Nunhead Cemetery: a preliminary invertebrate survey

BY RICHARD A. JONES F.R.E.S., F.L.S.

135 Friern Road, East Dulwich, London SE22 0AZ
bugmanjones@hotmail.com

CONTENTS

Summary 2

Introduction 3

Methods 3
- Site visits 3
- Site compartments 4
- Location and collection of specimens . . 4
- Taxonomic coverage 4

Survey results 4
- Noteworthy species 4

Discussion 11

Conclusion 13

References 13

Species list 15

Researched and written 2007 and 2008

Nunhead Cemetery: a preliminary invertebrate survey

BY RICHARD A. JONES F.R.E.S., F.L.S.

135 Friern Road, East Dulwich, London SE22 0AZ

SUMMARY

- An invertebrate survey of Nunhead Cemetery, Southwark, in south-east London, was carried out during 2007. Field visits were combined with records collected during several years of casual visits to the cemetery.

- A total of 207 species were recorded.

- Many unusual and scarce insects were found.

- Four nationally rare and scarce beetles were associated with sooty bark disease, *Cryptostroma corticale*, a fungus which attacks sycamore trees: *Cicones undatus*, *Synchita separanda*, *Enicmus brevicornis* and *Diplocoelus fagi*. Their strong association with the fungal disease was first demonstrated at Nunhead, which remains a stronghold for them.

- Several nationally scarce and uncommon beetles were associated with dead, decaying and fungoid timber: *Abdera biflexuosa*, *Anisoxya fuscula*, *Biphylus lunatus*, *Eledona agaricola*, *Mordellistena neuwaldeggiana*, *M. variegata*, *Ochina ptinoides*, *Orchesia undulata* and *Pyrochroa coccinea*.

- Also found were several nationally scarce and rare insects, including: *Agrilus sinuatus* (a jewel beetle), *Athous campyloides* (a click beetle), *Chrysolina oricalcia* (a leaf beetle), *Dasytes plumbeus* (a flower beetle), *Dorytomus ictor* (a weevil), *Kalcapion semivittatum* (a weevil), *Orthochaetes insignis* (a weevil), *Platyderus ruficollis* (a ground beetle), *Olibrus flavicornis* (a flower beetle), *Stenus niveus* (a rove beetle), *Asiraca clavicornis* (a leafhopper), *Lasius brunneus* (an ant), *Megalonotus antennatus* (a ground bug), *Volucella inanis* and *V. zonaria* (hoverflies).

- The species list for the cemetery also includes 18 butterflies, 12 ladybirds and 21 hoverflies.

- Nunhead Cemetery is accorded a status of metropolitan importance for nature conservation. This invertebrate survey supports this status.

Nunhead Cemetery: a preliminary invertebrate survey

BY RICHARD A. JONES F.R.E.S., F.L.S.

135 Friern Road, East Dulwich, London SE22 0AZ

INTRODUCTION

Nunhead Cemetery was consecrated in 1840, one of seven great cemeteries created around the outskirts of London in the middle of the 19th century. Part of a large private company that built cemeteries in an age of religious reverence and imperial grandeur, it was a lavish and majestic gesture in the Surrey landscape. It was landscaped with great ceremony and care, with architectural splendour in its chapels, gatehouses, funerary buildings and in the impressive memorials that soon began to be erected. But with changing burial fashions (cremation rather than interment) and increasing operating costs, it fell into disrepair and the company running it was bankrupted. By the middle of the 20th century the cemetery was in a ruinous state; abandoned by its former owners it suffered the abhorrent indignities of grave-robbing, vandalism and fly-tipping.

The cemetery was closed in 1969, but its decline continued until it was compulsorily purchased by Southwark Council, for the sum of £1, in 1975. Since then, all efforts have been made to halt and reverse the decay. Damaged buildings and monuments have been repaired, shored up or made safe, roadways have been cleared, boundary walls and gates have been replaced. The effects of vandalism and desecration have been soothed, but the ravages of nature have been impossible to reverse. What was once, by all accounts, a relatively formal garden or meadow setting, has become overgrown with scrub; it then developed into the largest secondary woodland in central London.

There are still some burials in Nunhead Cemetery, but most of the 52 acres are now a nature reserve, for the benefit of wildlife and local residents. Some areas of recent burials are regularly mown and tended, but the greatest part of the cemetery is managed simply, by clearing fallen trees from paths, or scrub cutting along tracks

This survey of the Nunhead's invertebrate interest was commissioned by the London Borough of Southwark, as part of its remit to understand and manage the wildlife of the cemetery.

METHODS

Site visits

The area was visited on 24 April, 11 June, 25 July and 28 August 2007. A walk-over survey of the site was complemented by the collection of specimens. In addition, records have been gleaned from many years of casual visits to the cemetery. These include visits with local school children and records from the Nunhead Cemetery Open Days where visiting children take part in bug hunts.

Site compartments
The cemetery is not divided into different compartments, but reference is made to individual trees or particular sections of the site where certain interesting species were found.

Location and collection of specimens
Invertebrates were located and collected by general methods using sweep net, beating tray and a stout knife. Flowers, leaf surfaces, rocks, bare ground, logs and tree trunks were examined by visual searching. Voucher specimens of all but the most common and characteristic species have been kept.

Taxonomic coverage
The survey concentrated on the following major insect groups: Coleoptera (beetles), Diptera (flies), Hemiptera (bugs, froghoppers etc), Hymenoptera (bees, wasps and ants) and Lepidoptera (butterflies and moths). Some examples of other groups were noted if seen.

SURVEY RESULTS

A systematic list of 207 invertebrate species is given, together with various comments on their statuses, habits and distributions, at the end of this report. They represent:

Coleoptera (beetles)	99 species
Diptera (flies)	42
Hemiptera (bugs)	22
Hymenoptera (bees, wasps etc)	16
Lepidoptera (butterflies & moths)	19
Orthoptera (grasshoppers)	2
Aranaea (spiders)	3
Isopoda (woodlice)	4
Total	207

Two hundred and seven species is a modest list, given the size of the cemetery and the recording effort of this survey. This is, perhaps, a reflection of the limited habitat types available.

Noteworthy species
Most of the insects seen or collected were common ones, which might be expected to turn up in any South-London garden or green open space. Nevertheless, a number are uncommon or otherwise unusual and worthy of comment.

The following species are picked out as being especially noteworthy. Criteria for allocation of accepted ‘nationally rare’ (red data book) and ‘nationally scarce’ (notable) statuses are varied and complex. However, they are listed in brief here.

- ***Endangered*** (RDB-1). The rarest taxa. Taxa in danger of extinction in Great Britain; species with very few recorded localities or living in especially vulnerable habitats.

- ***Vulnerable*** (RDB-2). Very rare species. Taxa likely to move into the RDB1 category; species declining in their range.
- ***Rare*** (RDB-3). Rare species. Taxa with small populations and which are at risk; species estimated to occur in 15 or fewer of the 10-km squares in the national Ordnance Survey grid since 1970.
- ***Insufficiently known*** (RDB-K). Species thought to be very rare in Britain, recorded from less than 15 of the 10-km squares of the national Ordnance Survey grid since 1970, and which warrant RDB classification of some sort, but for which there is a recognized lack of accurate information.
- ***Nationally scarce*** (notable A). Very local species, thought to occur in 16 to 30 of the 10-km squares of the national Ordnance Survey grid since 1970.
- ***Nationally scarce*** (notable B). Very local species, thought to occur in 31 to 100 of the 10-km squares of the national Ordnance Survey grid since 1970.
- ***Nationally scarce*** status is sometimes not subdivided into categories A and B, (notable, occurring in 16 to 100 10-km squares).
- ***Very local*** status is a much more subjective, but nevertheless useful, measure of scarcity and is based on personal experience, published and unpublished records. It is applied to species that are very limited in distribution or confined to very limited specialist habitats.

The following is a list of some of the more interesting and noteworthy species taken in the area.

Abdera biflexuousa (Curtis), a minute black and red fungus beetle, family: Melandryidae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). Although widespread over much of England, this beetle is very local, and usually associated with ancient woodlands and pasture woodlands (Harding & Rose, 1986). Several specimens were found under fungoid bark, 17 and 21.vii.1991.

Agrilus sinuatus (Olivier), a small pink jewel beetle, family: Buprestidae. Status: nationally scarce (notable A, Hyman & Parsons, 1992). The larvae bore characteristic winding burrows in the bark of dead hawthorn branches and trunks and leave distinctive D-shaped exit holes on their emergence. Originally given red data book status 2 (vulnerable, Shirt, 1987), this was revised when surveys showed the exit holes to be fairly widespread and the elusive adults rare and easily overlooked. It is associated with ancient hedges and old pasture-woodland where large hawthorns have grown up. It seems especially widespread in the London area. The exit holes have been found regularly in hawthorn branches in the cemetery.

Anisoxya fuscula (Illiger), a small brown fungus beetle, family: Melandryidae. Status: nationally scarce (notable A, Hyman & Parsons, 1992), revised from nationally rare (red data book 3, Shirt, 1987). A very local species recently recorded only from a very few southern vice-counties. Larvae develop in the dead twigs of ash, willow, beech, field maple and lilac. Associated with ancient broad-leaved woodland and regarded as an ancient woodland indicator species (Harding & Rose, 1986). One specimen was found under fungoid bark, 30.viii.1987.

Asiraca clavicornis (Fabricius), a small mottle leaf-hopper, family: Delphacidae. Status: nationally scarce (notable B, Kirby, 1992). Although historically recorded from many areas in southern Britain, this insect appears to have dramatically contracted it range until it is more or less confined to the Thames Estuary and the London area. It is associated with dry grassy places with areas of bare ground and has been found on a number of London sites during the last 10 years (Jones, R.A. & Hodge, 1999). Several specimens have been found over a number of years, in Nunhead Cemetery.

Athous campyloides Newman, a large brown click beetle family: Elateridae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). This very local species is associated with rough grassy places in south-east England (Mendel & Clarke, 1996). The larvae are thought to feed at the roots of grass and herbs. It was once regarded as an extremely rare species, but appears to have colonized Britain in the early 19th century, and is still spreading (Jones, 2001). A specimen was found by sweeping, 11.vi.2007.

Bethylus boops Thomson, a minute parasitoid wasp, family Bethylidae. Status: very local. Although the life history is unknown, it is thought to be a parasitoid of moth caterpillars as are others in the genus. Most records are from the London area, where it occurs in parks and gardens. It was first recorded as a British species when a specimen was found in a garden in Nunhead in 1992. One specimen was swept 24.iv.2007.

Bethylus dendrophilus, Richards, a minute parasitoid wasp, family: Bethylidae. Status: very rare. Although the life history is unknown, it is thought to be a parasitoid of moth caterpillars as are others in the genus. There are only a handful of records for this insect, but it is part of a group that is poorly studied by entomologists. One specimen was found by sweeping, 25.vii.2007.*

Biphylus lunatus (Fabricius), a minute fungus beetle (family Biphylidae). Status: very local. This widespread, but rather local species breeds almost solely in 'cramp ball' fungus, *Daldinia concentrica*, which in turn almost solely attacks ash logs and trees. The beetle is associated with ancient woodland and in conjunction with other dead-wood species is considered an ancient woodland 'indicator' species (Harding & Rose, 1986). It has been found several times in the cemetery (Jones, 1993).

Bruchidius varius (Olivier), a minute bean weevil, family: Bruchidae. Status: very local, but spreading. A recent colonist to Britain, this species has spread over much of south-east England since it was first discovered on the south coast in 1994. It occurs in flower-rich grasslands where it is associated with clovers. Several specimens were swept, 24.iv.2007.

Chorisops nagatomii Rozk., a small soldier fly, family Stratiomyidae. Status: nationally scarce (notable, Falk, 1991b). Although widespread in southern England, this species is decidedly scarce and usually associated with broadleaved woodland, parkland, rivers and fens. Its life history is unknown, but it is likely to feed in moist leaf litter or soil. Two specimens were found on 3.ix.2007.

* Note added 2010. This has subsequently been reidentified as a male of Bethylus boops.

Chrysolina oricalcia (Mull.), a medium-sized blue-bronze leaf beetle, family: Chrysomelidae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). A widespread, but rather local species associated with cow parsley, Anthriscus sylvaticus and other Umbelliferae in woodlands and hedgerows. Larvae and adults have been found in the cemetery on several occasions.

Cicones undatus Guerin-Meneville, a minute mottled fungus beetle, family: Colydiidae. Status: 'endangered' (red data book category 1, Hyman & Parsons, 1992). A very local beetle which occurs in sycamore logs infected with the sooty bark disease, a fungus *Cryptostroma corticale.* At the time of the status review (Hyman & Parsons, 1992) this beetle was known only from a handful of dead sycamores in Windsor Great Park and was thought to be an ancient woodland relic species associated with maples. It was originally given endangered (red data book category 1) status. When that review was being printed, the beetle was discovered on 20.x.1991 at its second British locality — Nunhead Cemetery. It has since been shown to be fairly widespread in the London area (Jones, 1993, 1996). It may be spreading but it is still very local in a national context, however its status requires reassessment and it should probably regarded as provisionally having notable status rather than red data book rank. Very many specimens have been found under dead sycamore bark in the cemetery, often in hundreds, during the last 16 years, the latest on 24.iv.2007.

Dasytes plumbeus (Muller), a small black flower beetle, family: Melyridae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). A scarce species of rough grassy places, including old chalk pits, railway cuttings, marshland and meadows. One specimen was found by sweeping, 11.vi.2007.

Diplocoelus fagi Guerin-Meneville, a minute brown and grey fungus beetle, family: Biphylidae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). Although regarded as being an ancient woodland indicator species by Harding & Rose (1986), this beetle has also been found fairly frequently in the London area associated with sycamores infected by the sooty bark disease, *Cryptostroma corticale,* and was first noted in this particular microhabitat in Nunhead Cemetery (Jones, 1993).

Dorytomus ictor (Herbst), a small mottled weevil, family: Curculionidae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). A widespread, but very local beetle associated with Italian poplar and probably also black poplar. It is especially associated with large, mature trees, where it can overwinter in crevices and under loose bark. It occurs in several London sites, usually on trees planted in parks and gardens. Specimens have been recorded on several occasions.

Eledona agricola (Herbst), a small black fungus beetle, family: Tenebrionidae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). Known from ancient woodlands in central and southern England and south Wales, this scarce beetle breeds in very dry powdery bracket fungus growing on broad-leaved trees. Many specimens were found in a large rotting bracket fungus attached to a dead standing tree.

Enicmus brevicornis (Mannerheim), a minute black fungus beetle, family: Lathridiidae. Status: nationally scarce (notable, Hyman & Parsons, 1994). Previously considered extremely local, but recently found in abundance in the London area in sycamore logs infected with the sooty bark disease fungus, *Cryptostroma corticale.* Although regarded as an ancient woodland indicator grade 2 by Harding & Rose (1986), this species is now known to be relatively widespread in the London area, where it is associated with sycamores infected with Cryptostroma. It has been found in many hundreds of thousands under the diseased bark of sycamore in Nunhead Cemetery (Jones, 1993).

Hypoponera punctatissima (Roger), a small ant, family: Formicidae. Status: very local. This is thought to be an introduction into the UK, because although it has been recorded here for many years it is usually associated with houses and buildings, offering it shelter to form its small colonies. One specimen was found under bark of a fallen tree, 23.x.1996 (Jones, 1998).

Kalcapion semivittatum Gyllenhal, a minute black weevil, family Apionidae. Status: nationally scarce (notable A, Hyman & Parsons, 1992). This species is found on annual mercury, *Mercurialis annua*, and is more or less confined to south-east England, the Thames Estuary and the Thames Valley, where the plant grows in disturbed places. The plant, and the beetle, are relatively common in south-east London, usually in untended gardens and derelict land. Several specimens were swept from annual mercury, 24.iv.2007.

Lasius brunneus (Latreille), a small brown ant, family: Formicidae. Status: nationally scarce (notable A, Falk, 1991a). A very local timber-living ant centred around central southern England from Essex to Shropshire and the Severn Valley (Edwards, 1998). It is widespread on the outskirts of London in old parks and woods and appears to be spreading. A small colony was found in a small dead elm tree, on 8.vi.2002 (Jones, 2003a).

Lasius fuliginosus (Latreille), a small black ant, family: formicidae. A widespread, but very local species with a complex biology. It is a semi-social parasite of a semi-social parasite, in that it only establishes its colonies in the nests of another ant, Lasius umbratus and its near relatives, which in turn has established its colonies in the nests of the black pavement ant Lasius niger or the yellow meadow ant Lasius flavus. Successful founding of nests is therefore a complex procedure and nests are usually highly localized in the field. A colony was found feeding on aphid honeydew on a sycamore tree on 8.vi.2002 (Jones, 2003a).

Lucanus cervus (Linnaeus), the stag beetle, family: Lucanidae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). Although common and widespread in south-east London, this species is thought to be declining nationally. It breeds in the dead heartwood of broad-leaved trees, especially partly subterranean wood such as old stumps, large logs lying on the soil and old roots. In London it is essentially a garden species. It is surprising that this beetle has not been recorded in Nunhead Cemetery, because it almost certainly occurs in gardens in the neighbouring area. In the early 1990s I was asked to remove a large ‘dangerous’ male from a garden in South Norwood, and, not having access to any other suitable site, released it into Nunhead Cemetery.

Megalonotus antennatus (Schilling), a small mottled ground bug, family: Lygaeidae. Status: nationally scarce (notable, Kirby, 1992). This scarce bug is found in a number of habitat types, but seems to be associated with areas of bare and disturbed soil in warm, sunny and well-drained substrates such as coastal grassland, quarries, chalky and sandy areas. It is mainly a species of south-east England. One specimen was found running on bare ground, 24.iv.2007.

Mordellistena neuwaldeggiana (Panzer), a small skipping flower beetle, family: Mordellidae. Status: nationally rare, but insufficiently known (red data book category K, Hyman & Parsons, 1992). A very local, but probably under-recorded species associated with ancient broad-leaved woodland. Several specimens were found by sweeping, 25.vii.2007.

*Mordellistena variegata (*Fab.), a small skipping flower beetle, family Mordellidae. Status: very local. A species of woodlands in southern and central Britain, where its larvae feed in decaying wood. Although provisionally suggested as warranting nationally scarce status by Hyman (1985), this was not confirmed by Hyman & Parsons (1992). One specimen was swept 25.v.2007.

Ochina ptinoides Marsham, a minute grey woodworm beetle, family Anobiidae. Status: very local. Although widespread in Britain, this beetle is rather uncommon and scarce. It breeds in the dead and dying stems of ivy, *Hedera helix*, and usually only occurs in old woodlands where large ivy stems are available. Several specimens were beaten from ivy, 11.vi.2007, and it has appeared several times during FONC Open Day bug hunts.

Olibrus flavicornis (Sturm), a minute black flower beetle, family: Phalacridae. Status: nationally rare but insufficiently known (red data book status K, Hyman & Parsons, 1992). This beetle is associated with autumn hawkbit *Leontodon autumnalis*, and possibly with other species in that and related genera. The larvae are thought to develop in the flower heads, while the adults feed on pollen. At the time of the national review of beetles (Hyman & Parsons, 1992), this species had not been seen since it was recorded in 1950 from Camber on the East Sussex coast. However, it now occurs, often in large numbers, on brownfield sites in London and the Thames Estuary. Its status needs to be reviewed. Many specimens were swept, 25.vii.2007.

Orchesia undulata Kraatz, a small mottled fungus beetle, family: Melandryidae. Status: very local. A widespread, but rather local species found under the rotten bark of fungoid logs and trees. Originally listed as nationally scarce (notable B) by Hyman (1985), this was not confirmed by Hyman & Parsons (1992). This beetle has been found in the cemetery on several occasions.

Orsillus depressus Dallas, a medium-sized brown 'ground' bug, family: Lygaeidae. Status: very local. Despite its common name, this bug lives on cypress trees, feeding on the fruiting bodies. It is a recent colonist to Britain, having first been discovered here in the 1990s. Although fairly common in some areas, it is still more or less confined to Surrey and the London area. Several specimens were beaten from cypress trees, 24.iv.2007.

Orthochaetes insignis Aubé, a minute brown weevil, family: Curculionidae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). A scarce, secretive, southern and eastern beetle, usually found at the roots of low-growing plants near the coast. One specimen was found by grubbing at plant roots, 11.vi.2007.

Platyderus ruficollis (Mars.), a medium-sized reddish brown ground beetle, family: Carabidae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). This southern and eastern species occurs in dry sandy or chalky places in open situations (Luff, 1998). It has been recorded several times in Nunhead Cemetery.

Psenulus concolor (Dahlbohm), a small black wasp, family: Sphecidae. Status: very local. This rather scarce wasp nests in hollow stems, leaving a store of dead leafhoppers for its brood. One specimen was found by sweeping, 25.vii.2007.

Pyrochroa coccinea (Linnaeus), a large red and black cardinal beetle, family: Pyrochroidae. Status: nationally scarce (notable B, Hyman & Parsons, 1992). A widespread, but rather local beetle, which breeds under the rotten bark of a variety of broad-leaved trees, in England and Wales. Considered an indicator of ancient woodland and pasture woodland (Harding & Rose, 1986). This species has been found during one of the FONC Open Day bug hunts.

Stenus niveus Fauvel, a small black rove beetle, family: Staphylinidae. Status: nationally scarce (notable B, Hyman & Parsons, 1994). A widespread, but locally scattered beetle associated with rough grasslands and marshy places. One specimen was found by sweeping, 24.iv.2007.

Strymonidia w-album Knoch, the white-letter hairstreak, family: Lycaenidae. Status: very local. The white-letter hairstreak is a very secretive butterfly and when Dutch elm disease destroyed so many elm trees in the 1970s, it was feared that this butterfly would suffer a serious decline in its range and abundance. Its caterpillars feed on the developing flower buds, and since elms have to achieve a relatively large size before they flower, loss of most large trees was thought to pose a problem for the insect. However, it has managed to survive by feeding on the leaves, perhaps normally a poor second choice of foodstuff. It has only a scattered distribution in the London area (Plant, 1987). One specimen was seen feeding at buddleja flowers, 17.vii.1994 (Jones, 1997).

Synchita separanda Reitter, a minute brown fungus beetle, family: Colydiidae. Status: nationally rare (red data book category 3, Shirt, 1987; Hyman & Parsons, 1992). A very local species found under the rotten bark of beech, chestnut and sycamore trees. This beetle has been regarded as being an indicator of ancient woodland (Harding & Rose, 1986), it was originally known, in Britain, only from Windsor Forest and Knole Park, until it was found in Peckham in May 1986 (Jones, 1987). Recently, this beetle has been found in several more London localities, associated with the sooty bark disease, a fungus, *Cryptostroma corticale*, of sycamore bark, and was first found in Nunhead Cemetery on 13.vii.1991. It has been regularly recorded since then, albeit infrequently, and the latest record is 11.vi.2007.

Tephritis matricariae (Loew), a small pink and grey picture-winged fly, Diptera: Tephritidae. Status: very local, probably a recent arrival to Britain and spreading. This small fly was first discovered in Britain at Sandwich, Kent, in April 2000. Despite its scientific name, it is not thought to be associated with *Matricaria* in Britain, and has been reared from the flower heads of hawksbeards, *Crepis* species. Over the last couple of years it has been discovered in various other coastal localities in the county and more recently also inland. It has occurred on several London sites (Clemons, 2004). One specimen was swept on 28.viii.2007.

Volucella inanis (Linnaeus), a large black and orange hornet-mimic hoverfly, family: Syrphidae. Status: nationally scarce (notable, Falk, 1991b). Breeds in the nests of social wasps, Vespula species. Although uncommon nationally, this large fly is frequently encountered in London and Surrey and is often seen in gardens at buddleia flowers and the like (Ball & Morris, 2000). It has been found regularly in Nunhead Cemetery, including 25.vii.2007.

Volucella zonaria (Poda), a very large black and orange hornet-mimic hoverfly, family: Syrphidae. Status: nationally scarce (notable, Falk, 1991b). A very local species, the larvae of which scavenge in the nests of social wasps, Vespula species. Although nationally scarce, this fly is fairly widespread and frequently seen in the London area, on which its British distribution appears to be centred (Ball & Morris, 2000). It is regularly seen in Nunhead Cemetery.

DISCUSSION

Nunhead Cemetery is still used for some burials, but by far the largest part of its 52 acres is now managed as a local nature reserve. It is the largest woodland in central London, and is accorded nature conservation value of metropolitan importance (Archer et al., 1989).

The list of 207 insects recorded during this survey is a modest one. This is perhaps a reflection of the limited habitats available in the cemetery. Most of the cemetery comprises woodland or regularly cut grass. There are relatively few areas of rough flowery grassland and now that burials have all but ceased, there are few areas of disturbed ground. And because of the nature of the cemetery (over a quarter of a million human bodies have been interred there), the soil is very nutrient-rich. High plant diversity (and subsequent invertebrate diversity) is usually associated with nutrient-poor soils where it is not possible for a few rank plants like nettles and brambles to become dominant.

Nevertheless, the list of scarce and unusual species given above, shows that the cemetery is an important locality. Eighteen butterflies are recorded and others are likely to occur (Jones, 1997). Twelve ladybirds were found and others are also very likely. Twenty-one hoverflies are listed, but this list should easily be expanded.

Not surprisingly, many of the insects, including a number of the rare and scarce species already commented upon, are associated with woodlands. The woods at Nunhead are not ancient in the sense used to understand the faunas of ancient woodland and pasture woodland. These are usually taken to be areas that have been more or less continuously wooded since 1600. The insects of truly old woods are well known, and studies have concentrated on insects that live all or part of their life cycle in dead, decaying and fungoid wood. A continuous supply of decaying timber has allowed these dead-wood insects (mainly beetles) to survive for many centuries. Even a short break in the availability of dead wood is enough to destroy these invertebrate communities. For most of them, the vital habitat in which they live is completely eradicated if woods are felled and cleared. Even if new trees are planted (plantations), or if scrub and then trees invade (secondary woodland), it takes very many years for falling and cut timber to reach the same level of decay found in ancient woods.

Many of the dead-wood insect species have been used as indicators, because either they only occur in known and documented ancient woods or they are regularly found to be part of the fauna of woods known or thought to be ancient (Harding & Rose, 1986).

A few of these 'ancient woodland' species occur in Nunhead Cemetery. These include the beetles: *Ochina ptinoides, Biphylus lunatus, Diplocoelus fagi, Synchita separanda, Enicmus brevicornis, Abdera biflexuosa, Anisoxya fuscula, Mordellistena neuwaldeggiana, M. variegata, Litargus connexus, Mycetophorus atomarius, M. quadripustulatus, Pyrochroa coccinea* and *Eledona agaricola*. Other typically woodland insects were the leaf beetle *Chrysolina oricalcia*, the soldier fly *Chorisops nagatomii* and the ants *Lasius brunneus* and *L. fuliginosus.* It is clear, however, from old maps that Nunhead Cemetery is not part of some ancient wood system. When it was created, in the 1840s it was surrounded by open fields and market gardens. Nevertheless, some large trees appear to predate the cemetery and may have been incorporated when the cemetery was formed. Surrounding hedges may well have contained some old trees and provided dead timber for these insects to eke out a living.

South-east London is still one of the most wooded parts of the capital, and several wooded open spaces are known to be of ancient origin. Some of these have been surveyed and found to have abundant dead-wood insects; these include Sydenham Hill and Dulwich Woods (Jones, 2002a), Downham Woodland Walk (Jones, 2003b), Beckenham Place Park (Jones, 1995) and Forster Memorial Park (Jones, 2002b). Although Nunhead Cemetery is not an ancient woodland, it is no surprise that many insects associated with ancient woods should have recolonized it since it was laid out in the 19th century.

The woods of Nunhead Cemetery are now dominated by sycamore, often derided by naturalists as being an invasive weed tree. However, at Nunhead, sycamores provide a niche habitat for several of the cemetery's most unusual insects. These are the beetles: *Cicones undatus, Synchita separanda, Enicmus brevicornis* and *Diplocoelus fagi*. Until they were all found, often in abundance, at Nunhead, they were regarded as being very scarce species. *Cicones* was accorded 'endangered' status (red data book category 1) since it was only known from one UK colony, in the ancient pasture woodlands of Windsor Park. *Synchita* was accorded nationally rare status (red data book category 3) because it was only known from Windsor and the equally ancient Knole Park near Sevenoaks. *Enicmus* and *Diplocoelus* were listed as nationally scarce and both were thought to be confined to dead and decaying beech trees. Their appearance at Nunhead coincided with a particular ecological event, one which is still evident here: in the late 1980s and early 1990s, sycamores in Nunhead Cemetery were attacked by sooty bark disease, a fungus, *Cryptostroma corticale*. It takes its common name from the thick layer of black soot-like spores that develops under the dead and pealing bark.

This fungus was first found on a felled sugar maple trunk, in Canada, in 1889, where it was growing as a harmless saprophyte (dead-wood feeder). It first appeared in Britain in 1945, growing (again harmlessly) on a dead and broken sycamore tree in Wanstead Park, north-east London. But within three years it had transformed its growing patterns and was now a virulent disease, killing sycamore trees through the park (Young, 1952). It continued to spread in the London area and its attacks have been linked to hot dry weather causing water stress to the trees (Dickenson & Wheeler, 1981). It is not clear exactly when it arrived in Nunhead, but by 1991 there were enough dead standing sycamore trunks to attract the attentions of a local entomologist (Jones, 1993), and it was not long before these and other beetles were found to be widespread and abundant in the cemetery.

The fungal disease still appears throughout the cemetery, because the sycamore trunks are so many. It attacks especially small to medium-sized trunks, between 10 and 30 cm diameter. This is thought to be because these are the specimens most susceptible to water stress: smaller trees requiring less water and larger trees having deeper and better developed roots.

Since the observations in Nunhead Cemetery were published (Jones, 1993, 1996), Cicones undatus appears to have spread and has been widely, if sporadically, recorded from southern England and East Anglia. However, nowhere does it seem to be found in such numbers as at Nunhead where many hundreds have been discovered under the flaking bark of even small trees. Synchita separanda remains an enigmatic species and most published records are from south-east London. Enicmus brevicornis and Diplocoelus fagi were always known to be fairly widespread, but again there are few published records of its occurrence under dead sycamore bark and it is still regarded by most entomologists as being a scarce insects found under fungoid bark in old or ancient woodlands.

There is something special about the dead sycamores of Nunhead Cemetery. It may be a combination of the facts that the cemetery is now the largest secondary woodland in central London and that London is rather warm and dry compared to the surrounding countryside. It may also be something to do with the fact that it has also received more than its fair share of entomological attention from a local resident.

CONCLUSION

Although the total species list for Nunhead Cemetery is only a modest 207 species, a large number of nationally scarce and unusual insects were found. The cemetery is justifiably accorded the status of metropolitan importance for nature conservation.

REFERENCES

Archer, J., Britton, B., Burley, R., Hare, T. & Yarham, I. 1989. *Nature conservation in Southwark*. London: London Ecology Unit.

Ball, S.G. & Morris, R.K.A. 2000. *Provisional atlas of British hoverflies (Diptera, Syrphidae).* Abbots Ripton: Biological Records Centre.

Clemons, L. 2004. A provisional atlas of the Tephritidae (Diptera) of Britain and Ireland. Version 2. *British Tephritidae Newsletter* **8:** 1-25.

Dickenson, S. & Wheeler, B.E.J. 1981. Effects of temperature, and water stress in sycamore, on growth of Cryptostroma corticale. *Transactions of the British Mycelogical Society* **76:** 181-185.

Edwards, R. 1998. *Provisional atlas of the aculeate Hymenoptera of Britain and Ireland. Part 2*. Abbots Ripton: Biological Records Centre.

Falk, S. 1991a. *A review of the scarce and threatened bees, wasps and ants of Great Britain.* Peterborough: Nature Conservancy Council.

Falk, S. 1991b. *A review of the scarce and threatened flies of Great Britain (part 1).* Peterborough: Nature Conservancy Council.

Harding, P.T. & Rose, F. 1986. *Pasture-woodlands in lowland Britain: a review of their importance for wildlife conservation*. Abbots Ripton: Institute of Terrestrial Ecology.

Hyman, P.S. 1985. *A provisional review of the status of British Coleoptera.* Invertebrate Site Register Report Number 60. Peterborough: Nature Conservancy Council.

Hyman, P.S. & Parsons, M.S. 1992. *A review of the scarce and threatened Coleoptera of Great Britain. Part 1.* Peterborough: Joint Nature Conservation Committee.

Hyman, P.S. & Parsons, M.S. 1994. *A review of the scarce and threatened Coleoptera of Great Britain. Part 2.* Peterborough: Joint Nature Conservation Committee.

Jones, R.A. 1987. *Synchita separanda* Reitter — a third British locality. *Entomologist's Record and Journal of Variation* **99:** 43-44.

Jones, R.A. 1993. Sycamore: an underrated pabulum for insects and some beetles associated with. *Entomologist's Record and Journal of Variation* **105:** 1-10.

Jones, R.A. 1995. *Beckenham Place Park: a preliminary invertebrate survey.* Unpublished report for London Borough of Lewisham.

Jones, R.A. 1996. *Cicones undata* Guer.-Men. (Coleoptera: Colydiidae) still common under sycamore bark in South East London. *British Journal of Entomology and Natural History* **9:** 91-92.

Jones, R.A. 1997. *The butterflies of Nunhead Cemetery. A visitor's guide to the many species likely to be seen in this beautiful Victorian cemetery*. London: Friends of Nunhead Cemetery.

Jones, R.A. 1998. *Hypoponera punctatissima* (Roger) (Hymenoptera: Formicidae) in south-east London. *British Journal of Entomology and Natural History* **10:** 256,

Jones, R.A. 2001. *Athous campyloides* (Elateridae) widespread in urban South London and a note on its spread in England. *The Coleopterist* **10:** 23-24.

Jones, R.A. 2002a. The beetles and other invertebrates of Sydenham Hill and Dulwich Woods — indicators of ancient woodland. *London Naturalist* **81:** 87-106.

Jones, R.A. 2002b. *Forster Memorial Park: an ancient woodland relic in Catford*. Unpublished report for London Ecology Unit.

Jones, R.A. 2003. Two uncommon ants (Hym.: Formicidae) in urban London. *Entomologist's Record and Journal of Variation* **115:** 28.

Jones, R.A. 2003. The beetles of Downham Woodland Walk — little more than a farm track, or an ancient woodland. *London Naturalist* **82:** 161-172.

Jones, R.A. & Hodge, P.J. 1999. Notes on the occurrence of the planthoppers *Reptalus panzeri* (Loew) (Hemiptera: Cixiidae) and *Asiraca clavicornis* (Fab.) (Hemiptera: Delphacidae). *British Journal of Entomology and Natural History* **12:** 239-240.

Kirby, P. 1992. *A review of the scarce and threatened Hemiptera of Great Britain*. Peterborough: Joint Nature Conservation Committee.

Luff, M.L. 1998. *Provisional atlas of the ground beetles (Coleoptera, Carabidae) of Britain*. Abbots Ripton: Biological Records Centre.

Mendel, H. & Clarke, R.E. 1996. *Provisional atlas of the click beetles (Coleoptera: Elateroidea) of Britain and Ireland*. Ipswich: Ipswich Borough Council Museums.

Plant, C.W. 1987. *The butterflies of the London area*. London: London Natural History Society.

Shirt, D.B. (ed.) 1987. *British red data books: 2. Insects.* Peterborough: Nature Conservancy Council.

Young, C.W.T. 1952. *Sooty bark disease of sycamore*. Arboricultural Leaflet 3. London: HMSO.