petersham Meadow and Ham River Lands, sites well known to Mr Hastings, got the attention of our meeting on 21 July. Pink-flowered *Veronica* plants were observed both in a wet spot on the meadow and along the river bank. It is usually assumed that this flower colour indicates the identity of *V. catenata*, which may indeed have been present, but I have to report that *V. anagallis-aquatica* can also have pink flowers and this is the name confidently given to material from the riverside near Ham House (17T62) sent to Dr J. H. Burdett for an expert opinion. It seems likely that records of *V. catenata* from elsewhere by

the Thames in London need re-examination. This party also found *Myriophyllum alterniflorum* in the middle of a small pond in Richmond Park (17T80) already known for its *Scutellaria minor* and other plants. In another part of the park (17T82) Mrs S. Luce found two plants of *Mimulus moschatus* in flower at a pond margin; on Wimbledon Common (border of 27T00 and T20) she found two well-established clumps of a garden scabious *Cephalaria gigantea* which I do not think have been spotted before. Three other plants from the v.c. 17 part of Greater London must be fitted into this paragraph, adder's-tongue *Ophioglossum vulgatum* of which 100 plants can still be found on Mitcham Common (26T88 according to D. J. Kite who confirmed and communicated R. Morris's discovery of them) in spite of the poor state of much of this common now, *Acanthus mollis* concerning which R. Gutteridge was able to give a positive reply to the question raised in *Flora of the London Area* (Burton 1983a: 129), and the alien aquatic *Crassula helmsii* which J. M. Montgomery found in very large quantities in a roadside pond near Coulsdon (35T08).

Another successful botanical excursion of the Society in Surrey was the one to Reigate Heath (25T00) at the southern edge of our recording area, led by Mr Montgomery. Many of the better plants of the Heath are already well known but leopard's-bane *Doronicum pardalianches* is a relatively new arrival and is already spreading away from the road on the south side. Dumped sand near the windmill produced *Anthriscus caucalis*, henbane *Hyoscyamus niger* and other plants which may perhaps not persist, and by a new path on the side of the hill was a strong plant of *Sisyrinchium striatum* J. E. Smith, a garden escape new to our records. The best list for the Surrey part of our area supplied to me was B. R. Spooner's, communicated by Mrs J. E. Smith (no connection with J. E. Smith, 1759-1828!), and the best plant in the list was *Polygonum mite* near Esher Mills (16T24), seen also by Dr T. A. Cope of Kew, where Mr Spooner had determined his *Glyceria* × *pedicillata* and *Crataegus* × *prunifolia* from Arbrook Common (16T42), far from houses. On Esher Common (16T22) he found several crowns of the mountain fern *Oreopteris limbosperma*. Mrs Smith herself found *Lemna minuscula* in Painshill Park (05T88), in that part of the year when it is possible to appreciate how well naturalised thereabouts is the snowdrop *Galanthus nivalis*, and with Mrs J. F. Leslie and A. J. Stevens a good number of coppiced trees of *Tilia cordata* in Great Hurst Wood, Headley (25T04). The alien *Lemna* was also collected from a pond near Merstham (25T82) by P. Macpherson. Miss O. Maunder found a single plant of *Bromus commutatus* near Hundred Pound Bridge at the corner of Bookham Common (15T26). Mrs L. J. Hyde and Miss P. A. Hyde found danewort *Sambucus ebulus* by a field near Box Hill, possibly outside our area.

V.C. 18, South Essex

Although they were impressed by the general quality of woodland on the north-eastern fringe of London as at present bounded, the best assemblage of plant species in their records which I have seen is the one from the extreme south-west of the vice-county, close to the mouth of the River Lea (38T80). This site has halophytes: sea aster *Aster tripolium*, sea club-rush *Scirpus maritimus* and wild celery *Apium graveolens*; fresh-water plants like the fat duckweed *Lemna gibba*; and an excellent selection of London's urban waste ground flora, including *Sisymbrium loeselii*, *Artemisia absinthium*, *Rumex patientia* and deadly nightshade *Atropa belladonna* to name but a few. Aquatic aliens *Crassula helmsii*, *Azolla filiculoides* and *Lemna minuscula* came from various ponds at Woodford (39T80). Also undoubted introductions, although native elsewhere in England, were *Cyperus longus* in Hainault Forest Country Park (49T62) and frog-bit *Hydrocharis morsus-ranae* in Romford Anglers' Club pond (59T02).

In places the present course of the River Lea coincides with the western boundary of the vice-county, which follows the county boundary as it was at the time of Watson (1852). However it was definitely from the Essex side of both lines

that Miss S. J. J. Lambert found the first v.c. 18 plant of *Bidens connata*, in the usual habitat by one of the waterways connecting with the Lea at Stratford (38T62, see Fig. 1) and at Bromley-by-Bow gasworks (38T82) *Chenopodium ambrosioides* and two large patches of Bermuda grass *Cynodon dactylon*. Hardly farther from the boundary are two hawkweeds found by the late J. N. B. Milton by a disused railway at Walthamstow (38T46) in 1983 but not determined, by P. D. Sell at Cambridge, until 1984, *Hieracium lepidulum* and *H. liljeholmii* Dahlst. The latter species, previously known only from Sweden, was also found to be represented in the herbarium at Cambridge by older specimens from Walthamstow Reservoirs (38T48), which has been placed with *H. scotosiactum* which has very similar foliage, and from Joyden's Wood in Kent (57T82?), collected in 1967 by R. W. Jones and B. A. Miles. Mr Milton also found *H. calcaricola*, our first record of this one from the Essex part of our area; the locality for this being just outside the London boundary in Hainault Forest (49T62), the plant should really be in the next paragraph. A more remarkable first record is R. B. Hastings's *Conyza sumatrensis*, of which a good stand was found in Rainham Marsh (58T20). Mr Hastings did not collect it but has supplied sufficient descriptive detail to allow a confident identification. Unlike the other plants of this species to be mentioned under Middlesex, these were in the open on a raised track between sludge lagoons, whose interest to the bird watcher has recently been described (Dennis 1982). The ornithological 'season' does not generally coincide well with the botanical one in these places which attract migrants, but it starts soon enough for people following both interests to catch the latest flowering plants, which in Mr Hastings's case also include 27 *Abutilon theophrasti* seen further south of lagoon banks (57T28). This malvaceous alien has now been seen for a few consecutive years at Rainham and is perhaps on the way to becoming naturalised. On waste ground near the North Circular Road on the Essex side of the Lea Valley (39T60) J. B. Latham found well established burnet rose *Rosa pimpinellifolia*. Plants found by B. Wurzell in the Essex part of the valley farther south, where the Lea Navigation coincides with the old boundary, will be considered later under Middlesex.

The only list received for the outer parts of our area in South Essex in 1984 is by Mr Hastings from West Thurrock (57T86), another area of sludge lagoons, where the most remarkable sighting was of a large population of yellow-wort *Blackstonia perfoliata* on adjacent raised areas. Another plant often regarded as calcicole is *Inula conyza* found on a roadside nearby (57T66).

V.C. 19, North Essex

Almost no 1984 records were received from this small part of our area, but Hunsdon Mead which was visited by our meeting on 2 June is divided between it and the next vice-county. The only known plants of *Orchis morio* still to be found in the north half of our area are right on the dividing line (and also on the line between 41T00 and T20). *Bromus commutatus* is also fairly plentiful in both counties and a smaller number of plants of *B. lepidus* were on the Essex side (41T00). *B. commutatus* was seen again here later by G. P. Smith. Mrs A. M. Boucher saw a single plant of *Lamium hybridum* in a car park in Harlow (40T46).

V.C. 20, Hertfordshire

Only a small part of this vice-county comes within the G.L.C. boundary in the borough of Barnet. It includes an area of old pastures (29T26) where the survey team was able to find or re-find the specialities of this part of our area, the great burnet *Sanguisorba officinalis* and the greater burnet-saxifrage *Pimpinella major*. In a hedgerow by the Great North Road (29T06) there was a grey alder *Alnus incana*, a species new to the London area as a wild plant; this appeared worthy of record though I suspect it might be a relic of a pre-war road beautification scheme.

In the same small part of v.c. 20 our meeting of 29 July found water-soldier

Stratiotes aloides dominating a small pond at Monken Hadley (29T46). In 1983 Dr D. Griffith found *Rosa stylosa* in a hedgerow close to the old county boundary near Totteridge (29T22), confirmed at the British Museum (Natural History).

Most of the 1984 Herts records received were contributed by Mrs A. M. Boucher. I will mention those from Rye Meads Sewage Farm (31T80), where the dumps of dried sludge often produce unusual aliens in late summer. This year they included numerous plants of *Physalis peruviana* and single plants of *P. philadelphica*, *Cucurbita maxima* complete with pumpkin, *Cucumis sativus*, *Sorghum halepense*, *Amaranthus quitensis*, *Setaria italica*, *S. faberi* and *Nicotiana glauca*. At the edge of our area, Mr Hastings found abundant *Trifolium striatum* at one end of the Amwell gravel pit (31T62). G. P. Smith discovered field gromwell *Lithospermum arvense* in fields below Hunsdon House (41T02). P. C. Holland found two substantial colonies of the uncommon grass *Calamagrostis epigejos* in the otherwise uninspiring Great Wood, Micklefield Green (09T48) at the edge of our area.

V.C. 21, Middlesex

The most important discovery arising from the G.L.C.'s survey was meadow land by the Yeading Brook west of Yeading (18T02). On the west side of the brook is uncut meadow with plentiful buttercups, *Silene*, adder's-tongue *Ophioglossum vulgatum*, etc. The more accessible east side is mostly closely mown, but near the brook there are three roundish areas of lower ground, perhaps the result of digging for gravel or clay long ago. The deepest and most northerly of the three is full of tall hawthorn bushes and the botanical interest is all in the other two. One of them contains several hundred plants of *Oenanthe silaifolia*; other Middlesex records of this nationally rare umbellifer are all ancient and doubtful, being unsupported by any specimens. There is none of this plant in the last of the hollows, a few yards away, which nevertheless has many good plants, such as spotted orchid *Dactylorhiza fuchsii*, sneezewort *Achillea ptarmica* and the glaucous sedge *Carex flacca*, of which various clones can be distinguished. There is a good prospect of these hollows being adopted as a local nature reserve.

More *Ophioglossum* was found in another riverside meadow, by the Colne near West Drayton (07T48), which was surveyed in the company of Richard Mabey, President of the London Wildlife Trust. A rarer Middlesex plant here is the twayblade *Listera ovata*. But these sites are in the borough of Hillingdon; several other superficially less promising sites in the borough turned up the grass vetchling *Lathyrus nissolia* in new tetrads. A pond on Uxbridge Common (08T84) contained water soldier *Stratiotes aloides* which someone must unwisely have put there. Ickenham pond nearby (08T66) had a plant of marsh-marigold *Caltha palustris* still in a pot! Another wet place inspected was the east side of Hampton Court park (16T68), less accessible and less well botanised than the drier ground near the golf course and the Thames bank; the most striking plant here was the pretty garden escape *Mimulus guttatus*. A small stream west of Willesden (28T04) apparently altered to be a feeder for the Grand Union Canal also had aquatic plants, but of more interest here, on the sort of ground more commonly populated by discarded supermarket trolleys, were the aliens *Amaranthus retroflexus*, *Digitaria sanguinalis* and *Salsola pestifer*.

The Middlesex habitat which impressed them most is surely the canal itself, which crosses the vice-county from the Colne in the west to the Thames and Lea in the east. The botany of the western part is already well known to some extent, but it is still worth extracting from their list for the best site, Norbury Locks and their associated ponds, partly derelict, *Angelica archangelica*, the great water dock *Rumex hydrolapathum*, *Bidens connata* and two duckweeds *Lemna gibba* and *L. polyrrhiza*. All these species reappear in the eastern part of the system which was explored by others to good effect in 1984. However it was the G.L.C.'s survey which first brought to light the established alien grass *Paspalum paspalodes*

(Michaux) Scribner (this odd name is used because of doubt whether the earlier name *P. distichum* L. is ambiguous). This forms a patch hiding slightly submerged brickwork on one side of the entrance to the Kingsland Basin (38T22), so placed that one cannot easily get to the plant without jumping or falling in. This discovery was trumpeted by the London Wildlife Trust in a press release which announced that according to the Trust's research *Paspalum paspalodes* was not known elsewhere in Britain as a naturalised alien. The research mentioned consisted entirely of a telephone conversation with myself and the information garnered was inaccurate; the plant has also been known on the harbour at Mousehole in West Cornwall since before 1971 (Margetts and David 1981: 323). Various suggestions concerning the origin of the London colony have been made. When I went to see it for myself the gate leading to the path alongside the Kingsland Basin was open and I could see that an adjacent yard houses council vehicles, including dustcarts. Near the fence grew flax *Linum usitatissimum*, cress *Lepidium sativum* and the umbellifer *Trachyspermum ammi*, three aliens which together indicate the sweepings from bird-cages. I would suggest that *Paspalum paspalodes*, which requires a wetter habitat than most alien grasses, is also of birdseed origin here.

A more complete account of the vegetation of the neighbourhood of the canal system from this point east and south to Limehouse and via the Hertford Union Canal and the Lea Navigation to Bromley-by-Bow has been supplied by B. Wurzell. The best single area in his most comprehensive report surrounds the junction of the Hertford Union and the Lea Navigation (38T64). Here there are plentiful arrow-head *Sagittaria sagittifolia*, water fern *Azolla filiculoides*, *Lemna polyrhiza* and *Callitriche obtusangula* and some *Potamogeton obtusifolius* in the water. *Alisma lanceolatum*, the rarer of our two water-plantain species, does not extend south beyond this point, which is the northern limit of the large Lea Valley populations of danewort *Sambucus ebulus* and Mexican tea *Chenopodium ambrosioides*. Other waste ground plants nearby are vervain *Verbena officinalis*, deadly nightshade *Atropa belladonna* and the grass *Bromus carinatus* which appears poised for a rapid spread along these towpaths like its earlier spread along and from the Thames paths below Teddington Lock. A little way east along Carpenter's Road is a colony of *Conyza sunatrensis*, which appears again in colonies on the towpath at Bow (38T62) and Bromley (38T82), commonly in the warmest situations among stones or backed by a south-facing wall. Also working south along the towpath, warty cabbage *Bunias orientalis* first appears where it passes under the Northern Outfall Sewer. Eastward along the sewer banks (38T62), i.e., into Essex, where *Sambucus ebulus* is at its most abundant, the scrub includes evidently bird-sown *Rosa spinosissima* and *R. rugosa*. Going instead northward from the junction (38T64) the waste ground plants are less interesting but many of the aquatic plants already mentioned occur in the water, as well as abundant *Lemna gibba* and single colonies of *L. minuscula* and *Scirpus lacustris*. East of the canal but west of the Lea before they separate south of Lea Bridge (38T46) there are derelict filter beds, whose vegetation includes such things as the odd *Bidens cernua*, a patch of *Typha angustifolia*, scarce willows like *Salix triandra*, lots of marsh dock *Rumex palustris*, and in one place most astonishingly thousands of seedlings of the hybrid poplar *Populus* × *canadensis*. The usual plantings of this are all male, but across the canal the mature trees include the uncommon female clone 'Marilandica'. North of Lea Bridge Road come Walthamstow Marshes, entirely in Essex. I shall have to pass over the new records from this already exciting area for lack of space, but will draw attention briefly to the unexpected flora of Springfield Park (38T46) over across the Lea in Middlesex, which includes species hardly to be expected in such an urbanised area, such as *Luzula campestris*, *Holcus mollis* and the strawberry clover *Trifolium fragiferum*. Mr Wurzell regards these as relict native plants, but I know of places where every one of them except *Holcus mollis* has undoubtedly been introduced accidentally, mostly in turf. Across Spring Lane in disturbed turf he found *Chenopodium murale*, *C. ficifolium* and abundant green nightshade

Solanum nitidibaccatum. Farther north again Mr Wurzell made his most unexpected discovery of the year in a corner of Markfield Recreation Ground (38T48), which incorporates another derelict filter bed area, the few surviving structures of which serve as a children's adventure playground. On a wall of a former water pen he found 15 plants of *Galium parisiense*, last recorded in Middlesex in 1690. The nearest known extant populations of this are miles away in Kent, but of course the plant is an often tiny annual which might have been overlooked somewhere nearer. By the towpath verge just under the railway from here he reports what would seem to be a very isolated patch of bur chervil *Anthriscus caucalis*. Farther north again on Tottenham Marshes, Mr Wurzell found a plant of *Rumex × lousleyi* to replace the original specimen from which this hybrid dock was first described (Kent 1977), which seems to have gone. Getting away from the immediate neighbourhood of the water, I should mention among his finds plentiful *Verbena officinalis* and *Geranium rotundifolium* in a new housing estate at Tottenham Hale (38T48), *Veronica agrestis* in Tottenham cemetery (39T20) and a single plant of *Conyza sumatrensis* at the edge of its known range at Stamford Hill (38T46).

Returning with Mr Wurzell to the junction of the Hertford Union Canal, it is only a little over a mile, passing one lock, which I will refer to again in the next paragraph, to its other end, from which one can proceed westward or southward. Westward leads in another mile and a half to the site for *Paspalum paspalodes* mentioned before (38T22), near which grew another colony of *Bromus carinatus*, more *Conyza sumatrensis* on a south-facing wall and an odd mixture of fodder burnet *Poterium polygonum* and the cultivated race of parsnip *Pastinaca sativa*, distinguishable from the wild race by its less hairy foliage. Going south brought him soon to an area where the *Poterium*, the cultivated race of sainfoin *Onobrychis viciifolia*, plentiful cornflower *Centaurea cyanus*, poppy *Papaver rhoeas*, buckwheat *Fagopyrum esculentum*, flax *Linum usitatissimum*, unidentifiably young *Lupinus* spp. and especially abundant mustard *Sinapis alba* and a fruiting *Vicia* sp. were all crowded together. What can be the origin of this strange assortment of species, in which many of the aliens most commonly recorded (grasses, Chenopodiaceae, Amaranthaceae) are totally lacking? If they were sown, by whom and with what motive? (Replies, please, to the address at the foot of the first page of this compilation). The canal near here (38T42) has more of the rare *Potamogeton obtusifolius* in its flora, which more generally includes *Lemna trisulca*, *Azolla*, *Elodea nuttallii* and *Callitriche obtusangula*. Along the wall are stunted plants of *Angelica archangelica* and less commonly *Bidens connata*. At the southern end by the Limehouse Basin (38T60) Mr Wurzell found his most 'spectacular' colony of *Conyza sumatrensis*, including plants up to six feet tall.

Others have paid their respects to the flora of the canal system in 1984. The only plant reported which Mr Wurzell missed was found in July by G. P. Smith, who sent me a voucher of *Juncus compressus* from the lock on the Hertford Union Canal (38T64). This is the first record of this uncommon rush in the eastern part of Middlesex for over 100 years.

Next I must mention two independent surveys of Middlesex sites conducted in 1984. The Hammersmith and Fulham group of the London Wildlife Trust, which is fortunate in counting two Kew professionals among its membership, had the opportunity to inspect a strip of land between Wormwood Scrubs and the Western Region main railway line (mostly 28T22). This is developing into secondary woodland, as such places will, but supports rest-harrow *Ononis repens*, hoary plantain *Plantago media* and commoner relict grassland plants among the numerous weedy species and garden throw-outs more typical of waste sites by railways in London. The other survey was of hay meadows in the Barn Hill and Fryent Way open space area, conducted by L. R. Williams and others, in succession to their survey of hedgerows described elsewhere in this issue of *The London Naturalist*. They show that a small part of the area escaped the war-time

ploughing which affected the rest of it, a distinction which is roughly related to the local distribution of the great burnet *Sanguisorba officinalis*, the major rarity of the site, whose range they extend to 18T86, and supply new records of many other grassland plants and of salsify *Tragopogon porrifolius* from the adjacent 18T88 and other tetrads. A drier field (18T86) is incipient oakwood but still has glades with devil's-bit scabious *Succisa pratensis*, pepper-saxifrage *Silaum silaus* and sneezewort *Achillea ptarmica*. Mr Williams and his colleagues in the Leisure Service Department of the London Borough of Brent are to be congratulated for their efforts to protect and interpret these sites, in effect an open-air museum, in a hard-pressed borough.

J. B. Latham sent me many records throughout the year, often of escapes from cultivation on London streets where they have little chance of persisting. Possibly one of these, though he put it down to bird-seed, is the plant of tunic flower *Petrorhagia saxifraga* (L.) Link, which he found among cobblestones at St Katherine's Dock (38T20 or T40). I would expect this rock-garden subject to be planted here, like some of the vegetation of the dock wall, but Mr Latham insists that it is inconceivable that anyone should have put this one plant into such a place. The native distribution of this perennial relative of *Dianthus* and *Gypsophila* overlaps with that of some common bird-seed alien species in the Mediterranean region, but the natural habitat on rocks makes it an unlikely contaminant of bird-seed. Bird-seed is a more probable origin for *Amaranthus cruentus* found near the Chelsea Embankment (27T66). He reports mats of *Cynodon dactylon* on a pavement in yet another new locality, at Hatton Cross (17T04). Plants in Kensal Green cemeteries (28T22) additional to those in his recent paper (Latham 1984) are *Iberis umbellata*, *Chenopodium opulifolium*, *Coioneaster divaricatus*, *Myosotis ramosissima*, *Veronica agrestis* and *Hordeum secalinum*. Two years ago I erroneously (Burton 1983b: 109) put his *Arum maculatum* from here into Brompton Cemetery.

More important records are among those contributed by D. Bevan. At East Finchley, in a boggy hollow in the Glebelands (29T60), he found a remnant of marsh speedwell *Veronica scutellata*; the site is part of the former Finchley Common where the plant was last seen in 1920 by J. E. Cooper (Kent and Lousley 1954: 207). New aliens for Middlesex are *Hypericum hircinum* seen on the Thames bank below Hampton Court (16T66) and *Malva alcea* L. established in waste ground by Coppetts Wood (29T60); the mallow is a garden plant which seeds itself readily and could be mistaken for *M. moschata*. I saw his specimens of *Geranium columbinum* from a council flower bed in New Southgate (29T80), orange foxtail *Alopecurus aequalis* from the edge of a small pond at Uxbridge (08T64) which also offered *Ranunculus aquatilis*, and the hybrid willow-herb *Epilobium montanum* × *roseum* from East Finchley (29T60), which he had also collected in 1983 in a garden at Highgate (28T66). The *Malva* was among plants which he pointed out at the meeting he led on 29 July, which also saw the *Oenanthe fistulosa* which he had found earlier and found a small colony of the broad-leaved helleborine *Epipactis helleborine*, both in woodland near the lake in Beech Hill Park (29T62). Both of these plants appear to be new to the north-east part of Middlesex.

Another remarkable discovery was Miss C. M. Balfour's *Carex demissa* on the East Heath, Hampstead (28T66). The only other records of this sedge from that area are nineteenth-century ones. However my statement (Burton 1983: 1) that the wood horsetail *Equisetum sylvaticum* had been lost from the heath since 1970 has been proved quite wrong; Miss Balfour reports it still flourishing on a damp patch in Ken Wood. Mrs E. Norman found a garden near Notting Hill (28T40) full of *Valerianella carinata*. This may have been introduced originally with shrubs, like the *Rubus nemoralis* which D. E. Allen told me had been in Whitefriars Street (38T00) since 1983; Mr Allen, who has also seen this bramble in the middle of Southampton, suggests a common source in a nursery in north England or Scotland, where this bramble is more common. Mrs D. Thompson found

pickerel-weed *Pontederia cordata* in Boot Pond, Stanmore (19T42). Two small clumps of adder's-tongue *Ophioglossum vulgatum* discovered in Northwick Park (18T66) by A. Leach were reported to me by D. J. Kite. I was asked about an unidentified broomrape growing on *Buddleia davidii* at the edge of the site of Camley Street Nature Park (28T22), which turned out to be plentiful and tall *Orobanche minor*. R. B. Hastings found *Azolla filiculoides* covering much of the Leg of Mutton Pond in Bushy Park (16T68) and a nice sedge *Carex pseudocyperus* on the floor of the drained Kempton East Reservoir (17T20).

All the Middlesex plants in the above paragraphs were from localities which are now in Greater London. The south-western part of the vice-county has been transferred to Surrey; the one good find from there is Mr Hastings's corn salad *Valerianella locusta*, abundant on the top of a bank of Wraysbury Reservoir (07T02).

V.C. 24, Bucks

All the new records received for this small part of the London Area in 1984 are from the extreme south of it, now in Berkshire, at Wraysbury gravel pits (07T02), a site better known to bird-watchers. Galingale *Cyperus longus* found by Mr Dews and summer snowflake *Leucojum aestivum* found by Mr Hastings imply that someone has been busy planting, but Mr Dews's *Erigeron acer*, *Hirschfeldia* and *Bidens cernuus* and the other's colony of *Valerianella locusta* make it plain that not all the ground has suffered that particular form of disturbance.

Acknowledgement

I would like to thank Bernice Brewster for lettering the map.

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Obituaries

HENRY ALDYN CRAW, 1916 – 1984

Harry Craw died on 2 December 1984. After early years in Berwickshire and Edinburgh, where he attended Merchiston College, he had already imbibed a love of his native country which proved to be permanent before settling in London and taking up a post with what is now the Ministry of Defence. This post entailed much travelling and enabled him to increase his knowledge of birds as well as performing his duties with aircraft production.

It was in 1947, after the end of World War II, that Harry became a member of the L.N.H.S., bringing with him his well-developed knowledge of birds to embellish his enthusiasm for taking part in the activities of the Society and of the Ornithology Section in particular. He was Honorary Secretary of the Society from 1957 to 1960 and played an active part in committee work. For a time he was Chairman of the Ornithology Section and also served on the Society's Committee for Dungeness.

The late 40s and 50s saw a burgeoning of activities such as coach parties and brief holidays outside the Society's area, and in these Harry played a prominent part. After a Cairngorm holiday in 1948 he started the first of numerous visits to Fair Isle where he had the good fortune to be present at several 'firsts'. Until the early 70s he had made an effort to attend most of the international ornithological congresses where he acquired a wide acquaintance. Latterly he was prevented from pursuing so active a role in the affairs of the Society and with his wife Gillian took an increasing interest in the natural history of the area within reach of their home near Dorking.

His natural diffidence may have dimmed the light of recognition, but the Society should be aware of the debt owed to him for the part he played in what were expansive years for the Society. We extend our sympathies to his widow.

We paid our last respects to Harry at a memorial service at St Columba's, Knightsbridge on 19 December 1984.

D. V. FRESHWATER

GEOFFREY KINNS, 1921 – 1984

Geoffrey Kinns was born at Naini Tal in northern India in 1921 and died in London in July 1984. With him we have lost not only a well-known wildlife photographer, but a naturalist with wide interests, whose knowledge of British mammals in particular was unrivalled. He joined the L.N.H.S. in the mid 1950s and became very involved in the Ecology Section and the newly formed Mammal Study Group.

I first met Geoffrey in 1956, when he was working in the Exhibition Section of the Natural History Museum. Here his Royal College of Art training was being put to use in designing exhibits and producing drawings to illustrate some of them. His meticulous approach to his work meant that he was often slower than some of his colleagues, but his determination to get everything exactly right resulted in some of the best art work to be seen in the galleries in recent years. For example, when making some small drawing of elephants to be used in an exhibition on mammalian teeth, he wanted to be certain that he was absolutely correct in his portrayal of the change in shape of the animals' feet as they are lifted with each

step. He spent days examining photographs and sketching zoo elephants before he was satisfied. Unfortunately, none of his work is on exhibition at the moment, although some models that he made of a badger and her cub, a hare and a stoat are in the reading room of the Museum's General Library.

Geoffrey's interest in animals always took precedence over everything else. A telegram received by his parents on the first day of a school term, which read 'Have bought alligator. Please send more money', was characteristic of the boy who watched and kept and collected every sort of creature that he could. This did not stop him, as a young man, from being a keen shot, though as a child in India he is credited with having, on a number of occasions, made a noise to disturb, and thus to save, hunted big game animals. A turning point in his shooting career came when he accidentally killed a dog instead of the badger that a farmer had asked him to destroy. After that he took more and more to photography, where his hunter's skills could be used without harming the animals. At a time when photographs of animals all too often showed the fact of their captivity, Geoffrey produced pictures of badgers, foxes and deer, among others, wild in the wild. In this, as in everything else, he was a perfectionist, as patient as the animals themselves when waiting for his subject to appear. When it did, he used film with stunning prodigality to ensure that there should be a perfect shot among the hundreds that he might take of any single creature. He insisted on using the best possible equipment and his passion for buying cameras and lenses kept him on the verge of bankruptcy. In spite of his wartime injuries, which included a lost leg, he would carry daunting amounts of equipment in case it should be needed for the assignment in hand.

To Geoffrey, watching an animal and taking its photograph was an end in itself and although his work appeared in many publications, he never capitalised fully on his ability. He never forgot a photograph that he had taken, but finding it again was a near impossibility. His 'filing system' was a number of large suitcases into which everything was thrown — they were the despair of everybody who ever asked him for a photograph. Moreover, his lack of business acumen meant that the returns that he received for his work were often less than they might have been. In spite of this, he had a running battle with the taxman, who had to be persuaded each year that Geoffrey's income from his photographs was outweighed by his expenses. He would laugh about this, but found it deeply worrying.

Almost whatever the situation, Geoffrey could find some humour in it. Those who have heard some of his wartime stories — of offering a horned asp to his sergeant major to hold 'while I get some scissors to defang it', or of constructing a Bailey bridge under fire in Germany, or even being blown up and badly injured while tracking a deer, know that he was a person to find some good in most things. One of the few that riled him was the dishonesty of slipshod work. A completely straightforward person, he would help anybody who asked his advice and to a naturalist he was a fund of knowledge that could scarcely be bettered. Bursting with information, he would give details of animals that he had watched and suggestions as to how to see them successfully oneself. A letter from Geoffrey was rather the same. Every scrap of the paper was filled, with extra information on his exploits, or notes on what he had seen, written round the edge of the main text. To a would-be photographer his criticism was stern, but totally without malice and always tempered with advice as to how a picture could have been improved. I count myself lucky in having had him as a friend. Though there may be other photographers and others who have an understanding of animals, Geoffrey's combination of talents and kindness are not likely to reappear. His death leaves a gap which for many of us can never be filled.

Representatives of the Museum and the L.N.H.S. were among the mourners at his funeral at Mortlake Crematorium on 3 August 1984.

	£		£
General Fund (incorporating the Hindson and Castell Bequests)		Assets	
Balance at 1 November 1983.....	96,163	Quoted investments at cost	121,734
<i>Add:</i> Investment deposit interest.....	70	Market value	227,449
Investment income received	6,110		
Income Tax recovered	2,465	Funds at bank and on deposit	
Profits on sales of investments.....	1,695	National Westminster Bank plc	
	<u>10,340</u>	Current account	1,745
	(1,575)	Deposit account	1,302
<i>Less:</i> Custodian's charges.....	8,765	Investment cash	1,254
		National Savings Bank account.....	<u>10,207</u>
<i>Add:</i> National Savings Bank interest	1,446		
Legacy (Estate of the late H. W. Payton)	1,955	Cash in Hand	14,508
Plant Mapping Fund surplus to requirements.....	—		66
	<u>12,166</u>		
<i>Less:</i> Deficit for year on ordinary operations	(9,928)		
	<u>2,238</u>		
	98,401		

	£		£
	92,361		175,446
	24,313		938
	13		15,302
			971
			<u>7,102</u>
			24,313
			13
			28,721
			<u>127,122</u>
			99
			<u>127,221</u>
			9,087
			<u>£116,687</u>

	£		£
Other Funds		On behalf of the Council	
Library Cataloguing Fund		J. H. SAND } Council	
Balance at 1 November 1983.....	99	K. F. BETTON } Members	
Plant Mapping Scheme: Research and Publication Fund			
(now transferred to General Fund)	212		
	<u>311</u>	3 December 1984	
	98,712		

Report of the Auditors to the Members of the London Natural History Society

We have audited the financial statements, comprising the above Statement of Affairs and attached receipts and payments account, in accordance with approved auditing standards.

In our opinion these statements give a true and fair view of the receipts and payments of the Society for the year ended 31 October 1984 and of its assets, current liabilities and fund balances at that date.

4 London Wall Buildings,
LONDON EC2M 5NT
3 December 1984

FRASER KEEN
Chartered Accountants

General Account for the year ended 31 October 1984

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The London Naturalist, No. 64, 1985

1983		1983		1983		1983	
£	£	£	£	£	£	£	£
		Payments		Receipts			
418	1,094	Hire of halls, etc	5,988	Subscriptions — current	6,647		
531	932	Lecturers' fees and expenses, Sectional expenses, etc.	68	in advance	158		
445	826	Library	6,056	entrance fees	106		6,911
1,144	—	Equipment repairs and renewals	208				267
376	414	<i>Bulletin</i> and <i>Newsletter</i> expenses	307	Donations			393
677	805	<i>Programme</i> printing costs	149	Tax recovered from deeds of covenant			282
	549	Costs of services (Auditors' fees, insurances, etc.)	—	Deposit Account interest			74
500	700			Sale of literature and surplus library stock			
625	149	Honoraria and expense allowances	(571)	<i>London Naturalist</i> 62			
134	615	Miscellaneous postage and telephone		Provision 1983	3,500		
408	20	Miscellaneous stationery		Printing and expenses	(3,466)		
515	1,574	Contributions to other organisations					34
		Mailing costs (<i>L.N.</i> 62 <i>L.B.R.</i> 47		<i>London Bird Report</i> 47			
		<i>Programmes, Bulletins</i> and <i>Newsletters</i> — including postage, envelopes, etc.)		Provision 1983	3,000		
1,152		Provisions —	17	Printing and expenses	(3,107)		(107)
		<i>Flora of the London Area</i>					
		3,800		Sales of journals	719		
		2,900		Expenses	(56)		
17,900	6,700		512				663
			29	Subscriptions to <i>Bulletin</i>			34
			—	<i>Flora of the London Area</i>			
				Provision 1983	11,400		
				Sales	2,055		
				Cash expenses	(11,516)		
			8,138				1,939
				<i>Atlas of Breeding Birds of the London Area</i>			
				Sales	22		
				Royalties	78		
			52				100
			9,928	Excess of payments over receipts (transferred to General Fund)			
			<u>£24,825</u>				<u>3,788</u>
			<u>£14,378</u>				<u>£14,378</u>

Book Reviews

Atlas of Butterflies in Britain and Ireland. By John Heath, Ernest Pollard and Jeremy Thomas. Viking, Penguin Books, Harmondsworth, Middlesex, in association with the Natural Environment Research Council and the Nature Conservancy Council. 1984. 158 pp., 64 maps. £17.50. ISBN 0 670 80006 6.

This small book represents the results of a considerable amount of field-work on the part of a very large number of amateur naturalists in the British Isles together with the endeavours of the staff at the Biological Records Centre at Monks Wood, and whilst some may feel that the importance of distribution maps is over-stated, the value of this particular set to those actively involved in butterfly conservation is immense. A five-page introductory chapter informs the lay reader of the reasons for the need to assess the distributions of our butterflies and outlines briefly the history of the recording scheme from its inception in 1967 to its successful completion in 1972. A map showing the ten-kilometre squares from which records have been received is presented within the introduction and is followed by distribution maps of 62 species, dividing the records into three date bands: pre-1940 (largely literature records); 1940 to 1969; and 1970 to 1982. These maps include the three common migrants red admiral *Vanessa atalanta*, painted lady *Cynthia cardui* and clouded yellow *Colias croceus*. Maps for rarer migrants are not included and this is really rather a pity since it would have been useful, albeit of limited ecological significance, to see over just what area the records of these species extend. The reader is referred in the introduction to Frohawk (1934) for an account of the immigrations of Bath white *Pontia daplidice*, pale clouded yellow *Colias hyale*, short-tailed blue *Everes argiades*, long-tailed blue *Lampides boeticus* and Queen of Spain fritillary *Argynnis lathonia* which is a poor substitute, and since Berger's clouded yellow *C. australis* was not split from *hyale* in Frohawk's day, then this species is mentioned in neither work and remains a complete mystery.

There follows a chapter on 'The Pattern of Change', in which distribution patterns are discussed and attempts are made to explain the expansions, contractions and extinctions of certain species: a further map shows the number of species recorded in each ten-kilometre square. It is however, the text which accompanies the distribution maps that makes this book invaluable. Here the distributions are discussed and the impact of environmental and other factors on the changes assessed. The bibliography of 202 references and several unpublished works testifies to the thoroughness of the authors in this department. It is interesting to note that they conclude from their evidence that which serious entomologists have known for years: that collecting has practically no effect whatsoever on butterfly populations, apart from when other factors are already at work causing serious declines locally. Habitat destruction is concluded to be the major threat to butterflies, and the anti-collecting lobby would do well to direct their attentions to the real problems. Some useful new data on the ecology of these insects, some previously unpublished, presented in the text and a table summarises the principal foodplants of the sixty-two species mapped.

A number of minor criticisms can be levelled. Some of the vignettes are somewhat less than convincing, and the size of the maps is far too small to distinguish the different symbols used in many cases. The omission of rarer migrants is mentioned above. I was surprised to see from the map on page 9 that a total of 152 squares lack any records at all (77 on the Irish mainland and 75 in Scotland, of which 52 lie on the mainland). It is a great pity that the effort was not made by the authors to visit at least the Scottish mainland squares in order to complete the picture; although it is unlikely that any overall difference would have been made to the maps, some useful extra records of species such as mountain ringlet *Erebia epiphron* may have resulted.

Notwithstanding this however, this is an extremely useful reference book the value of which will be appreciated for a long time to come by active butterfly conservationists. The only major criticism is the absolutely ridiculous price – could £17.50 really be a typing error for £7.50?

REFERENCE

FROWHAWK, F. W. 1934. *The Complete Book of British Butterflies*. Ward Lock, London.

COLIN W. PLANT

Colour Identification Guide to Moths to the British Isles (Macrolepidoptera). By Bernard Skinner. Illustrated by David Wilson. Viking, Penguin Books, Harmondsworth, Middlesex. 1984. 267 pp., 42 col. pls. £20. ISBN 0 670 80354 5.

This book is a major triumph in the world of natural history publishing. For nearly eighty years the student lepidopterist has been faced with the stark choice of Richard South's *Moths of the British Isles* or nothing! Even worse, if the student did not possess a first edition, or at least a later reprint of this, with its somewhat less than enlightening text, he was faced with the atrocious plates in the 1961 edition which are quite useless for most species. Now, thanks to the superb photographs by David Wilson, an acknowledged master in this specialised field, and the concise clear text of Bernard Skinner, himself one of Britain's leading entomologists, we have for the first time, drawn together into a single volume, a complete, useful and useable guide to the entire British Macrolepidoptera.

The important point is that *all* of the larger British moths are illustrated in colour, including *Mesapamea secalella* Remm, the latest addition to the British list, and for some species this is the first time this has been done. The specimens chosen are superbly set and herald largely from Skinner's own collection. With few exceptions all the specimens illustrated are of British origin, and depict not only the typical insects, but also all the races and many of the forms and aberrations which occur in this country. The illustrations are cross-referenced to the text pages where we are informed first of all of similar species and how to distinguish them from each other. This is illustrated in many places with line drawings clearly depicting the diagnostic features of each species. There follows a brief description of the adult moth and an account of major variations, a statement of where in the British Isles the species occurs together with its flight period, notes on the usual larval foodplants and the time of year in which they can be best found, and for the very rare species an account of the authentic records.

In addition, there is a small but very helpful useful glossary of terms, accompanied by a line drawing of a stylised moth on which the various parts are drawn and named. Following the plates is a list of protected species; a short bibliography; the addresses of the three principal entomological organisations in this country; a list of the scientific names of foodplants mentioned in the text under the vernacular; and separate indexes to vernacular and scientific names of the moths themselves.

All in all a very difficult book to criticise. Some of the drawings are a bit weak, probably more the fault of the printer than the artist. On page 160 the statement that *Mesapamea secalis* is usually smaller than *M. secalella* is incorrect, since the reverse is true. A few of the photographs are perhaps not all that they could be. Plate 2 for instance, depicting the Sesiidae and Zygaenidae, would probably have benefited from a different coloured background, particularly for the clearwings, whilst on the same plate the superb green colouration of the forester moths is totally lost. Similarly, on plate 17 the green of *Hylaea fasciaria* ab. *prasinaria* is lost in the printing. The attractive dust-jacket conceals a pure white cover which in my copy is already a bit grubby despite careful handling, and also on my own copy the protective lamination on the dust-jacket is peeling at the bottom on the back.

In spite of these minor criticisms this is to my mind the best book on the market as far as the British Macrolepidoptera are concerned, and if you are looking for just one book on British moths to add to your personal library at Christmas, this is the one to go for.

COLIN W. PLANT

Dear Lord Rothschild. Birds, Butterflies and History. By Miriam Rothschild. Hutchinson, London. 1983. 398 pp. £14.95. ISBN 0 09 153740 1.

As naturalists we should be interested in natural history in its widest aspects. Very many of us are and most of us have read selections from the works of Bates, Darwin, Huxley, Owen or Wallace, to name a few eminent nineteenth century British naturalists. Occasionally we delve into the lives and works of others and in so doing we read of world events in a way that puts us right in the scene of history in a most absorbing and lasting way.

Dear Lord Rothschild falls into this category. It is a most remarkable book about Lionel Walter Rothschild, an eccentric personality and an outstanding naturalist who contributed significantly to the Darwinian theory of evolution. And it is written in such an entertaining and intriguing way that it is difficult to put it down, despite its length. It is, in fact, an in-depth study of a most remarkable family whose name has become a household word. The book depicts life and customs in Victorian England and in the periods before, during and after the First World War. It is a history of the times. A complete explanation is given as to why the Balfour Declaration of the British Government supporting Palestine as a homeland for Jews was addressed to Walter in a letter beginning 'Dear Lord Rothschild'. Walter was involved in local and national politics, becoming an M.P. in 1899. He was elected a Fellow of the Royal Society in 1911. He was a disappointment to his father who wanted him to follow the family's banking business. Walter never married, but he was blackmailed by an aristocratic woman with whom he had had a short love affair, with the result that eventually he had to sell his precious bird collection.

When Walter was seven years old he told his father that he was going to make a museum. And he did – eventually! He amassed '2¼ million butterflies and moths, 30,000 bird skins, 144 giant tortoises, 200,000 birds' eggs and some 30,000 relevant scientific books' as well as lesser collections. Walter did much of his collecting himself, but he also employed an army of over 400 collectors who travelled throughout the world. This wide coverage probably led to his being especially interested in geographical variation on which he wrote a number of papers. But his interests were very wide and he wrote over 1,200 papers in all. The Rothschild Museum at Tring Park was bequeathed to the nation and currently houses the bird collections of the British Museum (Natural History) as well as public galleries.

It is very difficult to know exactly what to pick out in a review that can never do justice to the superb skill and wit that his niece Miriam Rothschild has put into this book. The family photographs are an important ingredient. They cover such diverse scenes as Walter astride a giant tortoise who eventually died of sexual desire; Walter with 'Foxy' Ferdinand, King of Bulgaria, two great bird collectors who enjoyed the same jokes; Walter breaking in a wild zebra harnessed to a trap – he drove them four in hand down Piccadilly; a touching shot of his tennis-playing sisters-in-law, one of whom was beaten to death by guards wielding meat-hooks on arrival at the Nazi extermination camp at Auschwitz; Przewalski's wild horses at Tring Park; kangaroos at Tring Park; duck on Tring Reservoirs; the dogs' cemetery at Tring. There are over 170 photographs in all. I would thoroughly recommend this book to all with a genuine interest in the history of natural history. My only regret is that this review did not appear in last year's *London Naturalist*. But history is history and the delay will not lessen the fascinating and revealing interest in the book. I have read it twice and thumbed through it many times.

K. H. HYATT

The London Naturalist

Instructions to contributors

Submission of papers

Papers relevant to the natural history and archaeology of the London Area should be submitted to the editor, Mr K. H. Hyatt, Department of Zoology, British Museum (Natural History), Cromwell Road, London SW7 5BD, before the end of January if they are to be considered for publication in the same year. They should be typed, with double spacing and wide (three cm) margins, on one side of the paper. Authors must retain a duplicate copy. Papers should include at the beginning an abstract, summary, or synopsis.

Text

Locality spellings should follow the latest editions of the maps published by the Ordnance Survey. Capitalization should be kept to a minimum. Common names of animals and plants must begin with lower-case initials, and scientific names must be underlined. When both common and Latin names are given there should be no brackets or commas separating them. Genus names should appear in full where first used within each paragraph. When scientific names are taken from a standard work, which must be cited, authorities should be omitted. In descriptive matter numbers under 10 should be in words, except in a strictly numerical context. Dates should follow the logical sequence of day, month, year (i.e. 25 December 1971). Measurements should be in metric and follow the SI system (Système International d'Unités), with imperial equivalents in parentheses where appropriate. There should be no full point following Dr, Mr, Mrs or St. Lists should be in natural, alphabetical or numerical order.

References

Reference citation should be based on the Madison rules (in *Bull. Torrey bot. Club* 22: 130-132 (1895)), except that a colon should always precede a page number. Capitalization in titles of papers in journals should be kept to a minimum. Journal titles should follow the abbreviations in the *World List of Scientific Periodicals* and be underlined. Examples are as follows:

In text:

Meadows (1970 : 80) or (Meadows 1970).

In references:

MEADOWS, B. S. 1970. Observations on the return of fishes to a polluted tributary of the River Thames 1964-9. *Lond. Nat.* 49: 76-81.

MELLANBY, K. 1970 *Pesticides and Pollution*. Ed. 2. Collins, London.

WHITE, K. G. 1959. Dimsdale Hall moat, part II. *Trans. a. Rep. N. Staffs. Fld Club* 92: 39-45.

Illustrations

Distribution maps should be submitted in the form of a Recording Map with symbols in Indian ink or Letraset. Solid dots are used to indicate contemporary or recent presence, circles for old records and crosses (not pluses) for other information, such as introduced species. Tetrad dots and circles should be 4.0 mm and tetrad crosses 5.0 mm, with a line thickness of 0.8 mm; all monad symbols should be 1.6 mm with a line thickness 0.5 mm. The caption should be written outside the frame of the map and will be set up by the printer. The Mapping Schemes Secretary can provide Recording Maps, advice and dies for printing distribution symbols.

Line drawings should be in Indian ink on white card, larger than the printed size. Place names, etc., must be produced with stencils or Letraset. Captions should be separate as they will be set up by the printer.

Photographs should be glossy black-and-white prints, of good contrast, preferably half-plate in size.

Proofs

Proofs will be sent to authors for scrutiny, but only essential corrections can be made at that stage.

Reprints

Up to 25 free reprints will be supplied on request. Additional copies may be purchased if ordered when the proofs are returned.

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