

MORE THAN MEETS THE EYE

THE WILDLIFE OF GRACE DIEU, LEICESTERSHIRE



**Stephen Woodward
& Helen Ikin**



A Loughborough Naturalists' Club survey of
Grace Dieu Priory, Grace Dieu Wood,
Cademan and Swannymote

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Loughborough Naturalists' Club

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PREFACE

This book is about the wealth of wildlife that has been found near Grace Dieu Priory, NW Leicestershire. It is the outcome of a Loughborough Naturalists' Club project, the latest in a series of survey reports that begins in 1963.

The first objective of the book is to summarise our compilation of biological records – 14,000 sightings of wild plants, animals (and other organisms) by ourselves and others. Full details of these records are available in electronic form, but in the following pages we include a comprehensive list of species with at least a few details of each. Supplementary information is given in the captions for those that we illustrate and for species that we consider important or interesting.

For each group we have explained our fieldwork and identification methods, along with the sources of old records. Our coverage is unavoidably patchy and we hope that others will be motivated to fill in the gaps, or to instigate similar projects in other areas.

Our second objective is to raise awareness among local people of the wildlife here: not just the conspicuous flowers and birds, but in particular the smaller, scarcer creatures that generally go un-noticed. We believe that few people appreciate the fascinating lives of earth stars, ruby-tailed wasps and leafy liverworts – they are all here to be found and enjoyed. Brief accounts of all of these are included, along with the fascinating and sometimes surprising interactions between disparate groups. Links with past landscapes and industrial activity are also revealed. We hope that a better appreciation of local wildlife will improve the prospects for its conservation.

In the course of our fieldwork we have re-found rare Leicestershire plants that had been lost for more than a century. We caught up with a snail that had not been seen at Grace Dieu for 173 years. We squelched into a former lake in Grace Dieu Wood that no-one seems to have reported before. Our research established links with several eminent 19th-century naturalists, including Charles Darwin's mentor. It was particularly satisfying to add dozens of new plants and animals to the county list.

The historic importance of this area is well-documented. As far as wildlife is concerned, we are in no doubt that Grace Dieu is one of Leicestershire's best remaining areas: there is certainly more than meets the eye.

1. INTRODUCTION

NATURE AND NATURALISTS

The natural world offers limitless scope for exploration and enjoyment – those who take up an interest in wildlife will never run out of stimulating objects to study. Exactly how one engages with wildlife is a personal matter – many people are content to enjoy their garden butterflies, or to learn the names of wild flowers on their favourite ramble. Those of a more acquisitive disposition might desire to photograph all the British orchids, or to accumulate a long list of birds seen in their county. For all naturalists, developing the skills to find and identify our flora and fauna is truly rewarding (Figs. 1.1, 1.2).



Fig. 1.1. Searching for wildlife takes naturalists to some beautiful places, in all seasons. Grace Dieu Wood in October puts on a wonderful display of autumn leaves and, as Chapter 6 will demonstrate, a bewildering range of fungi.

Most naturalists have a broad knowledge of certain taxonomic groups (i.e. groups of related organisms) – typically birds, larger mammals, butterflies and common flowers. A small minority tackle the more challenging groups, such as beetles, lichens or spiders. Competence in those groups demands a level of dedication that is beyond most of us. Loughborough Naturalists' Club (LNC) has been fortunate in having among its members a healthy mix of generalists, specialists, and a few talented individuals who seem to know a great deal about many groups (Fig. 1.3).

BIOLOGICAL RECORDING

Biological recording has been at the heart of the Club's projects and publications since its inception¹. What that means is that members are encouraged to record their wildlife encounters so that their observations can be collated and published². Information built up in this way is of interest to other members but, more importantly, it contributes to the body of knowledge about plants and animals that underpins nature conservation. How else would we learn about the distribution and population trends of wild plants and animals?



Fig. 1.2. The Purple Hairstreak butterfly is not rare but is unlikely to be spotted except by naturalists who have learned about its habits. With binoculars, on a fine July evening, the silvery wings of this insect can be seen fluttering in the tops of oak trees.

Recording really needs a focus if it is to produce useful results, so it has been customary for naturalists to concentrate on a particular geographical area, covering one taxonomic group. In the UK there is a long tradition of working at the county level, so for Leicestershire, amateur naturalists have produced distribution atlases for birds, flowering plants, spiders, mosses and liverworts, woodlice and millipedes³ (among others). At the smaller scale, studies have been published on individual parishes⁴ and sites such as nature reserves⁵. It is feasible to cover a wider range of groups over smaller areas: a survey of a suburban Leicester garden⁶ is one of most ambitious ever published, in terms of the groups that have been tackled. The studies previously published by LNC⁷ have generally covered areas intermediate in size



Fig. 1.3. Loughborough "Nats" participating in survey work, March 1973. Peter Gamble (left), was a talented all-round naturalist and expert botanist. Jack Ward (centre) was a specialist on moths and Dorothy Fieldhouse (right) was a keen recorder of fungi. All three made records at Grace Dieu.
Photo: LNC Archive.

between the county and an individual site – corresponding with the “survey units” delimited by the Club for the Charnwood Forest Survey⁸. These are areas of particular wildlife interest that were considered to be worthy of further biological recording. One of them is Grace Dieu⁹, an area named after a ruined priory near Loughborough in north-west Leicestershire.

COLLECTING RECORDS FOR GRACE DIEU

Previous LNC reports generally cover the flowering plants, fungi, vertebrates, butterflies and moths, perhaps with contributions from the Club's beetle or spider specialists. The authors of this report have wider interests in natural history and a curiosity about the less popular groups. We have many helpful friends and contacts, both within and beyond the Club, who are specialists in various groups. We were keen to make use of our knowledge and contacts, and to learn more.

Following the advice¹⁰ of our mentor and former Club chairman, Ian Evans, we would confine our survey to a smallish area close to where we live – and get to know it intimately: Grace Dieu fits the bill. Whatever we (or others) could reliably identify would be within our scope. Much as we would like to master identification in all taxonomic groups, we recognise the futility of such an ambition – nonetheless we have learned to place most of our finds in the right group and, crucially, we have the experience to know when we need specialist help. We are fortunate in Leicestershire to have a network of County Recorders and Co-ordinators for the various groups¹¹, who can help with identification. Beyond the county, many national experts have generously offered their help to check or identify specimens.

So this project covers more groups than previous LNC reports. It has drawn us into the realms of microfungi (Fig. 1.4), bark-flies, solitary bees, spider-hunting wasps, water-bears and planthoppers – about which

we knew next to nothing previously. The reward for studying the obscure groups is the greatly increased chance of finding something new – we have added dozens of plants and animals to the county list (see p. 25-1). Wherever possible, we have had specimens (rather than photographs) of unfamiliar species checked by specialists. More details of our validation methods are given in Appendix 3.



Fig. 1.4. The orange spots on the leaves of Common Mallow *Malva sylvestris* are caused by a rust fungus *Puccinia malvacearum*. Rusts and other microfungi are often host-specific.

Previous fieldwork had been undertaken by the Club in the Grace Dieu survey unit, but only interim reports were produced¹². A particularly enjoyable and productive excursion to Grace Dieu in the spring of 2008 led some of the participants to agree that a fresh phase of fieldwork was justified here, with a view to publishing a final report. Our first few excursions in summer 2008 reminded us just how diverse this area really is – we recognised that a couple of years would be needed to record a representative portion of its flora and fauna. After two years, then again after three, the species list was still growing at such a rate that we added another year to our fieldwork.

In June 2012 (partly due to the dreadful weather) we curtailed the record-gathering excursions and began to sort out the records and specimen backlog. We could not resist making the odd visit during the rest of 2012, but only a handful of records were added. The last scheduled recording session was on 31 December 2012, which was remarkable for a number of reasons. We were lucky with the weather and 15 participants took part (notably the Leicestershire Fungi Study Group). Secondly, a “common” bird that had eluded us for four years put in an appearance – the Reed Bunting. Finally, we added nine species (mostly fungi) to the Grace Dieu list, of which three were first county records!



Fig. 1.5. Grace Dieu survey participants at the top of Cademan Moor in 2008. Stephen Woodward, Phill Carpenter, Gill Carpenter, Helen Ikin, Kathryn Ward.



Fig. 1.6. A well-deserved supper at Ruby's Fish Shop (Thringstone) after a productive recording meeting in 2011. John Walton, Monika Walton, John Kramer, Anona Finch, Graham Finch, Helen Ikin.



Fig. 1.7. The more eyes the better ... Ann Petty, Bill Newton, Louise Marsh, Russell Parry, Helen Ikin, Stephen Smith, Geoffrey Hall, Jan Dawson by the priory ruins in 2012.

This shows clearly that our “final” list, long though it is, is far from being definitive.

A handful of supplementary records were made at Grace Dieu after the formal end of our fieldwork, during the preparation of this report. They include some extra plant species, a moss that had been “lost” for 180 years and a species of mammal never previously seen here – so we have incorporated those¹³.

Thanks to the good reputation of LNC, the landowners we approached were willing to let us explore – in fact much of the area has public access anyway (details in Chapter 2). Most of the fieldwork was undertaken by the two authors but we were joined on occasions by other Club members, specialists from further afield and local people with a keen interest in the area (Figs 1.5-1.7). They are all listed in the Acknowledgements.

We made considerable efforts to gather old records for the survey unit. The only report of Brown Trout in the Grace Dieu Brook appears in an angling book from 1834. We found a record of Dipper (Fig. 1.8) in the diaries of James Harley (1855). Among the records published in the 19th century are some from well-known botanists (see Chapter 3). We found a Grace Dieu “record” by William Wordsworth, who visited in about 1806 and mentioned the “ivied ruins” in one of his poems¹⁴. From transcribed priory manuscripts¹⁵ we learned that Foxes were being a nuisance back in 1414. We found most old records by checking museum specimens and by searching the biological records maintained by the Leicestershire & Rutland Environmental Records Centre (LRERC)¹⁶.

This most amusing little native bird is not so frequently met with in the County, as it is in these districts which partake of a more truly monotonous character. However, it is not altogether unknown to us, neither is the bird unknown to many of our more rapid means and wider circuits. It occurs on the Rock which flows down from the forest of Charnwood by way of Grace Dieu priory. It also has been seen by ourselves on the

Fig. 1.8. Harley knew the Dipper as *Cinclus aquaticus* Water Ouzel. This is his account from the 1840s (courtesy of Leicester Museums & Galleries). There have been no recent Dipper records at Grace Dieu – the bird shown here was photographed in Scotland.



PRESENTATION OF RESULTS

The result of all this fieldwork and research is a database of what was found, where, when and by whom (known in the biological recording world as “the four Ws”). It has more than 14,000 entries. Most of our report summarises this factual information, however to put it into context and render it more digestible, each chapter that covers a taxonomic group summarises the biology of the group, how its members can be recognised, previous recording effort, and how we went about fieldwork and identification. The results are summarised, highlighting any significant finds, then the species list is presented. We illustrate the more



photogenic plants and animals, with captions that include snippets of natural history. For many readers these will be more interesting than the lists! Identification hints are sometimes given, but this book is certainly not intended as a field guide – nonetheless we hope readers will be inspired to look harder and find out more about local wildlife. For this reason we provide numerous references, via the numbered notes at the end of each chapter.

We have tried hard to ensure that our identifications are accurate, by seeking training, using the best available books, and having unfamiliar species checked by specialists (Appendix 3 & 4). For records whose identification may be questioned, we state how they were validated, or else clarify that some doubt remains.

Record details in electronic (spreadsheet) format have been sent to LRERC and are included on the web site.

Before the first of the systematic chapters, we describe in Chapter 2 various aspects of the survey unit's landscape. In that chapter will also be found an explanation of how we recorded the locations of our finds and how we have condensed that information in the species lists.

Having acknowledged that biological records can be used to inform nature conservation, we have stopped short of making any formal assessments wildlife value. Nor have we recommended how land should be managed to conserve its wildlife interest. Our view is that this is the business of the conservation agencies working in conjunction with the landowners.

Fig. 1.9. Thanks to low-key management, dead wood is a feature of Grace Dieu, in the form of standing trees, fallen trunks, detached branches and twigs. This condition mimics primeval woodland and helps to sustain rare fungi and invertebrates.

NOTES AND REFERENCES

- 1 Graham & Ikin (2014).
- 2 The quarterly journal *Heritage* is the regular channel for publishing summaries of records – see Ikin (2010). Special LNC projects generate extra records and survey reports.
- 3 See the corresponding chapter for details.
- 4 e.g. Hesselgreaves (1973); Evans (1977).
- 5 e.g. Squires (2000).
- 6 Owen (2010).
- 7 LNC Survey Reports are available at LRERC.
- 8 Crocker (1972).
- 9 The local pronunciation is "Grays Dyoo".
- 10 Evans (1978).
- 11 Ikin & Woodward (2013).
- 12 Anon (1974); Gamble & Blunt (1976).
- 13 We had already finalised the Fungi chapter when we learned of several new species, including *Descolea antarctica*, only the third record for Britain - see Hering (2019).
- 14 Fay (2018).
- 15 Johnson *et al.* (2013).
- 16 LRERC is the central point for gathering, checking and distributing biological records in Leics. and Rutland. LRERC provides records to businesses submitting planning applications on a commercial basis, but offers a free service to amateur naturalists making simple enquiries. See Timms (2018).
Leicestershire and Rutland Environmental Records Centre,
Leicestershire County Council, County Hall, Room 200,
Glenfield, Leicester LE3 8RA. 0116 305 4108.
<https://www.leicestershire.gov.uk/environment-and-planning/planning/planning-and-ecology>

the Catholic faith: devotional walks were laid out through Grace Dieu Wood and beyond, representing the fourteen stations of the cross⁷⁴ with shrines, monuments, a calvary and a chapel⁷⁵. Here and there, the banks of the brook were revetted with stone and small weirs inserted to make cascades of tumbling water (Fig. 2.30). Mott (1868) was impressed by the results:

The winding path through Gracedieu wood is one of the loveliest walks in England. A most romantic rivulet accompanies the path, playing hide-and-seek among the trees and rocks, and beds of water plants. The pathway is well kept, and rustic seats are fixed at the most tempting spots. It forms part of a foot-path from Gracedieu Manor to [Mount St. Bernard] Monastery, a distance of between two and three miles, the whole of which is of rare and varied beauty.

The structures and icons have mostly been removed, but the footpath network can still be traced: an arch (Fig. 2.28), steps, (Fig. 2.29) culverts and footbridge footings. Judging from late 19th century maps (Fig. 2.22), the flooded quarries were tidied up and incorporated into the pleasure-grounds – the site of a small boat house and its access causeway is still visible⁷⁶.

In 1933, the Manor became Grace Dieu Manor School⁷⁷, whereupon sports fields were set out within the parkland (Fig. 2.27).

LNW Railway

The second transportation project had a much greater impact than the canal and still dominates the priory area today. This was the Charnwood Forest branch of the London and North Western Railway, which opened in 1883 to link Loughborough to Coalville. We use the compartment reference P50 for the railway (Fig. 2.38). From Loughborough, it entered the survey unit at the north, over a road bridge (now demolished⁷⁸) onto a high embankment to the south of the priory ruins. At this point, the railway overlies the canal. To cross the Grace Dieu Brook, an impressive viaduct



Fig. 2.27. Grace Dieu Manor School, viewed from Warren Lane (near point 4 on Fig. 2.22), with its playing fields set among parkland trees.



Fig. 2.28. A rustic arch between Grace Dieu Manor and Wood.



Fig. 2.29. An outcrop incorporated into a landscaping feature known as Twenty Steps. Another example is called Hob's Hole (both named on Fig. 2.10).

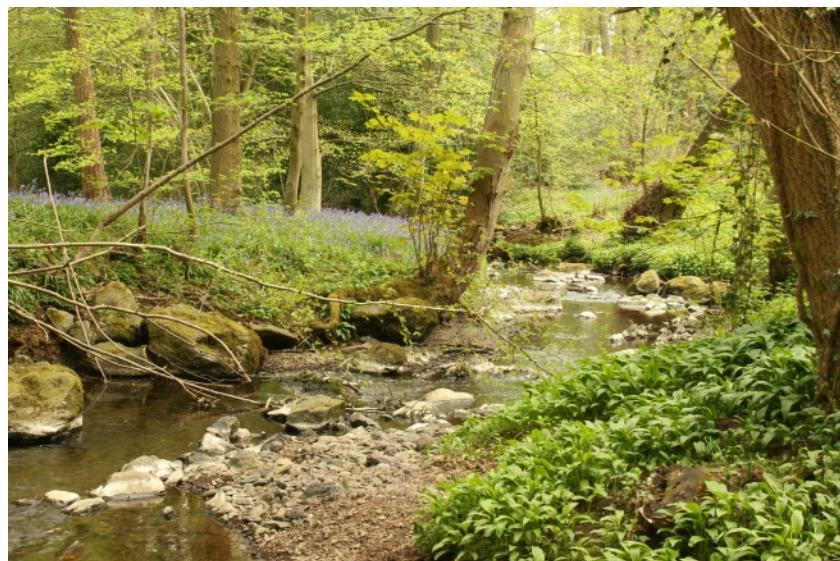


Fig. 2.30. The babbling brook certainly adds to the enjoyment of a walk through Grace Dieu Wood, especially when the spring flowers are in bloom, the Grey Wagtails are feeding their young and the scent of garlic (from the Ramsons) fills the air.

was built (Fig. 2.31). A little further south, the line enters a cutting as it approaches Whitwick, along the western boundary of our survey unit.

The line earned the nickname “Bluebell Line” as it passed the western edge of Grace Dieu Wood. It was never a commercial success and passenger traffic ceased in 1931. The last freight train ran in 1963.

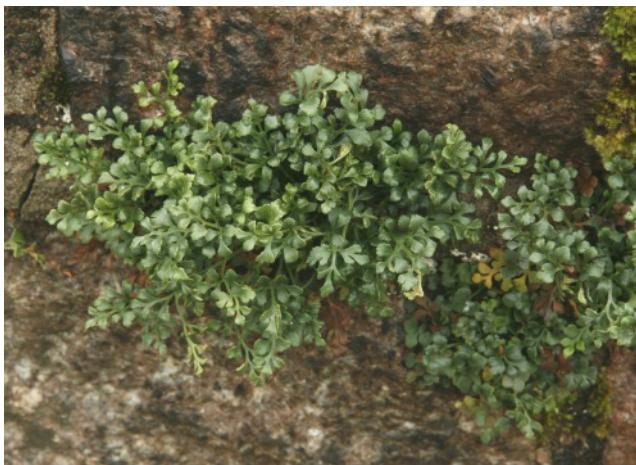


Fig. 3.20. *Asplenium ruta-muraria* Wall-rue is a common fern in the crevices of stone walls where it can reach the mortar.



Fig. 3.21. *Asplenium ceterach* Rustyback, a scarce (but apparently spreading) fern in Leics. Only found on walls.



Fig. 3.22. *Polystichum setiferum* Soft Shield-fern is plentiful in the old limestone quarries, here growing on a fallen trunk.

was seen in 1997 but recent thorough searches have failed to find it (see p. 2-16).

***Equisetum palustre* Marsh Horsetail.**

GD: Su. Records: 4, Compts: 1 (M49). L&R: Na. Found only in the marsh beside the fishing lake, where it is frequent.

***Equisetum telmateia* Great Horsetail.**

Fig. 3.18. GD: Su. Records: 4, Compts: 2 (P14 C74). L&R: Na. In the marshy ground in the middle of GD Wood and on a roadside verge. The local name is "Lego Plant" as the stems can be pulled apart at the joints and re-assembled.

Osmundaceae

***Osmunda regalis* Royal Fern.** GD: Ex. Records: 1, Compts: 1 (P36). L&R: Na. An undated (probably 19th century) record by G. Tomlinson "about the ruins of Gracedieu Abbey" is mentioned in Horwood & Noel (1933). This native plant is not uncommon in boggy woodland in some parts of the country (e.g. the New Forest) but it was most likely planted at Grace Dieu. This majestic fern was a prime target for the Victorian fern-collectors⁵² and was never seen again here.

Dennstaedtiaceae

***Pteridium aquilinum* Bracken.** GD: Su. Records: 48, Compts: 29. L&R: Na. Locally abundant, often dominant, on well-drained, acid soil.

Aspleniaceae: Spleenworts

***Asplenium scolopendrium* Hart's-tongue.** Fig. 3.19. GD: Su. Records: 18, Compts: 11. L&R: Na. Damp and shady places, especially walls, stream banks and especially the disused quarry in compt P12. Curiously, not recorded until 1976.

***Asplenium trichomanes* Maidenhair Spleenwort.** GD: Su. Records: 2, Compts: 2 (P76 C74). L&R: Na. Stone walls by roadside verges.

***Asplenium ruta-muraria* Wall-rue.** Fig. 3.20. GD: Su. Records: 3, Compts: 3 (P42 M57 M75). L&R: Na. On stone walls, one of which (the old railway bridge by compt P42) was demolished in 2013.

***Asplenium ceterach* Rustyback.** Fig. 3.21. GD: Su. Records: 1, Compts: 1 (M75). L&R: Na, scarce. 14 plants on the west side of the ancient stone wall at Manor Farm, 2011, SFW.

Thelypteridaceae

***Oreopteris limbosperma* Lemon-scented Fern.** GD: Vu. Records: 1, Compts: 1 (C31), L&R: Na, scarce. Five plants together in a shady woodland ditch, 2009, SFW & HI.

Woodsiaceae

***Athyrium filix-femina* Lady-fern.** GD: Su. Records: 10, Compts: 7 (P09 P10 P11 P14 M52 C43 C74). L&R: Na. Damp, shady places, especially near streams.

Blechnaceae

***Blechnum spicant* Hard-fern.** GD: Su. Records: 3, Compts: 2 (P14 C31). L&R: Na. On acid soil in woodland.

7. LICHENS

SCOPE

Lichens adorn the surfaces of tree-trunks, branches, wooden structures, rocks, walls and undisturbed soil. They come in a variety of shades of brown, yellow, orange and grey (which may turn greenish when moistened). Some produce bright red fruiting structures (Fig. 7.1). Lichens generally grow as a crust (*crustose*), a scaly mat (*foliose*) or a miniature bush (*fruticose*). With a few exceptions, lichens (unlike mosses and liverworts) are opaque with a powdery or leathery texture. Lichens that favour rocks and bark are known as *saxicolous* and *corticulous*, respectively.

A lichen is a fungus with a special mode of nutrition, which is to embed, just below its surface, another organism known as a photobiont that is capable of photosynthesis. The fungus and photobiont form a symbiotic relationship – the fungus provides a sheltered environment in which the photobiont can grow and the latter feeds the fungus with the products of photosynthesis. The host fungus is what we see from the outside and its identity is used to name the lichen. The photobiont may be an alga or a cyanobacterium¹.

Lichenised fungi belong to either the Ascomycota or Basidiomycota (both included in the previous chapter), however it is conventional to treat lichenised fungi separately. Lichens have their own books and specialists. Lichenologists traditionally study some fungi that are parasitic on true lichens, but not actually lichenised themselves – these are included at the end of the species list.

Lichens generally occur in exposed situations so that their photobionts receive adequate light. They manage to grow, often very slowly, on a meagre supply of nutrients. Lichens do not have roots but they are sensitive to the chemistry (in particular the pH) of the substrate on which they grow. Most of their water and nutrients come directly from the air, making them vulnerable to atmospheric pollution. Lichens were decimated in much of Britain when sulphur dioxide levels were high¹. Now that SO₂ is much reduced, lichens are flooding back in to Leicestershire².

In the UK there are approximately 1873 species³. Publication of a vice-county checklist is awaited and is expected to list over 500 names⁴.

The objectives of our lichen study at Grace Dieu were restrained, as we have no lichen expertise in the Club and we relied on external help. We gathered previous records, looked up some herbarium specimens and visited a few promising sites in the company of expert lichenologists (see overleaf), but a comprehensive survey of the whole unit was not feasible. Most compartments have not been searched at all.



Fig. 7.1. *Cladonia diversa* is a conspicuous lichen on account of its stalked outgrowths (podetia) supporting bright red spore-bearing surfaces (apothecia). It is growing in a crack on the outcrop at High Cademan.

PREVIOUS RECORDS

Lichen recording at Grace Dieu begins with Andrew Bloxam and Churchill Babington in the early 19th century. F.A. Sowter made three records in the early 1970s. The first survey was made by D. C. Lindsay in 1974, from the rocks at High Cademan (Fig. 7.2) and Calvary Rock⁵ (Fig. 7.3). Further survey work was undertaken by Anthony Fletcher between 1980 and 2005. Specimens collected by Sowter, Lindsay and Fletcher are preserved in the herbarium LSR at Leicestershire Museums (see p. 3-2).

FIELDWORK METHODS

Lichens are present throughout the year and generally grow in conspicuous places, so finding them is simply a matter of searching trees, fence-posts, rocks, and so on. A hand lens and some experience are needed to detect the smaller species.

IDENTIFICATION

A large proportion of lichens can be identified in the field by an experienced lichenologist, using simple chemical tests to separate similar-looking species. All of the lichen records made during our fieldwork were identified in that way by our local specialist I. G. Pedley. This approach may have missed some species that can only be determined under the microscope – however, previous surveyors did collect specimens and these have recently been checked carefully (and in some cases re-determined) by Fletcher (2014). The current identification Flora is Smith et al. (2009) and a popular field guide is Dobson (2018).



Fig. 16.16. *Chelostoma florisomne* a solitary bee that is an aerial nester, i.e. above the ground. This species often uses a beetle hole in a tree. The name *florisomne* refers to its endearing habit of snoozing in flowers. Pollen is obtained from buttercups and is collected not on the legs but on the brush of pale hairs that can be seen under the abdomen.



Fig. 16.17. *Osmia bicornis* Red Mason Bee. This bee nests in pre-existing cavities, such as those found in old walls and fences and is frequent in suburban habitats. As a placid bee, it is popular as a “pet” in gardens or schools, where it takes to artificial nest boxes²⁶. It is also encouraged in farmland and orchards, where its pollination services are appreciated.

Halictidae

Halictus rubicundus. Records: 15, Compts: P14 M05 M58 M75 S54 S64 S65 C45. Nesting in the “bee bank” (see *A. cineraria* above) and a couple of banks in GD Wood. Present between Apr and Sep.
Halictus tumulorum. Fig. 16.14. Records: 3, Compts: C32 C43. Nesting in footpaths.
Lasioglossum albipes. Records: 3, Compts: P72 M05 S54. One feeding on Common Fleabane.

Lasioglossum calceatum. Records: 8, Compts: P36 P42 P72 P76 M75 S66. Feeding on Ragwort and Bramble. Jul - Sep.

Lasioglossum lativentre. Records: 3, Compts: P72 S68 C43.

Lasioglossum malachurum. Records: 3, Compts: P14.

Lasioglossum rufitarse. Records: 1, Compts: P14. 2012, SFW, conf. Collins.

Sphecodes ephippius. Fig. 16.15. Records: 2, Compts: P14 M58.

Sphecodes geoffrellus. Records: 1, Compts: P36. 2011, SFW, conf. Archer.

Megachilidae

Chelostoma florisomne. Fig. 16.16. Records: 1, Compts: P14. A female in a woodland clearing, 2011, HI.

Osmia leiana. Records: 1, Compts: P12. 2009, HI.

***Osmia bicornis* Red Mason Bee**. Fig. 16.17. Records: 5, Compts: P14 P76 M58. One was found collecting mud (for sealing her nest) from the edge of a stream.

Megachile ligniseca a leaf-cutter bee. Records: 2, Compts: P14 P36.

Megachile versicolor a leaf-cutter bee. Fig. 16.18. Records: 1, Compts: P14. 2011, HI.

Apidae

Nomada fabriciana. (Fig. 16.21). Records: 1, Compts: P14. On an earthen bank, investigating holes, probably of its main host species *Andrena bicolor*. 2012, SFW.

Nomada flava. Records: 4, Compts: P13 P14 P15 M05. The usual host species is *Andrena carantonica*.

Nomada flavoguttata. Records: 3, Compts: P10 P37 P50. Known host species include *Andrena subopaca* and *A. semilaevis*.

Nomada goodeniana. Records: 6, Compts: P41 P42 M75. Most records were from the “bee bank” on the school drive where its main host species *Andrena nigroaenea* occurs.

Nomada lathburiana. Records: 2, Compts: P14. JNCC: Red. Its host is probably *Andrena cineraria*.

Megachile: Leaf-cutter bees



Fig. 16.18. *Megachile versicolor* a leaf-cutter bee. This is a robust, big-headed species whose females have an orange brush under the abdomen for transporting pollen. Leaf-cutter bees are so-called because they line their nests with discs that they snip from leaves, often rose bushes. The nest is frequently a hole in tree, which will be sealed up with leaves when all the brood cells are complete.



GRACE DIEU CATERPILLARS

A life devoted to eating may appeal to some readers, but caterpillars are under constant threat of predation and attack by parasites. Some of their strategies for reducing these risks are illustrated in these examples.



Fig. 17.19. *Ectoedemia septembrella* has a leaf-mining caterpillar that make a characteristic blotch in the leaves of Square-stalked St John's-Wort *Hypericum tetrapterum*. The dark lines are the trails of frass (droppings).



Fig. 17.21. The caterpillar of *Acronicta psi* Grey Dagger is easily distinguished from that of *A. tridens* Dark Dagger, whereas the adult moths are virtually identical. Long, irritating hairs are a common defence in caterpillars



Fig. 17.24. Cinnabar Moth caterpillars *Tyria jacobaeae* sequester toxins from their foodplant (ragwort, *Senecio* spp.) and advertise their distastefulness with the "warning" pattern of yellow and black stripes, shared by many insects.



Fig. 17.20. The larvae of *Coleophora* species make hardened cases for themselves from plant fragments. This one (of uncertain species) has finished feeding on one Hawthorn bud (leaving a hole) and has moved to the next. By fixing its case to the bud, the larva is completely hidden while feeding.



Fig. 17.22. The larva of *Psyche casta* makes a protective case from silk and bits of rush or grass. An opening at the lower end allows its legs to grip the leaf, to move around and to feed.



Fig. 17.23. The larva of *Psychooides verhuella* first mines the fronds of Hart's-tongue Fern *Asplenium scolopendrium*, then emerges to feed among the spores.



Fig. 17.25. The zebra-like caterpillar of *Helcystogramma rufescens* feeds within rolled-up grass leaves. We dislodged this one by sweeping. In contrast to its boldly-marked larva, the adult moth is plain brown.



Fig. 17.26. The Bird Cherry *Prunus padus* in Grace Dieu Wood has not escaped the notice of *Yponomeuta evonymella*, whose caterpillars strip the leaves and spin a dense silken web.