NATURE
CONSERVANCY
COUNCIL

# British Red Data Books:
# 2. Insects

Edited by D. B. Shirt

Co-ordinated by
the Insect Red Data Book Committees
in collaboration with
the Institute of Terrestrial Ecology (NERC)
the International Union for Conservation of Nature and Natural Resources
the Joint Committee for the Conservation of British Insects
the Nature Conservancy Council and
the Royal Society for Nature Conservation

1987

# HYMENOPTERA: PARASITICA

## The Parasitic Wasps

Although accounting for about a quarter of our insect fauna (with about 5600 species), the parasitic Hymenoptera are among the least understood insects in Britain and, at a time when the ecology – and indeed taxonomy – of so many remains obscure, it is difficult to single out the species and groups whose populations are most at risk. Impressions of declining abundance or distribution can only be sought in the most conspicuous or striking groups, since only these have been even moderately well collected and identified over the years. Among the Ichneumonidae belonging in this category a continuous decline of many species appears to have taken place this century, to the point at which several species common in old collections are now rarely or no longer encountered in the field. Examples include many of the larger Ichneumoninae (e.g. some *Amblyteles* and *Callajoppa* species), some *Banchus* species (notably *B. falcatorius* (F.)), and *Metopius dentatus* (F.): in these cases the host species (if known) have remained more or less abundant to the present day. Presumably similar declines have taken place among the less conspicuous species as well, and it is clear that parasitic Hymenoptera in general will tend to be especially vulnerable to changes and instabilities in the environment because of their extreme trophic positions. Although no hard data demonstrating these declines in Britain are available, Thirion (1976, 1981) has analysed the history of distribution and abundance of many Ichneumoninae in Belgium and shown that numerous striking declines have apparently taken place, particularly in the 30 years after 1950.

Those parasitic Hymenoptera which are effectively or locally host-specific, as many are, tend to be considerably less abundant than the insect species they parasitise. It follows that any recession, whether numerical or spatial, in the host population would be expected to have a corresponding or even greater impact on the associated parasitic Hymenoptera, some of which will be unable to compensate by attacking alternative hosts. Thus all parasites known to be dependent on restricted or declining hosts should be treated as at risk. These include the ichneumonids *Trogus lapidator* (F.) (parasitic on the Swallowtail *Papilio machaon* L.), *Cotiheresiarches* (=*Zimmeria*) *dirus* (Wesmael) (on the Small Eggar *Eriogaster lanestris* (L.)), and *Lissonota setosa* (Geoffroy) (on the Goat Moth *Cossus cossus* (L.)). Similarly, within the context of habitat destruction, parasitic Hymenoptera always occupy a particularly precarious position. The widespread pollution or draining of ponds, for example, will threaten parasites such as the already rare *Chalcis* species (Chalcididae) even more acutely than their hosts, flies of the genus *Stratiomys*.

Many parasitic Hymenoptera have been collected on only one or two occasions in Britain but, in view of our ignorance of their origins and host associations and the paucity of collectors, it is probably advisable to ignore all of these as candidate species until ecological knowledge enables surveys to be made with respect to their host populations. One example of a rare oligophagous parasite of abundant, widespread and often-collected hosts is the braconid *Rogas pulchripes* (Wesmael), which attacks the Grey Dagger moth *Acronicta psi* (L.) and related species, but

has been found in Britain only at Chat Moss (near Manchester). In general, however, there is rarely sufficient information to apportion species found only once or twice in Britain to categories reflecting their true distribution and abundance.

M. R. Shaw

# HYMENOPTERA: ACULEATA

## The Ants, Bees and Wasps

The aculeate Hymenoptera number some 580 species in Britain, and, with the Parasitica, constitute the suborder Apocrita. They have not had a great following in the past, perhaps due in part to the lack of adequate identification guides (though the situation is improving). Many people are familiar with the social ants, bees and wasps, including bumblebees and honeybees, but most aculeates are solitary species whose presence attracts little attention. Many of them are economically important as pollinators or predators, and they are of great interest to the biologist in view of their advanced behaviour patterns and wide variety of life cycles. There are many examples of parasitism and 'cuckoo' relationships (brood parasites), 'cuckoo' species being specifically dependent upon a host species which may itself be rare.

The Red Data Book includes 37 Endangered, 12 Vulnerable and 97 Rare species. At least eight of the Endangered species are believed to be extinct, and a further 18 species are listed in the Appendix (extinct before 1900). The total number listed is 164, representing 28% of the British aculeate fauna – the highest proportion of threatened species in any group. This is due to the precise habitat requirements of many species, which make them very sensitive to environmental change, and the low population levels at which they normally occur.

Suitable nesting sites are the first requirement, many species favouring sunny banks on dry sandy soils for the excavation of their burrows. Others nest above ground, burrowing in dead wood and other plant material or in old walls. Threats to nesting sites include the loss of bare banks and tracks, excessive trampling (though a limited amount may be necessary), the removal of dead wood and too frequent cutting of bramble. All species are dependent to varying degrees on flowers for nectar or pollen, and the habitat requirements for nesting and for food gathering are often very different. Food resources are threatened by the mowing, over-grazing and spraying of herbage, and by the removal and cutting of flowering shrubs. Many species require a specific prey or host, and any threats to it pose an even more serious threat to the predator or parasite. Finally, the Hymenoptera appear to be more susceptible than most insects to the use of toxic sprays by gardeners and farmers.

An introduction and key to the families of Hymenoptera are included in the RESL's series of *Handbooks* (Richards, 1977). When the two titles under preparation (the spider wasps and the bees) are completed, all the aculeates will have been covered in this series. Unfortunately there is no general book on the group currently in print, though *Bees, ants and wasps. The British aculeates* (Willmer, 1985) in the Field Studies Council's AIDGAP series facilitates the identification of all genera occurring in Britain. Books by Spradbery on *Wasps* (1973), Brian on *Ants* (1977) and Alford on *Bumblebees* (1975) are also out of print. The Naturalists' Handbooks series includes an identification guide to *Solitary wasps* (Yeo & Corbet, 1983). NCC has published a booklet on *The conservation of bees and wasps* (Else, Felton & Stubbs, 1978).

There is an Aculeate Recording Scheme organised by one of the authors of these data sheets. Provisional distribution atlases have been published on the ants (Barrett, 1979) and the social wasps (Archer, 1979), and there is an *Atlas of the bumblebees of the British Isles* (Anon., 1980).

## Omalus truncatus

A ruby-tailed wasp — **ENDANGERED**

Order **Hymenoptera** — Family **Chrysididae**

*Omalus* (*Chrysellampus*) *truncatus* (Dahlbom, 1831).

**Identification** Morgan (1984), p.15.

**Distribution** Only a few old records from Kent, Dorset, Gloucestershire (or Somerset?), Berkshire, Surrey, London and Essex.

**Habitat and ecology** A specimen has been observed exploring the cavities in the stem of a rose *Rosa*; otherwise nothing is known about the life-history of this wasp. The host is apparently unknown. It flies in June.

**Status** The most recent example was collected in 1910.

**Authors** G. R. Else and G. M. Spooner, using information from Spooner (1954).

## Chrysis fulgida

A ruby-tailed wasp — **ENDANGERED**

Order **Hymenoptera** — Family **Chrysididae**

*Chrysis* (*Chrysis*) *fulgida* L., 1761.

**Identification** Morgan (1984), p.21.

**Distribution** Very rare: there are no recent records. Kent to Devon, Hereford & Worcester, Berkshire, Surrey and Cambridgeshire (Wicken, June 1906, where it occurred in some numbers: over twenty collected by Nevinson (1916)).

**Habitat and ecology** Little information is available. Has been reared from a nest of the wasp *Odynerus spinipes* (L.). Presumed hosts include the bee *Osmia leaiana* (Kirby) and possibly the wasp *Trypoxylon figulus* (L.). Flies in June and July.

**Status** The last records were in 1929 at Portland, Dorset (G. M. Spooner), and in 1941 south of Bere Regis, Dorset (H. L. Andrewes).

**Authors** G. R. Else and G. M. Spooner.

## Chrysogona gracillima

A ruby-tailed wasp — **VULNERABLE**

Order **Hymenoptera** — Family **Chrysididae**

*Chrysogona gracillima* (Foerster, 1853), formerly known as *Chrysis gracillima*.

**Identification** Morgan (1984), p.20, figs 18, 23, 80 and 81.

**Distribution** In Britain known only from four sites: Yalding, Kent, 1977, G. W. Allen; Midhurst, West Sussex (two sites), 1982-84, M. Edwards; Winchester, Hampshire, 1984, G. R. Else.

**Habitat and ecology** The first British specimen was fished out of a dyke in Kent in 1977. Five years later in 1982, and again in 1983, further examples were collected in West Sussex from a wooden post which contained nests of the sphecid wasps *Trypoxylon clavicerum* Lepeletier and *Psenulus pallipes* (Panzer), both possible hosts. In 1984 two specimens were collected from a dead tree near Winchester, and two more in a Malaise trap near Midhurst. In Europe the species has been reared from a bramble *Rubus* stem. Small eumenid and sphecid wasps and megachilid bees (e.g. *Osmia* species) are all possible hosts in Britain. It flies in July and August.

**Status** It seems reasonable to assume that the wasp is probably more widely distributed in southern England.

**Authors** G. R. Else and G. M. Spooner.

## Chrysura hirsuta

A ruby-tailed wasp — **VULNERABLE**

Order **Hymenoptera** — Family **Chrysididae**

*Chrysura hirsuta* (Gerstaecker, 1869), formerly known as *Chrysis* (*Chrysogona*) *hirsuta*.

**Identification** Morgan (1984), p.19, figs 85 and 88.

**Distribution** Restricted to Scotland, where it has been recorded from the central Grampian Highlands (Speyside in Highland Region, and one or two sites near Blair Atholl, Perth, Tayside Region). Two specimens have also been collected in Dumfries & Galloway (Whithorn, 16 May 1973, A. B. Duncan).

**Habitat and ecology** The special cleptoparasite of the mason bee *Osmia inermis* (Zetterstedt) and possibly *O. parietina* Curtis. Very rare and local, confined to a few sites on open upland base-rich soils in Scotland. The wasp larva apparently attacks and devours the host larva before spinning its own cocoon within that of the bee (Morgan, 1984).

**Threats** Destruction of habitat, especially by afforestation on upland sites between 350 and 400m.

**Authors** G. R. Else and G. M. Spooner.

## Formica pratensis

A wood ant — **ENDANGERED**

Order **Hymenoptera** — Family **Formicidae**

*Formica pratensis* Retzius *in* Degeer, 1783.

**Identification** Bolton & Collingwood (1975), pp.7, 11 and 15.

**Distribution** This species has always been a great rarity in Britain and is now almost extinct, being represented by perhaps less than half a dozen nests near Wareham, Dorset, e.g. on Morden and Gore Heaths. For map see Barrett (1979), map 39.

**Habitat and ecology** Dry heathland. Nests are usually isolated, not occurring in groups, and have a single or very few queens. Winged queens and males are developed in the nests both in early summer and later in August-September.

**Status** Last seen in 1975 on Gore Heath by G. M. Spooner.

**Threats** The destruction of nests or nest habitat. In Britain this species is clearly on the very edge of its range and it is possible that adverse climatic changes may be the most significant threat.

**Conservation** Morden Bog NNR lies between Morden and Gore Heaths. *F. pratensis* is among the *Formica* species listed as Vulnerable in the IUCN Red Data Book (Wells, Pyle & Collins, 1983).

**Authors** G. R. Else and G. M. Spooner.

## Formica transkaucasica

A wood ant — **ENDANGERED**

Order **Hymenoptera** — Family **Formicidae**

*Formica transkaucasica* Nasonov, 1889.

**Identification** Bolton & Collingwood (1975), pp.6, 11 and 15.

**Distribution** A very rare species found only in the New Forest, Hampshire (e.g. Matley and Ridley Bogs, Picket Plain), and near Wareham, Dorset (e.g. Morden Bog and Hartland Moor). There is an old record for the Isle of Wight. For map see Barrett (1979), map 48.

**Habitat and ecology** A shining black ant confined to a few *Sphagnum* bogs. Colonies usually have a single queen and the nest, which is sometimes found in the very wettest parts of the bog, is built up in the form of a small, conical dome of fine grassy fragments in grass tussocks (e.g. purple moor-grass *Molinia caerulea*).

**Threats** Drainage of wetland habitat. In dry years the species may not be seen.

**Conservation** Morden Bog and Hartland Moor are NNRs.

**Authors** G. R. Else and G. M. Spooner, using additional information from Collingwood (1954).

## Arachnospila rufa

A spider wasp **ENDANGERED**

Order **Hymenoptera** Family **Pompilidae**

*Arachnospila* (*Arachnospila*) *rufa* (Haupt, 1927), formerly known as *Pompilus* or *Psammochares rufus*.

**Identification** Wolf (1972), pp.91-108, figs 236, 240 and 278; Day (in preparation).

**Distribution** South-east Dorset: Gore Heath, north of Wareham, a fresh male and female on a bank, 15 June 1934, G. M. Spooner (Spooner, 1937); Sherford Bridge (on the north-west boundary of Gore Heath), male at *Angelica* blossom, 15 September 1938, G. M. Spooner (unpublished; specimens housed in Spooner's collection). It is widely distributed and rather common on the Continent including the Channel Islands (Jersey).

**Habitat and ecology** Heathland, from June to September. On the Continent the wasp is reported as occurring in sandy localities, frequenting banks and cuttings where there are suitable exposures of sand. A noteworthy peculiarity is its habit of reoccupying old burrows, the females apparently returning to those from which they have emerged. Prey consists mainly of spiders of the families Lycosidae and Drassidae, but also Attidae, Clubionidae and Salticidae (Richards & Hamm, 1939; Spooner, 1937). The nesting behaviour is described in some detail by Richards & Hamm (1939). A selection of photographs illustrating prey capture and nest provisioning is provided by Olberg (1959, pp.154-163).

**Status** It is perhaps worth noting that the above specimens were collected close to a stretch of ground colonised by the eumenid wasp *Pseudepipona herrichii* (Saussure), a Vulnerable species which also has a southern range and which in Britain is confined to the heaths of south-east Dorset.

**Threats** Much of Gore Heath has become a conifer plantation since Spooner's captures; only a small portion of the southern area remains open heathland.

**Authors** G. R. Else and G. M. Spooner.

## Evagetes pectinipes

A spider wasp — **ENDANGERED**

Order **Hymenoptera** — Family **Pompilidae**

*Evagetes pectinipes* (L., 1758), a name formerly used incorrectly in Britain for *E. crassicornis* (Shuckard).

**Identification** Wolf (1972), pp.137-147, figs 372, 382 and 407; Day (in preparation).

**Distribution** Occurs only in east Kent on the Deal-Sandwich dunes, where it was first collected by K. M. Guichard in 1966 (Day, 1979, p.14).

**Habitat and ecology** Coastal sand dunes. Occasionally observed on umbellifer blossoms. A cleptoparasite, probably of the pompilid wasp *Episyron rufipes* (L.). Little is known about its biology, but no doubt it is very similar to that of *E. crassicornis* (Shuckard) (for details see Richards & Hamm, 1939, pp.88-89). Flies in July.

**Status** Possibly a recent introduction, but apparently well-established. Several were recorded in 1975-81.

**Threats** Destruction of the habitat (which includes the Royal Cinque Ports Golf Links).

**Authors** G. R. Else and G. M. Spooner.

## Homonotus sanguinolentus

A spider wasp — **ENDANGERED**

Order **Hymenoptera** — Family **Pompilidae**

*Homonotus sanguinolentus* (F., 1793), formerly known as *Pompilus* or *Wesmaelinius sanguinolentus*.

**Identification** Wolf (1972), pp.87-89, figs 211-213; Day (in preparation).

**Distribution** Rare, recorded from only a very few localities in Dorset, Hampshire and Surrey. The most recent record seems to be a male swept from roadside flowers at Tadnall Heath, Dorset, on 4 August 1962 by G. M. Spooner.

**Habitat and ecology** Heathland and perhaps open woodland in southern England. On the Continent this pompilid attacks females of the spider *Cheiracanthium erraticum* (Walck) in their leaf-roll nests in grass (Richards & Hamm, 1939, pp.105-106). There have been no rearing records from Britain.

**Status** If searched for in the right way and reared it might prove to be commoner than is generally supposed. For example, in France in early August 1934 and 1935, Maneval (1936) found that four-fifths of the spider nests contained early stages of *Homonotus*, but only one wasp was seen (Richards & Hamm, 1939).

**Threats** The loss of heathland habitat.

**Authors** G. R. Else and G. M. Spooner, using additional information from Champion, Champion & Morice (1914), Champion (1915), and Saunders (1900).

## Ceropales variegata

A spider wasp **ENDANGERED**

Order **Hymenoptera** Family **Pompilidae**

*Ceropales variegata* (F., 1798).

**Identification** Wolf (1972), pp.165-168, fig. 476; Day (in preparation).

**Distribution** Rare. Recorded at irregular intervals from a few sites in Surrey, Hampshire and Dorset.

**Habitat and ecology** Heathland in southern England. Specimens have been found flying round or under small pines (Richards & Hamm, 1939), visiting *Angelica* blossom, and have been swept from heather (*Calluna* and *Erica*) and bog myrtle *Myrica gale*. Nothing has been recorded of its life-history (Richards & Hamm, 1939), but it is probably another cleptoparasite like its relative *C. maculata* (F.). In this subfamily (Ceropalinae) the females oviposit in the lung books of spiders which have already been paralysed and are in the course of being dragged along the ground by females of other pompilid genera (Richards & Hamm, 1939, p.55). It flies in July-August.

**Status** The most recent record appears to be a Dorset specimen collected in 1955.

**Threats** The loss of vulnerable heathland habitat.

**Authors** G. R. Else and G. M. Spooner.

## Pseudepipona herrichii

A mason wasp — **VULNERABLE**

Order **Hymenoptera** — Family **Eumenidae**

*Pseudepipona herrichii* (Saussure, 1856), formerly known as *Odynerus* (*Lionotus*) *herrichii* or *O. basalis* Smith.

**Identification** Richards (1980), p.23 and fig. 28.

**Distribution** A very rare and attractive speciality of heathland in south-east Dorset – on the Isle of Purbeck between Wareham and Studland, and a little to the north of Wareham (Gore Heath). The first British example was collected on Stoborough Heath in 1868 and the species continues to survive on Purbeck, although it remains extremely local and elusive.

**Habitat and ecology** Dry, open, sandy heathland. The life-history is described in detail by Mortimer (1908b) and Spooner (1934). The wasp is gregarious, occurring in rather compact colonies. Females excavate shallow nest burrows and provision the cells with green tortricid moth larvae extracted from webs in heather. G. R. Else and M. Edwards found the species nesting extensively on mounds of sand and clay spoil with a sparse covering of heather (*Erica* and *Calluna*). The nest burrows were flush with the surrounding soil, and one nest excavated consisted of vacated cells of the bee *Heliophila* (=*Anthophora*) *bimaculata* (Panzer), one cell being provisioned with 3-4 immobilised larvae. The flight period is a short one, lasting from mid or late June to late July (rarely early August).

**Status** A few colonies have been discovered by G. M. Spooner and K. White in recent years. G. R. Else and M. Edwards found the species in profusion on Godlingston Heath on 24 June 1984, the season being an excellent one for eumenid wasps.

**Threats** The east Dorset heathlands have been experiencing a variety of detrimental exploitation this century ranging from changes in land use (e.g. coniferous afforestation, building developments) to, in recent years, exploration for gas and oil and the extraction of ball clay. Pressures of this kind are bound adversely to affect the populations of such a rare insect. Heathland fires are an annual hazard (Hartland Moor NNR was almost entirely destroyed in 1976), particularly as the provisioned cells are constructed just beneath the surface of the soil. Recently one site on Stoborough Heath was destroyed, probably by the activities of motorcyclists "dirt-tracking" over the nesting site.

**Conservation** Studland Heath and Godlingston Heath are NNRs.

**Authors** G. R. Else and G. M. Spooner, using additional information from Haines (1934).

## Odynerus reniformis

A mason wasp — **ENDANGERED +**

Order **Hymenoptera** — Family **Eumenidae**

*Odynerus* (*Spinicoxa*) *reniformis* (Gmelin *in* L., 1790).

**Identification** Richards (1980), p.22 and fig. 35.

**Distribution** Always a rarity since its discovery in Britain by Saunders in 1876 (Saunders, 1876). Surrey (Billups, 1884; Morice, 1906; Saunders, 1876, 1887); Hampshire (Arnold, 1905; Jones, 1925-26). Apart from Morice's colony – c. 50 nest entrance tubes in 1906 – specimens have been encountered in very small numbers. Jones (1925-26), however, reported that in the New Forest the species is local, but not very uncommon: the evidence for this statement is lacking.

**Habitat and ecology** Small and very local colonies on heathland in southern England (also, once, on a railway embankment); usually on level ground, but once in the walls of a ruined cottage (Morice, 1906). Tends to be gregarious, each nest entrance characteristically surmounted by a vertical, slightly curved tubular chimney constructed from excavated spoil. The dimensions of these are about 20mm long x 4mm broad. Their purpose is not fully understood. The cells are provisioned with paralysed moth larvae (e.g. 33 small noctuid larvae in one cell (Billups, 1884)). Flies from late June (exceptionally late May) to mid July, rarely August.

**Status** The reason for the abrupt decline is unknown. There have been no records since about 1915.

**Authors** G. R. Else and G. M. Spooner.

## Odynerus simillimus

A mason wasp — **ENDANGERED +**

Order **Hymenoptera** — Family **Eumenidae**

*Odynerus* (*Spinicoxa*) *simillimus* Morawitz, 1867.

**Identification** Richards (1980), pp.22-23 and fig. 36.

**Distribution** Essex: Colchester, 1901-1902, W. H. & B. S. Harwood (Saunders, 1903). Some specimens in museums were also collected in 1892, 1898 and 1905. The species was described from Russian material and is also rare on the Continent (Richards, 1980).

**Habitat and ecology** Adults have been collected from flowers by a ditch on the marshes near Colchester (Saunders, 1903). Nothing seems to be known about its life history, but it almost certainly nests in the soil. Flies in July.

**Status** There have been no records since about 1905.

**Threats** Possibly loss of habitat.

**Authors** G. R. Else and G. M. Spooner.

## Miscophus ater

A digger wasp — **VULNERABLE**

Order **Hymenoptera** — Family **Sphecidae**

*Miscophus ater* Lepeletier, 1845, formerly known as *M. maritimus* Smith, 1858.

**Identification** Richards (1980), p.38 and figs 167-168.

**Distribution** F. Smith first discovered this species on the Deal dunes (east Kent) in early August 1856 (Smith, 1858, pp.91-92). The species remains firmly established on these dunes and north to Sandwich. It also occurs on the Camber dunes, East Sussex (M. Edwards and G. H. L. Dicker, pers. comm.), where O. W. Richards first collected it in 1945.

**Habitat and ecology** Coastal sand dunes. The females nest in the soil and provision their cells with small spiders. A small, active, and easily overlooked wasp.

**Status** Another Deal speciality (see *Evagetes pectinipes* (L.), Endangered).

**Threats** Adverse development of the dunes and possible inundation by seawater during winter gales (as has happened recently).

**Authors** G. R. Else and G. M. Spooner.

## Crossocerus vagabundus

A digger wasp — **ENDANGERED**

Order **Hymenoptera** — Family **Sphecidae**

*Crossocerus* (*Acanthocrabro*) *vagabundus* (Panzer, 1798).

**Identification** Richards (1980), p.47 and figs 95 and 97.

**Distribution** Formerly widespread throughout much of southern England as far north as Leicestershire and Nottinghamshire.

**Habitat and ecology** Nests are constructed in rotten wood, the wasp making use of old beetle galleries; galleries may be branched or straight. The prey normally consists of tipulid flies, which are stored after their legs have been amputated (Hamm & Richards, 1926, p.316; Lomholdt, 1975-76). The wasp flies from May to July.

**Status** Within the zone described above the species has rarely been common. The absence of records for the past thirty years indicates a serious decline or possible extinction.

**Authors** G. R. Else and G. M. Spooner.

## Rhopalum gracile

A digger wasp — **VULNERABLE**

Order **Hymenoptera** — Family **Sphecidae**

*Rhopalum* (*Corynopus*) *gracile* Wesmael, 1852, formerly known as *Crabro kiesenwetteri* Morawitz.

**Identification** Richards (1980), p.57 and figs 155-156.

**Distribution** First recorded by C. G. Nurse at Ampton, Suffolk (two males, three females), June 1912, and at West Stow, Suffolk, June and August 1912 (Nurse, 1913). Other records include: Suffolk, Barton Mills, one female, 9 August 1901, A. H. Hamm Collection; Cambridgeshire, Wicken Fen, 1898 to 1973, and old records for Chippenham Fen (J. Field, pers. comm.).

**Habitat and ecology** Restricted to two or three fenland localities in East Anglia where it remains very scarce. Females in Wicken Fen have been taken at *Angelica* blossom. The Ampton site was a swampy spot, on the bank of the River Lark, covered with reeds and rushes (*Phragmites* and *Juncus*), and studded with old sallows *Salix* and alders *Alnus*. The wasp nests in stems and (in Japan) preys on Psocoptera and Diptera (Richards, 1980).

**Status** This species appears to belong to the 'Rhine-basin' element of our fauna, which also contains such aculeates as *Hylaeus pectoralis* Foerster and *Passaloecus clypealis* Faester (a Vulnerable species).

**Threats** The drainage of wetland habitat.

**Conservation** Wicken Fen is National Trust property, where current management of the carr vegetation appears to be benefiting the species. Countermeasures are necessary to safeguard the few remaining sites in the East Anglian fens where the species occurs or may occur.

**Authors** G. R. Else and G. M. Spooner.

## Psen atratinus

A digger wasp — **VULNERABLE**

Order **Hymenoptera** — Family **Sphecidae**

*Psen* (*Mimumesa*) *atratinus* (Morawitz, 1891).

**Identification** Richards (1980), p.62 and fig. 175.

**Distribution** At present known only from four sites on the southern coast of the Isle of Wight: Whale Chine, Blackgang Chine, Ventnor, and cliffs at Luccombe.

**Habitat and ecology** Confined to wet flushes at the base of clay cliffs or on landslips. The species associates in two sites with *P. unicolor* (Vander Linden) and in suitable weather both species frequently alight on the leaves of coltsfoot *Tussilago farfara* or fly amongst reeds *Phragmites*. Nests have not been found in Britain, but on the Continent the species has been described as nesting in dry, decayed wood, often in vacated insect burrows. This commodity is scarce in the Isle of Wight sites and it seems likely that females nest in dead *Phragmites* stems. Continental prey records involve nymphs of small cicadas (Issidae) (Lomholdt, 1975-76). The flight period extends from June-August.

**Status** The first British specimen was collected by O. W. Richards on 7 August 1950. In 1980-82 the species was locally common at two sites.

**Threats** Coastal subsidence probably destroys some nests, but otherwise the species does not appear to be at risk. Coastal defences could also jeopardise sites.

**Conservation** The Luccombe cliffs are owned by the National Trust.

**Authors** G. R. Else and G. M. Spooner.

## Passaloecus clypealis

A digger wasp — **VULNERABLE**

Order **Hymenoptera** — Family **Sphecidae**

*Passaloecus clypealis* Faester, 1947.

**Identification** Richards (1980), p.72.

**Distribution** Very rare. Cambridgeshire: Wicken Fen (c. 1899, 1929, 1936) (Yarrow, 1970), Chippenham Fen, 1983 (J. Field, pers. comm.). Norfolk: Strumpshaw Reserve, 28 July 1980, A. Irwin. Essex: Benfleet, one female about *Phragmites* in ditch, 1 August 1971, P. J. Chandler. Kent: Higham (on the edge of the North Kent Marshes), three females reared from old *Lipara* galls, June 1978, G. H. L. Dicker; Burham (on the Medway), female reared from *Lipara* gall, June 1978,

G. H. L. Dicker (Dicker, 1979); Swanscombe, 1 July 1983, and Wouldham, 28 July 1983, G. H. L. Dicker.

**Habitat and ecology** Fens and ditches. Has been reared from vacated galls of the fly *Lipara lucens* Meigen. Lomholdt (1975-76) reports that nests have been found in stems of honeysuckle *Lonicera* and reed *Phragmites*. Flies from June-August.

**Status** Rare throughout Europe.

**Threats** The drainage of suitable wetlands. The North Kent Marshes are currently threatened by drainage in order that parts at least can be developed for cultivation and building (e.g. oil refinery at Cliffe).

**Conservation** Chippenham Fen is an NNR, and Wicken Fen is owned and managed by the National Trust.

**Authors** G. R. Else and G. M. Spooner.

## Mellinus crabroneus

A digger wasp — **ENDANGERED +**

Order **Hymenoptera** — Family **Sphecidae**

*Mellinus crabroneus* (Thunberg, 1791), formerly known as *M. sabulosa* (F.).

**Identification** Richards (1980), pp.77-78 and fig. 217.

**Distribution** Formerly widely distributed and locally common in good years. It has been recorded from Hampshire, the Isle of Wight, Dorset, Cornwall, Berkshire, Oxfordshire, Surrey, Suffolk, Norfolk, Lincolnshire, Nottinghamshire, Humberside, Tyne & Wear, Cumbria, West and Mid Glamorgan, Dyfed and Gwynedd. There has been no record for over thirty years.

**Habitat and ecology** Nests in burrows in the ground and provisions its cells with paralysed Diptera (Hamm & Richards, 1930, p.101; Lomholdt, 1975-76). Specimens have been observed visiting *Angelica* and wild carrot *Daucus carota* blossom, and males have been seen in great numbers running on the leaves of coltsfoot *Tussilago farfara* (Smith, 1858, pp.114-116). The species flies from July to early September.

**Status** Declined rapidly after the mid-1920s. The cause of the decline remains unknown and it is possible that it may now be extinct as a British species.

**Authors** G. R. Else and G. M. Spooner.

## Cerceris quadricincta

A digger wasp — **ENDANGERED**

Order **Hymenoptera** — Family **Sphecidae**

*Cerceris quadricincta* (Panzer, 1799).

**Identification** Richards (1980), p.85 and figs 237, 240.

**Distribution** This has always been a very rare wasp; restricted to two sites in Kent, and formerly Colchester, Essex. G. H. L. Dicker (pers. comm.) found a colony in the training area of the Royal School of Military Engineering at Upnor, near Chatham, Kent, between 1977 and 1979. A female was found on a sandy area near the top of a chalk cliff at Ramsgate on 25 August 1979. In 1900 specimens were collected elsewhere in the county, from Tilmanstone and St Margaret's Bay (Sladen, 1900). There are no recent records from Essex, though it used to be found within the town of Colchester itself, but later died out (*teste* R. C. L. Perkins, manuscript).

**Habitat and ecology** Nests in clay or sand, provisioning its cells with weevils. It tends to be gregarious. The flight period extends from about mid-July to mid-September.

**Status** The Chatham colony was small, with probably less than twenty burrows, and was located in the vertical faces of bare, sandy terraces cut in a hillside. Shortly after 1979 the area was realigned, involving the removal of the nesting site. No specimens have been seen there since 1980.

**Authors** G. R. Else and G. M. Spooner.

## Philanthus triangulum

The Bee Wolf — **VULNERABLE**

Order **Hymenoptera** — Family **Sphecidae**

*Philanthus triangulum* (F., 1775).

**Identification** Richards (1980), pp.82-83 and figs 231, 232.

**Distribution** The British headquarters of this species has long been the Isle of Wight (St Helens, Shanklin, Totland Bay, and, since at least 1851, Sandown Bay where it used sometimes to occur in profusion). Since 1976 it has been found at three sites, in abundance at one in most seasons. It is very irregular elsewhere, although several were found on Nacton Heath, near Ipswich, Suffolk, by M. Archer on 5 August 1976 (flying over heather *Calluna*), and one on a thistle flower on a heath in south Norfolk by J. P. Field in July 1983. There are also ancient records from Hampshire, Surrey, Kent, Essex and south Wales. For map of European distribution see Heath & Leclercq (1981), map 17.

**Habitat and ecology** Coastal sand dunes and cliffs on the Isle of Wight, and heathlands in East Anglia. The nest burrows are excavated in both vertical and level sandy soil. The cells are provisioned with paralysed bees, most frequently honeybees *Apis mellifera*, but if these are scarce then with various suitably-sized mining-bees (*Andrena* and *Lasioglossum* species). This habit has earned the wasp the colloquial name of 'Bee Wolf'. The species flies from early July to mid or late August, and visits bramble *Rubus*, thrift *Armeria maritima* and thistle *Cirsium* flowers. The life-history and ecology has been studied in depth by Tinbergen (1951).

**Threats** The destruction of existing sites. It seems to benefit from trampled sandy soil with sparse vegetation on the St Helens dunes.

**Conservation** One Isle of Wight site is on National Trust property, another is on an SSSI.

**Authors** G. R. Else and G. M. Spooner, using additional information from Smith (1851a), Saunders (1896), Blair (1948) and Wakely (1955).

## Andrena ferox — A mining bee — ENDANGERED

Order **Hymenoptera** — Family **Andrenidae**

*Andrena* (*Hoplandrena*) *ferox* Smith, 1847.

**Identification** Else (in preparation).

**Distribution** It has apparently always been a rarity and, on account of its unusual nesting behaviour, extremely local. There are records from Kent, Berkshire, Hampshire, East Sussex, Cornwall and Avon. The most recent is a small collection of females from Pluckley, Kent, 15 May 1966, K. M. Guichard.

**Habitat and ecology** Meadowland and probably open woodland. In common with the related *A. bucephala* Stephens and *A. scotica* Perkins, the nesting behaviour is remarkable among British bees. The females of an entire colony use a single entrance hole in the ground to gain access to their underground cells (Yarrow & Guichard, 1941; Leys, 1978). Each shared nest is inhabited by up to eighty females, and (in a Dutch example) consisted of one vertical shaft with side passages radiating from it in all directions, each of the side passages terminating in a cell. A continuous flow of females passes through the entrance in fine weather. In a Hampshire locality about four such colonies have been discovered in close proximity to one another. The species is also unusual in that provisioning females visit oak *Quercus* flowers. A spring species, flying in April-May.

**Threats** A rare species with such unusual nesting behaviour is clearly at risk, as it would obviously be very easy to destroy an entire colony.

**Authors** G. R. Else and G. M. Spooner, using additional information from Perkins (1919b).

## Andrena floricola

A mining bee **ENDANGERED**

Order **Hymenoptera** Family **Andrenidae**

*Andrena* (*Micrandrena*) *floricola* Eversmann, 1852.

**Identification** Else (in preparation).

**Distribution** The sole British specimen was a female taken at Princes Risborough, Buckinghamshire, on 11 May 1939 by E. Ernest.

**Habitat and ecology** The British specimen was probably taken at late sallow *Salix*. On the Continent this species is double-brooded, the first visiting shepherd's purse *Capsella bursa-pastoris* and mustards *Brassica*, while the second visits only *Berteroa incana* (a cruciferous plant not indigenous to this country). The species nests in the soil.

**Authors** G. R. Else and G. M. Spooner, using additional information from Stoeckhert (1933, p.125) and Yarrow & Guichard (1941).

## Andrena gravida

A mining bee **ENDANGERED**

Order **Hymenoptera** Family **Andrenidae**

*Andrena* (*Zonandrena*) *gravida* Imhoff, 1832, formerly misidentified as *A. fasciata*.

**Identification** Else (in preparation).

**Distribution** Kent has always been the British headquarters for this bee, with records from numerous localities including Maidstone, East Malling, St Leonards (possibly the one near Malling), Canterbury, Gravesend, and Chatham. It has also been collected in Essex (Colchester, Dovercourt), and East Sussex (Hastings and south of Tunbridge Wells). The record for Perth, Tayside (cited in Saunders, 1896 and Perkins, 1919b) can safely be dismissed. Most records were made in the latter half of the last century and the early years (up to 1931) of the present one. The latest is from East Malling, Kent, a female on apple flowers, 25 April 1961, J. R. Chiswell.

**Habitat and ecology** The typical habitat in Britain is not known. Flower visits include sallow *Salix*, mallows *Malvus* and dandelions

*Taraxacum*. The bee flies from late March to May, but there are three records of a second brood in July and August. (Its sibling *A. flavipes* Panzer is regularly double-brooded.)

**Status**

The above history certainly suggests a marked decline which cannot easily be explained. However, it is most unlikely that this species is extinct in Kent. No one has especially searched for it in recent years and unless one happened to chance upon a nesting aggregation the chances of success are probably remote (Felton, pers. comm.).

**Authors**

G. R. Else and G. M. Spooner, using additional information from Jones (1932).

## Andrena hattorfiana

A mining bee — **VULNERABLE**

Order **Hymenoptera** — Family **Andrenidae**

*Andrena* (*Charitandrena*) *hattorfiana* (F., 1775).

**Identification**

Else (in preparation). This, our largest and perhaps most attractive *Andrena*, is usually black-brown, but forms of the female with red-banded abdomens are occasionally encountered.

**Distribution**

Rare and declining. Formerly widely distributed, but local and not always common where it did occur, over much of southern England and parts of south Wales – Norfolk, Essex, Kent to Cornwall (including the Isle of Wight), Wiltshire, Oxfordshire, Surrey and Glamorgan. In Devon it was even found high up on Dartmoor. In recent years there have only been a few, scattered records (usually of odd specimens) from Kent, East Sussex, Wiltshire, Cornwall and Devon. Its special nest parasite, *Nomada armata* Herrich-Schaeffer, is even rarer (an Endangered species).

**Habitat and ecology**

Dry grassland (particularly on calcareous soils) and even roadside verges with field scabious *Knautia arvensis*. Females provision their cells only with field scabious pollen. Males have been observed visiting nipplewort *Lapsana*. The bee also visits white clover *Trifolium repens* and smooth hawk's-beard *Crepis capillaris*, probably for nectar. The flight period extends from July to August.

**Threats**

The decline is almost certainly the result of loss of habitat, especially the ploughing-up of downland for cultivation; indeed one East Sussex colony manages to exist on the edge of a cereal field. Field scabious is becoming more a plant of roadside verges and railway cuttings and embankments.

**Conservation**

The purchase (or agreement on land use) of the remaining sites should be considered.

**Authors**

G. R. Else and G. M. Spooner, using information from Hamm (1901) and Perkins (1919b).

## Andrena lathyri — A mining bee — ENDANGERED

Order **Hymenoptera** — Family **Andrenidae**

*Andrena* (*Taeniandrena*) *lathyri* Alfken, 1899.

**Identification** Else (in preparation).

**Distribution** Wiltshire: near Burbage, 16 and 19 May 1970, K. M. Guichard and S. Thewes (Guichard, 1971) and 15 May and 4 July 1971 (a worn female), K. M. Guichard. Somerset: Moorlinch, a female, 22 May 1950, J. Cowley (unpublished). It is widespread on the Continent.

**Habitat and ecology** The Wiltshire colony was located along the banks of a disused railway line where the bees were visiting the flowers of common vetch *Vicia sativa* and less frequently bush vetch *V. sepium*. In France males have been taken at the pink flowers of a vetchling (*Lathyrus* species). The species nests in the soil.

**Status** The above are the only known British records. None were observed on two visits in 1984 to the Burbage site by G. R. Else and M. Edwards.

**Threats** The destruction of habitat.

**Conservation** No measures proposed, though clearly steps to protect the habitat should be taken.

**Authors** G. R. Else and G. M. Spooner.

## Andrena lepida — A mining bee — ENDANGERED

Order **Hymenoptera** — Family **Andrenidae**

*Andrena lepida* Schenck, 1859. Misidentified as *A. combinata* Christ by Yarrow (1955).

**Identification** Else (in preparation).

**Distribution** Extremely rare, recorded only from one site in Berkshire and two in Dorset. A male was collected at Aldworth, on the Berkshire Downs, on 9 May 1931, by E. Burtt (BM(NH)); a female at Witchampton, Dorset on 11 July 1951, by P. Harwood; and a female at Badbury Rings, near Wimborne, Dorset, 2 August 1952, by G. M. Spooner (a second possible specimen in poor condition was observed but not retained). (See Yarrow, 1955 and 1968.)

**Habitat and ecology** Chalk grassland. The Badbury Rings specimen was visiting hogweed *Heracleum sphondylium*. In Britain the species is clearly double-brooded, as on the Continent (where the spring brood flies in April and May, the summer one in July and August).

**Status** Searches at Badbury Rings in 1953 and 1954 by G. M. Spooner and in 1984 by G. R. Else and M. Edwards have failed to produce further specimens.

**Threats** Loss of habitat.

**Authors** G. R. Else and G. M. Spooner.

## Andrena nana — A mining bee — ENDANGERED

Order **Hymenoptera** — Family **Andrenidae**

*Andrena* (*Micrandrena*) *nana* (Kirby, 1802).

**Identification** Else (in preparation). In the past other distinct species in the *A. minutula* (Kirby) complex were sometimes misidentified as *A. nana*.

**Distribution** There are only four British specimens. The first was collected at Barham, Suffolk, by W. Kirby (Kirby, 1802, pp. 161–162) and this is the type specimen; it is in the Kirby Collection, BM(NH). The second specimen was a female collected near Luddesdown, Kent, on 27 August 1899 by H. Elgar, and is in the Maidstone Museum (Felton, 1963, p.185). A male was collected at Oxshott, Surrey in July 1915, collector unknown (specimen in the University Museum, Oxford). Finally, a female was obtained at Sudbury, Suffolk, in 1923 by Harwood (BM(NH)).

**Habitat and ecology** There is nothing on record for Britain, but it is almost certainly double-brooded (as in Europe).

**Authors** G. R. Else and G. M. Spooner.

## Andrena polita — A mining bee — ENDANGERED +

Order **Hymenoptera** — Family **Andrenidae**

*Andrena polita* Smith, 1847.

**Identification** Else (in preparation).

**Distribution** In Britain the bee has been recorded from only two sites, both in north Kent. Northfleet: at least two examples prior to 1855 by F. Smith (Smith, 1855, p.88). Halling: one female, 6 July 1901, H. Elgar (Maidstone Museum Collection); one female, 6 July 1902, H. Lamb (BM(NH)); one male, 2 July 1933, G. E. Frisby (Frisby, 1934, p. 136); and one male, 1 July 1934, J. F. Perkins (Oxford University Museum). (See also Elgar, 1901b; Frisby, 1928, p. 98; Felton, 1963, p. 184.)

**Habitat and ecology** The Northfleet specimens were collected in chalk pits, and those from Halling were taken on chalk grassland at Upper Halling. In West Germany the bee has been observed nesting gregariously in a rock wall (Stoeckhert, 1933). The Elgar specimen was reported as visiting a flower of field rose *Rosa arvensis*; the Frisby male was visiting a yellow composite. On the Continent the following are said to be visited: bindweed *Convolvulus arvensis*, chicory *Cichorium intybus* and mouse-ear hawkweed *Hieracium pilosella*. In Europe the species is widespread, but uncommon in the north. The flight period extends from early June to mid August.

**Status** The last British record was more than fifty years ago and it must be feared that the species may now be extinct here.

**Threats** Loss of chalk downland habitat.

**Authors** G. R. Else and G. M. Spooner.

## Andrena tridentata

A mining bee **ENDANGERED**

Order **Hymenoptera** Family **Andrenidae**

*Andrena* (*Cnemidandrena*) *tridentata* (Kirby, 1802).

**Identification** Else (in preparation).

**Distribution** Very rare with only a few scattered records from East Anglia (Suffolk, Norfolk and Essex) and Dorset. The majority of the few British records were made in the last century. Since 1901 only five females from four localities have been recorded from Britain, and only one since 1920 – Norden, Corfe, Dorset, a female at smooth hawk's-beard *Crepis capillaris* on a railway bank, 30 July 1944, C. D. Day.

**Habitat and ecology** Little information. Specimens have been collected from ragwort *Senecio*, purple loosestrife *Lythrum salicaria*, and smooth hawk's-beard. The bee flies in July-August.

**Authors** G. R. Else and G. M. Spooner, using additional information from Perkins (1919b).

## Andrena vaga

A mining bee — **ENDANGERED**

Order **Hymenoptera** — Family **Andrenidae**

*Andrena* (*Melandrena*) *vaga* Panzer, 1799.

**Identification** Else (in preparation).

**Distribution** There are just four British records: an ancient (pre-1850) male, without locality in Walcott's collection (Perkins, 1917); Deal, Kent: a male on 12 April 1939, K. M. Guichard (Yarrow & Guichard, 1941); Bignor, West Sussex: a female on 16 April 1945, C. H. Andrewes (Andrewes, 1946); and Folkestone, Kent: a female on 12 April 1946 (Collins, 1946).

**Habitat and ecology** Of the two British females, one was investigating a garden bank (in which was a large colony of *Andrena flavipes* Panzer) and the other was flying above a roadside bank and bore a load of pollen. A soil-nester.

**Status** Yarrow (in Yarrow & Guichard, 1941) reports that this species is not uncommon on the Continent and individuals may well be blown across the Channel to this country, where they may survive and breed for a few seasons. However, the possibility of the species being indigenous but extremely local must not be overlooked, since a collector would never find it unless he chanced to be in the right place at the right time.

**Authors** G. R. Else and G. M. Spooner, using additional information from Perkins (1919b).

## Halictus eurygnathus

A mining bee — **ENDANGERED +**

Order **Hymenoptera** — Family **Halictidae**

*Halictus* (*Halictus*) *eurygnathus* Bluethgen, 1931, formerly misidentified as *H. quadricinctus* (Kirby).

**Identification** Else (in preparation).

**Distribution** In Britain this bee has always been a very rare species with a few very old sporadic records from the London district, Dorset (Portland), and Suffolk. Its headquarters, however, in the first half of the present century, have been Kent (Rochester, Dover, St Margaret's Bay, Upper Halling) and East Sussex (Brighton, Eastbourne, Ovingdean, Seaford, Littlington).

**Habitat and ecology** Chalk downland, usually near the coast. In the south-east it was sometimes reported as being abundant, but forming extremely local colonies. Both sexes visit *Centaurea* flowers, including greater knapweed *C. scabiosa* and lesser knapweed *C. nigra*. Females have been collected from early June to late September, males from early August to early September.

**Status** The most recent record was about forty years ago. It may well be extinct in Britain.

**Threats** The loss of suitable habitat (e.g. chalk grassland on the cliff top at St Margaret's Bay has been ploughed up), and doubtless too by pressure from the holiday trade (chalets and similar developments).

**Authors** G. R. Else and G. M. Spooner, using information from Saunders (1881), Sladen (1897), Elgar (1901a), and Malloch (1904).

## Halictus maculatus

A mining bee **ENDANGERED +**

Order **Hymenoptera** Family **Halictidae**

*Halictus* (*Halictus*) *maculatus* Smith, 1848.

**Identification** Else (in preparation).

**Distribution** Although widely distributed in western Europe this is another bee which has always been very rare in Britain, with only a few records (nearly all of single examples). It has been collected in Kent (Upper Halling), East Sussex (Hastings), Hampshire (Blackwater), Isle of Wight (Sandown Bay), south Devon (Chudleigh and possibly Exeter) and Surrey (Weybridge).

**Habitat and ecology** The only detailed information available is provided by Perkins (1919a). In a Devon colony the bees nested in burrows scattered singly over three or four square metres of level ground in a pasture field. There are no flower records for Britain. Females fly from May to September, males from early July to September.

**Status** Perkins (1919a) discovered a thriving colony at Chudleigh which persisted from 1919 to 1930. His son, J. F. Perkins, informed G. M. Spooner that it was a prolific colony in the bank of an old gravel pit (in valley alluvium) by the River Teign opposite Chudleigh Knighton; it also occurred down the river valley at Gooseham. Shortly after 1930 the pit was filled with rubbish and levelled off, and the colony wiped out. The species has not been seen in Britain since.

**Authors** G. R. Else and G. M. Spooner, using additional information from Elgar (1901a).

## Lasioglossum laticeps

A mining bee — **VULNERABLE**

Order **Hymenoptera** — Family **Halictidae**

*Lasioglossum* (*Evylaeus*) *laticeps* (Schenck, 1870), formerly misidentified as *Halictus semipunctulatus* Schenck.

**Identification**

Else (in preparation).

**Distribution**

In Britain it is confined to the coast of Dorset and extreme east Devon, from Kimmeridge in the east to the Devon side of Lyme Regis in the west. However, since its discovery in Britain in 1903 (Saunders, 1904) the species has been reported from only about five or six sites. Colonies appear to be few and far between and the attendant females are extremely localised and elusive. When colonies are found both sexes can be locally common.

**Habitat and ecology**

Coastal undercliffs and landslips, nesting, usually gregariously, in the clay soil (some have also been noted nesting in the joints of a stone wall). Females have been collected from wild carrot *Daucus carota* flowers and the males, which appear in late summer, have been swept from fleabane *Pulicaria dysenterica*, ragwort *Senecio* and *Daucus*. This bee is one of many *Lasioglossum* species which are semisocial, i.e. a worker caste is produced in the early summer. L. Packer has recently studied the life-history of this species in Dorset (Packer, 1983). The flight period of the females is April-August, and the males July-August.

**Status**

Probably not declining, but the extreme localisation of colonies and the difficult terrain make this a difficult species to monitor.

**Threats**

Sections of the Dorset coast are extremely unstable and it is thus probable that some colonies are occasionally eliminated by landslips or cliff falls.

**Conservation**

Two sites are on National Trust property, one is a reserve of the Dorset Naturalists' Trust, one is probably on the Axmouth-Lyme Regis Undercliffs NNR, and one is on Ministry of Defence property.

**Authors**

G. R. Else and G. M. Spooner, using additional information from Nevinson (1904).

## Dufourea minuta

A mining bee — **ENDANGERED**

Order **Hymenoptera** — Family **Halictidae**

*Dufourea minuta* Lepeletier, 1841, formerly known as *D. halictula* (Nylander).

**Identification** Else (in preparation).

**Distribution** Extremely rare with very few British records, which are summarised as follows. Surrey: Byfleet, many specimens 1913–20, C. H. Mortimer and E. Nevinson (specimens in BM(NH)); Woking, a female from a large sand-pit on Woking Heath, O. C. Silverlock (Saunders, 1910, p. 11). Dorset: Ferndown, four males, 14 July 1948, P. Harwood; Parley, one female, 30 July 1953, P. Harwood (Harwood specimens also in BM(NH)).

**Habitat and ecology** Confined to sandy soils. Mortimer (1913) described a populous nesting aggregation at Byfleet. Here the males were usually found at rest on stones or low-growing plants and within a week the females appeared in equal abundance. These constructed their burrows between stones, chiefly on a hard sandy pathway, less frequently in an adjoining sandy, moss-covered bank. The cells were provisioned with sheep's-bit *Jasione montana* pollen. The species has been found on the wing from late June to late July.

**Threats** Loss of heathland habitat.

**Authors** G. R. Else and G. M. Spooner.

## Dufourea vulgaris

A mining bee — **ENDANGERED**

Order **Hymenoptera** — Family **Halictidae**

*Dufourea vulgaris* Schenck, 1859.

**Identification** Else (in preparation).

**Distribution** Recorded only from Surrey, the south Hampshire-Dorset boundary, and Dorset. The records are as follows: Surrey: Woking, 1 August 1881, a number observed by banks of the canal, visiting ragwort *Senecio*, a few caught (Billups, 1881). Hampshire-Dorset boundary: Chewton, coastal undercliff, by sweeping chamomile *Matricaria* flowers and low herbage, 12 August 1879, one male (S. S. Saunders, 1880). Dorset: Holt, 14 August 1956, fresh female, P. Harwood (unpublished).

**Habitat and ecology** Sandy soils. Specimens have been collected from dandelion *Taraxacum* and ragwort flowers: E. Saunders (1896) describes the male as wriggling into the flower in a highly characteristic manner. The flight period extends from early to mid August.

**Status** A small active species, readily overlooked or not recognised.

**Authors** G. R. Else and G. M. Spooner

## Melitta dimidiata

A mining bee **ENDANGERED**

Order **Hymenoptera** Family **Melittidae**

*Melitta dimidiata* Morawitz, 1876, formerly known as *Pseudocilissa dimidiata*.

**Identification** Else (in preparation).

**Distribution** Very rare, known in Britain from only two or three sites near Tilshead, Salisbury Plain, Wiltshire, and from another on chalk downland in the Vale of Pewsey, near Easton Royal, Wiltshire. It is also rare in Europe.

**Habitat and ecology** The largest of the four British *Melitta* species, occurring on chalk grassland. The species exclusively provisions its cells with sainfoin *Onobrychis viciifolia* pollen and nectar. During dull, cold spells males have been observed sheltering in the racemes of the host plant (Baker, 1965). A typical 'mining-bee', the nest burrows being excavated in soil. Flies from June to late July.

**Status** The small, vulnerable colony near Easton Royal was observed as recently as 30 June 1984 (G. R. Else).

**Threats** The loss of habitat. A major colony on White Barrow, near Tilshead, was destroyed a few years ago when the ancient monument was surrounded by fencing and sheep introduced. The grazing has favoured the chalk grassland flora generally, but the stock virtually eliminated the sainfoin. Although the plant is still found outside the fencing, the bee has not been seen since despite special searches made during the flight season and in favourable weather conditions.

**Conservation** White Barrow is a property of the National Trust.

**Authors** G. R. Else and G. M. Spooner, using additional information from Yarrow (1968) and Guichard (1973).

## Stelis breviuscula

A cuckoo bee — **ENDANGERED**

Order **Hymenoptera** — Family **Megachilidae**

*Stelis breviuscula* (Nylander, 1848).

**Identification** Else (in preparation).

**Distribution** A very recent addition to the British list. A fresh male was collected from a flower of ragwort *Senecio jacobaea* at Iping Common, near Midhurst, West Sussex, on 8 August 1984 by G. R. Else.

**Habitat and ecology** In Western Europe the bee *Heriades truncorum* (L.) is reported as the host of *S. breviuscula* (Bischoff, 1927, p. 397; Schmiedeknecht, 1930, p. 836; Stoeckhert, 1933, p. 230). The host nests in burrows in dead wood and occasionally crumbling masonry. The British specimen of *S. breviuscula* was collected on the edge of heathland, close to felled, stacked trees where *H. truncorum* also occurred. Stoeckhert (1933) records the following flowers visited by *S. breviuscula*: bramble *Rubus*, sheep's-bit *Jasione montana*, yarrow *Achillea millefolium*, mouse-ear hawkweed *Hieracium pilosella*, and dandelion *Taraxacum*.
On the Continent the flight period extends from early June to the beginning of September.

**Status** All four British *Stelis* species are rare bees, but although there is only a single record of *S. breviuscula* it is considered to be an indigenous species in view of its obligate association with *H. truncorum*.

**Threats** Probably in no immediate danger; although its host is nationally a very scarce species, it seems to be well-established in the Midhurst area.

**Authors** G. R. Else and G. M. Spooner.

## Osmia inermis

A mason bee — **VULNERABLE**

Order **Hymenoptera** — Family **Megachilidae**

*Osmia* (*Melanosmia*) *inermis* (Zetterstedt, 1838), formerly misidentified as *O. parietina* Curtis.

**Identification** Else (in preparation).

**Distribution** An arctic-alpine mason bee which is one of the rarest and, until recently, least known of British bees. It is confined to the central Grampian Highlands in both Highland and Tayside Regions (Speyside in Inverness District, several sites between Blair Atholl and Rannoch, and Glen Almond, north-west of Perth).

**Habitat and ecology** Exposed upland sites between about 350 and 400m on floristically diverse base-rich soils. The female constructs from leaf mastic tight clusters of naked oval cells attached to the underside of a flat rock overlying a slight depression in the ground. The number of cells per rock varies between one and about sixty, but up to 230 have been found. Very large totals are probably the product of more than one female, or more than a single generation. Adults resulting from these cells usually emerge after two or more winters, the first spent as a prepupa, the second as a diapausing bee. One south-facing site near Blair Atholl consisted of heavily-grazed sheep pasture on well-drained hillocky ground dominated by a short sward of heather *Calluna vulgaris* interspersed with various herbs (e.g. violets *Viola*, bilberry *Vaccinium myrtillus*, primrose *Primula vulgaris*, bugle *Ajuga reptans*, and birdsfoot-trefoil *Lotus corniculatus*). A further important feature was numerous loose rocks of suitable size. Forage plants have not been recorded from Britain, but probably include birdsfoot-trefoil, sallows *Salix* and bilberry, as quoted in the literature for Europe and North America. The bees fly from late May to July.

**Threats** The destruction of habitat by afforestation of upland sites. According to the recent Perthshire Structure Plan there is at present an area of 11% forestation, but this is likely to be increased.

**Authors** G. R. Else and G. M. Spooner, using additional information from Smith (1851b).

## Osmia uncinata — A mason bee — VULNERABLE

Order **Hymenoptera** — Family **Megachilidae**

*Osmia* (*Melanosmia*) *uncinata* Gerstaecker, 1869, formerly misidentified as *O. inermis* (Zetterstedt), another Vulnerable species.

**Identification** Else (in preparation).

**Distribution** A very rare boreo-alpine mason bee, recorded only from a few sites in Speyside (Inverness, Highland), between Kincraig and Nethy Bridge (c. 250-300m). A very recent addition to the British list.

**Habitat and ecology** Open sites in relict Caledonian Forest, at lower altitudes than *O. inermis*. British nests have not been found, but in Europe they occur in borings in the trunks and stumps of pine *Pinus*, including pieces of loose bark lying on the ground. Both sexes visit birdsfoot-trefoil *Lotus corniculatus*, occasionally broom *Cytisus scoparius* and bilberry *Vaccinium myrtillus*, and fly from late April to late June (sometimes early July).

**Threats** Reduction and destruction of the surviving remnants of its forest habitat.

**Authors** G. R. Else and G. M. Spooner, using additional information from Stoeckhert (1933), pp. 205-206.

## Osmia xanthomelana

A mason bee **ENDANGERED**

Order **Hymenoptera** Family **Megachilidae**

*Osmia* (*Melanosmia*) *xanthomelana* (Kirby, 1802), formerly known as *Osmia atricapilla* Curtis.

**Identification** Else (in preparation).

**Distribution** Now only on the south coast of the Isle of Wight. Formerly as two apparently discontinuous populations, one in southern England (Suffolk, Essex, Kent, Sussex, Hampshire, Isle of Wight, Devon, Cornwall, Gloucestershire and Avon), the other in north-west England and north Wales (Cumbria, Durham, Lancashire, Merseyside and north Gwynedd – especially the north and south coastline of the Lleyn Peninsula).

**Habitat and ecology** On the Isle of Wight coastal landslips and cliffs. The females forage on birdsfoot-trefoil *Lotus corniculatus* and horse-shoe vetch *Hippocrepis comosa* and probably nest at the roots of vegetation on the less steep gradients of cliff faces. The nest consists of several 'pot-like' cells constructed from mud (see Waterhouse, 1844). Females visit seepages at the base of the cliffs to collect the mud. The flight period extends from April to July, both sexes overwintering in their cells as freshly emerged adults.

**Status** The species always appears to have been uncommon and very local. After an interval of twenty-six years, when no specimens were recorded in Britain, C. H. Andrewes took a female at Chale, Isle of Wight, on 18 May 1954. No more were found until G. R. Else and D. M. Appleton discovered two sites in 1977 and 1978, but only one of these seems to have a small but permanent population.

**Threats** The cause of decline (which began during the last century) of this handsome bee is not known, but may be related to climatic changes. The females are perhaps vulnerable to collectors as they congregate at wet mud. Also, the sites are threatened by cliff falls, which occasionally occur along the Isle of Wight coastline.

**Conservation** Former sites need to be visited to establish if the species has survived to the present day.

**Authors** G. R. Else and G. M. Spooner, using additional information from Kirby (1802, pp.246-247), Smith (1876, pp.155-156), Saunders (1896; 1909), Perkins (1923, p.217; 1924, p.147), and Jones (1932).

## Nomada armata

A cuckoo bee — **ENDANGERED**

Order **Hymenoptera** — Family **Anthophoridae**

*Nomada armata* Herrich-Schaeffer, 1839.

**Identification** Else (in preparation).

**Distribution** To Perkins (1919b) this species seemed generally to occur more or less freely in all the districts recorded for its host (with the exception of the eastern counties where it appeared unexpectedly rare), though not with every host colony. Its distribution within Britain includes Kent, Isle of Wight, Dorset, Devon, Cornwall, Berkshire, Oxfordshire, Surrey, Essex, Norfolk and West Glamorgan.

**Habitat and ecology** The special cleptoparasite or cuckoo-bee of *Andrena hattorfiana* (F.). Both sexes, in common with the host, visit field scabious *Knautia arvensis* flowers. Flies from June to August.

**Status** Today it is an extremely rare species, the most recent record being a specimen taken in a malaise trap in an Oxford garden in 1974 (C. O'Toole).

**Threats** The present scarcity of this bee can be at least partially explained by the decline of its host, which is itself a Vulnerable species.

**Authors** G. R. Else and G. M. Spooner, using additional information from Hamm (1901).

## Nomada errans

A cuckoo bee — **ENDANGERED**

Order **Hymenoptera** — Family **Anthophoridae**

*Nomada errans* Lepeletier, 1841.

**Identification** Else (in preparation).

**Distribution** Only known from a short stretch of coast in the Isle of Purbeck, south-east Dorset. First discovered in Britain by C. D. Day on 6 August 1944 (Spooner, 1946). Subsequently it was found in very small numbers in July and August 1945-46, Spooner & Day; 21 July 1974, K. M. Guichard; and 26 July 1982, G. R. Else. The first British specimen, however, was a male collected in 1878 by C. W. Dale, but was misidentified until correctly determined by G. M. Spooner in 1971 (unpublished).

**Habitat and ecology** Rough grassland and landslip. Specimens have been observed visiting yarrow *Achillea millefolium*, wild carrot *Daucus carota* and ragwort *Senecio* flowers. On the

Continent the species is a nest parasite of the bees *Andrena nitidiusculus* Schenck and *A. pallitarsis* Perez (a species not found in Britain) (Stoeckhert, 1933, pp. 157-158). In Purbeck the presumed host is *A. nitidiusculus*, which in this site is usually uncommon and, nationally, occurs sporadically in about half a dozen southern counties.

**Status** Other colonies of *A. nitidiusculus* in Dorset and Hampshire have been investigated for *N. errans*, but none have so far been found.

**Threats** The small, permanent population is perhaps at risk from over-collecting. The host too seems to be scarce in this locality (in contrast to one or two other sites along the Dorset coast), only rarely becoming abundant.

**Conservation** The locality is a Country Park, administered by the Dorset County Council, from whom a permit is necessary for collecting.

**Authors** G. R. Else and G. M. Spooner.

## Nomada guttulata

A cuckoo bee — **ENDANGERED**

Order **Hymenoptera** — Family **Anthophoridae**

*Nomada guttulata* Schenck, 1859.

**Identification** Else (in preparation).

**Distribution** Formerly widely distributed in the south, but has always been considered a rarity since its discovery in Britain in 1897. Dorset (Swanage, Mortimer, 1908a), Suffolk (Morley, 1897), Kent (Chitty, 1903), Cornwall (G. M. Spooner), Devon (Hamm, 1903, etc.), and East Sussex (Ditchling, 8 May 1943). Also reported from the London area, Essex and Buckinghamshire.

**Habitat and ecology** The special nest parasite of *Andrena labiata* F. The species has been collected on coastal cliffs and in woodland, and flies in May and June. Both sexes have been taken at the flowers of germander speedwell *Veronica chamaedrys*, which is also the host's main forage plant, and at tormentil *Potentilla*.

**Status** The most recent record known to the authors is a female collected at Wembury, south Devon, on 11 May 1967 by G. M. Spooner. The host bee is by no means a common species and may be decreasing.

**Authors** G. R. Else and G. M. Spooner, using additional information from Perkins (1919b).

## Nomada sexfasciata

A cuckoo bee — **ENDANGERED**

Order **Hymenoptera** — Family **Anthophoridae**

*Nomada sexfasciata* Panzer, 1799.

**Identification** Else (in preparation). The largest British *Nomada* species.

**Distribution** A rare and declining species known today only from one coastal site in south Devon which supports a thriving extended colony of *Eucera longicornis* (L.). In the past it was widely distributed but local and recorded from localities in Hampshire (New Forest), Surrey, East Sussex, Gloucestershire and south Devon.

**Habitat and ecology** The special nest parasite of *E. longicornis* (and perhaps the Endangered *E. tuberculata* (F.)?). Flies in May and June.

**Status** The Devon colony was discovered by G. M. Spooner in the mid-1970s and seems to be stable, as specimens have been seen several times in subsequent years.

**Threats** The cause of decline is not known; doubtless the host bee is not as widespread as in earlier decades, but still remains quite common, especially along the south coast (e.g. Isle of Wight and Dorset).

**Conservation** The site is in need of protection.

**Authors** G. R. Else and G. M. Spooner, using additional information from Perkins (1919b).

## Nomada xanthosticta

A cuckoo bee — **ENDANGERED**

Order **Hymenoptera** — Family **Anthophoridae**

*Nomada xanthosticta* (Kirby, 1802).

**Identification** Else (in preparation).

**Distribution** Very rare, recorded from Hampshire, Dorset, Buckinghamshire, the London area, Bedfordshire, Hertfordshire, Cambridgeshire, Leicestershire, Suffolk and Norfolk. Old literature records (e.g. Smith, 1876, pp.121-122) quote Yorkshire, Northumberland and other northern records, but these really refer to *N. obtusifrons* Nylander. In common with other cleptoparasites, it is usually scarcer than its host, though on one or two occasions it has been reported as locally abundant in the vicinity of its host's colonies. There has been no record since specimens were collected at Leckford, Hampshire on 17 April 1947 (J. Lewis Collection).

**Habitat and ecology** The special cleptoparasite of the mining-bee *Andrena praecox* (Scopoli). It is mainly associated with open broad-leaved woodland, visiting sallow *Salix* catkins.

Individuals have also been observed flying low over dead leaf litter in partial shade (presumably searching for the host's nesting burrows). It flies from April to May.

**Status** The reason for its rather dramatic decline to the point of extinction within Britain remains a mystery. However, two other *Nomada* species (*N. sexfasciata* Panzer and *N. signata* Jurine) have similarly declined sharply, in contrast to their hosts which remain locally common in many areas. *Andrena praecox* similarly remains a common early spring bee pre-eminently associated with *Salix* blossom over much of southern England.

**Authors** G. R. Else and G. M. Spooner, using additional information from Perkins (1919b) and Chambers (1949, p. 246).

## Eucera tuberculata

A mining bee — **ENDANGERED +**

Order **Hymenoptera** — Family **Anthophoridae**

*Eucera tuberculata* (F., 1793).

**Identification** Else (in preparation).

**Distribution** Formerly rather widely distributed but rare in southern England, recorded from Kent, East Sussex, Isle of Wight, Gloucestershire, Berkshire, and Suffolk. Some of these records are very old. It has not been found in Britain for over forty years.

**Habitat and ecology** Virtually unknown for Britain, but it has occurred in open deciduous woodland, and at least one site (since built over) was open grassland. Its flower preferences and nesting habits are probably similar to *E. longicornis* (L.), i.e. various vetches *Vicia*, and nesting burrows excavated in soil.

**Status** Much less common than the widespread *E. longicornis*, except in Kent. Occasionally the two species fly together, as at Hothfield (Felton, 1963), but *E. tuberculata* seems to be more confined to sheltered or wooded situations. The reason for its apparent decline remains unknown. It has not been recorded in Britain since 1941.

**Authors** G. R. Else and G. M. Spooner, using additional information from Yarrow (1968).

## Melecta luctuosa

A cuckoo bee — **ENDANGERED**

Order **Hymenoptera** — Family **Anthophoridae**

*Melecta luctuosa* (Scopoli, 1770).

**Identification** Else (in preparation).

**Distribution** Rare, with no recent British records. Dorset (several localities), Surrey, Hampshire (New Forest), Essex, and London (Hampstead Heath). The host bee is also decreasing: there are recent records only from a site in Essex and one on the Isle of Wight.

**Habitat and ecology** A nest parasite of the bee *Anthophora retusa* (L.) (e.g. Morice, 1901). It flies in April and May. It may be expected flying about banks, sandy cliffs and cuttings where the host nests.

**Threats** Not known. However, a favoured locality many years ago was the New Forest (near Lyndhurst). As a result of very heavy grazing by ponies flowering plants are generally scarce and are invariably at their best on the roadside verges, protected for the most part by the enclosure fences. Most bees have declined in this once famous locality. *A. retusa* was once abundant there, but is now perhaps extinct.

**Authors** G. R. Else and G. M. Spooner.

## Bombus cullumanus

A bumblebee — **ENDANGERED +**

Order **Hymenoptera** — Family **Apidae**

*Bombus* (*Cullumanobombus*) *cullumanus* (Kirby, 1802).

**Identification** Else (in preparation).

**Distribution** Formerly widespread but always very rare and local. It has been recorded from Kent, East Sussex, Hampshire, Dorset, Berkshire (several localities on downland in the Thames Basin, 1916-1926), the border of Bedfordshire and Hertfordshire (the Chilterns between Tring and Dunstable), Hertfordshire, Essex, Bedfordshire and Suffolk. There has been no record in Britain since May 1926. For map of former distribution see Anon. (1980), map 6.

**Habitat and ecology** Chalk or limestone grassland.

**Status** In spite of searches by different observers, especially in Dorset and Berkshire, no specimens have been found. It is feared that the species may be extinct in Britain.

**Threats** If the species has survived it is threatened by the loss of habitat and by modern agricultural practices which are destroying natural downland ecology.

**Authors** G. R. Else and G. M. Spooner, using additional information from Yarrow (1954) and Alford (1975).

# DIPTERA

## The Flies

With about 6000 species in Britain, the Diptera are the largest order covered in the Red Data Book. The majority are small, rather poorly-known and often difficult to identify. Three sections, however, are quite well-known – the Tipulidae (craneflies), the larger Brachycera (horseflies, robber-flies, soldier-flies, etc.), and the Syrphidae (hoverflies). Because of the large size of the order and the relatively poor knowledge of many of the groups, species accounts have been prepared for only 82 of the Endangered and Vulnerable species – about 17% of the species listed in those categories.

The Red Data Book includes 270 Endangered, 226 Vulnerable and 328 Rare species. With a further three species included in the Appendix (extinct before 1900), a total of 827 species are listed. This represents approximately 14% of the British fly fauna – the same proportion as for the Coleoptera.

Of the selection of Endangered and Vulnerable species described in these accounts, 45% are aquatic. Their larvae occur in more or less still water (ponds, ditches, bogs, marshes, etc.) or in wet habitats adjacent to water (e.g. wet moss by streams). The adults may be seen in flight around waterside vegetation. A quarter of the aquatic species are associated with the brackish conditions found in coastal ditches and pools. As has been seen in the previous orders, aquatic habitats of all types are greatly threatened by land drainage and other aspects of agricultural improvement. 37% of the species described occur in broad-leaved woodland, many of them associated with rot-holes in old trees. As in the Coleoptera, ancient woodlands such as Windsor Forest are frequently the only known sites for such species. Their future depends upon the retention of over-mature, dead and fallen timber, and less zeal in the 'tidying-up' of forests. The remaining 18% of described species occur in other terrestrial habitats such as pine forest, heathland, sand dunes and grassland.

A general introduction to the Diptera is provided by Colyer & Hammond's *Flies of the British Isles* (1968), though this is now out of print. An introduction and key to the families of Diptera are included in the RESL's series of *Handbooks* (Oldroyd, 1970), and many families are covered in this series. *A key to the families of British Diptera* (Unwin, 1981) is a title in the Field Studies Council's AIDGAP series. A good recent guide to a single popular family is *British hoverflies* (Stubbs & Falk, 1983). The AES has published *A dipterist's handbook* (Stubbs & Chandler, 1978).

There are several Diptera recording schemes, coordinated by A. E. Stubbs. A bulletin is issued, and there are regular meetings. A preliminary distribution atlas of the hoverflies has been produced (Entwistle & Stubbs, 1983).

## Ctenophora flaveolata

A cranefly — **ENDANGERED**

Order **Diptera** — Family **Tipulidae**

*Ctenophora flaveolata* (F., 1794).

**Identification** R. L. Coe *in* Coe *et al* (1950), p.8. A large ichneumon wasp-mimic with yellow and black banded abdomen and large feathery antennae in the male.

**Distribution** Formerly widespread in central southern England though with few localities; also in North Wales and Yorkshire. There are recent records only from the New Forest, Windsor Forest, the south Chilterns and the Sussex downs.

**Habitat and ecology** Woodland with ancient trees, especially beech *Fagus*. Breeds in dead wood, probably on an annual life cycle. The adults fly in May and June. It is believed to breed in large over-mature beech trees.

**Status** Of fifteen historic 10km squares for this large spectacular species, only five apply to the post-1960 period. The New Forest is possibly the best area, with two sites (in different 10km squares). In Windsor Forest it is exceedingly rare, and there are possible problems of habitat continuity affecting the other two sites.

**Threats** The reduction and loss of dead wood habitat.

**Conservation** In Windsor Forest there is a conservation management agreement and a less precise one concerning the New Forest.

**Author** A. E. Stubbs.

## Nephrotoma sullingtonensis

A cranefly — **ENDANGERED**

Order **Diptera** — Family **Tipulidae**

*Nephrotoma sullingtonensis* Edwards, 1938.

**Identification** R. L. Coe *in* Coe *et al* (1950), p.8.

**Distribution** Confined in Britain to Sullington near Worthing in West Sussex. It has been recorded on the Continent so it is not endemic.

**Habitat and ecology** Heathland with pine woods. It was recently taken beside a sandy path across a patch of heather *Calluna* with lichens. This patch of heather is in a glade only 100m across, surrounded by pine *Pinus*. It is not known whether the insect is strictly confined to this type of habitat on the site.

**Status** Only known from the type locality at Sullington Warren, where it was taken on two occasions in June 1938 (Edwards, 1938b). The Warren was subject to several unsuccessful searches in the 1970s, but two males and a female were found (by M. Edwards) on 4 June 1983. The area of available habitat is extremely small since pine now covers much of the site, open areas now being mostly grassland. Southern heathland and pine woods have been well worked for craneflies, especially in the adjacent county of Surrey, so this is considered to be a genuinely very rare insect.

**Author** A. E. Stubbs.

## Limonia aperta

A cranefly **ENDANGERED**

Order **Diptera** Family **Tipulidae**

*Limonia* (*Dicranomyia*) *aperta* (Wahlgren, 1904).

**Identification** Edwards (1938a), p.41; R. L. Coe *in* Coe *et al* (1950), p.28.

**Distribution** Only known from Craven District (North Yorkshire) and Moray (Grampian).

**Habitat and ecology** Adults have been found sitting on the flowers of grass of Parnassus *Parnassia palustris* at a bog locality. The details are otherwise unknown.

**Status** Although said to be 'common locally', it is only known from Austwick Bog, where it was taken on 3 September 1930, and it is said to have been found in Moray (Coe, 1950).

**Conservation** Austwick Bog is now an SSSI, though somewhat changed since the record was made.

**Author** A. E. Stubbs.

## Limonia bezzii

A cranefly **VULNERABLE**

Order **Diptera** Family **Tipulidae**

*Limonia* (*Geranomyia*) *bezzii* (Alexander & Leonard, 1912).

**Identification** R. L. Coe *in* Coe *et al* (1950), p.30.

**Distribution** Originally found at Chesil Beach, Dorset, in 1891 and again in 1939, but not confirmed there recently. In recent years it has been found at Arne in Poole Harbour (Dorset), Pagham Harbour (West Sussex), and Stiffkey (Norfolk).

**Habitat and ecology** Coastal lagoons where the upper tidal shore has gravel with the alga *Enteromorpha*. Its life history is unknown but the larvae probably live in intertidal gravel in brackish lagoons, possibly feeding on *Enteromorpha*. The adults fly between June and September.

**Status** Of interest as one of the few marine craneflies independent of saltmarsh. Its potential habitat is of limited occurrence. Though the sites are in amenity areas, they are sensitive to many pressures. Shores with gravel would not attract the same conservation concern as muddy shores of high ornithological value.

**Threats** Sailing and other amenity facilities could affect shores directly or indirectly by disrupting the sedimentary regime; mineral workings may upset the shore at Arne, and oilfield development in Poole Harbour may have a direct or indirect impact; a proposed nuclear power station in the Fleet could affect water temperatures on the Chesil Beach saltmarsh; potential gravel extraction.

**Conservation** All sites are of some conservation status – an LNR at Pagham, an RSPB reserve at Arne (though the lease does not cover mineral workings), and an SSSI.

**Author** A. E. Stubbs.

## Limonia omissinervis

A cranefly **VULNERABLE**

Order **Diptera** Family **Tipulidae**

*Limonia* (*Dicranomyia*) *omissinervis* (de Meijere, 1918), formerly misidentified as *L. patens* (Lundstroem).

**Identification** R. L. Coe *in* Coe *et al* (1950), p.28 (as *L. patens*); Hutson & Stubbs (1974).

**Distribution** Very sporadic occurrence. At one site on the River Tay (Tayside), two nearby sites on the River Spey (Highland), a site on the River Usk (Gwent), and another on the River Wye (Hereford & Worcester). It is only found commonly on the Spey.

**Habitat and ecology** Alluvial, usually sandy river banks within the shade of alders *Alnus*, willows *Salix* or other trees. Its life cycle is unknown but the larvae probably occur in alluvial river banks. The adults may be found in July and August.

**Status** Apart from a previously misidentified specimen taken in 1911, all records date from 1972. Though it may yet prove more widespread, it does seem to be highly localised even on its chosen rivers.

**Threats** River improvement, including the removal of trees on the Usk and the Wye. Amenity management could affect a critical section of the Spey.

**Author** A. E. Stubbs.

## Limnophila fasciata

A cranefly — **ENDANGERED**

Order **Diptera** — Family **Tipulidae**

*Limnophila* (*Idioptera*) *fasciata* (L., 1767).

**Identification** R. L. Coe *in* Coe *et al* (1950), p.40. A medium-sized species with banded wings.

**Distribution** Between 1920 and 1938 it was found in five localities in north-west England, comprising one in Cumbria, two in Yorkshire and two in north Cheshire. In 1964 it was found at one site in Cheshire, which was probably an additional site though this cannot be certain.

**Habitat and ecology** Mosses and marshes beside lakes. Its life history is unknown but it is assumed to be univoltine, with the larvae occurring in marsh soil. The adults fly May to July.

**Status** A very attractive species, yet there have been no records in the last fifteen years despite an unprecedented level of recording.

**Threats** The 1964 site was very vulnerable to damage by trampling from amenity use. Austwick Moss (North Yorkshire) has become drier and scrubbed over in part, and Cliburn Moss (Cumbria) has been partially drained. The exact location of the other old sites is unknown.

**Conservation** Austwick Moss and the more recent Cheshire site are SSSIs. All localities need further checking.

**Author** A. E. Stubbs.

## Gonomyia punctata

A cranefly — **VULNERABLE**

Order **Diptera** — Family **Tipulidae**

*Gonomyia* (*Idiocera*) *punctata* Edwards, 1938.

**Identification** Edwards (1938a), pp.107-108; R. L. Coe *in* Coe *et al* (1950), p.50.

**Distribution** Northern and western England: Hereford & Worcester, North Yorkshire and Cumbria.

**Habitat and ecology** Unknown.

**Status** Very rare, with no recent records. The type locality is Mulgrave Woods in North Yorkshire, where it was taken in the period 23 August-1 September 1937 (Edwards, 1938a). The other localities are the Monnow Valley on 3 July 1906 and the Wyre Forest in 1938 (Hereford & Worcester), and Melkinthorpe in Cumbria on 27 June 1922.

**Author** A. E. Stubbs.

## Gonomyia sexguttata

A cranefly — **ENDANGERED**

Order **Diptera** — Family **Tipulidae**

*Gonomyia* (*Idiocera*) *sexguttata* (Dale, 1842).

**Identification** Edwards (1938a), p.107; R. L. Coe *in* Coe *et al* (1950), p.49.

**Distribution** Confined to Cornwall and Dorset.

**Habitat and ecology** Unknown.

**Status** Only known from the type locality, Glanvilles Wootton, Dorset, in about 1860, and from St Merryn, Cornwall, in June 1912.

**Author** A. E. Stubbs.

## Erioptera bivittata

A cranefly — **VULNERABLE**

Order **Diptera** — Family **Tipulidae**

*Erioptera* (*Mesocyphona*) *bivittata* (Loew, 1873).

**Identification** Hutson & Vane-Wright (1969), p.249 and figs 7-10. A small dark brown species only recently added to the British list.

**Distribution** Originally discovered on the North Kent Marshes, and subsequently found at Romney Marsh (Kent), Walberswick (Suffolk), and Stiffkey and Catfield Fen (Norfolk). Common in restricted areas.

**Habitat and ecology** Coastal ditches with mildly brackish water, in one case an inland fen where other brackish species also occur. Its life history is unknown but the larvae are assumed to breed in wet, slightly brackish mud. The adults have been found between June and August.

**Status** Not quite as endangered as recently feared because some new sites have been found. However, the total area of potential habitat is becoming very reduced because of agricultural improvement, and on the safer sites it remains to be seen whether the right brackish conditions and management can be maintained.

**Threats** Agricultural improvement of coastal levels could largely eliminate the Kent populations. The East Anglian sites are relatively safe even though problems remain.

**Conservation** Occurs on one NNR (Walberswick), and all other populations are on SSSIs. Firmer habitat protection measures on certain Kent sites are proposed.

**Author** A. E. Stubbs.

## Erioptera limbata

A cranefly — **VULNERABLE**

Order **Diptera** — Family **Tipulidae**

*Erioptera* (*Erioptera*) *limbata* Loew, 1873.

**Identification** Edwards (1938a), p.123 and fig. 24i; R. L. Coe *in* Coe *et al* (1950), p.55 and fig. 25i.

**Distribution** Dorset, Gwent and east Kent.

**Habitat and ecology** By a small, wooded stream with tufa (in Kent), and under willows *Salix* on the banks of a river (in Gwent).

**Status** Only known from three specimens in Great Britain. The Dorset record is from Glanvilles Wootton, taken in 1864. The Gwent record is for a specimen taken by the River Usk at Newbridge-on-Usk on 7 August 1972, and the Kent record was from Asholt Wood in August 1974 (Stubbs, 1976).

**Conservation** Asholt Wood is an SSSI.

**Author** A. E. Stubbs.

## Erioptera pusilla

A cranefly — **ENDANGERED**

Order **Diptera** — Family **Tipulidae**

*Erioptera* (*Psiloconopa*) *pusilla* (Schiner, 1865).

**Identification** Edwards (1938a), p.130 and fig. 23e; R. L. Coe *in* Coe *et al* (1950), p.57 and fig. 24e.

**Distribution** Hereford & Worcester.

**Habitat and ecology** Unknown, though assumed to be associated with sandy river banks.

**Status** Only known from the River Monnow, where it was taken on 17 July 1907, 31 July 1908 and 30 May 1911. There are no recent records.

**Threats** The Monnow has already been modified by the water authorities along some stretches.

**Author** A. E. Stubbs.

## Dasyhelea lithotelmatica

A biting midge **VULNERABLE**

Order **Diptera** Family **Ceratopogonidae**

*Dasyhelea lithotelmatica* Strenzke, 1951.

**Identification** Strenzke (1950).

**Distribution** Limestone pavement karst of the Yorkshire Dales and about Morecambe Bay, occurring from near sea level to about 350m. Suitable breeding sites are sparse, though individual solution cups can have about 100 larvae. The majority of limestone pavement is unsuitable.

**Habitat and ecology** Small solution cups on exposed limestone pavement clints. The larvae are aquatic, able to withstand drying-out of the sediment in and on which they live.

**Status** A prime example of an insect with a highly specialised habitat of exceedingly localised occurrence. It is in danger through illicit limestone pavement removal, though the problem is now reduced and some localities have effective protection.

**Threats** The destruction of limestone pavement by removal as rockery stone. Quarrying is a more local threat. The development of vegetation cover is a potential threat on some sites.

**Conservation** The Wildlife and Countryside Act 1981 has strengthened legislation for the conservation of limestone pavements. Present on one, possibly two, NNRs. Also occurs on several SSSIs, including those situated in the Yorkshire Dales National Park. It will be necessary to locate breeding cups on pavements where scrub encroachment is a potential threat, so that management can take the species' needs into account.

**Author** A. E. Stubbs, using additional information from Disney (1975).

## Asindulum nigrum

A fungus gnat — **VULNERABLE**

Order **Diptera** — Family **Mycetophilidae**

*Asindulum nigrum* Latreille, 1805.

**Identification** Hutson *et al* (1980), p.34, figs 15 and 131.

**Distribution** Only known from East Anglia (the Norfolk Broads south to Thorndon Fen and Mildenhall in Suffolk), Oxfordshire (Longwall Street, Oxford), and Somerset (Shapwick Heath).

**Habitat and ecology** Fenland. The adults feed at umbel flowers. The biology is not known. The larvae of related species are predatory, spinning webs in which they catch their prey.

**Status** It was found relatively frequently in the earlier years of this century but appears to have become scarcer and has not been found in recent years.

**Threats** The drainage of fenland.

**Conservation** Shapwick Heath is an NNR.

**Author** P. J. Chandler, using additional information from Edwards (1913), Morley (1920), and Hamm (1926).

## Neoempheria lineola

A fungus gnat — **ENDANGERED**

Order **Diptera** — Family **Mycetophilidae**

*Neoempheria lineola* (Meigen, 1818), formerly known as *Empheria lineola*.

**Identification** Hutson *et al* (1980), p.45 and fig. 184.

**Distribution** Only known from the New Forest in Hampshire, where it has been found at Brockenhurst and in Denny Wood.

**Habitat and ecology** Old deciduous forest. It develops in decaying wood, according to continental records.

**Status** It has been found in the New Forest area on several occasions but most recently in 1939 at Denny Wood, and confirmation is required of its survival there.

**Threats** The removal of old trees and dead wood.

**Author** P. J. Chandler, using additional information from Jenkinson (1908), p. 154.

## Sciophila ochracea

A fungus gnat — **ENDANGERED**

Order **Diptera** — Family **Mycetophilidae**

*Sciophila ochracea* Walker, 1856.

**Identification** Hutson *et al* (1980), p.52 and fig. 207.

**Distribution** Very local but evidently widespread in southern England. There are records from a Cambridge garden in 1915, of larvae on fungus on an old plum tree at Woodwalton Fen before 1925, and of larval webs on a cherry branch near Oxford in 1956.

**Habitat and ecology** Deciduous woodland. Probably in old orchards, etc., where its host fungus occurs. The larvae spin webs on the surface of hard bracket fungi (probably tawny fomes *Phellinus pomaceus*) on plum and cherry trees (*Prunus* species), feeding on the spores.

**Status** No records are more recent than 1956, and the species should be sought in suitable habitats where the presence of larvae is probably easier to establish than that of adults.

**Threats** The destruction of old and dying trees.

**Conservation** Woodwalton Fen is an NNR.

**Author** P. J. Chandler, using additional information from Edwards (1925) and Smith (1957).

## Oxycera dives

A soldier fly — **VULNERABLE**

Order **Diptera** — Family **Stratiomyidae**

*Oxycera dives* Loew, 1845.

**Identification** Oldroyd (1969), p.26.

**Distribution** The Highland, Tayside, Central and Strathclyde Regions of Scotland, and Co. Durham and North Yorkshire in northern England.

**Habitat and ecology** At mossy springs, wet rock faces and small streams in partially shaded situations. A calcareous influence is usually apparent. Larvae are assumed to live in wet moss kept moist by seepages in woodland. The adults are found on foliage in the vicinity of probable breeding sites.

**Status** Historically a rare species. Verrall (1909) was only aware of a few specimens: one was taken at Rannoch on 8 June 1896 ("Rannoch" was used as a very general label at that time), and three were found near Rob Roy's Leap waterfall at Aberfoyle (Central) between 6 and 9 July 1903. Another was

found in Lanark (Strathclyde). Recently it has been found at four localities, all associated with exceedingly small breeding sites. It was taken in forest beside Loch Ness (Highland) at Port Clair in June 1965, at the Pass of Killiecrankie (Tayside), at Cotherstone Wood near Barnard Castle (Co. Durham) on 23 June 1981, and recently at Ashbury Pastures (North Yorkshire). The species is also rare in Europe, with the majority of records from the Alps.

**Conservation** Whilst the three most recent sites are all within SSSIs, the habitat is so small and fragile that Vulnerable status is justified. Ashbury Pastures is a reserve of the Yorkshire Wildlife Trust.

**Author** A. E. Stubbs.

## Oxycera pardalina

A soldier fly — **VULNERABLE**

Order **Diptera** — Family **Stratiomyidae**

*Oxycera pardalina* Meigen, 1822.

**Identification** Oldroyd (1969), p.26.

**Distribution** England, South Wales, and the Scottish Highlands.

**Habitat and ecology** Verrall (1909) cites an observation that the species is associated with the margins of small overgrown streams in hilly districts. Oldroyd (1969) reports that the males hover 6-10m up near trees by a stream and that females have been swept from vegetation. Recent experience indicates that calcareous flushes are a favoured habitat. Rozkosny (1983, pp.138-144), in commenting on the European position, says that limestone water is preferred and that the larvae are on wet rocks and stones and in wet moss by streams and torrents. In Britain it has been bred from moss on a wet limestone rock face in woodland. The adults can occur at flowers, including hogweed *Heracleum sphondylium*.

**Status** Verrall (1909, pp.104-106) comments that this was a rare species, even at that time. It was recorded in Dorset in about 1830 (though Verrall did not examine specimens to confirm identification). A specimen was taken in 1901, it is believed near Abergavenny in Gwent. A few years later it was found at Tarrington, Woolhope, Pembridge and Cusop in south Hereford & Worcester (the last locality being on the Welsh border). Audcent noted it at Wells, Somerset and Rozkosny (*loc. cit.*) gives a record for Failand, Somerset (the dates of these records are not stated). Oldroyd (1969) refers to a record for Dovedale, Derbyshire, which was in fact taken on 4 July 1950. Recent records are as follows: 1 June 1970, Guiting Power reserve (Gloucestershire); 5 July 1979, Petits Tor Point, Torbay (Devon); 1 July 1980, Luccombe

Chine (Isle of Wight); and 23 June 1981, Cotherstone Wood (Co. Durham). It was also found in June 1982 near Tomintoul in the Scottish Highlands.

**Conservation** Dovedale is a property of the National Trust and Cotherstone Wood is part of an SSSI.

**Author** A. E. Stubbs.

## Oxycera terminata

A soldier fly **VULNERABLE**

Order **Diptera** Family **Stratiomyidae**

*Oxycera terminata* Meigen, 1822.

**Identification** Oldroyd (1969), p.26.

**Distribution** South-west England (Dorset, Avon, Gloucestershire, Hereford & Worcester), Bedfordshire, and the Welsh Borders. This is a rare species in Europe, indeed most records are from eastern Europe. The map in Rozkosny (1983, pp.153-154) indicates one record for the Pyrenees and one off southern Sweden; the next nearest record is inside Czechoslovakia. (His map wrongly places a spot near the west coast of Wales; the text lists all records and makes no reference to a record in this district.)

**Habitat and ecology** Oldroyd (1969) mentions that the species was once found in great numbers where a woodland stream had been diverted. Rozkosny (*loc. cit.*) simply says that adults have been collected along streams. The larva is unknown, though it is probable that it lives in streamside moss.

**Status** Verrall (1909, pp.102-104) regarded this as a very rare species. He notes reports for Dorset dating from the period 1830-40. The other records that he cites are from Hereford & Worcester: Stoke Wood (in and after 1897), one at West Malvern on 8 June 1901, and it was not uncommon in the Monnow Valley on 3 July 1906. The Monnow River runs along the Hereford/Wales border for some miles and it is believed that the most frequently collected stretch was a little north of Pontrilas. The only more recent records are for Bridge Fall, Sundon (Bedfordshire), on 13 July 1947 and for Blaise Woods, near Bristol, Avon, in July 1947 and 1948.

**Author** A. E. Stubbs.

## Odontomyia angulata

A soldier fly — **ENDANGERED**

Order **Diptera** — Family **Stratiomyidae**

*Odontomyia angulata* (Panzer, 1798).

**Identification** Oldroyd (1969), p.31 and fig. 67.

**Distribution** Norfolk, Somerset and Suffolk.

**Habitat and ecology** The larvae are aquatic and the only breeding record (from Denmark) was of a larva found in a lake, and adults have been found on waterside vegetation and flowers beside standing water.

**Status** No recent records are available for this very rare species. Verrall (1909, pp.137-140) found it at Tuddenham, Suffolk, on 20 July 1880 and later saw it at Chippenham Fen, Cambridgeshire (but it has not been confirmed from the latter locality), and noted that H. W. Andrews found it at Sutton Broad, Norfolk, on 14 July 1905. Subsequently J. Cowley found it in Somerset, at Edington on 27 June 1947, Chilton Polden on 3 July 1951, and Street Heath on 7 July 1951.

**Threats** The drainage of pools and the lowering of water levels in ditches, pollution of standing water bodies, and extensive machine clearance of ponds and ditches.

**Author** I. F. G. McLean.

## Odontomyia argentata

A soldier fly — **VULNERABLE**

Order **Diptera** — Family **Stratiomyidae**

*Odontomyia argentata* (F., 1794).

**Identification** Oldroyd (1969), p.31, figs 68 and 70.

**Distribution** Somerset, Dorset, Hampshire, Suffolk, East Sussex, Cambridgeshire, Bedfordshire, Surrey, London, Essex, and Kent.

**Habitat and ecology** Larvae have been found in marshes and probably also occur at ditch margins. The adults are found early in the year, April-May in Britain.

**Status** A rare species in Britain and Europe. Verrall (1909, pp.131-134) implies that it was more frequent in the early 19th century than in his time, and records it from Fordingbridge, Hampshire (1897), Mildenhall, Suffolk (c. 1901), Seaford, East Sussex (before 1860), Dorset, and Cambridgeshire (1832). Since then it has been found in Somerset (Street Heath, 1949), Dorset (Witchampton, 1947),

Hampshire (Leckford, 1940s and 1970s), Surrey (Bookham Common, 1948, and Staines Moor, 1955), Greater London (Uxbridge, 1926), Kent (Erith, 1948), Essex (Henny, 1911), Suffolk (Timworth, 1913), Bedfordshire (Fancott, 1944), and Cambridgeshire (Milton, 1924, Wicken Fen, 1929 and 1957, Woodwalton Fen, 1949, and Chippenham Fen, currently). There are therefore only two post-1960 localities.

**Threats** Drainage of wetlands, pollution of standing water bodies, and extensive machine clearance of ponds and ditches.

**Conservation** Chippenham and Woodwalton Fens are NNRs, and Wicken Fen is owned by the National Trust.

**Author** I. F. G. McLean.

## Odontomyia ornata

A soldier fly **VULNERABLE**

Order **Diptera** Family **Stratiomyidae**

*Odontomyia ornata* (Meigen, 1822).

**Identification** Oldroyd (1969), p.31 and fig. 66.

**Distribution** Somerset, East Sussex, Norfolk, Kent, London, Surrey and Wiltshire.

**Habitat and ecology** The larvae are found in shallow standing water in pools and dykes, mainly in levels marshes. The adults can be found in May and June on vegetation near the breeding sites and also feeding at flowers (especially on umbels).

**Status** This rare species is now almost confined to the Somerset Levels, where a detailed NCC entomological survey in 1983 revealed its presence in ten 10km squares, and one 10km square in Avon, showing a preference for sites on peat. Other available records are mostly old, suggesting that this species has undergone a considerable recent decline: Wiltshire (South Marston, 1922), East Sussex (Bexhill, 1872, Lewes Levels, 1885, Pevensey Levels, 1973, Pett Level, 1986), Surrey (Byfleet, 1939), Kent (Cliffe, 1897), Greater London (Acton, 1894, Mitcham, 1900, and Stanmore, 1953), and Norfolk (Barton Broad, 1937).

**Threats** The drainage of wetlands, pollution of standing water bodies, and extensive machine clearance of ponds and ditches.

**Author** I. F. G. McLean.

## Stratiomys chamaeleon

A soldier fly — **ENDANGERED**

Order **Diptera** — Family **Stratiomyidae**

*Stratiomys chamaeleon* (L., 1758).

**Identification**

Oldroyd (1969), p.27, figs 79, 80 and 82; Rozkosny (1973), pp. 69-72.

**Distribution**

Has been recorded from Cambridgeshire, Leicestershire, Norfolk and Oxfordshire. Currently known from only one site (Oxfordshire).

**Habitat and ecology**

In pools and ponds at least partially fringed with emergent vegetation. There may be a requirement for areas of shallow water overlying a fine muddy substrate, and a generally shallow profile at the water margin. The larvae are aquatic, floating on the water-surface among vegetation, and often hibernate in mud. The adults fly from July to September and visit flowers.

**Status**

Adults have been found in the late 1970s and early 1980s at one site in Britain (Dry Sandford Pit, Oxfordshire) but at no other site in Britain since at least before 1940. It has not been found recently at Chippenham Fen NNR, Cambridgeshire, (recorded 1892) but has not been looked for at the former Leicestershire or Norfolk sites. The continuing loss of its already scarce habitat makes it increasingly unlikely that new sites will be discovered.

**Threats**

The drainage and robust clearance of small water bodies, resulting in the loss of larval habitat by its modification to deep, steep-sided ponds which lack marginal emergent vegetation.

**Conservation**

Believed to be breeding on one local Trust reserve (Berks, Bucks & Oxon Naturalists' Trust), and possibly on a nearby NNR (Cothill). It is necessary to investigate probable breeding sites (in the vicinity of the location of adult sightings) to determine the distribution of larvae in relation to available habitat, in order to assess what management may be required.

**Author**

I. F. G. McLean, using additional information from J. W. Ismay and A. G. Irwin (pers. comms).

## Stratiomys longicornis

A soldier fly — **VULNERABLE**

Order **Diptera** — Family **Stratiomyidae**

*Stratiomys longicornis* (Scopoli, 1763).

**Identification** Oldroyd (1969), p.27; Colyer & Hammond (1968), pl. 8:2.

**Distribution** Coast from East Anglia to Hampshire.

**Habitat and ecology** The larvae develop in standing water among aquatic vegetation in saline coastal marshes and saltmarsh pools. The adults occur on low vegetation and flowers, usually near the larval habitats.

**Status** This rare species has been principally known from the Thames Marshes of Essex and Kent (Shoeburyness, Benfleet and Belvedere, Isle of Grain, Northfleet, and Gravesend), and also Walland Marsh, Kent (1954), Salisbury, Wiltshire (1950: likely to be a stray), Wicken Fen, Cambridgeshire (likely to be a stray), Yarmouth, Isle of Wight (1922), Felixstowe, Suffolk, and Lymington, Hampshire, but there are very few recent records.

**Threats** Agricultural 'improvement' of saltmarshes and coastal levels marshes, coastal defence works, and the associated destruction of larval habitat.

**Author** I. F. G. McLean.

## Xylomyia maculata

A soldier fly — **VULNERABLE**

Order **Diptera** — Family **Xylomyiidae**

*Xylomyia maculata* (Meigen, 1820).

**Identification** Oldroyd (1969), p.33, figs 89 and 99. A medium-sized black and yellow fly, mimicking a wasp in pattern and behaviour.

**Distribution** The three major southern ancient forests – New Forest, Windsor Forest (including Silwood Park), and Epping Forest. Also Finchley in London. Rarely found, even in apparently suitable trees.

**Habitat and ecology** Ancient forest or remnants with large over-mature trees with rot holes. The life cycle takes one or possibly more years to complete. The adults fly in May and June. The larvae and pupae have been found in dead wood, including rot holes above ground, being occasionally numerous in small pockets of breeding material. Beech *Fagus* has been recorded as a host tree.

**Status** This has always been an infrequent species to find. There are long series in collections because larvae and pupae

have been found on a few occasions. The adult is rarely seen, despite its striking appearance. Today it is rarely found even in apparently suitable trees, so there must be concern at the progressive decline in suitable habitat.

**Threats** Large numbers of ancient trees have been cleared for modern afforestation, for firewood, or for safety or amenity tidiness in public areas. Age-gap problems in the supply of suitable over-mature trees may arise, and with a smaller population of ancient trees there is less chance of ideal breeding sites being available.

**Conservation** Conservation management for over-mature timber is in hand in Windsor Forest. Strengthening of the conservation measures in the New Forest and Epping Forest is required.

**Authors** A. G. Irwin and A. E. Stubbs.

## Xylophagus junki

A soldier fly **ENDANGERED**

Order **Diptera** Family **Xylophagidae**

*Xylophagus junki* Szilady, 1932.

**Identification** Oldroyd (1969), p.34; the male is unknown.

**Distribution** Strathspey, Highland Region.

**Habitat and ecology** The larvae of members of this genus are found in dead wood, and it is probable that *X. junki* breeds in over-mature pine trees *Pinus*, because the only British example was found in an ancient Caledonian pine forest. The adults are elusive in this genus, but may be found resting on tree trunks.

**Status** A very rare species in Britain, still only known from a single female found by J. E. Collin in Glenmore Forest, Aviemore, on 5 June 1913 (see Collin, 1962). The subsequent extraction of mature pine trees from this forest makes the continued survival of this species at its only known site very doubtful, but possibly it may yet be re-found in one of the Caledonian pine woods of the Spey or Dee valleys. For any site to support this species it is essential that continuity in the presence of ancient trees and dead wood is maintained. It is considered most improbable that it could survive in commercially managed pine woods.

**Threats** This species would be threatened by the felling of mature and over-mature trees or the clearance of dead wood. In commercially managed forests trees are not allowed to reach an age or condition suitable for the larvae to develop successfully.

**Author** I. F. G. McLean.

## Chrysopilus erythrophthalmus

A snipe fly — **VULNERABLE**

Order **Diptera** — Family **Rhagionidae**

*Chrysopilus erythrophthalmus* Loew, 1840.

**Identification** Cole (1981).

**Distribution** Hereford & Worcester, and North Yorkshire.

**Habitat and ecology** Larvae are found in cool water streams running at 30-70cm per second, under stones and among aquatic bryophytes (Cole, 1981, quoting data obtained by Thomas in France). Upland streams in western and northern Britain are most likely to support this species, and, as adults are seldom captured even within the known range of the species in continental Europe, it is possible that further sites may be found only by searching for larvae.

**Status** Known in Britain from one female found by J. H. Wood at Stoke Plantation, Hereford & Worcester (thought to be the site now called Haugh Wood which has one quite large stream), on 1 July 1896. A second female was found by J. H. Cole on 3 July 1979 at Rake Beck, North Yorkshire, along the banks of a stream within a clearing in a wooded gully at about 250m above sea level (Cole, 1981).

**Author** I. F. G. McLean.

## Chrysopilus laetus

A snipe fly — **ENDANGERED**

Order **Diptera** — Family **Rhagionidae**

*Chrysopilus laetus* (Zetterstedt, 1842).

**Identification** Oldroyd (1969), p.46 and fig. 102. A medium-sized yellow fly.

**Distribution** The original rearing record is from Windsor Great Park. All subsequent records are from a nearby area of Windsor Forest. The larvae are of fairly regular occurrence in wet wood mould, though only one or two occur in any one piece of medium.

**Habitat and ecology** Open-structured beech woodland with ancient beech trees *Fagus*. Probably univoltine. Adults probably fly in May and June. Bred in 1939 from a pupa said to have been found in mud, but this information is probably erroneous or the circumstances misleading. In the 1960s and 1970s larvae have been found in wet wood mould in rotten stumps, rot holes and aerial logs up to 3m above ground, nearly always in beech. All British specimens have been bred except for one recent capture of an adult. The larvae are very active as if predatory, but such habits have not been confirmed.

**Status** It is of interest that this species has never been found in other major areas of ancient forest such as the New Forest or Epping Forest. It is one of the special elements of the dead-wood fauna of Windsor Forest.

**Threats** Windsor Forest has a much reduced area of ancient trees following widespread introduction of modern forestry. Fallen ancient trees have been cut up for firewood on many occasions.

**Conservation** A conservation management agreement for ancient trees provides reasonable safeguards for the future.

**Author** A. E. Stubbs.

## Chrysops sepulcralis

A horse fly — **VULNERABLE**

Order **Diptera** — Family **Tabanidae**

*Chrysops sepulcralis* (F., 1794).

**Identification** Oldroyd (1969), pp.52-54; see also Colyer & Hammond (1968), pl. 9:5.

**Distribution** Confined to Dorset, apart from a recent record from the New Forest (Hampshire).

**Habitat and ecology** Adults have been found in the vicinity of ponds and boggy areas on heaths and do not fly far from their breeding sites. It is probable that this species is breeding in damp ground within its known heathland localities. Unlike other tabanids, the larvae of *Chrysops* are probably saprophagous rather than predatory. Adults have been taken in late July and August.

**Status** Apparently confined to a few localities in the Dorset Heaths: Wareham, 1915 and 1919; Wareham Common, 1916; Studland, 1906, 1909 and 1933; Studland Heath, 1895; Morden Heath, 1916; Verwood, 1922; Rempstone Heath, 1931; near Agglestone (Godlingston Heath), 1933; and Stoborough Heath, 1953. Verrall (1909) gives additionally Parley Heath and Bloxworth and mentions old records from Scotland which are very doubtful (these may be referable to the black form of *C. caecutiens* (L.)). Goffe (1931) refers to a record from Hengistbury Head (Dorset) but he gave no records for the New Forest. However, a specimen has now been taken in the New Forest, at Holmhill on 11 July 1983 (by D. Sheppard), though this could be a stray from Dorset.

**Threats** The drainage of wet heath resulting in loss of suitable habitat for larvae is believed to be the most significant threat to the survival of this species in Britain. Other threats are ball clay extraction, oil-related developments, and building development.

**Authors** I. F. G. McLean and A. E. Stubbs.

## Atylotus plebeius

A horse fly — **ENDANGERED**

Order **Diptera** — Family **Tabanidae**

*Atylotus plebeius* (Fallen, 1817).

**Identification** Chvala *et al* (1972), pp.260-262 and 264-266.

**Distribution** Cheshire.

**Habitat and ecology** The larvae occur in "marshy places near peat bogs" (Chvala *et al*, 1972) where they are predators of other insect larvae. The females have not yet been observed as blood-sucking.

**Status** A very rare species in Britain with no recent records, it is known only from Abbots Moss (22 July 1911 and 6 June 1922) and Delamere (15 July 1911) and so is apparently confined to bogs in Cheshire. It is also a rare species in Europe (Chvala *et al*, 1972).

**Threats** Drainage of mosses and their invasion by pine trees, and possibly recreational pressure round Delamere.

**Conservation** Abbots Moss is an SSSI.

**Author** I. F. G. McLean.

## Atylotus rusticus

A horse fly — **ENDANGERED**

Order **Diptera** — Family **Tabanidae**

*Atylotus rusticus* (L., 1758).

**Identification** Oldroyd (1969), p.64 and fig. 126.

**Distribution** The only records are from Cambridgeshire (Monks Wood, 1828) (presumed to have originated from nearby fenland) and East Sussex (two records from near Lewes in the early 1880s, one record from near Eastbourne in 1900, one record from near Lewes in the 1960s, and one record from the Pevensey Levels in 1981).

**Habitat and ecology** Cattle-grazed levels marshes, with ditches managed on a medium length (probably about five years) clearance regime. The larvae probably live in mud at the margins of ditches on levels marshes. The adults fly from July to September.

**Status** The few records available suggest that this species is likely to be confined to the remaining grazing levels marshes in East Sussex, as this habitat type no longer occurs in Cambridgeshire, with the exception of the similar fen habitat at Woodwalton Fen NNR where this species is unlikely to have been overlooked.

**Threats** Drainage and agricultural improvement of the Lewes and Pevensey Levels, resulting in lower water tables and aquatic pollution from run-off from arable fields.

**Conservation** The most recent record is within an SSSI. A clearer definition of status and requirements is necessary.

**Author** I. F. G. McLean.

## Hybomitra expollicata

A horse fly — **ENDANGERED**

Order **Diptera** — Family **Tabanidae**

*Hybomitra expollicata* (Pandelle, 1883).

**Identification** Chvala *et al* (1972), pp.170-177 and 243-245.

**Distribution** Dorset and Essex.

**Habitat and ecology** A marsh species usually associated with brackish biotopes in Europe and recorded from two coastal localities in Britain. The larvae of Tabanidae are typically found in damp soil where they are predators of other insect larvae, and it is probable that this species is breeding beside saline pools and dykes in its known localities.

**Status** Only recorded from Studland, Dorset, on 1 and 3 August 1909, from Hadleigh, Essex, on 27 July 1969, and from Langenhoe, Essex, on 20 July 1983. This is a very rare species not recorded from coastal marshes during detailed recent surveys in Norfolk, Suffolk, Kent, Sussex, Somerset and Gwent.

**Threats** Drainage and agricultural improvement of coastal marshes.

**Author** I. F. G. McLean.

## Epitriptus arthriticus

A robber fly — **ENDANGERED**

Order **Diptera** — Family **Asilidae**

*Epitriptus arthriticus* (Zeller, 1840).

**Identification** Oldroyd (1969), p.93.

**Distribution** Norfolk and Somerset.

**Habitat and ecology** A dune locality in Somerset and the edge of the Breck (which has sandy heaths) in Norfolk. The adults prey upon other insects. The larvae may be predicted to be soil-dwelling.

**Status** The only known British records are those given in Oldroyd (1969): a female on 14 July 1907 at Merton, Norfolk, and a male on 16 July 1955 on Berrow sand dunes, Somerset.

**Author** A. E. Stubbs.

## Epitriptus cowini

A robber fly — **VULNERABLE**

Order **Diptera** — Family **Asilidae**

*Epitriptus cowini* Hobby, 1946.

**Identification** Oldroyd (1969), p.93.

**Distribution** Confined to north-west Wales.

**Habitat and ecology** Recorded from sand-dunes.

**Status** Only known recently from Morfa Harlech, where it was taken on 23 August 1968 and 17 August 1969 by P. Crow. There remains a possibility that Newborough Warren NNR and Morfa Dyfryn NNR may support this species. It has an interesting distribution in that, as far as the British Isles are concerned, it is confined to the coast of the Irish Sea; apart from north-west Wales, it is also known from eastern Ireland and the Isle of Man.

**Conservation** Morfa Harlech is an NNR.

**Author** A. E. Stubbs.

## Eutolmus rufibarbis

A robber fly — **VULNERABLE**

Order **Diptera** — Family **Asilidae**

*Eutolmus rufibarbis* (Meigen, 1820).

**Identification** Oldroyd (1969), p.92 and fig. 223. A large yellowish-grey fly.

**Distribution** The New Forest and eastern England up to Lincolnshire, but always regarded as rare and local. However, most records are old. Records from Surrey and Sussex are recent.

**Habitat and ecology** Open dry heathland. Possibly univoltine. The adults fly in late June to late August. It is probable that the larvae are predatory on beetle larvae such as those of chafers or dung beetles. The adults are predatory.

**Status** Since this species is confined to large blocks of open dry heathland, it is in an especially vulnerable habitat and it is on relatively few sites.

**Threats** The destruction of heathland, natural tree invasion of heathland (especially pines), and frequent fires reducing the age class of heath.

**Conservation** Occurs on Chobham Common LNR, Surrey, and on several SSSIs. Clarification of its status on other historic sites is required.

**Authors** A. G. Irwin and A. E. Stubbs.

## Neoitamus cothurnatus

A robber fly — **ENDANGERED**

Order **Diptera** — Family **Asilidae**

*Neoitamus cothurnatus* (Meigen, 1820).

**Identification** Oldroyd (1969), p.90.

**Distribution** Two sites in Oxfordshire.

**Habitat and ecology** Woodland, though its exact requirements are unknown. The related species *N. cyanurus* (Loew) occurs in woodland rides and along wood edges, often on tree foliage. It is assumed that *N. cothurnatus* occurs in a similar situation. Adult robber flies catch other insects as prey. The larvae are likely to be soil-dwelling (rather than living in dead wood).

**Status** Verrall (1909) summarises the records of his time: a male was taken at Stow Wood, Oxford, on 10 June 1895 and one of each sex at Tubney Wood (then placed in Berkshire) on 2 June 1901. Subsequent searches were unsuccessful. These remain the only British records. Tubney Wood has been extensively converted to conifers so it is questionable whether a very rare asilid would have survived.

**Author** A. E. Stubbs.

## Laphria gilva

A robber fly — **ENDANGERED**

Order **Diptera** — Family **Asilidae**

*Laphria gilva* (L., 1758).

**Identification** Oldroyd (1969), p.87. A large black fly with golden reflections formed by hairs on parts of the abdomen.

**Distribution** Only reputed to be British before 1938, but in that year several specimens were taken in Windsor Forest. A pair was taken *in cop.* at Oxshott, Surrey, in 1946, and a pupa was found at Silchester (about the Berkshire/Hampshire border). None have been found since.

**Habitat and ecology** Pine *Pinus* woodland. Assumed to be univoltine. The adults fly mostly in July, also June. Pupae have been recorded from pine stumps. It is possible that the larvae are predatory on xylophagous beetle larvae. The adults are predatory on other insects.

**Status** Pine was introduced into southern England in the 1800s, so mature pine and the related dead wood was not really available until this century. It is not surprising that this species should be among the many pine species to have colonised the large areas of pine habitat now available; rather it is less easy to explain why, having bred here, the species should die out. It could be that there was a temporary period of favourable climate. It is quite likely that it has remained in elusive small numbers or that the species will attempt to re-establish.

**Author** A. E. Stubbs.

## Psilocephala melaleuca

A stiletto fly **ENDANGERED**

Order **Diptera** Family **Therevidae**

*Psilocephala melaleuca* (Loew, 1847).

**Identification** Oldroyd (1969), p.100, figs 244 and 246. The male is covered in silver hairs, and the female is a drab brown.

**Distribution** All records but one are from Windsor Forest or nearby (Ascot and Egham). First found (as a larva) in 1929. The most recent records are of a larva in 1980 from Greenwich Park, Greater London, and an adult which emerged in 1981 from a pupa collected in Windsor Forest. Overall there are very few records.

**Habitat and ecology** Ancient woodland with over-mature oaks *Quercus*. Presumed to be univoltine. The adults fly in June and early July. Larvae have been found in decayed oak in the autumn, becoming adult the following summer.

**Status** One of the rarest and least known of our spectacular flies. It has not been found in other ancient forest areas.

**Threats** Reduction in the population of ancient oaks, either through direct destruction following modern afforestation or through shading out. A major age-class gap in suitable oaks could arise.

**Conservation** A conservation management agreement for Windsor Forest gives some hope for the future.

**Author** A. E. Stubbs.

## Villa cingulata

A bee fly — **VULNERABLE**

Order **Diptera** — Family **Bombyliidae**

*Villa cingulata* (Meigen, 1804).

**Identification** Oldroyd (1969), p.118, figs 328 and 330.

**Distribution** Oxfordshire, Buckinghamshire and Kent.

**Habitat and ecology** A species found in southern dry grassland or woodland localities; the larvae are parasitoids of other insects (no British breeding records). Adults have been found in July and August.

**Status** A rare species known from Stokenchurch (1898) in Buckinghamshire, Wormsley (1907) and Hell Coppice (Bernwood Forest) (1935) in Oxfordshire, and Soakham Down, Kent (1937, 1938).

**Author** I. F. G. McLean.

## Villa circumdata

A bee fly — **VULNERABLE**

Order **Diptera** — Family **Bombyliidae**

*Villa circumdata* (Meigen, 1820).

**Identification** Oldroyd (1969), p.118, figs 327 and 331.

**Distribution** Dorset, Surrey, Hampshire and the Isle of Wight.

**Habitat and ecology** A species of southern heaths; the larvae are parasitoids of other insects (no British breeding records). Adults may be found sunning themselves on bare patches of sandy ground in July and August.

**Status** A rare species known only from Arne (1901), Bloxworth (1906), Tadnoll Winfrith (1909), Wareham Heath (1918), Corfe Castle (1944), and Morden (1956) in Dorset; Chobham, Surrey (1904); Lyndhurst, Hampshire (1894); and St Helens, Isle of Wight (1950).

**Author** I. F. G. McLean.

## Syneches muscarius

A dance fly — **ENDANGERED**

Order **Diptera** — Family **Empididae**

*Syneches muscarius* (F., 1794).

**Identification** Collin (1961).

**Distribution** Known only from two sites in Dorset.

**Habitat and ecology** Beside or close to ditches in unimproved wet meadows. Adults occur low down on vegetation or can be taken by sweeping. The larval biology is unknown (may be predatory in soil). The adults are predatory on other insects among grass stems and have been recorded during July.

**Status** Recorded from The Moors, Wool, Dorset, in 1953 and 1954, but it is unlikely that the habitat remains suitable. It was refound a few miles away near Turners Puddle on 4 July 1984 during an NCC survey of Dorset meadows. The rapid and continuing loss of agriculturally-unimproved damp meadows makes it increasingly unlikely that any further sites will be discovered. This species must be at the edge of its range in southern Britain, as it is regarded as a species of south-west Europe.

**Threats** Modification of habitat by changed agricultural methods.

**Conservation** Assessment of the current status of the only known site and the population size of the single colony of this species is required.

**Authors** I. F. G. McLean and A. E. Stubbs, using additional information from E. C. M. d'A. Fonseca (pers. comm.).

## Poecilobothrus ducalis

**VULNERABLE**

Order **Diptera** Family **Dolichopodidae**

*Poecilobothrus ducalis* (Loew, 1857).

**Identification** Fonseca (1978), p.37.

**Distribution** Recorded from Essex, Kent, Sussex and Somerset.

**Habitat and ecology** Saltmarsh pools and also brackish ditches in levels marshes. The larval biology is unknown: they may be predatory in mud beside saline pools and ditches. The adults fly from July to September and are found on patches of mud beside these pools and ditches where they are predators of small insects.

**Status** Known from eight sites recently in Britain.

**Threats** The destruction of saltmarsh, and the intensive management of ditches on levels marshes, resulting in the loss of associated mud banks of low gradient, so that only steep-sided ditches remain.

**Conservation** Occurs at Chetney Marshes, Kent, within an SSSI.

**Author** I. F. G. McLean.

## Callomyia elegans

A flat-footed fly — **VULNERABLE**

Order **Diptera** — Family **Platypezidae**

*Callomyia elegans* Meigen, 1804.

**Identification** Chandler (1974).

**Distribution** Very local in south-west England (Dorset and the New Forest), South Wales (Glamorgan and Powys), Hereford & Worcester, and one record from south-west Scotland (Dumfries). All localities except those in Powys and Hereford & Worcester are near the coast. (It is scarce but widespread in Ireland.)

**Habitat and ecology** Mixed deciduous woodland. Its biology is not known but is probably similar to related species, i.e. the larva is a surface feeder on encrusting fungi on dead wood.

**Status** Most records are from the period 1861 to 1913, only the Dumfries (Gretna) record being more recent (1940). It has, however, been found in two Irish localities in recent years. Confirmation is necessary of its survival in its range in Great Britain.

**Threats** The loss of old-established woodland.

**Author** P. J. Chandler.

## Nephrocerus scutellatus

A big-headed fly — **ENDANGERED**

Order **Diptera** — Family **Pipunculidae**

*Nephrocerus scutellatus* Macquart, 1834.

**Identification** Coe (1966), p.36.

**Distribution** A single specimen was taken in 1979 at Kings Park Wood, West Sussex (Stubbs, 1980).

**Habitat and ecology** Deciduous woodland (with partial coniferisation; taken along a ride). Its life history is unknown but it is assumed to be an internal parasite of a large leaf-hopper (Homoptera, Auchenorhyncha). The adult was taken in mid-June.

**Status** Being an inch across, very much larger than the previously known British species of this family, this is an interesting addition to the British fauna. It seems highly unlikely that the specimen was a single stray blown across from Europe. Unless it is a recent colonist, the species must be very localised in occurrence to have escaped notice for so long.

**Threats** It is not clear whether the growth of conifers, which will swamp out much of the deciduous woodland, will have an effect. Sufficient deciduous trees may remain.

**Conservation** Kings Park Wood is a Forestry Commission conservation area.

**Author** A. E. Stubbs.

## Cephalops perspicuus

A big-headed fly — **VULNERABLE**

Order **Diptera** — Family **Pipunculidae**

*Cephalops perspicuus* (de Meijere, 1907).

**Identification** Coe (1966), p.58.

**Distribution** Only recorded from Norfolk (two localities).

**Habitat and ecology** The margin of fenland with a rich fen plant community. The larvae of Pipunculidae are internal parasites of plant bugs (Homoptera); the genus *Cephalops* has only been reared from bugs of the family Delphacidae. The adults of this species have only definitely been recorded in September (Irwin) but there may be an earlier brood in June-July (see Coe, 1966).

**Status** The only British records known are Horning Ferry (by J. E. Collin) and Catfield Fen (1977, by A. G. Irwin). Any further loss of fen habitat through agricultural reclamation will make a decline in the population of this species likely.

**Threats** The proposed Yare barrage would result in the loss of fen habitat which could have serious repercussions for this species.

**Conservation** Horning Ferry is within Bure Marshes NNR, and Catfield Fen is a Norfolk Naturalists' Trust reserve.

**Author** A. G. Irwin.

## Parasyrphus nigritarsis

A hoverfly — **ENDANGERED**

Order **Diptera** — Family **Syrphidae**

*Parasyrphus nigritarsis* (Zetterstedt, 1843).

**Identification** Stubbs & Falk (1983), pp. 69 and 150.

**Distribution** The Scottish Highlands.

**Habitat and ecology** The larvae are recorded (on the Continent) as feeding on the eggs and larvae of chrysomelid beetles. The habitat details in Britain are unknown.

**Status** There are only a few British specimens, all old. This is one of four British hoverflies which have not been confirmed as occurring in Britain in the post-1970 period.

**Author** A. E. Stubbs.

## Doros conopseus

A hoverfly **VULNERABLE**

Order **Diptera** Family **Syrphidae**

*Doros conopseus* (F., 1776).

**Identification** Stubbs & Falk (1983), pp. 61 and 135, pl. 4:14.

**Distribution** The western Weald, also south Essex, Wiltshire, Hampshire, and a few other records including north Cumbria.

**Habitat and ecology** Mainly chalk grassland, at the edge of scrub or woodland, often in association with bramble *Rubus*. The ecology of the larva is unknown but it will be of the predatory type.

**Status** Always very rare, recent records being confined to a few chalkland sites in the western Weald, Wiltshire and south Essex. Two were taken by D.A. Sheppard on Martin Down, Hampshire, in June 1982.

**Conservation** Martin Down is an NNR.

**Author** A. E. Stubbs.

## Didea alneti

A hoverfly **ENDANGERED**

Order **Diptera** Family **Syrphidae**

*Didea alneti* (Fallen, 1817).

**Identification** Stubbs & Falk (1983), pp. 61 and 134, pl. 3:17.

**Distribution** The West Midlands, also Essex, Kent and north Scotland.

**Habitat and ecology** Unknown. The larvae will be of the aphid-feeding type.

**Status** Always a great rarity, last taken in 1948 in Kent. This is one of four British hoverflies which have not been confirmed as occurring in Britain in the post-1970 period.

**Author** A. E. Stubbs.

## Sphaerophoria loewi

A hoverfly — **VULNERABLE**

Order **Diptera** — Family **Syrphidae**

*Sphaerophoria loewi* Zetterstedt, 1843.

**Identification** Stubbs & Falk (1983), pp. 70 and 153, pl. A:17,18.

**Distribution** Scattered coastal localities in southern counties and also north Lancashire. One inland locality in the Scottish Highlands.

**Habitat and ecology** Mainly a species of brackish marsh, usually in association with sea club-rush *Scirpus maritimus* or reed *Phragmites*. The larvae will be of the aphid-feeding type.

**Status** Very rare and in very few localities.

**Author** A. E. Stubbs.

## Chrysotoxum octomaculatum

A hoverfly — **VULNERABLE**

Order **Diptera** — Family **Syrphidae**

*Chrysotoxum octomaculatum* Curtis, 1837.

**Identification** Stubbs & Falk (1983), pp. 60 and 131, pl. 4:12.

**Distribution** Confined to heaths in east Dorset, the New Forest and the western Weald. For map see Entwistle & Stubbs (1983), map 11.

**Habitat and ecology** Confined to dry heathland. The ecology is virtually unknown, but the larvae will be of the aphid-feeding type, probably subterranean.

**Status** Very rare.

**Author** A. E. Stubbs.

## Chrysotoxum vernale

A hoverfly — **ENDANGERED**

Order **Diptera** — Family **Syrphidae**

*Chrysotoxum vernale* Loew, 1841.

**Identification** Stubbs & Falk (1983), pp. 59 and 131, pl. 4:8.

**Distribution** The southern coastal belt of south-west England, from south-west Hampshire to east Cornwall. For map see Entwistle & Stubbs (1983), map 12.

**Habitat and ecology** Unknown. The larvae will be of the aphid-feeding type, probably subterranean.

**Status** Historically seemingly very rare; only one recent record, in Dorset.

**Author** A. E. Stubbs.

## Rhingia rostrata

A hoverfly — **VULNERABLE**

Order **Diptera** — Family **Syrphidae**

*Rhingia rostrata* (L., 1758).

**Identification** Stubbs & Falk (1983), pp. 88 and 178, pl. 5:5.

**Distribution** Scattered records for southern England, also north-west Wales.

**Habitat and ecology** Woodland. The larval habitat is unknown; *R. campestris* feeds in cattle dung so *R. rostrata* could use dung or perhaps carrion.

**Status** Recorded very infrequently but it can suddenly appear in numbers at a site for a few weeks and then vanish. No permanent populations are known. It was last reported in Britain in 1976.

**Author** A. E. Stubbs.

## Ferdinandea ruficornis

A hoverfly — **VULNERABLE**

Order **Diptera** — Family **Syrphidae**

*Ferdinandea ruficornis* (F., 1775).

**Identification** Stubbs & Falk (1983), pp. 87 and 177, pl. 5:2.

**Distribution** Only currently known from a few places in the New Forest. Otherwise there are only a few old records for southern England, and one specimen from Derbyshire.

**Habitat and ecology** Woodland with sufficient goat moth trees. Adults occur in mid-summer sitting on tree trunks with sap runs caused by caterpillars of the goat moth *Cossus cossus*. The larvae have also been found in such situations, seemingly the essential breeding conditions.

**Status** This species has always been rare, but it is in danger of extinction if the goat moth declines for any reason at the only known sites. The population is estimated to be very small.

**Threats** The major decline in the status of the goat moth in the last thirty years has severely reduced the potential habitat. The hoverfly clearly requires continuity of habitat in viable quantity. The reason for the decline of the moth is not entirely clear, though reduction in the abundance of old trees and the removal of unsound infested trees must have contributed to the problem.

**Conservation** The priority is to ensure that the habitat is not destroyed. It is very difficult to devise positive measures: a survey of any new major sites for goat moth will be required.

**Author** A. E. Stubbs, using additional information from Coe (1953) and I. Perry (pers. comm.).

## Chamaesyrphus caledonicus

A hoverfly — **ENDANGERED**

Order **Diptera** — Family **Syrphidae**

*Chamaesyrphus caledonicus* Collin, 1940.

**Identification** Stubbs & Falk (1983), pp. 102 and 204, pl. 5:20.

**Distribution** Moray (Grampian).

**Habitat and ecology** Unknown.

**Status** One female was taken in August 1938 at Culbin Sands, a locality now largely covered in conifer plantations. This is the only reliable specimen (M. C. D. Speight, pers. comm.) though a very few other specimens from the Scottish Highlands have been attributed to this species. If these other specimens are in future regarded as a different species, such a species will itself be a Red Data Book candidate.

**Author** A. E. Stubbs.

## Myolepta potens

A hoverfly — **ENDANGERED**

Order **Diptera** — Family **Syrphidae**

*Myolepta potens* (Harris, 1780).

**Identification** Stubbs & Falk (1983), pp. 92 and 184, pl. 7:2.

**Distribution** Only recorded from a small area near Bristol and the Shapwick/Edington area of Somerset. For map see Entwistle & Stubbs (1983), map 22.

**Habitat and ecology** Unknown. It is assumed to be a woodland species, breeding in dead wood (in common with *M. luteola*, whose larvae are adapted to live in wet rot-holes).

**Status** Only a few specimens are known, all found in the 1940s. At least one of its former woods has been coniferised. This is one of four British hoverflies which have not been confirmed as occurring in Britain in the post-1970 period.

**Author** A. E. Stubbs.

## Brachyopa bicolor

A hoverfly — **VULNERABLE**

Order **Diptera** — Family **Syrphidae**

*Brachyopa bicolor* (Fallen, 1817).

**Identification** Stubbs & Falk (1983), pp. 89 and 180.

**Distribution** The New Forest and Windsor Forest; also Hertfordshire and Sussex.

**Habitat and ecology** Dead wood (or possibly sap runs), associated with large standing live trees, especially beech *Fagus*.

**Status** The only known regular site is in the New Forest. It is certainly very rare in Windsor Forest/Great Park. The other records are old.

**Author** A. E. Stubbs.

## Hammerschmidtia ferruginea

A hoverfly — **ENDANGERED**

Order **Diptera** — Family **Syrphidae**

*Hammerschmidtia ferruginea* (Fallen, 1871), formerly known as *Brachyopa ferruginea*.

**Identification** Stubbs & Falk (1983), pp. 91 and 183, pl. 7:12.

**Distribution** Only positively known from Strathspey (Highland) but there is another probable sighting from Torboll, south-east Sutherland. The population is believed to be small.

**Habitat and ecology** Open structured woodland with birch *Betula* and aspen *Populus tremula*. Its ecology is unknown but the related genus *Brachyopa* breeds in dead wood and sap runs. The adult has been reported from the stumps and trunks of aspen and birch, and also at flowers including rose *Rosa*. Recently three females were found at a large rot-hole in the side of a mature aspen, suggesting that this is the real breeding site.

**Status** It has always been a great rarity; there are very few recent sightings and it is in danger of extinction. It was found at an aspen stand in Sutherland in 1984. Suitable breeding sites are few and large aspens with rot-holes are particularly rare. Its ecological requirements are poorly understood.

**Threats** The removal and coniferisation of native deciduous woodland. Also the felling of aspens before maturity, when rot-holes and sap runs develop.

**Conservation** Recorded in one SSSI, but whether there is breeding here is unknown. There is a need for another SSSI in the Spey Valley to include the best historic locality where it still occurs.

**Author** A. E. Stubbs, using additional information from Coe (1953) and I. Perry (pers. comm.).

## Callicera aenea — A hoverfly — VULNERABLE

Order **Diptera** — Family **Syrphidae**

*Callicera aenea* (F., 1777).

**Identification** Stubbs & Falk (1983), pp. 73 and 159, pl. 9:2.

**Distribution** Scattered records, mainly in southern England but extending northwards to Yorkshire. For map see Entwistle & Stubbs (1983), map 3.

**Habitat and ecology** Unknown. The larvae almost certainly live in dead wood (an adult has been seen about birch logs). There is no obvious habitat association, perhaps open structured woods being the most plausible.

**Status** Unpredictable in occurrence and seemingly extremely rare.

**Author** A. E. Stubbs.

## Callicera rufa — A hoverfly — ENDANGERED

Order **Diptera** — Family **Syrphidae**

*Callicera rufa* Schummel, 1841.

**Identification** Stubbs & Falk (1983), pp. 73 and 159, pl. 9:3.

**Distribution** Ancient Caledonian pine forests on the eastern side of the Scottish Highlands. For map see Entwistle & Stubbs (1983), map 3. The population is believed to be small.

**Habitat and ecology** The larvae live in partially water-filled rot-holes in large ancient pine trees *Pinus sylvestris*. The needs of the adults are unknown, but they are normally seen on the trunks of live trees and on stumps.

**Status** It has always been rare, but is now in danger of extinction. A large area of over-mature trees is required to ensure that some are in the right condition. It has a chance on two NNRs, but otherwise the outlook is bleak.

**Threats** Suitable ancient pines with the right type of rot-hole would seem to be very rare nowadays. Modern commercial forestry practice is changing the structure of native forests so that over-mature trees with rot-holes will not be represented in the future.

**Conservation** Present on two NNRs, but only one has long-term provision for the right habitat. There is a need to ensure that other sites have suitable forestry plans.

**Author** A. E. Stubbs, using additional information from Coe (1953).

## *Callicera spinolae*

A hoverfly **ENDANGERED**

Order **Diptera** Family **Syrphidae**

*Callicera spinolae* Rondani, 1844.

**Identification** Stubbs & Falk (1983), pp. 73 and 159, pl. 9:1.

**Distribution** A few localities in East Anglia. For map see Entwistle & Stubbs (1983), map 3.

**Habitat and ecology** Adults occur at ivy blossom *Hedera helix* in the autumn. The larvae are unknown, but almost certainly live in rot-holes in trees.

**Status** Always a rarity but was reasonably strong at one site in the 1970s. However, it has rapidly declined and has seemingly disappeared in the last few years. There is strong reason to believe that it bred in elm trees (*Ulmus* species) which have now died and been removed after Dutch elm disease. It was rediscovered at its former strongest site in 1984, but is scarce, apparently dependent now on beech *Fagus*.

**Author** A. E. Stubbs, using additional information from I. Perry (pers. comm.).

## Microdon devius

A hoverfly

**VULNERABLE**

Order **Diptera**

Family **Syrphidae**

*Microdon devius* (L., 1761).

**Identification**

Stubbs & Falk (1983), pp. 112 and 228 (genus, pl. 9:4,5).

**Distribution**

Mainly the North Downs of Surrey and the Chilterns, but also the South Downs, Oxfordshire and perhaps Wyre Forest, and more doubtfully north-west Wales. However, records are few and mostly old. Only known in recent years from the North Downs. The population is believed to be small.

**Habitat and ecology**

Chalk grassland is the normal habitat. Some localities would equate with other calcareous grassland and possibly other habitats. Scrub edge may or may not be required. The larvae live in ants' nests, feeding on buccal pellets. The literature is confused and probably unreliable as to the ant hosts, but the best candidates are in the genera *Lasius* and *Formica*, probably also *Myrmica*. The adults are normally swept from long grass or found sitting beside paths.

**Status**

The absence of knowledge about its ecological requirements makes the future very uncertain. Only the two North Downs sites are good prospects and one of these is extremely small. It is possible that further sites may be located on the North Downs, the Chilterns or elsewhere though the species is always very localised and elusive.

**Threats**

Changes in the character of chalk grassland and its ant fauna; scrub encroachment; ploughing, afforestation and other forms of land improvement. Close grazing is also probably damaging.

**Conservation**

Present on two National Trust properties in Surrey, of which one is an SSSI. The management plan for the main site is probably satisfactory for this species. There is a need to survey the distribution and status more accurately, and in particular the biology.

**Author**

A. E. Stubbs, using additional information from Donisthorpe (1927, pp. 125-126) and Coe (1953).

## Chalcosyrphus eunotus

A hoverfly — **VULNERABLE**

Order **Diptera** — Family **Syrphidae**

*Chalcosyrphus eunotus* (Loew, 1873), formerly known as *Brachypalpus eunotus*.

**Identification** Stubbs & Falk (1983), pp. 110 and 221, pl. 10:7.

**Distribution** Hereford & Worcester, and Oxfordshire (that part formerly in Berkshire).

**Habitat and ecology** Undoubtedly breeds in dead wood but nothing is known of the early stages. Since the adult has been found on a log resting in a stream, and flying over a shaded pool, it is possible that it breeds in semi-submerged logs, but this remains far from proven.

**Status** Has only been found on four occasions, two of them in 1899 near Ledbury (Hereford & Worcester). In 1953 one was found at Cothill (Oxfordshire) and another in the Wyre Forest in 1977. There is thus only one recent record of this very rare species and nothing is known of management needs; possibly this species should be classified as Endangered, but the Welsh Borders are poorly recorded at present.

**Conservation** Cothill and Wyre Forest are NNRs.

**Author** A. E. Stubbs.

## Caliprobola speciosa

A hoverfly — **ENDANGERED**

Order **Diptera** — Family **Syrphidae**

*Caliprobola speciosa* (Rossi, 1790).

**Identification** Stubbs & Falk (1983), pp. 110 and 219, pl. 10:9.

**Distribution** Currently only in Windsor Forest and the New Forest. There are very old records for Yorkshire and Derbyshire.

**Habitat and ecology** A puparium was found in wet wood pulp in the base of a hollow beech stump *Fagus*. The adults seem to favour tall stumps in small sunny glades, mainly of beech but rarely also of oak *Quercus*.

**Status** A great rarity. It is now almost certainly confined to the New Forest, where it is only frequent at one site, and to Windsor Forest, where it has become much rarer over the last twenty years. This is one of our most handsome hoverflies, so the restriction and decline at its best sites in the last forty years as a consequence of reduction in habitat is of concern.

**Author** A. E. Stubbs.

## Pocota personata

A hoverfly — **VULNERABLE**

Order **Diptera** — Family **Syrphidae**

*Pocota personata* (Harris, 1780).

**Identification** Stubbs & Falk (1983), pp. 110 and 222, pl. 10:11.

**Distribution** Mainly southern England, but sparse records extend to Devon and Nottinghamshire.

**Habitat and ecology** Breeds in rot-holes in trees, usually high above ground. It occurs in ancient forests but there are a few records in other places.

**Status** This has always been a rarity though on a few occasions it has been reared in numbers from a concentration of larvae in rot-holes. Currently it is rare even in major ancient forests such as Windsor Forest and the New Forest, and modern records outside these are very infrequent.

**Author** A. E. Stubbs.

## Blera fallax

A hoverfly — **ENDANGERED**

Order **Diptera** — Family **Syrphidae**

*Blera fallax* (L., 1758).

**Identification** Stubbs & Falk (1983), pp. 109 and 218, pl. 10:5.

**Distribution** Historically in the main Caledonian pine forests of eastern Scotland, but currently only known at one site in the Spey Valley. The population is believed to be small.

**Habitat and ecology** Mature or over-mature native pines *Pinus sylvestris*, and possibly deciduous trees, in Caledonian forests. An old observation of unknown source or reliability is of a female laying eggs in sap exuding from beech *Fagus* and oak *Quercus* trees. Recent observations have been of adults sitting on live pine trunks and flying about the bases of such trunks where a thick mass of flakes of bark is exposed end-on at soil level. The hoverfly is related to genera which breed in dead wood, so it is possible that the larvae live between such pine-bark flakes and perhaps under similar circumstances about deciduous trees.

**Status** It was formerly local but widespread in the pine-woods of the eastern Highlands, but is now in danger of extinction. Its ecological requirements are unknown so it is difficult to cater for.

**Threats** The loss of ancient trees through forest clearance and modern forestry practice in Scotland.

**Conservation** The one remaining known site is an RSPB reserve. Further survey is required to check on its biology and to find further populations.

**Author** A. E. Stubbs, using additional information from Coe (1953), G. Else and I. Perry (pers. comms).

## Psilota anthracina

A hoverfly **VULNERABLE**

Order **Diptera** Family **Syrphidae**

*Psilota anthracina* Meigen, 1822.

**Identification** Stubbs & Falk (1983), pp. 101 and 203, pl. 5:3.

**Distribution** Southern England, principally the New Forest (Hampshire) and Windsor Forest (Berkshire).

**Habitat and ecology** The larval ecology is unknown. Sites usually contain ancient trees so dead wood could be the breeding site (though apparently related genera feed in bulbs and herbaceous roots). The adults are normally found on hawthorn blossom *Crataegus*.

**Status** A great rarity, only regularly seen at Windsor Forest. It is difficult, in the absence of meaningful ecological information, to assess the stability of its status on sites.

**Author** A. E. Stubbs.

## Anasimyia interpuncta

A hoverfly **VULNERABLE**

Order **Diptera** Family **Syrphidae**

*Anasimyia interpuncta* (Harris, 1776) (no longer regarded as synonymous with *A. transfuga*).

**Identification** Stubbs & Falk (1983), pp. 96, 97 and 191, pl. 12:8.

**Distribution** Greater London, and in the fens and marshes of East Anglia and the East Midlands. A total of four sites.

**Habitat and ecology** The larvae are of the rat-tailed maggot type, living an aquatic existence (details are unknown). The margins of ditches and ponds provide breeding sites.

**Status** A very little-known species. Its London site has been destroyed (by industrial infilling). It occurs on Wicken Fen and has been recorded from Woodwalton Fen, but it is scarce and its management requirements are not known. In Norfolk it has been taken on one site which is grazing marsh.

**Conservation** Woodwalton Fen is an NNR, and Wicken Fen is a property of the National Trust.

**Author** A. E. Stubbs.

## Lejops vittata — A hoverfly — VULNERABLE

Order **Diptera** — Family **Syrphidae**

*Lejops vittata* (Meigen, 1822).

**Identification** Stubbs & Falk (1983), pp. 99 and 197, pl. 12:5.

**Distribution** Mainly coastal: the Thames estuary (Kent and Essex), the south-eastern Channel coast (East Sussex and Kent), and in Norfolk and Somerset.

**Habitat and ecology** Mainly coastal grazing marshes, associated with mildly brackish ditches (especially those with sea club-rush *Scirpus maritimus* intermixed with freshwater plants). Some sites are several miles from the coast where sea club-rush survives from earlier times of more saline conditions. The larvae are unknown but are predictably of the rat-tailed maggot type adapted to aquatic conditions.

**Status** In the past it was regarded as a rarity, apart from in the "Thames Marshes" where it was locally frequent. It is now much more localised and rare in the Thames estuary, but it has recently been found in small areas in some additional counties. At only one site, in Somerset, has it been seen in reasonable numbers, and then only along one short length of dyke (1983, A. P. Foster).

**Threats** The extensive conversion of coastal grazing marshes to intensive cereal farming has destroyed a great deal of habitat and threatens most of the known sites. Major deepening and clearance of ditches, often with pump drainage, is associated with the eutrophication of ditches from fertiliser run-off. The Thames Barrage has resulted in extensive modification of flood embankments and ditches for many miles of coast. Saline influence is likely to weaken on most remaining sites. Nearly all sites are in areas suffering conservation problems, such as the Somerset Levels.

**Conservation** Present on at least two SSSIs.

**Author** A. E. Stubbs.

## Parhelophilus consimilis

A hoverfly — **VULNERABLE**

Order **Diptera** — Family **Syrphidae**

*Parhelophilus consimilis* (Malm, 1863).

**Identification** Stubbs & Falk (1983), pp. 100 and 199.

**Distribution** Scattered records in England, South Wales and south-west Scotland.

**Habitat and ecology** The transition between bog and fen, with pools and great reedmace *Typha latifolia*, is apparently preferred. However, the habitat does not always agree with this description. The larvae are aquatic.

**Status** There are few records, either old or recent, often concerning small and vulnerable sites.

**Conservation** Only one record applies to a nature reserve, run by the Herefordshire and Radnorshire Nature Trust.

**Author** A. E. Stubbs.

## Eristalis cryptarum

A hoverfly — **VULNERABLE**

Order **Diptera** — Family **Syrphidae**

*Eristalis* (*Eoseristalis*) *cryptarum* (F., 1794).

**Identification** Stubbs & Falk (1983), pp. 97 and 194, pl. 11:8.

**Distribution** South-west England to the New Forest and Gloucestershire.

**Habitat and ecology** The larvae are of the rat-tailed maggot type adapted to aquatic conditions. Little is known of the ecology but it is believed that there may be a preference for stream sides and pond margins with a rich marsh soil and plants such as yellow flag *Iris pseudacorus*.

**Status** Records are sparse and mostly old. Brown & Searle (1974) in a survey of east Dorset cited 1938 as the last known record. Recent surveys in the New Forest have not revealed the species. There has been recording effort in south-west England in recent years which, though not exhaustive, has only revealed a single specimen, in Devon.

**Author** A. E. Stubbs.

## Rainieria calceata

A stilt-legged fly — **ENDANGERED**

Order **Diptera** — Family **Micropezidae**

*Rainieria calceata* (Fallen, 1820).

**Identification** Collin (1945); see also Colyer & Hammond (1968), pl. 50:5.

**Distribution** Only known from a limited part of Windsor Forest. The population fluctuates; some years few are seen but it can be frequent on a few trees on occasion.

**Habitat and ecology** Forest with large, old beech trees *Fagus*. The biology is unknown, but the larvae are assumed to live in dead wood. The adults walk over the standing and fallen trunks of dead beech trees.

**Status** A large and rather peculiar fly which would readily gain attention if it had been seen elsewhere, so Windsor Forest is almost certainly the only site in Britain.

**Threats** A partial age-class gap in beech trees may occur in the future, reducing the quantity of dead beech to a level which may not be viable for this species, since only a small percentage of trees seem to reach the required state.

**Conservation** The site is an SSSI subject to a management agreement with the Crown Estate. There is a need to clarify its life cycle and ecological requirements.

**Author** A. E. Stubbs, using additional information from P. J. Chandler (pers. comm.).

## Acrometopia wahlbergi

A silverfly — **VULNERABLE**

Order **Diptera** — Family **Chamaemyiidae**

*Acrometopia wahlbergi* (Zetterstedt, 1846).

**Identification** Cogan (1978), pp. 228-229; Seguy (1934), pp.354 and 356.

**Distribution** Recorded from Lancashire (one site), and Anglesey and Gwynedd (four sites). The population size is not known, but it is highly localised within the available area of fen habitat.

**Habitat and ecology** Fens with sedges (*Carex* species) and a rich botanical community. The known larvae of Chamaemyiidae are predators of homopteran bugs, but there is no information on the biology of the early stages of *Acrometopia*.

**Status** This species can be frequent, but only on small areas within each fen. The single Lancashire site where it was first discovered in Britain by Sir C. H. Andrewes (Cliburn Moss) may no longer support the species, because of habitat changes associated with forestry operations.

**Threats** The drainage of fens for agriculture (Wales) or forestry planting (Lancashire) would severely modify or destroy the required habitat.

**Conservation** The Welsh sites are all either NNRs (Cors Erddreiniog and Cors Geirch) or SSSIs (Cors Bodeilio and Cors Goch); the last is also a North Wales Naturalists' Trust reserve.

**Author** I. F. G. McLean, using additional information from A. E. Stubbs (pers. comm.).

## Salticella fasciata

A snail-killing fly **VULNERABLE**

Order **Diptera** Family **Sciomyzidae**

*Salticella fasciata* (Meigen, 1830), p.68.

**Identification** Knutson & Lyneborg (1965), p.68.

**Distribution** Recorded from nine coastal dunes in southern Britain. The population size is not known, but it is very restricted in distribution within the localities where it occurs. Adults may be found at any one time in areas of a few square metres only, and not nearby in apparently identical habitat.

**Habitat and ecology** In Britain confined to coastal dunes, and recorded from fixed dune grassland at Tenby, Dyfed, by Knutson *et al* (1970). The larvae have been recorded feeding on living or dead snails of the family Helicidae, and pupariate externally. There are two or three generations per year.

**Status** With some records over seventy years old (localities not recently searched), this is a species with few known current localities and it is believed to be vulnerable to any loss of habitat for the reason given below.

**Threats** The erosion of dune habitat by recreational pressure, and construction or modification of golf courses and other developments affecting dunes. It is likely to be particularly vulnerable because of the highly localised nature of its colonies.

**Conservation** Occurs on Gibraltar Point NNR and Tenby SSSI.

**Author** I. F. G. McLean.

## Sciomyza dryomyzina

A snail-killing fly — **VULNERABLE**

Order **Diptera** — Family **Sciomyzidae**

*Sciomyza dryomyzina* Zetterstedt, 1846.

**Identification** Knutson & Lyneborg (1965), p.76.

**Distribution** Recorded from Conwy, Gwynedd (one locality), Oxfordshire (one locality), Suffolk (two localities) and Yorkshire (one locality), with only one example recorded from each locality. All records date from the 1920s except Port Meadow, Oxford, 3 June 1962 (K. G. V. Smith) and Dolgarrog Marsh, Conwy, 2 August 1969 (P. Skidmore).

**Habitat and ecology** Marshes and water meadows. The larvae have been recorded as parasitoids of the snail *Oxyloma* in North America. (*Oxyloma pfeifferi* is a frequent species in fens and marshes in Britain but *S. dryomyzina* has not yet been reared here.) The adults fly in May and June and again in August.

**Status** A rare species which must have declined owing to the drainage and agricultural improvement of its marsh and wet meadow habitats.

**Threats** The drainage of wetlands.

**Conservation** Port Meadow and Dolgarrog Marsh are SSSIs.

**Author** I. F. G McLean.

## Centrophlebomyia furcata

The Bone Skipper — **ENDANGERED +**

Order **Diptera** — Family **Piophilidae**

*Centrophlebomyia furcata* (F., 1794).

**Identification** McAlpine (1977), p.53.

**Distribution** The only known sites are Porthcawl (Mid Glamorgan) and Mount Edgecumbe Park (Cornwall).

**Habitat and ecology** The habitat preferences in Britain are unknown. The adults are attracted to large carcasses (of horses, cattle, dogs, etc), especially around wounds and the skull. Adults have been recorded in spring and autumn. The larvae develop in the bone marrow and are able to leap distances of several centimetres on leaving the bone tissue, as do related *Piophila* species (hence the English name coined by Friedberg, 1981).

**Status** As this species has not been recorded in Britain since 1906 there is a strong possibility that it may now be extinct.

**Threats** The more hygienic practices associated with the disposal of large carcasses in Britain have resulted in the virtual disappearance of potential breeding sites.

**Author** I. F. G. McLean, using additional information from Cogan & Dear (1975).

## Paraclusia tigrina

**VULNERABLE**

Order **Diptera** Family **Clusiidae**

*Paraclusia tigrina* (Fallen, 1820).

**Identification** Seguy (1934), pp.351 and 353. An attractively marked species with spotted wings, the largest member of the family.

**Distribution** About ten British records; scattered sites in southern England and one in South Wales. The population size is not known, but is apparently always small.

**Habitat and ecology** Old trees in copses, shelter belts, hedgerows or ancient parkland, more rarely within larger woods. Believed to be univoltine, the adults flying mainly in August. The life cycle is unknown but it almost certainly breeds in dead wood. The adults are usually found on the surface of dead wood on live tree trunks, mainly beech *Fagus* but also elm *Ulmus*.

**Status** It is noteworthy that this species has not been found in the large ancient forests noted for their dead-wood faunas. This is one of the few dead-wood Diptera known to prefer parkland or otherwise isolated large trees.

**Threats** By inhabiting isolated or small groups of over-mature trees, this species is very vulnerable to losing its habitat through the felling or natural death of those trees. Dutch elm disease has reduced the chances of finding breeding sites, an aspect of the wider problem of the decline of large trees in the agricultural landscape. The future will be precarious in some districts.

**Conservation** Occurs in three SSSIs (in only one of which are trees a reason for notification), but most sites are too small for such status. Recorded from National Trust properties in Kent and Cornwall. There is a need to consider replacement generations of trees on SSSIs.

**Author** A. E. Stubbs.

## Anthomyza bifasciata

**VULNERABLE**

Order **Diptera** Family **Anthomyzidae**

*Anthomyza bifasciata* Wood, 1911.

**Identification** Collin (1944).

**Distribution** Formerly only known by old specimens from Hereford & Worcester. It has been recorded recently from single sites in Oxfordshire, East Sussex and Essex, and at two coastal sites in Kent. The population is usually small, more rarely abundant in a small area.

**Habitat and ecology** Ditches and pondsides with the foodplant. It breeds in the seed heads of reedmace *Typha*, probably only lesser reedmace *T. angustifolia*. The adults may be swept from the seed heads.

**Status** Though small, the fly is very distinctive because of its banded wings. It does appear to be genuinely rare.

**Threats** Clearance of the foodplant, especially during mechanical ditch clearance; drainage.

**Conservation** Within an RSPB reserve which is also an SSSI. The best recent site will be within an SSSI extension, with an NNR under negotiation.

**Author** A. E. Stubbs, using additional information from Ismay (1981).

## Ochthera schembrii

A shore fly

**ENDANGERED**

Order **Diptera** Family **Ephydridae**

*Ochthera schembrii* Rondani, 1847, formerly known as *O. mantispa* Loew.

**Identification** Claussen (1977), pp.516-518; Seguy (1934), p.420.

**Distribution** Recorded from only one site in Cornwall (St Merryn) by G. C. Lamb in 1908, and not found since. The population size is not known, but is likely to be very small.

**Habitat and ecology** Its known habitat in Britain is the edge of a freshwater stream entering the sea over a sandy substrate, but the species may not be confined to coastal situations and could occur beside streams or ponds inland. Its larval biology is unknown. Adults were found by G. C. Lamb over sand and plants at the margin of a stream entering the sea, where they would be predators of other small insects (including related Ephydridae).

**Status** This species is believed to have a mainly southern European distribution and must be on the edge of its range in south-west England. The known habitat is very vulnerable to damage as a result of its limited size and distribution. One recent visit failed to locate the fly but apparently suitable habitat is still present.

**Threats** Recreational activities on beaches, and the modification of stream channels for any purpose.

**Author** I. F. G. McLean.

## Ernoneura argus

**VULNERABLE**

Order **Diptera** Family **Scathophagidae**

*Ernoneura argus* (Zetterstedt, 1838).

**Identification** Collin (1958), p.54.

**Distribution** Known from Loch Garten and Loch Einich, Speyside (Highland); Loch Etchachan, Aberdeen (Grampian); and a lochan north of Lochavat, Lewis (Western Isles). The population size is not known, but it is locally frequent where it occurs.

**Habitat and ecology** Adults have been recorded on stony lake shores, or 'hydroplaning' on the water surface, in June and July. The larval biology is unknown.

**Status** This is a rare northern element in the Scottish fauna, which on present information is highly restricted in its distribution.

**Threats** Loss of the shingle shore zone following any change in water level, or disturbance associated with recreational activity.

**Conservation** Loch Garten is an RSPB reserve. Loch Einich is an SSSI.

**Author** I. F. G. McLean, using additional information from A. C. Pont and E. C. M. d'A. Fonseca (pers. comms).

## Parallelomma paridis

**VULNERABLE**

Order **Diptera** Family **Scathophagidae**

*Parallelomma paridis* Hering, 1923, formerly known as *Americina paridis*.

**Identification** Collin (1958), p.40.

**Distribution** Known from Chapel le Dale, North Yorkshire (1921), and Woodditton Wood, Cambridgeshire (1908) (Collin, 1958). The population size is not known: only two British specimens have been recorded.

**Habitat and ecology** Woods where the larval foodplant occurs. The larvae mine the leaves of herb paris *Paris quadrifolia*. The adults fly in May.

**Status** Woodditton Wood has been converted to a conifer plantation by the Forestry Commission. The status of the site at Chapel le Dale is unknown.

**Threats** Loss of ancient woodland where the foodplant occurs, through clearance or coniferisation.

**Conservation** Investigation of its current status is needed, preferably by searching for the leaf mines.

**Author** I. F. G. McLean.

## Chirosia montana

**ENDANGERED**

Order **Diptera** Family **Anthomyiidae**

*Chirosia montana* Pokorny, 1893.

**Identification** Collin (1955).

**Distribution** Only recorded from Perth (Tayside).

**Habitat and ecology** Probably open-structured woodland. Its biology is unknown, but the larvae probably live in bracken *Pteridium aquilinum* or some other fern. The adults are found in June.

**Status** Originally collected in 1932, but not found in recent surveys.

**Threats** The destruction of forests and of the foodplant.

**Author** A. C. Pont.

## Pseudomyopina moriens

**VULNERABLE**

Order **Diptera** Family **Anthomyiidae**

*Pseudomyopina moriens* (Zetterstedt, 1845).

**Identification** Hennig (1969), p.323.

**Distribution** Probably confined to the high peaks of the Cairngorms (Grampian), and perhaps other parts of Scotland.

**Habitat and ecology** Mountain tundra. Its biology and larvae are unknown. The adults are found in early July.

**Status** Originally collected in 1951, and may be locally frequent in high mountain tundra habitats.

**Threats** Habitat loss, or damage from recreational activities such as ski development leading to the loss of vegetation and soil erosion.

**Conservation** Occurs within the Cairngorms NNR.

**Author** A. C. Pont.

## Lispocephala rubricornis

**VULNERABLE**

Order **Diptera** Family **Muscidae**

*Lispocephala rubricornis* (Zetterstedt, 1849).

**Identification** Fonseca (1968), p.68.

**Distribution** Coastal, and now restricted to a few areas of unspoiled dunes: Bettyhill, Caithness (Highland); Culbin Sands, Moray (Grampian); Aberffraw, Anglesey; Oxwich, West Glamorgan; and Braunton Burrows, Devon.

**Habitat and ecology** Dunes, dune slacks and dune copses, in the vicinity of water. Univoltine, the adults flying from June to early August. Its biology is unknown, but the larvae probably live in mosses and soggy vegetation in or near slow-flowing water.

**Status** Genuinely rare and, like many other species in the coastal environment, under threat from the pressures of recreation requirements.

**Threats** The draining of dune slacks; recreational activities and developments; afforestation.

**Conservation** Oxwich and Braunton Burrows are NNRs.

**Author** A. C. Pont.

# BIBLIOGRAPHY


AGUESSE, P. 1968. Les Odonates. *Faune de l'Europe et du Bassin Mediterraneen, 4.* 258pp.

AIRY SHAW, H.K. 1944. *Dictyopterus (Platycis) cosnardi* Chevr. (Col., Cantharidae, Lycinae) new to Britain. *Entomologist's Monthly Magazine, 80:* 204-205.

AIRY SHAW, H.K. 1961. *Phosphaenus hemipterus* (Goeze) (Col., Lampyridae) in Ashdown Forest. *Entomologist's Monthly Magazine, 97:* 182.

ALFORD, D.V. 1975. *Bumblebees.* London: Davis-Poynter. xii + 352pp.

ALLEN, A.A. 1936. *Adelocera quercea* Herbst (Col., Elateridae) established as British. *Entomologist's Monthly Magazine, 72:* 267-269.

ALLEN, A.A. 1937a. Two species of Coleoptera new to science. *Entomologist's Monthly Magazine, 73:* 51-54.

ALLEN, A.A. 1937b. *Limoniscus violaceus,* Mull. (Elateridae), a genus and species of Coleoptera new to Britain. *Entomologist's Record & Journal of Variation, 49:* 110.

ALLEN, A.A. 1938. *Elater ruficeps* Muls.: a beetle new to Britain. *Entomologist's Monthly Magazine, 74:* 172.

ALLEN, A.A. 1942. Some records of *Aleochara* and *Anthicus* spp. (Col.). *Entomologist's Monthly Magazine, 78:* 117-118.

ALLEN, A.A. 1945. *Globicornis nigripes* F. (Col., Dermestidae) rediscovered in Windsor Forest and reinstated as British. *Entomologist's Monthly Magazine, 81:* 84-85.

ALLEN, A.A. 1947a. *Hypulus quercinus* Quens. (Col., Melandryidae) not extinct in Britain. *Entomologist's Monthly Magazine, 83:* 9.

ALLEN, A.A. 1947b. *Globicornis nigripes* F. (Col., Dermestidae) in Britain: corrections and additions. *Entomologist's Monthly Magazine, 83:* 171.

ALLEN, A.A. 1950. *Laemophloeus monilis* F. (Col., Cucujidae) recaptured in Sussex. *Entomologist's Monthly Magazine, 86:* 70.

ALLEN, A.A. 1953. Two remarkable discoveries in the British Coleoptera. *Entomologist's Monthly Magazine, 89:* 148-149.

ALLEN, A.A. 1954. *Gastrallus immarginatus* Mull., not *laevigatus* Oliv. (Col., Anobiidae), a British species. *Entomologist's Monthly Magazine, 90:* 16.

ALLEN, A.A. 1955a. *Rhizophagus simplex* Reit. (Col., Rhizophagidae) in Oxfordshire. *Entomologist's Monthly Magazine, 91:* 129.

ALLEN, A.A. 1955b. *Procraerus tibialis* Lac. (Col., Elateridae), *Hylotrupes bajulus* L. and *Obrium brunneum* F. (Cerambycidae), etc., in Hants. *Entomologist's Monthly Magazine, 91:* 140.

ALLEN, A.A. 1956a. Maple confirmed as the host-tree of *Gastrallus immarginatus* Mull. (Col., Anobiidae) at Windsor. *Entomologist's Monthly Magazine, 92:* 42.

ALLEN, A.A. 1956b. *Copris lunaris* L. (Col., Scarabaeidae) in the Box Hill area of Surrey. *Entomologist's Monthly Magazine, 92:* 382.

ALLEN, A.A. 1958. A comment on the recurrence in Britain of *Platydema violaceum* F. (Col., Tenebrionidae). *Entomologist's Monthly Magazine, 94:* 235.

ALLEN, A.A. 1960a. The history and present-day status of *Gnorimus variabilis* L. (Col., Scarabaeidae) in Britain. *Entomologist's Record & Journal of Variation, 72:* 129-132.

ALLEN, A.A. 1960b. A new capture of *Cryptocephalus 10-maculatus* L. (Col., Chrysomelidae) in Scotland. *Entomologist's Monthly Magazine, 96:* 271.

ALLEN, A.A. 1962. A short account of *Emus hirtus* L. in Britain. *Entomologist's Record & Journal of Variation, 74:* 219-221.

ALLEN, A.A. 1963. The occurrence of *Teretrius picipes* F. (Col., Histeridae) at Oxshott, Surrey: with short notes on the other British records. *Entomologist's Monthly Magazine, 99:* xix.
ALLEN, A.A. 1964a. *Megapenthes lugens* Redt. (Col., Elateridae) in Hants., Gloucs., etc., with additional notes. *Entomologist's Monthly Magazine, 100:* 95-96.
ALLEN, A.A. 1964b. A postcript on *Emus hirtus* L. *Entomologist's Record & Journal of Variation, 76:* 145-146.
ALLEN, A.A. 1964c. *Harpalus honestus* Duft. (Col., Carabidae) confirmed as British. *Entomologist's Monthly Magazine, 100:* 155-157.
ALLEN, A.A. 1966. The rarer Sternoxia (Col.) of Windsor Forest. *Entomologist's Record & Journal of Variation, 78:* 14-23.
ALLEN, A.A. 1967. A review of the status of certain Scarabaeoidea (Col.) in the British fauna: with the addition to our list of *Onthophagus similis* Scriba. *Entomologist's Record & Journal of Variation, 79:* 201-206.
ALLEN, A.A. 1968. Two additions to the British species of *Atomaria* Steph. (Col., Cryptophagidae), with notes on others of the genus in Britain. *Entomologist's Record & Journal of Variation, 80:* 318-326.
ALLEN, A.A. 1969a. Notes on some British Staphylinidae (Col.). 1. – The genus *Scopaeus* Er., with the addition of *S. laevigatus* Gyll. to our list. *Entomologist's Monthly Magazine, 104* (1968): 198-207.
ALLEN, A.A. 1969b. Notes on some British serricorn Coleoptera, with adjustments to the list. 1.- Sternoxia. *Entomologist's Monthly Magazine, 104* (1968): 208-216.
ALLEN, A.A. 1969c. Notes on some British Scydmaenidae (Col.), with corrections to the List. *Entomologist's Record & Journal of Variation, 81:* 239-246.
ALLEN, A.A. 1970a. *Scopaeus minutus* Er. (Col., Staphylinidae) in Devon. *Entomologist's Monthly Magazine, 105* (1969): 162.
ALLEN, A.A. 1970b. Notes on various little-known, doubtful, or misidentified British Staphylinidae (Col.). *Entomologist's Monthly Magazine, 105* (1969): 193-196.
ALLEN, A.A. 1970c. *Ernoporus caucasicus* Lind. and *Leperisinus orni* Fuchs (Col., Scolytidae) in Britain. *Entomologist's Monthly Magazine, 105* (1969): 245-249.
ALLEN, A.A. 1970d. An overlooked Sussex record of *Cryptocephalus 10-maculatus* L. (Col., Chrysomelidae), and *C. biguttatus* Scop. in Surrey. *Entomologist's Monthly Magazine, 106:* 120.
ALLEN, A.A. 1971a. Notes on *Omophron limbatum* F. (Col., Carabidae) in Britain. *Entomologist's Monthly Magazine, 106* (1970): 221-223.
ALLEN, A.A. 1971b. *Procraerus tibialis* Lac. (Col., Elateridae) in Wilts. and Herts. *Entomologist's Monthly Magazine, 107:* 12.
ALLEN, A.A. 1971c. *Microlomalus parallelepipedus* Hbst. (Col., Histeridae) in Kent. *Entomologist's Monthly Magazine, 107:* 80.
ALLEN, A.A. 1971d. British Coleoptera: corrections and supplementary notes, including the addition of *Axinotarsus marginalis* Lap. (Melyridae) to our list. *Entomologist's Record & Journal of Variation, 83:* 46-51.
ALLEN, A.A. 1973. *Melandrya barbata* F. (Col., Serropalpidae) in Surrey, with further notes. *Entomologist's Monthly Magazine, 108* (1972): 239.
ALLEN, A.A. 1974a. *Rhinoncus albicinctus* Gyll. (Col., Curculionidae) new to Britain. *Entomologist's Monthly Magazine, 109* (1973): 188-190.
ALLEN, A.A. 1974b. *Bledius crassicollis* Bsd. & Lac. (Col., Staphylinidae) reinstated in the British list. *Entomologist's Monthly Magazine, 109* (1973): 234-235.
ALLEN, A.A. 1975. Two species of *Anaspis* (Col.: Mordellidae) new to Britain: with a consideration of the status of *A. hudsoni* Donis., etc. *Entomologist's Record & Journal of Variation, 87:* 269-274.
ALLEN, A.A. 1977. *Microglotta picipennis* (Gyll.) (Col., Staphylinidae): another Devonshire locality. *Entomologist's Monthly Magazine, 112* (1976): 154.

ALLEN, A.A. 1979. *Longitarsus rutilus* (Ill.) (Col., Chrysomelidae) in East Cornwall. *Entomologist's Monthly Magazine, 114* (1978): 62.
ALLEN, A.A. 1980. *Peritrechus gracilicornis* Puton (Hem., Lygaeidae) well established in the Studland area, Dorset. *Entomologist's Monthly Magazine, 116:* 65-66.
ALLEN, A.A. & LLOYD, R.W. 1951. *Pyrrhidium sanguineum* L. (Col., Cerambycidae) as a British species. *Entomologist's Monthly Magazine, 87:* 157-158.
ANDREWES, C.H. 1946. *Andrena vaga* Panz. (Hym., Apidae) in Sussex. *Entomologist's Monthly Magazine, 82:* 39.
ANGUS, R.B. 1964. Some Coleoptera from Cumberland, Westmorland and the nothern part of Lancashire. *Entomologist's Monthly Magazine, 100:* 61-69.
ANGUS, R.B. 1971. Revisional notes on *Helophorus* F. (Col., Hydrophilidae). 3: Species resembling *H. strigifrons* Thoms. and some further notes on species resembling *H. minutus* F. *Entomologist's Monthly Magazine, 106* (1970): 238-256.
ANGUS, R.B. 1976. A preliminary note on the British species of *Graphoderus* Sturm, with the additions of *G. bilineatus* Degeer and *G. zonatus* Hoppe to the British list. *Balfour-Browne Club Newsletter* No. 1: 1-3.
ANGUS, R.B. 1978. The British species of *Helophorus*. *Balfour-Browne Club Newsletter*, No.11: 2-15.
ANON., 1980. *Atlas of the bumblebees of the British Isles*. Cambridge: Institute of Terrestrial Ecology. 32pp.
ANON., 1981. *The conservation of butterflies*. London: Nature Conservancy Council. 28pp.
APPLETON, D. 1970. *Pterostichus aterrimus* (Herbst) (Col., Carabidae) in the New Forest. *Entomologist's Monthly Magazine, 105* (1969): 179.
APPLETON, D. 1972. *Eucnemis capucina* Ahr. (Col., Eucnemidae) in the New Forest. *Entomologist's Monthly Magazine, 108:* 2.
APPLETON, D. 1974. *Corymbites castaneus* (L.) (Col., Elateridae) in the Isle of Wight. *Entomologist's Monthly Magazine, 109* (1973): 202.
APPLETON, D. 1975. Two interesting rediscoveries in the Isle of Wight Coleoptera during 1973. *Entomologist's Monthly Magazine, 110* (1974): 122.
ARCHER, M.E. (ed.) 1979. *Provisional atlas of the insects of the British Isles: Part 9, Hymenoptera: Vespidae, Social wasps*. 2nd edition. Huntingdon: Biological Records Centre.
ARNOLD, G. 1905. Aculeate Hymenoptera in the New Forest. *Entomologist's Monthly Magazine, 41:* 261-262.
ASHE, G.H. 1944. Devonshire and Sussex Coleoptera in 1942-43. *Entomologist's Monthly Magazine, 80:* 70.
ASHE, G,H, 1952. Coleoptera at Nethy Bridge, Inverness-shire. *Entomologist's Monthly Magazine, 88:* 165-168.
ATTY, D.B. 1970. Gloucestershire beetles: a few records and an appeal. *Entomologist's Monthly Magazine, 105:* 199.
ATTY, D.B. 1983. *Coleoptera of Gloucestershire*. Cheltenham: privately published. 136pp.
BADCOCK, R.M. 1978. The *Hydropsyche fulvipes – instabilis – saxonica* (Trichoptera) complex in Britain and the recognition of *H. siltalai* Dohler. *Entomologist's Monthly Magazine, 113* (1977): 23-29.
BAKER, D.B. 1965. Two bees new to Britain (Hym., Apoidea). *Entomologist's Monthly Magazine, 100* (1964): 279-286.
BALACHOWSKY, A.S. (ed.) 1963. *Entomologie appliquee a l'agriculture. Tome 1: Coleopteres*. Part 2. Paris: Masson & Cie. 1391pp.
BALFOUR-BROWNE, F. 1940. *British water beetles*. Vol. 1. London: Ray Society. 375pp.
BALFOUR-BROWNE, F. 1950. *British water beetles*. Vol. 2. London, Ray Society. xx + 394pp.

BALFOUR-BROWNE, F. 1953. Coleoptera: Hydradephaga. *Handbooks for the identification of British insects, 4* (3).
BALFOUR-BROWNE, F. 1958. *British water beetles.* Vol. 3. London: Ray Society. 1iii + 210pp.
BANNISTER, R.T. 1969. *Halticus macrocephalus* Fieber (Hem., Miridae) in Cornwall. *Entomologist's Monthly Magazine, 104* (1968): 284.
BARNARD, P.C. 1985. An annotated check-list of the Trichoptera of Britain and Ireland. *Entomologist's Gazette, 36:* 31-45.
BARRETT, C.G. 1891. *Coleophora leucanipennella*, Hb.: an addition to the British fauna. *Entomologist's Monthly Magazine, 27:* 302.
BARRETT, K.E.J. (ed.) 1979. *Provisional atlas of the insects of the British Isles: Part 5, Hymenoptera: Formicidae, Ants.* 2nd edition. Huntingdon: Biological Records Centre.
BEDWELL, E.C. 1909. Coleoptera captured in various localities in 1908. *Entomologist's Monthly Magazine, 55:* 163-165.
BEDWELL, E.C. 1923. *Prionychus* (*Eryx*) *fairmairei* Reiche: a southern record. *Entomologist's Monthly Magazine, 59:* 236-237.
BEDWELL, E.C. 1926. *Lymexylon navale* L. at Windsor. *Entomologist's Monthly Magazine, 62:* 240.
BEIRNE, B.P. 1952. *British pyralid and plume moths.* London: Warne. 208pp.
BENICK, L. 1952. Pilzkafer und Kaferpilze. *Acta Zoologica Fennica, 70.*
BILLUPS, T.R. 1881. *Dufourea vulgaris*, Schk., at Woking. *Entomologist's Monthly Magazine, 18:* 161.
BILLUPS, T.R. 1884. *Odynerus reniformis*, Gmel., at Chertsey. *Entomologist's Monthly Magazine, 21:* 68-69.
BILTON, D.T. 1984. Four water beetles (Col., Dytiscidae) new to Cumberland, including *Hydroporus scalesianus* Stephens. *Entomologist's Monthly Magazine, 120:* 251.
BISCHOFF, H. 1927. *Biologie der Hymenopteren eine Naturgeschichte der Hautfluegler.* Berlin: Springer Verlag. *vii* + 598pp.
BLAIR, K.G. 1930. *Aglyptinus agathidioides* sp. n. (Fam. Silphidae), a new British beetle. *Entomologist's Monthly Magazine, 66:* 7-8.
BLAIR, K.G. 1935. *Bagous frit* Herbst in Britain, with notes on some other species of the genus. *Entomologist's Monthly Magazine, 71:* 249-253.
BLAIR, K.G. 1933. *Aleochara inconspicua* Aube reinstated in the British list of Coleoptera. *Entomologist's Monthly Magazine, 69:* 250.
BLAIR, K.G. 1934. A new species of *Cathormiocerus* from Britain (Col.). *Entomologist's Monthly Magazine, 70:* 26-28.
BLAIR, K.G. 1948. *Philanthus triangulum* F. (Hym., Sphecidae) in the Isle of Wight. *Entomologist's Monthly Magazine, 84:* 240.
BLAIR, K.G. & DONISTHORPE, H. St J. 1943. *Hypebaeus flavipes* F. (not *Ebaeus abietinus* Abeille) (Col., Malachiidae) in Britain: a correction. *Entomologist's Monthly Magazine, 79:* 16.
BOLTON, B. & COLLINGWOOD, C.A. 1975. Hymenoptera: Formicidae. *Handbooks for the identification of British insects, 6* (3c).
BRADLEY, J.D. & FLETCHER, D.S. 1979. *A recorder's log book or label list of British butterflies and moths.* London: Curwen Books. 136pp.
BRADLEY, J.D., TREMEWAN, W.G. & SMITH, A. 1973. *British tortricoid moths, Cochylidae and Tortricidae: Tortricinae.* London: Ray Society. viii + 251pp.
BRADLEY, J.D., TREMEWAN, W.G. & SMITH A. 1979. *British tortricoid moths, Tortricidae: Olethreutinae.* London: Ray Society. viii + 336pp.
BRAY, R.P. 1967. The taxonomy of the larvae and pupae of the British Phryganeidae (Trichoptera). *Journal of Zoology, London, 153:* 223-244.

BRENDELL, M.J.D. 1975. Coleoptera: Tenebrionidae. *Handbooks for the identification of British insects, 5* (10).
BRIAN, M.V. 1977. *Ants*. London: Collins. 223pp.
BRINDLE, A. 1964. Notes on *Anabolia* (*Phacopteryx*) *brevipennis* (Curtis), and *Ironoquia* (*Caborius*) *dubia* (Stephens), (Trichoptera, Limnephilidae). *Entomologist's Record & Journal of Variation, 76:* 289-292.
BRITTON, E.B. 1956. Coleoptera: Scarabaeoidea. *Handbooks for the identification of British insects, 5* (11).
BROMLEY, P.J. 1947. Biological observations on *Chrysomela tremula* F. (Col., Chrysomelidae) at Oxford. *Entomologist's Monthly Magazine, 83:* 57-58.
BROOKS, M. & KNIGHT, C. 1982. *A complete guide to British butterflies*. London: Jonathan Cape. 157pp.
BROWN, A.J. & SEARLE, C.A. 1974. Syrphidae (Diptera) in Dorset. *Entomologist's Gazette, 25:* 111-123.
BROWN, C. & CROWSON, R.A. 1980. Observations on scydmaenid (Col.) larvae with a tentative key to the main British genera. *Entomologist's Monthly Magazine, 115* (1979): 49-59.
BROWN, E.S. 1965. Notes on the migration and direction of flight of *Eurygaster* and *Aelia* species (Hemiptera, Pentatomoidea) and their possible bearing on invasions of cereal crops. *Journal of Animal Ecology, 34:* 93-107.
BROWN, S.C.S. 1954. The Britsh Lyonetiidae. *Proceedings & Transactions of the South London Entomological & Natural History Society, 1952-53*: 110-116, pl. 9.
BROWN, S.C.S. 1963. The early history of *Emus hirtus* (L.) in Britain. *Entomologist's Record & Journal of Variation, 75:* 87-88.
BROWN, S.C.S. 1982. *Pyrrhocoris apterus* L. (Hem.: Pyrrhocoridae) in Dorset. *Entomologist's Record & Journal of Variation, 94:* 96.
BROWN, V.K. 1983. *Grasshoppers. Naturalists' Handbooks* No. 2. Cambridge: University Press. 65pp.
BUCK, F.D. 1952. *Melandrya dubia* Schall. (Col., Serropalpidae) not a British insect. *Entomologist's Monthly Magazine, 88:* 189.
BUCK, F.D. 1954. Coleoptera: Lagriidae to Meloidae. *Handbooks for the identification of British insects, 5* (9).
BUCK, F.D. 1955. A provisional list of the Coleoptera of Epping Forest. *Entomologist's Monthly Magazine, 91:* 174-192.
BUCKLAND, P.C. & JOHNSON, C. 1983. *Curimopsis nigrita* (Palm) (Coleoptera: Byrrhidae) from Thorne Moors, South Yorkshire. *Naturalist, Hull, 108:* 153-154.
BUNTING, W. 1955. Water beetles at Thorne, Yorkshire. *Entomologist's Monthly Magazine, 91:* 85.
BURTON, J.A. 1984. Bibliography of Red Data Books (Part 1. Animal Species). *Oryx, 18:* 61-64.
BUTLER, E.A. 1923. *A biology of the British Hemiptera-Heteroptera*. London: Witherby. 682pp.
BUTTERFLIES UNDER THREAT TEAM. 1986. The management of chalk grassland for butterflies. *Focus on Nature Conservation*, No. 17. Peterborough: Nature Conservancy Council. 80pp.
CAMERON, M. 1917. On the occurrence of *Trogophloeus schneideri* Ganglb. in Britain. *Entomologist's Monthly Magazine, 53*: 156-157.
CAREY RIGGALL, E. 1944. Additions to the list of Lincolnshire Coleoptera. *Entomologist's Monthly Magazine, 80:* 74-75.
CARR, J.W. 1916. *The invertebrate fauna of Nottinghamshire*. Nottingham: Bell. 618pp.
CARTER, I.S., OWEN, J.A. & TAYLOR, S. 1980. *Haploglossa picipennis* (Gyll.) (Col., Staphylinidae) and other beetles from an osprey's nest in Speyside. *Entomologist's Monthly Magazine, 116:* 70.

CHAMBERS, V.H. 1949. The Hymenoptera Aculeata of Bedfordshire. *Transactions of the Society for British Entomology, 9*: 197-252.
CHAMPION, G.C. 1908. *Aleochara crassiuscula* Sahlb., a British insect. *Entomologist's Monthly Magazine, 44:* 194-195.
CHAMPION, G.C. & LLOYD, R.W. 1909. Some interesting British insects. *Entomologist's Monthly Magazine, 45:* 196-197.
CHAMPION, G.C. & LLOYD, R.W. 1910. Some interesting British insects (II). *Entomologist's Monthly Magazine, 46:* 1-3, pl. 1: 3.
CHAMPION, H.G., CHAMPION, R.J. & MORICE, F.D. 1914. *Homonotus* (*Pompilus*) *sanguinolentus*, F., in Surrey, with notes on the characters of the male and the distribution and nomenclature of the genus. *Entomologist's Monthly Magazine, 50:* 270-273.
CHAMPION, R.J. 1915. *Homonotus sanguinolentus* F., in Surrey: a correction. *Entomologist's Monthly Magazine, 51:* 43.
CHANDLER, P.J. 1974. Additions and corrections to the British List of Platypezidae (Diptera), incorporating a revision of the Palaearctic species of *Callomyia* Meigen. *Proceedings & Transactions of the British Entomological & Natural History Society, 7*: 1-32.
CHELMICK, D.G. (ed.) 1979. *Provisional atlas of the insects of the British Isles: Part 7, Odonata: Dragonflies.* 2nd edition. Huntingdon: Biological Records Centre.
CHELMICK, D., HAMMOND, C., MOORE, N. & STUBBS, A. 1980. *The conservation of dragonflies.* London: Nature Conservancy Council. 24pp.
CHINERY, M. 1973. *A field guide to the insects of Britain and northern Europe.* London: Collins. 352pp.
CHITTY, A.J. 1903. *Nomada guttulata*, Schk., *Psen concolor*, Dalb., and other aculeates from East Kent. *Entomologist's Monthly Magazine, 39:* 282.
CHVALA, M., LYNEBORG, L. & MOUCHA, J. 1972. *The horse flies of Europe (Diptera, Tabanidae).* Copenhagen: Entomological Society of Copenhagen. 500pp., 8pls.
CLAPHAM, A.R., TUTIN, T.G. & WARBURG, E.F. 1981. *Excursion flora of the British Isles.* 3rd edition. Cambridge: University Press. 499pp.
CLARIDGE, M.F. & STADDON, B.W. 1960. *Stenelmis canaliculata* Gyll. (Col., Elmidae): A species new to the British list. *Entomologist's Monthly Magazine, 96:* 141-144.
CLAUSSEN, P.J. 1977. A revision of the Nearctic, Neotropical and Palearctic species of the genus *Ochthera*, including one Ethiopian species and one new species from India. *Transactions of the American Entomological Society, 103:* 451-530.
COE, R.L. 1953. Diptera: Syrphidae. *Handbooks for the identification of British insects, 10* (1).
COE, R.L. 1966. Diptera: Pipunculidae. *Handbooks for the identification of British insects, 10* (2c).
COE, R.L., FREEMAN, P. & MATTINGLEY, P.F. 1950. Diptera 2. Nematocera: Tipulidae to Chironomidae. *Handbooks for the identification of British insects, 9* (2).
COGAN, B.H. 1978. A revision of *Acrometopia* Schiner and closely related genera. *Beitrage zur Entomologie, 28:* 223-250.
COGAN, B.H. & DEAR, J.P. 1975. Additions and corrections to the list of British acalypterate Diptera. *Entomologist's Monthly Magazine, 110* (1974): 173-181.
COIFFAIT, H. 1960. Les *Astenus* d'Europe et de la region Mediterraneene (Coleopteres Staphylinidae). *Bulletin de la Societe d'Histoire Naturelle de Toulouse, 95:* 48-99.
COLE, J.H. 1981. *Chrysopilus erythrophthalmus* Loew (Diptera: Rhagionidae) new to Britain. *Entomologist's Gazette, 32:* 275-277.
COLLIER, R. 1986. The conservation of the chequered skipper in Britain. *Focus on Nature Conservation*, No. 16, Peterborough: Nature Conservancy Council. 16pp.

COLLIN, J.E. 1944. The British species of Anthomyzidae (Diptera). *Entomologist's Monthly Magazine, 80:* 265-272.
COLLIN, J.E. 1945. British Micropezidae (Diptera). *Entomologist's Record & Journal of Variation, 57:* 115-119.
COLLIN, J.E. 1955. Genera and species of Anthomyiidae allied to *Chirosia* (Diptera). *Journal of the Society for British Entomology, 5:* 94-100.
COLLIN, J.E. 1958. A short synopsis of the British Scatophagidae (Diptera). *Transactions of the Society for British Entomology, 13:* 37-56.
COLLIN, J.E. 1961. *British flies: Vol. 6, Empididae.* Cambridge: University Press. 782pp.
COLLIN, J.E. 1962. A species of *Xylophagus* (Diptera, Xylophagidae) new to Britain. *Entomologist, 95:* 272-274.
COLLINGWOOD, C.A. 1954. Rare ants (Hym., Formicidae) in Dorset. *Entomologist's Monthly Magazine, 90:* 43-44.
COLLINS, G.B. 1946. *Andrena vaga* Panz. (Hym., Apidae) in Kent. *Entomologist's Monthly Magazine, 82:* 245.
COLLINS, N.M. & MORRIS, M.G. 1985. *Threatened swallowtail butterflies of the world. The IUCN Red Data Book.* Gland, Switzerland: IUCN.
COLYER, C.N. & HAMMOND, C.O. 1968. *Flies of the British Isles.* 2nd edition. London: Warne. 384pp.
COOMBS, C.W. & WOODROFFE, G.E. 1955a. A revision of the British species of *Cryptophagus* (Herbst) (Coleoptera: Cryptophagidae). *Transactions of the Royal Entomological Society of London, 106:* 237-282.
COOMBS, C.W. & WOODROFFE, G.E. 1955b. An annotated check list of the British species of *Cryptophagus* (Herbst) (Col., Cryptophagidae). *Entomologist's Monthly Magazine, 91:* 249-250.
COOMBS, C.W. & WOODROFFE, G.E. 1962. A note on the nomenclature, taxonomy and distribution of certain European species of *Cryptophagus* Herbst (Coleoptera: Cryptophagidae). *Proceedings of the Royal Entomological Society of London (B), 31:* 103-106.
COOTER, J. 1970. *Platycis cosnardi* Chevr. (Col., Lycidae), the third British record. *Entomologist's Monthly Magazine, 105* (1969): 171.
COOTER, J. 1973. (Exhibit of Coleoptera). *Proceedings & Transactions of the British Entomological & Natural History Society, 6:* 26.
COOTER, J. 1976. A note on some beetles captured in Moccas Park, Herefordshire, during 1975. *Entomologist's Record & Journal of Variation, 88:* 319-320.
COOTER, J. 1981a. A further note on *Pyrrhidium sanguineum* (L.) (Col., Cerambycidae). *Entomologist's Monthly Magazine, 116* (1980): 104.
COOTER, J. 1981b. A note on *Ernoporus caucasicus* Lind. (Col., Scolytidae) in Britain. *Entomologist's Monthly Magazine, 166* (1980): 112.
COOTER, J. 1981c. (Editorial note). *Coleopterist's Newsletter,* No.5: 3.
COOTER, J. 1982. Richmond Park field meeting. *Coleopterist's Newsletter,* No.9: 4.
CORBET, P.S. 1962. *A biology of dragonflies.* London: Witherby. 247pp. (Reprinted 1983 by Classey, Faringdon).
CORBET, P.S., LONGFIELD, C. & MOORE, N.W. 1960. *Dragonflies.* London: Collins. 260pp. (Reprinted 1985).
COX, D. 1947. *Lytta vesicatoria* L. (Col., Meloidae) and *Zeugophora flavicollis* Marsh. (Col., Chrysomelidae) in Essex. *Entomologist's Monthly Magazine, 83:* 104.
CRIBB, J. 1946. *Phosphaenus hemipterus* Goeze (Col., Lampyridae) in Sussex. *Entomologist's Monthly Magazine, 82:* 254.
CROSSLEY, R. & NORRIS, A. 1976. *Bembidion humerale* Sturm (Col., Carabidae) new to Britain. *Entomologist's Monthly Magazine, 111* (1975): 59-60.
DALTRY, H.W. 1958. *Philonthus dimidiatipennis* Er. (Col., Staphylinidae) in Britain. *Entomologist's Monthly Magazine, 94:* 66.

DANDY, J.E. 1969. *Watsonian vice-counties of Great Britain.* London: Ray Society. 2 maps + booklet.
DAY, M.C. 1979. Nomenclatural studies on the British Pompilidae (Hymenoptera). *Bulletin of the British Museum (Natural History) (Entomology), 38:* 1-26.
DAY, M.C. (In preparation). Spider wasps (Hymenoptera, Pompilidae). *Handbooks for the identification of British insects, 6* (4).
DEMPSTER, J.P. & HALL, M.L. 1980. An attempt at re-establishing the swallowtail butterfly at Wicken Fen. *Ecological Entomology, 5:* 327-334.
DEMPSTER, J.P., KING, M.L. & LAKHANI, K.H. 1976. The status of the swallowtail butterfly in Britain. *Ecological Entomology, 1:* 71-84.
DICKER, G.H.L. 1979. *Passaloecus clypealis* Forster (Hym., Sphecidae) in Kent. *Entomologist's Monthly Magazine, 114* (1978): 129.
DICKSON, R. 1976. *A lepidopterist's handbook.* Hanworth, Middlesex: Amateur Entomologists' Society. 136pp.
DIECKMANN, L. 1964. Die mitteleuropaischen Arten aus der Gattung *Bagous* Germ. *Entomologische Blatter fur Biologie and Systematik der Kafer, 60:* 88-111.
DIECKMANN, L. 1971. *Ceutorhynchus* – Studien. *Beitrage zur Entomologie, 21:* 581-595.
DIECKMANN, L. 1972. Beitrage zur Insektenfauna der DDR: Coleoptera – Curculionidae: Ceutorhynchinae. *Beitrage zur Entomologie, 22:* 3-128.
DISNEY, R.H.L. 1975. A midge (Dipt., Ceratopogonidae) new to Britain that is abundant in the limestone pavement of the Yorkshire Pennines. *Entomologist's Monthly Magazine, 110* (1974): 227-228.
DOBSON, R.M. 1964. The third instar larva of *Aleochara inconspicua* Aube (Col., Staphylinidae), a parasite of the wheat bulb fly *Leptohylemyia coarctata* (Fall.) (Dipt., Muscidae). *Entomologist's Monthly Magazine, 100:* 210-211.
DOLLING, W.R. 1971. *Macroplax preyssleri* (Fieber) (Hem., Lygaeidae) new to Britain. *Entomologist's Monthly Magazine, 106* (1970): 155-156.
DONISTHORPE, H.St J. 1918. *Caenocara subglobosa* Muls., a species of Coleoptera new to Britain. *Entomologist's Monthly Magazine, 54:* 55-56.
DONISTHORPE, H.St J. 1922. A few notes on Coleoptera in 1921. Entomologist's *Monthly Magazine, 58:* 52-55.
DONISTHORPE, H.St J.1925. *Dryophthorus corticalis* Pk., a genus and species of Coleoptera new to Britain. *Entomologist's Monthly Magazine, 61:* 182.
DONISTHORPE, H.St J. 1927. *The guests of British ants.* London: Routledge. xxiii + 244pp.
DONISTHORPE, H.St J. 1928. *Dorcatoma dresdensis* Herbst and *D. serra* Pz.: two new British insects. *Entomologist's Monthly Magazine, 64:* 196-199.
DONISTHORPE, H.St J. 1931. Coleoptera, etc., in Moorhens' and Swans' nests. *Entomologist's Record & Journal of Variation, 43:* 177.
DONISTHORPE, H.St J. 1936. *Gastrallus laevigatus* Ol. (Col., Anobiidae), a genus and species of Coleoptera new to Britain. *Entomologist's Monthly Magazine, 72:* 200.
DONISTHORPE, H.St J. 1939. *A preliminary list of the Coleoptera of Windsor Forest.* London: Nathaniel Lloyd. 126pp.
DONISTHORPE, H.St J. & CHAPMAN, T.A. 1913. Notes on the capture of *Claviger longicornis*, Mull., and a description of its supposed larva. *Entomologist's Record & Journal of Variation, 25:* 290-294, pl.24.
DONISTHORPE, H.St J. & TOMLIN, J.R. le B. 1934. *Ebaeus abietinus* Abeille (Malachiidae, Col.), a beetle new to Britain. *Entomologist's Monthly Magazine, 70:* 198-199.
DONISTHORPE, H.St J. & WALKER, J.J. 1931. *An annotated list of the additions to the British coleopterous fauna.* (Reprinted from *Entomologist's Monthly Magazine.*) London: Nathaniel Lloyd. 103pp, 8pls.

DRANE, A.B. 1985. A second Northants. locality for *Ernoporus caucasicus* Lindemann (Col., Scolytidae) and notes on some other beetles. *Entomologist's Monthly Magazine, 121:* 107.
DRISCOLL, R.J. 1978. A preliminary report on the distribution of water beetles in Broadland dykes. *Balfour-Browne Club Newsletter,* No.8: 3-14.
DRUMMOND, D.C. 1956. Food plants of *Chrysolina violacea* (Mull.), *C. haemoptera* (L.), *C. crassicornis* (Hell.) and *C. polita* (L.) (Col., Chrysomelidae). *Entomologist's Monthly Magazine, 92:* 368.
DUFFY, E.A.J. 1952. Coleoptera: Cerambycidae. *Handbooks for the identification of British insects, 5*(12).
DUFFY, E.A.J. 1953. *A monograph of the immature stages of British and imported timber beetles (Cerambycidae).* London: British Museum (Natural History). 350pp.
EDINGTON, J.M. 1964. The taxonomy of British polycentropid larvae (Trichoptera). *Proceedings of the Zoological Society of London, 143:* 281-300.
EDINGTON, J.M. & HILDREW, A.G. 1981. A key to the caseless caddis larvae of the British Isles. *Scientific Publications of the Freshwater Biological Association* No. 43.
EDWARDS, F.W. 1913. Notes on British Mycetophilidae. *Transactions of the Entomological Society of London, 1913*: 334-382.
EDWARDS, F.W. 1925. British fungus-gnats (Diptera, Mycetophilidae). With a revised generic classification of the family. *Transactions of the Entomological Society of London, 1924*: 505-670.
EDWARDS, F.W. 1937. Craneflies in Mulgrave Woods. *Naturalist, Hull, 1937*: 253-254.
EDWARDS, F.W. 1938a. British short-palped craneflies. Taxonomy of adults. *Transactions of the Society for British Entomology, 5*: 1-168.
EDWARDS, F.W. 1938b. A new species of the genus *Nephrotoma* Mg., with notes on the species of the *flavescens* group. (Diptera, Tipulidae). *Encyclopedie Entomologique, ser. B2. Diptera, 9*: 97-101.
ELGAR, H. 1901a. Rare aculeate Hymenoptera at Halling, Kent. *Entomologist's Monthly Magazine, 37:* 17.
ELGAR, H. 1901b. *Andrena polita*, Smith, in Kent. *Entomologist's Monthly Magazine, 37:* 277.
ELSE, G.R. (In preparation). Bees (Hymenoptera, Apoidea). *Handbooks for the identification of British insects, 6.*
ELSE, G., FELTON, J. & STUBBS A. 1979. *The conservation of bees and wasps.* London: Nature Conservancy Council. 13pp.
van EMDEN, F.I. 1941. Larvae of British beetles. II. A key to the British Lamellicornia larvae. *Entomologist's Monthly Magazine, 77:* 117-127, 181-192.
van EMDEN, F.I. 1943. Larvae of British beetles. IV. Various small families. *Entomologist's Monthly Magazine, 79:* 209-223, 259-270.
van EMDEN, F.I. 1945. Larvae of British beetles. V. Elateridae. *Entomologist's Monthly Magazine, 81:* 13-37.
EMMET, A.M. 1976. *Phyllocnistis xenia* Hering – its foodplant and life history. *Entomologist's Record & Journal of Variation, 88:* 306.
EMMET, A.M. (ed.) 1979. *A field guide to the smaller British Lepidoptera.* London: British Entomological & Natural History Society. 271pp.
ENTWISTLE, P.F. & STUBBS, A.E. 1983. *Preliminary atlas of the hoverflies (Diptera: Syrphidae) of the British Isles.* Huntingdon: Biological Records Centre.
FARRELL, L. 1975. A survey of the status of the chequered skipper butterfly (*Carterocephalus palaemon*) (Pallas) (Lep., Hesperiidae) in Britain, 1973-1974. *Entomologist's Gazette, 26:* 148-149.
FARROW, R.A. & LEWIS, E.S. 1971. *Omophron limbatum* (F.) (Col., Carabidae) an addition (or restoration?) to the British list. *Entomologist's Monthly Magazine, 106* (1970): 219-221.

FELTON, J.C. 1963. The Hymenoptera in the Maidstone Museum Collection. *Transactions of the Kent Field Club, 1*(4): 171-190.
FISHER, D. 1977. Identification of adult females of *Tinodes* in Britain (Trichoptera: Psychomyiidae). *Systematic Entomology, 2*: 105-110.
FLETCHER, T.B. 1944. (Exhibit and note on *Cryptocephalus primarius* Harold.) *Proceedings of the Royal Entomological Society of London (C), 9*: 23-24.
FLINT, J.H. 1957. *Aphodius brevis* Er. (Col., Scarabaeidae) in Yorkshire. *Entomologist's Monthly Magazine, 93:* 12.
FONSECA, E.C.M.d'A. 1968. Diptera, Cyclorrhapha, Calyptrata: Section (b) Muscidae. *Handbooks for the identification of British insects, 10* (4b).
FONSECA, E.C.M.d'A. 1978. Diptera, Orthorrhapha, Brachycera: Dolichopodidae. *Handbooks for the identification of British insects, 9* (5).
FORD, L.T. 1946. The Psychidae. *Proceedings & Transactions of the South London Entomological & Natural History Society, 1945-46*: 103-110, pl.11.
FORSTER, H.W. 1955. *Epuraea terminalis* Man. and *Rhizophagus simplex* Reit. (Col., Nitidulidae) in Epping Forest, Essex. *Entomologist's Monthly Magazine, 91:* 6.
FORSTER, H.W. 1956. *Spercheus emarginatus* Schall. (Col., Hydrophilidae) rediscovered in Great Britain. *Entomologist's Monthly Magazine, 92:* 330.
FOSTER, A.P. 1984. Modern water beetle records from the Somerset Levels and Moors. *Balfour-Browne Club Newsletter,* No. 30: 11-23.
FOSTER, G.N. 1972. The aquatic Coleoptera of East Sussex. *Entomologist's Gazette, 23:* 25-60.
FOSTER, G.N. 1981. Atlas of British water beetles. Preliminary edition – part 1. *Balfour-Browne Club Newsletter,* No. 22: 1-18.
FOSTER, G.N. 1982. Notes on rare Dytiscidae (Coleoptera) in Norfolk. *Transactions of the Norfolk and Norwich Naturalists' Society, 26:* 3-10.
FOSTER, G.N. 1983. Atlas of British water beetles. Preliminary edition – part 2. *Balfour-Browne Club Newsletter,* No. 27: 1-23.
FOSTER, G.N. 1984. Atlas of British water beetles. Preliminary edition – part 3. *Balfour-Browne Club Newsletter,* No. 31: 1-22.
FOSTER, G.N. 1985. Atlas of British water beetles. Preliminary edition – part 4. Balfour-Browne Club Newsletter, No. 35: 1-22.
FOWLER, W.W. 1887-91. *The Coleoptera of the British islands.* 5 vols. London: Reeve.
FOWLER, W.W. & DONISTHORPE, H.St J. 1913. *The Coleoptera of the British islands.* Vol. 6. London: Reeve. xiii + 351pp.
FREUDE, H., HARDE, K.W. & LOHSE, G.A. (eds.) 1964-83. *Die Kafer Mitteleuropas.* 11 vols. Krefeld: Goecke & Evers.
FRIEDBERG, A. 1981. Taxonomy, natural history and immature stages of the bone-skipper, *Centrophlebomyia furcata* (Fabricius) (Diptera: Piophilidae, Thyreophorina). *Entomologica Scandinavica, 12*: 320-326.
FRISBY, G.E. 1928. The Hymenoptera of the Rochester District. *Rochester Naturalist, 6* (No. 131): 90-101.
FRISBY, G.E. 1934. *Andrena polita* Smith male at Halling, Kent. *Entomologist's Monthly Magazine, 70:* 136.
FRYER, J.C.F. & FRYER, H.F. 1923a. *Sitones gemellatus* Gyll. in Britain. *Entomologist's Monthly Magazine, 59:* 80-81.
FRYER, J.C.F. & FRYER, H.F. 1923b. *Dibolia cynoglossi* Koch in Cambridgeshire. *Entomologist's Monthly Magazine, 59:* 89.
GOATER, B. 1974. *The butterflies and moths of Hampshire and the Isle of Wight.* Faringdon: Classey. 439pp.
GOFFE, E.R. 1931. British Tabanidae (Diptera) with an account of the principal variation. *Transactions of the Entomological Society of the South of England, 6*: 43-114.

GORHAM, H.S. 1870. Occurrence in Britain of *Aleochara maculata* (C. Brisout). *Entomologist's Monthly Magazine, 7:* 136.
GOURREAU, J.M. 1974. Systematique de la tribu des Scymnini (Coccinellidae). *Annales de Zoologie – Ecologie Animale*, (hors serie): 1-223.
GUICHARD, K.M. 1971. A bee new to Britain from Wiltshire – *Andrena lathyri* Alfken (Hym., Apidae). *Entomologist, 104:* 40-42.
GUICHARD, K.M. 1973. *Melitta dimidiata* (Morawitz) (Hym., Melittidae) again in Wiltshire. *Entomologist's Monthly Magazine, 109:* 39.
HAES, E.C.M. (ed.) 1979. *Provisional atlas of the insects of the British Isles: Part 6, Orthoptera: Grasshoppers and crickets.* 2nd edition. Huntingdon: Biological Records Centre.
HAINES, F.H. 1934. *Odynerus* (*Lionotus*) *herrichi* Sauss. in Dorset. *Entomologist's Monthly Magazine, 70:* 117.
HALL, M.L. 1981. *Butterfly monitoring scheme.* Huntingdon: Institute of Terrestrial Ecology. 14pp.
HALLETT, H.M. 1952. The Coleoptera of Herefordshire. First supplement. *Transactions of the Woolhope Naturalists' Field Club, 1951*: 279-282.
HALL-SMITH, D.H., BRADLEY, J.D. & FLETCHER, D.S. 1983. *A recorder's log book or label list of British butterflies and moths: Index.* Leicester: Leicestershire Museums Service. 59pp.
HALSTEAD, D.G.H. 1963. Coleoptera: Histeroidea. *Handbooks for the identification of British insects, 4* (10).
HAMM, A.H. 1901. *Andrena hattorfiana*, Fab., and *Nomada armata*, H.-Schff., near Oxford. *Entomologist's Monthly Magazine, 37:* 16.
HAMM, A.H. 1903. *Nomada guttulata*, Schenck, in south Devon. *Entomologist's Monthly Magazine, 39:* 300.
HAMM, A.H. 1926. Diptera. In *The natural history of the Oxford district*: 248-279. Walker, J.J. (ed.). Oxford. 336p.
HAMM, A.H. & RICHARDS, O.W. 1926. The biology of the British Crabronidae. *Transactions of the Entomological Society of London, 74:* 297-331.
HAMM, A.H. & RICHARDS, O.W. 1930. The biology of the British fossorial wasps of the families Mellinidae, Gorytidae, Philanthidae, Oxybelidae, and Trypoxylidae. *Transactions of the Entomological Society of London, 78:* 95-131.
HAMMOND, C.O. 1983. *The dragonflies of Great Britain and Ireland.* 2nd edition, revised by R. Merritt. Colchester: Harley Books. 116pp.
HAMMOND, P.M. 1979. Beetles in Epping Forest. In: The wildlife of Epping Forest. *Essex Naturalist,* No. 4: 43-60.
HARDE, K.W. 1984. *A field guide in colour to beetles.* Ed. P.M. Hammond. London: Octopus Books. 334pp.
HARDING, P.T. 1982. A further note on *Ernoporus caucasicus* Lind. (Col., Scolytidae) in Britain. *Entomologist's Monthly Magazine, 118:* 166.
HARWOOD, P. 1918. *Scaphium immaculatum* Oliv. An additional genus and species to our list of British Coleoptera. *Entomologist's Monthly Magazine, 54:* 131-132.
HARWOOD, P. 1928. *Longitarsus nigerrimus* Gyll. in Dorset. *Entomologist's Monthly Magazine, 64:* 11.
HARWOOD, P. 1929. *Trox perlatus* Goeze in Dorset: an addition to the British coleopterous fauna. *Entomologist's Monthly Magazine, 65:* 171.
HEAL, N.F. 1984. A second British locality for *Phyllocnistis xenia* Hering. *Entomologist's Record & Journal of Variation, 96:* 98.
HEATH, J. (ed.) 1976. *The moths and butterflies of Great Britain and Ireland. Vol. 1. Micropterigidae – Heliozelidae.* London: Curwen Press (now Colchester: Harley Books). 343pp.

HEATH, J. 1981. *Threatened Rhopalocera (butterflies) in Europe. Nature and Environment Series* No. 23. Strasbourg: Council of Europe. 157pp.
HEATH, J. 1983. The insects of the Yellow Balsam, *Impatiens noli-tangere. Proceedings & Transactions of the British Entomological & Natural History Society, 16:* 125-131.
HEATH, J. & EMMET, A.M. (eds.). 1979. *The moths and butterflies of Great Britain and Ireland. Vol. 9. Sphingidae – Noctuidae (Noctuinae – Hadeninae).* London: Curwen Books (now Colchester: Harley Books). 288pp.
HEATH, J. & EMMET, A.M. (eds.). 1983. *The moths and butterflies of Great Britain and Ireland. Vol. 10. Noctuidae (Cuculliinae – Hypeninae) - Agaristidae.* Colchester: Harley Books. 459pp.
HEATH, J. & EMMET, A.M. (eds.) 1985. *The moths and butterflies of Great Britain and Ireland. Vol. 2. Cossidae-Heliozelidae.* Colchester: Harley Books. 460pp.
HEATH, J. & LECLERCQ, J. (eds.) 1981. *Provisional atlas of the invertebrates of Europe. Maps 1-27.* Huntingdon: Biological Records Centre, & Gembloux: Faculte des Sciences Agronomiques.
HEATH, J., POLLARD, E. & THOMAS, J.A. 1984. *Atlas of butterflies in Britain and Ireland.* Harmondsworth, Middlesex: Viking. 162pp.
HENNING, W. 1969. In *Die Fliegen der Palaearktischen Region, 63a.* Lindner, E. (ed.).
HICKIN, N.E. 1953. *Tinodes pallidula* McLachlan (Trichoptera, Psychomyidae). A second British station. *Entomologist, 86:* 113.
HICKIN, N.E. 1967. *Caddis larvae: Larvae of the British Trichoptera.* London: Hutchinson. 476pp.
HILDREW, A.G. & MORGAN, J.C. 1974. The taxonomy of the British Hydropsychidae (Trichoptera). *Journal of Entomology (B), 43:* 217-229.
HILEY, P.D. 1976. The identification of British limnephilid larvae (Trichoptera). *Systematic Entomology, 1*: 147-167.
HODGE, P.J. 1978. Two rare water beetles on the Lewes Levels, East Sussex. *Balfour-Browne Club Newsletter,* No. 7: 3.
HODGE, P.J. 1979. *Graptodytes flavipes* (Ol.) (Col., Dytiscidae) in East Sussex. *Entomologist's Monthly Magazine, 113* (1977): 242.
HOLLAND, D.G. 1972. A key to the larvae, pupae and adults of the British species of Elminthidae. *Scientific Publications of the Freshwater Biological Association,* No. 26.
HOLLAND, D.G. 1980. Distribution of Elmidae/Elminthidae. *Balfour-Browne Club Newsletter,* No. 16: 1-12.
HOLMEN, M. 1981. Status over Danmarks Haliplidae (Coleoptera) med bemaerkninger om zoogeografi og autoekologi. *Entomologiske Meddelelser, 49:* 1-14.
HOLMES, P.F. 1963. Trichoptera. *Proceedings of the Leeds Philosophical & Literary Society (Scientific Section), 9*: 31-35.
HORION, A. 1961. Clavicornia 2, Teredilia, Coccinellidae. *Faunistik der Mitteleuropaischen Kafer.* Vol. 8. Uberlingen. xv + 375pp.
HORSFIELD, D. & FOSTER, G.N. 1982. *Hydroporus scalesianus* Stephens and *Laccornis oblongus* (Stephens) (Col. Dytiscidae) in Hart Bog, County Durham. *Entomologist's Monthly Magazine, 119:* 62.
HORTON, G.A.N. 1980. *Pyrrhidium sanguineum* L. and *Criocephalus rusticus* L. (Col.: Longicornia) in Monmouthshire. *Entomologist's Record & Journal of Variation, 92:* 52.
HOWARTH, T.G. 1973a. *South's British butterflies.* London: Warne. 210pp, 48 pls. (Abridged edition reprinted 1984 as *Colour identification guide to butterflies of the British Isles* by Viking, Harmondsworth, Middlesex.)
HOWARTH, T.G. 1973b. The conservation of the Large Blue butterfly (*Maculinea arion* L.) in West Devon and Cornwall. *Proceedings and Transactions of the British Entomological and Natural History Society, 5:* 121-126.

HUGGINS, H.C. 1962. *Emus hirtus* L. in the Southend district. *Entomologist's Record & Journal of Variation, 74:* 279.
HUNT, O.D. 1965. Status and conservation of the large blue butterfly, *Maculinea arion* L. In *Symposium on the conservation of invertebrates*: 35-44. Huntingdon: Nature Conservancy.
HUNTER, F.A. 1977. Ecology of pinewood beetles. In *Native pinewoods of Scotland*: 42-55. Bunce, R.G.H. & Jeffers, J.N.R. (eds.) Cambridge: Institute of Terrestrial Ecology.
HUTSON, A.M., ACKLAND, D.M. & KIDD, L.N. 1980. Diptera, Nematocera: Mycetophilidae (Bolitophilinae to Manotinae). *Handbooks for the identification of British insects, 9* (3).
HUTSON, A.M. & STUBBS, A.E. 1974. *Limonia* (*Dicranomyia*) *omissinervis* de Meijere (Diptera: Tipulidae) new to Britain, and the identity of *L.* (*D.*) *patens* in Britain. *Entomologist's Gazette, 25:* 297-301.
HUTSON, A.M. & VANE-WRIGHT, R.I. 1969. Corrections and additions to the list of British Nematocera (Diptera) since Kloet and Hincks' 'A check list of British insects' (1945). Part 1. *Entomologist's Gazette, 20:* 231-256.
ISMAY, J.W. 1981. Some Diptera from Wytham Wood. *Entomologist's Monthly Magazine, 117:* 26.
JACKSON, P.H. 1907. Coleoptera in North Wales. *Entomologist's Monthly Magazine, 43:* 251.
JACOBS, S.N.A. 1951. The British Oecophoridae (Part 2). *Proceedings & Transactions of the South London Entomological & Natural History Society, 1949-50*: 187-203, pl.19.
JENKINSON, P.J. 1908. Notes on certain Mycetophilidae, including several species new to the British list. *Entomologist's Monthly Magazine, 44:* 129-133, 151-154.
JOHNSON, C. 1962a. The deletion of the Herefordshire record for *Aphodius niger* (Col., Scarabaeidae). *Entomologist's Monthly Magazine, 98:* 88.
JOHNSON, C. 1962b. The scarabaeoid (Coleoptera) fauna of Lancashire and Cheshire and its apparent changes over the last 100 years. *Entomologist, 95:* 153-165.
JOHNSON, C. 1967. Taxonomic notes on British Coleoptera. No.6 *Stenus glacialis* Heer (Staphylinidae). *Entomologist, 100:* 22-24.
JOHNSON, C. 1974. Studies on the genus *Corticaria* Marsham (Col., Lathridiidae). Part 1. *Annales Entomologici Fennici, 40:* 97-107.
JOHNSON, C. 1975. Five species of Ptiliidae (Col.) new to Britain, and corrections to the British list of the family. *Entomologist's Gazette, 26:* 211-223.
JOHNSON, C. 1976a. The identity of the British *Prionychus fairmairei* Reiche (Col., Alleculidae). *Entomologist's Gazette, 27:* 112.
JOHNSON, C. 1976b. Synonymic and other notes on British Coleoptera. *Entomologist's Monthly Magazine, 111* (1975): 111-113.
JOHNSON, C. 1978. Notes on Byrrhidae (Col.): with special reference to, and a species new to, the British fauna. *Entomologist's Record & Journal of Variation, 90:* 141-147.
JOINT COMMITTEE FOR THE CONSERVATION OF BRITISH INSECTS. 1973a. British Macrolepidoptera: rare and endangered species and forms. *Entomologist's Monthly Magazine, 108* (1972): 179-180.
JOINT COMMITTEE FOR THE CONSERVATION OF BRITISH INSECTS. 1973b. British Odonata and Orthoptera: rare and endangered species. *Entomologist's Monthly Magazine, 109:* 50.
JOINT COMMITTEE FOR THE CONSERVATION OF BRITISH INSECTS. 1974. Rare and endangered species – general list. *Entomologist's Monthly Magazine, 109* (1973): 250-251.
JONES, H.P. 1925-26. The Hymenoptera – Aculeata of Hampshire. *Entomologist's Record & Journal of Variation, 37-38*, Supplement. 14pp.

JONES, H.P. 1932. The Aculeate Hymenoptera of Hampshire: supplementary list. *Transactions of the Entomological Society of the South of England, 8:* 108-116.
JOY, N.H. 1930. Coleoptera in birds' nests, including a species of *Microglossa* new to Britain. *Entomologist's Monthly Magazine, 66:* 41-42.
JOY, N.H. 1932. *A practical handbook of British beetles.* 2 vols. London: Witherby. (Reprinted 1976 by Classey, Faringdon).
KAUFMANN, R.R.U. 1948. Notes on the distribution of the British longicorn Coleoptera. *Entomologist's Monthly Magazine, 84:* 66-85.
KEEN, D. 1977. *Collecting and studying dragonflies (Odonata).* AES leaflet No.12. 24pp.
KENDALL, P. 1982. *Bromius obscurus* (L.) in Britain (Col., Chrysomelidae). *Entomologist's Monthly Magazine, 117* (1981): 233-234.
KEVAN, D.K. 1959. The British species of the genus *Sitona* Germar (Col., Curculionidae). *Entomologist's Monthly Magazine, 95:* 251-261.
KEVAN, D.K. 1967. The British species of the genus *Longitarsus* Latreille (Col., Chrysomelidae). *Entomologist's Monthly Magazine, 103:* 83-110.
KEYS, J.H. 1916. *Anchonidium unguiculare* Aube: a genus and species of Coleoptera new to the British list. *Entomologist's Monthly Magazine, 52:* 112-113.
KEYS, J.H. 1921. *Cathormiocerus attaphilus* Bris.: an addition to the British Coleoptera. *Entomologist's Monthly Magazine, 57:* 100-102, pl. 1.
KIMMINS, D.E. 1942. *Cyrnus insolutus* McL. (Trichoptera), new to Britain. *Entomologist, 75:* 66-68.
KIMMINS, D.E. 1952. *Agrypnetes crassicornis* McLachlan (Fam. Phryganeidae), a caddis fly new to Britain. *Annals & Magazine of Natural History, 12th ser., 5:* 1039-1043.
KIMMINS, D.E. 1957. Notes on some British species of the genus *Hydropsyche* (Trichoptera). *Entomologist's Gazette, 8:* 199-210.
KIRBY, W. 1802. *Monographia Apum Angliae.* Vol. 2. Ipswich: J. Raw. xxii + 388pp.
KLEMPERER, H.G. 1982a. Normal and atypical nesting behaviour of *Copris lunaris* (L.): comparison with related species (Coleoptera, Scarabaeidae). *Ecological Entomology, 7:* 69-83.
KLEMPERER, H.G. 1982b. Parental behaviour in *Copris lunaris* (Coleoptera, Scarabaeidae): care and defence of brood balls and nest. *Ecological Entomology, 7:* 155-167.
KLOET, G.S. & HINCKS, W.D. 1964-78. A check list of British insects. 2nd edition. 5 parts. *Handbooks for the identification of British insects, 11.*
KNUTSON, L.V. & LYNEBORG, L. 1965. Danish acalypterate flies. 3. Sciomyzidae (Diptera). *Entomologiske Meddelelser, 34:* 61-101.
KNUTSON, L.V., STEPHENSON, J.W. & BERG, C.O. 1970. Biosystematic studies of *Salticella fasciata* (Meigen), a snail-killing fly (Diptera: Sciomyzidae). *Transactions of the Royal Entomological Society of London, 122:* 81-100.
KULLENBERG, B. 1944. Studien uber die Biologie der Capsiden. *Zoologiska Bidrag fran Uppsala, 23* (Suppl.). 522pp.
LAST, H.R. 1963. Notes on *Quedius molochinus* Gravenhorst (Col., Staphylinidae) with the addition of two species new to the British list. *Entomologist's Monthly Magazine, 99:* 43-45.
LEAR, N.W. 1986. The capture of *Emus hirtus* (Linn.) (Col.: Staphylinidae) in West Gloucestershire (Vice County 34). *Entomologist's Record & Journal of Variation, 98:* 135-136.
LEFKOVITCH, L.P. 1959. A revision of the European Laemophloeinae (Coleoptera: Cucujidae). *Transactions of the Royal Entomological Society of London, 111:* 95-118.
LEPNEVA, S.G. 1971. *Fauna of the USSR. Trichoptera Vol. 2 No. 2. Larvae and pupae of Integripalpia.* Jerusalem: Israel Program for Scientific Translations.

LEVEY, B. 1977. Coleoptera: Buprestidae. *Handbooks for the identification of British insects, 5* (1b).

LEYS, R. 1978. On the biology of *Andrena ferox* Smith (Hymenoptera, Aculeata: Andrenidae). *Entomologische Berichten, 38:* 58-60.

LINDROTH, C.H. 1960. On *Agonum sahlbergi* Chd. (Col., Carabidae). *Entomologist's Monthly Magazine, 96:* 44-47.

LINDROTH, C.H. 1972. Taxonomic notes on certain British groundbeetles (Col., Carabidae). *Entomologist's Monthly Magazine, 107* (1971): 209-223.

LINDROTH, C.H. 1974. Coleoptera: Carabidae. *Handbooks for the identification of British insects, 4* (2).

LINSSEN, E. 1959. *Beetles of the British Isles.* 2 vols. London: Warne.

LLOYD, R.W. 1953. *Ostoma ferrugineum* L. (Col., Clavicornia, Ostomidae) new to Britain. *Entomologist's Monthly Magazine, 89:* 251.

LUFF, M.L. 1982. *Preliminary atlas of British Carabidae (Coleoptera).* Huntingdon: Biological Records Centre.

LUMHOLDT, O. 1975-76. The Sphecidae (Hymenoptera) of Fennoscandia and Denmark. 2 parts. *Fauna Entomologica Scandinavica, 4.* 452pp.

MACAN, T.T. 1965. A key to British water bugs (Hemiptera – Heteroptera). 2nd edition. *Scientific Publications of the Freshwater Biological Association,* No.16.

MACAN, T.T. 1973. A key to the adults of the British Trichoptera. *Scientific Publications of the Freshwater Biological Association,* No.28.

MACAN, T.T 1982. *The study of stoneflies, mayflies and caddis flies.* Hanworth, Middlesex: Amateur Entomologists' Society. 44pp.

MacNULTY, B.J. 1971. An introduction of the study of Acari – Insecta associations. *Proceedings & Transactions of the British Entomological & Natural History Society, 4:* 46-70.

MAILLARD, Y.-P. 1970. Etude comparee de la construction du cocon de ponte chez *Hydrophilus piceus* L. et *Hydrochara caraboides* L. (insecte Coleopt. Hydrophilidae). *Bulletin de la Societe Zoologique de France, 95:* 71-84.

MAITLAND, P.S. 1963. *Ecological studies on the fauna of the River Endrick.* PhD thesis, University of Glasgow.

MALICKY, H. 1983. *Atlas of European Trichoptera.* The Hague: Junk. 298pp.

MALICKY, H. 1984. The distribution of *Hydropsyche guttata* Pictet and *H. bulgaromanorum* Malicky (Trichoptera: Hydropsychidae), with notes on their bionomics. *Entomologist's Gazette, 35:* 257-264.

MALLOCH, J.R. 1904. Some rare aculeates at Rochester. *Entomologist's Monthly Magazine, 40:* 87.

MANEVAL, H. 1936. Nouvelles notes sur divers hymenopteres et leurs larves. *Revue Francaise d'Entomologie, 3:* 18-32.

MARSHALL, J.E. 1978a. Trichoptera: Hydroptilidae. *Handbooks for the identification of British insects, 1* (14a).

MARSHALL, J.E. (ed.) 1978b. Provisional atlas of the insects of the British Isles: *Part 8, Trichoptera, Hydroptilidae: Caddisflies (part 1).* Huntingdon: Biological Records Centre.

MASSEE, A.M. 1945. Abundance of *Labidostomis tridentata* L. (Col., Chrysomelidae) in Kent. *Entomologist's Monthly Magazine, 81:* 164-165.

MASSEE, A.M. 1964. *Some of the more interesting Coleoptera (beetles) and Hemiptera – Heteroptera (plant bugs) recorded at Moccas Deer Park, Moccas, Herefordshire.* Manuscript report to Nature Conservancy. 8pp.

MATTHEWS, A. 1868. On some species of Trichopterygia new to the British list. *Entomologist's Monthly Magazine, 5:* 9-13.

McALPINE, J.F. 1977. A revised classification of the Piophilidae, including 'Neottiophilidae' and 'Thyreophoridae' (Diptera: Schizophora). *Memoirs of the Entomological Society of Canada* No.103. 66pp.

MENDEL, H. 1979. *Prionychus melanarius* (Germ.) (Col., Tenebrionidae) in Staverton Park, Suffolk, a third British locality. *Entomologist's Monthly Magazine, 114* (1978): 190.

MEYRICK, E. 1928. *A revised handbook of British Lepidoptera.* London: Watkins & Doncaster. 914pp. (Reprinted 1968 and 1970 by Classey, Hampton, Middlesex).

MILLS, N.J. 1981. Essential and alternative foods for British Coccinellidae (Coleoptera). *Entomologist's Gazette, 32:* 197-202.

MOORE, N.W. 1980. *Lestes dryas* Kirby – a declining species of dragonfly (Odonata) in need of conservation: notes on its status and habitat in England and Ireland. *Biological Conservation, 17:* 143-148.

MORGAN, D. 1984. Cuckoo-wasps. Hymenoptera, Chrysididae. *Handbooks for the identification of British insects, 6* (5).

MORICE, F.D. 1901. Hymenopterological notes. *Entomologist's Monthly Magazine, 37:* 96-98.

MORICE, F.D. 1906. Nidification of *Odynerus reniformis*, Gmel., near Chobham. *Entomologist's Monthly Magazine, 42:* 216-220.

MORLEY, C. 1897. *Nomada guttulata*, Schenck, at Ipswich. *Entomologist's Monthly Magazine, 33:* 280.

MORLEY, C. 1920. Collecting fungus-gnats. *Entomologist, 53:* 83-89.

MORRIS, M.G. 1963. Two rare scarabaeid beetles rediscovered in the Suffolk Breckland. *Transactions of the Suffolk Naturalists' Society, 12:* 245-247.

MORTIMER, C.H. 1908a. *Nomada guttulata* at Swanage, Dorset. *Entomologist's Monthly Magazine, 44:* 186.

MORTIMER, C.H. 1908b. *Odynerus basalis* in Dorset. *Entomologist's Monthly Magazine, 44:* 236.

MORTIMER, C.H. 1913. *Dufourea halictula* (Nyl.) at Byfleet, Surrey. *Entomologist's Monthly Magazine, 49:* 214-215.

NASH, D.R. 1975. *Silpha carinata* Herbst – a remarkable re-discovery in the British Coleoptera. *Entomologist's Record & Journal of Variation, 87:* 285-288.

NASH, D.R. 1977. *Silpha carinata* Herbst (Col.: Silphidae) confirmed as a British breeding species. *Entomologist's Record & Journal of Variation, 89:* 305-308.

NASH, D.R. 1979. *Agabus brunneus* (F.) (Col., Dytiscidae) in Wiltshire. *Entomologist's Monthly Magazine, 114* (1978): 30.

NASH, D.R. 1980. *Leptophloeus clematidis* (Erichson) (Col., Cucujidae) discovered in Suffolk. *Entomologist's Record & Journal of Variation, 92:* 120-121.

NASH, D.R. 1982. *Prionychus ater* (Germ.) (Col., Tenebrionidae) in Suffolk – a further record. *Entomologist's Monthly Magazine, 118:* 144.

NAU, B.S. 1979. Two plant bugs new to Britain, *Placochilus seladonicus* (Fall.) and *Campylomma annulicornis* (Sig.) (Heteroptera, Miridae). *Entomologist's Monthly Magazine, 114* (1978): 157-159.

NAU, B.S. 1980. *Tuponia carayoni* Wagner (Hem., Miridae) new to Britain. *Entomologist's Monthly Magazine, 116:* 83-84.

NEVINSON, E.B. 1904. Aculeate Hymenoptera at Lyme Regis. *Entomologist's Monthly Magazine, 40:* 13-14.

NEVINSON, E.B. 1916. Aculeate Hymenoptera and Chrysididae at Wicken. *Entomologist's Monthly Magazine, 52:* 90-91.

NEWBERY, E.A. 1902. A revision of the British species of *Bagous*, Schoen. *Entomologist's Record & Journal of Variation, 14:* 149-156.

NEWTON, H.C.F. 1934. On the biology of *Psylliodes hyoscyami* Linn. (Chrysomelidae, Coleoptera), the henbane flea-beetle, with descriptions of the larval stages. *Annals of Applied Biology, 21:* 153-161.

NICHOLSON, G.W. 1921. *Cryptocephalus biguttatus* Scop. on *Erica tetralix. Entomologist's Monthly Magazine, 57:* 36-37.

NURSE, C.G. 1913. Two species of aculeate Hymenoptera new to Britain. *Entomologist's Monthly Magazine, 49:* 83-84.

O'CONNOR, J.P. 1980. *Limnephilus pati* sp. n. (Trichoptera: Limnephilidae), a caddisfly new to Great Britain and Ireland. *Irish Naturalists' Journal, 20:* 129-133.

O'CONNOR, J.P. & BARNARD, P.C. 1981. *Limnephilus tauricus* Schmid (Trichoptera: Limnephilidae) new to Great Britain, with a key to the *L. hirsutus* (Pictet) group in the British Isles. *Entomologist's Gazette, 32:* 115-119.

OLBERG, G. 1959. *Das Verhalten der Solitaren Wespen Mitteleuropas (Vespidae, Pompilidae, Sphecidae).* Berlin: Veb Deutscher Verlag der Wissenschaften. xiii + 402pp.

OLDROYD, H. 1969. Diptera, Brachycera: Tabanoidea and Asiloidea. *Handbooks for the identification of British insects, 9* (4).

OLDROYD, H. 1970. Diptera 1. Introduction and key to families. 3rd edition. *Handbooks for the identification of British insects, 9* (1).

OMER-COOPER, J., PERKINS, M.G.L. & TOTTENHAM, C.E. 1928. The Coleoptera of Wicken Fen. II. Geodephaga. In *The natural history of Wicken Fen, 4*: 277-297. Gardiner, J.S. (ed.). Cambridge: Bowes & Bowes.

OMER-COOPER, J. & TOTTENHAM, C.E. 1932. The Coleoptera of Wicken Fen. V. Staphylinidae – Ipidae. In *The natural history of Wicken Fen, 6:* 516-538. Gardiner, J.S. (ed.). Cambridge: Bowes & Bowes.

d'ORCHYMONT, A. 1952. *Bulletin du Musee Royale d'Histoire Naturelle de Belgique, 18* (39): 1-16.

OWEN, J.A. 1981. Six beetles apparently new to Windsor Forest, Berkshire. *Entomologist's Monthly Magazine, 117:* 96.

OWEN, J.A. 1982a *Cryptophagus falcozi* Roubal (Col., Cryptophagidae) in Windsor Forest. *Entomologist's Monthly Magazine, 118:* 22.

OWEN, J.A. 1982b. *Anaspis schilskyana* Csiki (Col., Scraptiidae) at Moccas Park, Hereford. *Entomologist's Monthly Magazine, 118:* 68.

OWEN, J.A. 1984. *Bembidion virens* Gyll. (Col., Carabidae) in Easter Ross. *Entomologist's Monthly Magazine, 120:* 258.

PACKER, L. 1983. The nesting biology and social organisation of *Lasioglossum (Evylaeus) laticeps* (Hymenoptera, Halictidae) in England. *Insectes Sociaux, 30:* 367-375.

PALM, T. 1951. Die Holz- und Rindenkafer der norschwedischen Laubbaume. *Meddelanden fran Statens Skogsforskningsinstitut, 5:* 40.

PALM, T. 1959. Die Holz- und Rindenkafer der Sud- und Mittelschwedischen Laubbaume. *Opuscula Entomologica*, Supplementum *16.*

PALMER, M. 1981. Relationship between species richness of macrophytes and insects in some water bodies in the Norfolk Breckland. *Entomologist's Monthly Magazine, 117:* 35-46.

PARRY, J. 1979. *Emus hirtus* Linnaeus (Col.: Staphylinidae) at Canterbury in 1950. *Entomologist's Record & Journal of Variation, 91:* 102.

PEACOCK, E.R. 1977. Coleoptera: Rhizophagidae. *Handbooks for the identification of British insects, 5* (5a).

PEARCE, E.J. 1926. A list of the Coleoptera of Dorset. *Proceedings of the Dorset Natural History & Antiquarian Field Club, 47:* 51-128.

PEARCE, E.J. 1957. Coleoptera: Pselaphidae. *Handbooks for the identification of British insects, 4* (9).

PEARCE, E.J. 1971. *Bibloplectus tenebrosus* (Reitter) in Yorkshire (Col., Pselaphidae). *Entomologist's Monthly Magazine, 106* (1970): 173.

PELHAM-CLINTON, E.C. 1966. *Nemotaulius punctatolineatus* (Retzius), a caddis-fly new to the British Isles (Trichoptera, Limnephilidae). *Entomologist's Gazette, 17:* 5-8.

PELHAM-CLINTON, E.C. 1976. *Phyllocnistis xenia* Hering, 1936, a recent addition to the British list of Lepidoptera. *Entomologist's Record & Journal of Variation, 88:* 161-164.

PERKINS, R.C.L. 1917. Note on an old specimen of *Andrena vaga* Panz. (*ovina* Kl.), a species not recorded as British. *Entomologist's Monthly Magazine, 53:* 236-237.

PERKINS, R.C.L. 1919a. Note on a peculiarity in the burrows of *Halictus maculatus* Sm. *Entomologist's Monthly Magazine, 55:* 160-161.

PERKINS, R.C.L. 1919b. The British species of *Andrena* and *Nomada*. *Transactions of the Entomological Society of London, 1919:* 218-319, pls 11-15.

PERKINS, R.C.L. 1923. The Aculeate Hymenoptera of Devon. *Transactions of the Devonshire Association for the Advancement of Science, Literature and Art, 55:* 188-241.

PERKINS, R.C.L. 1924. The Aculeate Hymenoptera of Gloucestershire and Somerset. *Proceedings of the Bristol Naturalists' Society,* 4th ser., *6:* 133-160.

PERRING, F.H. & FARRELL, L. 1983. *British Red Data Books: 1. Vascular plants.* 2nd edition. Lincoln: Royal Society for Nature Conservation. 99pp.

PHILP, E.G. 1973. *Omophron limbatum* F. and other Coleoptera new to Kent. *Entomologist's Monthly Magazine, 108* (1972): 211.

POPE, R.D. 1953. Coleoptera: Coccinellidae & Sphindidae. *Handbooks for the identification of British insects, 5* (7).

POPE, R.D. 1973. The species of *Scymnus* (s. str.), *Scymnus* (*Pullus*) and *Nephus* (Col., Coccinellidae) occurring in the British Isles. *Entomologist's Monthly Magazine, 109:* 3-39.

PORTEVIN, G. 1934. Histoire naturelle des Coleopteres de France. 3. Polyphaga: Heteromera, Phytophaga. *Encyclopedie Entomologique, 17.*

RAGGE, D.R. 1965. *Grasshoppers, crickets and cockroaches of the British Isles.* London: Warne. 299pp.

RATCLIFFE, D. (ed.) 1977. *A nature conservation review.* 2 vols. Cambridge: University Press.

REID, C. 1982. Rediscovery of *Stenus fossulatus* Er. (Col., Staphylinidae) in Durham. *Entomologist's Monthly Magazine, 118:* 246.

REITTER, E. 1911. *Fauna Germanica. Die Kafer des Deutschen Reiches.* Vol. 3. Stuttgart: Lutz. 436pp.

RICHARDS, O.W. 1977. Hymenoptera: Introduction and key to families. 2nd edition. *Handbooks for the identification of British insects, 6* (1).

RICHARDS, O.W. 1980. Scolioidea, Vespoidea and Sphecoidea. Hymenoptera, Aculeata. *Handbooks for the identification of British insects, 6* (3b).

RICHARDS, O.W. & HAMM, A.H. 1939. The biology of the British Pompilidae (Hymenoptera). *Transactions of the Society for British Entomology, 6* (4): 51-114.

ROBERT, P.-A. 1958. *Les Libellules (Odonates).* Neuchatel: Delachaux & Niestle. 364pp.

ROCHE, P.J.L. 1964a. (Exhibit of *Lymexyion navale* L.). *Proceedings & Transactions of the South London Entomological & Natural History Society, 1963*(1): 15.

ROCHE, P.J.L. 1964b. (Exhibit of Coleoptera from Hatfield, Herts.). *Proceedings & Transactions of the South London Entomological & Natural History Society, 1963*(1): 18.
ROZKOSNY, R. 1973. The Stratiomyoidea (Diptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica, 1.* 152pp.
ROZKOSNY, R. 1983. *A biosystematic study of the European Stratiomyidae (Diptera).* Vol.2. The Hague: Junk.
SANKEY, J.H.P. 1956. *Diaperis boleti* (L.) (Col., Tenebrionidae) in Hants. *Entomologist's Monthly Magazine, 92:* 405.
SAUNDERS, E. 1876. Captures of rare Coleoptera, Hemiptera, and Hymenoptera, at Chobham: including an *Odynerus* new to Britain. *Entomologist's Monthly Magazine, 13:* 113-114.
SAUNDERS, E. 1887. *Odynerus reniformis*, Gmel., at Chobham, Surrey. *Entomologist's Monthly Magazine, 24:* 68.
SAUNDERS, E. 1896. *The Hymenoptera Aculeata of the British Islands.* London: Reeve. xii + 391pp., 52pls.
SAUNDERS, E. 1900. *Pompilus* (*Wesmaelinius*) *sanguinolentus*, F.: an addition to the British list. *Entomologist's Monthly Magazine, 36:* 206-207.
SAUNDERS, E. 1903. *Odynerus* (*Hoplopus*) *simillimus*, Mor., a wasp new to the British list. *Entomologist's Monthly Magazine, 39:* 6-7.
SAUNDERS, E. 1904. Two new species of British aculeate Hymenoptera. *Entomologist's Monthly Magazine, 40:* 10-12.
SAUNDERS, E. 1909. *Osmia xanthomelana* and other aculeates at Shanklin, Isle of Wight. *Entomologist's Monthly Magazine, 45:* 237-238.
SAUNDERS, E. 1910. On four additions to the list of British Hymenoptera. *Entomologist's Monthly Magazine, 46:* 10-12.
SAUNDERS, S.S. 1880. Capture of a *Dufourea* in Hants, a genus of Hymenoptera new to Britain. *Entomologist's Monthly Magazine, 16:* 181.
SAUNDERS, S.S. 1881. Capture of rare Hymenoptera on the south coast of England. *Entomologist's Monthly Magazine, 18:* 160-161.
SCHMIEDEKNECHT, O. 1930. *Die Hymenopteren Nord- und Mitteleuropas.* Jena: Verlag von Gustav Fischer. x + 1062pp.
SEGUY, E. 1934. Dipteres (Brachyceres). Muscidae Acalypterae et Scathophagidae. *Faune de France, 28.* 832pp., 27pls.
SHARPE, D. 1917. Studies in Rhynchophora. 2 – The British Bagoini. *Entomologist's Monthly Magazine, 53:* 100-108.
SHEPHARD, G. 1970. *Dyschirius obscurus* Gyll. (Col., Carabidae) in Sussex, and a key to the British species of the genus. *Entomologist's Monthly Magazine, 106:* 91-94.
SHUTE, S.L. 1975. The specific status of *Psylliodes luridipennis* Kuts. *Entomologist's Monthly Magazine, 111:* 123-127.
SITWELL, N. 1984. *The Shell guide to Britain's threatened wildlife.* London: Collins. 208pp.
SKIDMORE, P. 1973. *Chrysanthia nigricornis* Westh. (Col., Oedemeridae) in Scotland, a genus and species new to the British list. *Entomologist, 106:* 234-237.
SKIDMORE, P. & HUNTER, F.A. 1981. *Ischnomera cinerascens* Pand. (Col., Oedemeridae) new to Britain. *Entomologist's Monthly Magazine, 116* (1980): 129-132.
SKINNER, B. 1984. *Colour identification guide to the moths of the British Isles.* Harmondsworth, Middlesex: Viking. 267pp.
SLADEN, F.W.L. 1897. *Cilissa melanura*, Nyl., a species new to the British list, and other bees at St Margaret's Bay. *Entomologist's Monthly Magazine, 33:* 229.

SLADEN, F.W.L. 1900. Aculeate Hymenoptera on the coast of Kent. *Entomologist's Monthly Magazine, 36:* 265.
SMITH, F.D. 1851a. Notes on the Hymenoptera of the Undercliff, Isle of Wight. *Zoologist, 9:* 3248-3253.
SMITH, F.D. 1851b. On the habits of *Osmia parietina*. *Zoologist, 9:* 3253-3255.
SMITH, F.D. 1855. *Catalogue of the British Hymenoptera in the collection of the British Museum.* London: British Museum. 252pp.
SMITH, F.D. 1858. *Catalogue of British fossorial Hymenoptera, Formicidae and Vespidae in the collection of the British Museum.* London: British Museum. 236pp.
SMITH, F.D. 1876. *Catalogue of British Hymenoptera in the British Museum. Pt.1 Andrenidae and Apidae.* 2nd edition. London: British Museum. xi + 236pp.
SMITH, K.G.V. 1957. Some miscellaneous records of bred Diptera. *Entomologist's Record & Journal of Variation, 69:* 214-216.
SOKOLOFF, P. 1980. *Practical hints for collecting and studying the Microlepidoptera.* Hanworth, Middlesex: Amateur Entomologists' Society. 40pp.
SOMMERVILLE, A. 1984. The ecology of the chequered skipper in Scotland. *British Ecological Society. Bulletin, 15:* 143-145.
SOUTH, R. 1961. *Moths of the British Isles.* Revised edition. 2 vols. London: Warne.
SOUTHWOOD, T.R.E. & LESTON, D. 1959. *Land and water bugs of the British Isles.* London: Warne. 436pp.
SPOONER, G.M. 1934. Observations on *Odynerus* (*Lionotus*) *herrichi* Sauss. in Dorset. *Entomologist's Monthly Magazine, 70:* 46-54.
SPOONER, G.M. 1937. *Psammochares rufus* Haupt, a wasp new to Britain. *Entomologist's Monthly Magazine, 73:* 220-224.
SPOONER, G.M. 1946. *Nomada errans* Lep., a bee new to Britain. *Entomologist's Monthly Magazine, 82:* 105-106.
SPOONER, G.M. 1954. Notes on species of *Omalus* (Hym., Chrysididae) including one new to the British list. *Entomologist's Monthly Magazine, 90:* 135-138.
SPOONER, G.M. 1963. On causes of the decline of *Maculinea arion* L. (Lep. Lycaenidae) in Britain. *Entomologist, 96:* 199-120.
SPRADBERY, J.P. 1973. *Wasps.* London: Sidgwick & Jackson. xvi + 408pp.
STEPHENS, J.F. 1827-35. *Illustrations of British entomology. Mandibulata.* 7 vols. London.
STEPHENS, J.F. 1839. *A manual of British Coleoptera.* London. 443pp.
STEVENS, S. 1877. Capture of *Teretrius picipes*. *Entomologist's Monthly Magazine, 14:* 70.
STICHEL, W. 1955-62. *Illustrierte Bestimmungstabellen der Wanzen. II. Europa (Hemiptera – Heteroptera Europae).* 4 vols. Berlin: Hermsdorf.
STOECKHERT, F.K. 1933. Die Bienen Frankens (Hym. Apid.). *Deutsche Entomologische Zeitschrift, 1932* (Supplement). viii + 294pp.
STRENZKE, K. 1951. *Dasyhelea lithotelmatica* n. sp. Appendix to Thienemann, A. Lunzer Chironomiden uber Hochalpine Diamesa – Formen. *Archiv fur Hydrobiologie*, Supplement, *18:* 1-202.
STUBBS, A.E. 1976. Craneflies of Seabrook Valley and Holy Well, Cheriton, Kent. *Transactions of the Kent Field Club, 6* (1): 43-51.
STUBBS, A.E. 1980. The largest pipunculid in the land: *Nephrocerus scutellata* (Macquart, 1834) (Diptera, Pipunculidae) new to Britain, with observations on its behaviour in Greece. *Proceedings & Transactions of the British Entomological & Natural History Society, 13:* 46-48.
STUBBS, A.E. & CHANDLER, P.J. 1978. *A dipterist's handbook.* Hanworth, Middlesex: Amateur Entomologists' Society. 255pp.

STUBBS, A.E. & FALK, S.J. 1983. *British hoverflies. An illustrated identification guide.* London: British Entomological & Natural History Society. 253pp., 12pls.
THIRION, C. 1976. Les Ichneumoninae "Amblypygi" sensu Wesmael, en Belgique. *Bulletin et Annales de la Societe Royale Entomologique de Belgique, 112:* 29-69.
THIRION, C. 1981. Les Ichneumoninae (Hymenoptera Ichneumonidae) en Belgique (2eme partie). *Bulletin et Annales de la Societe Royale Entomologique de Belgique, 117:* 229-254.
THOMAS, J.A. 1975. *The Black Hairstreak: Conservation Report.* Cambridge: Institute of Terrestrial Ecology.
THOMAS, J.A. 1980a. Why did the Large Blue become extinct in Britain? *Oryx, 15:* 243-247.
THOMAS, J.A. 1980b. The extinction of the large blue and the conservation of the black hairstreak butterflies (a contrast of failure and success). *Institute of Terrestrial Ecology Annual Report 1979:* 19-23.
THOMSON, G. 1980. *Butterflies of Scotland. A natural history.* London: Croom Helm. xvii + 267pp.
TINBERGEN, N. 1951. *The study of instinct.* Oxford: University Press.
TOBIAS, W. 1972. Zur kenntnis europaischer Hydropsychidae (Insecta: Trichoptera). *Senckenbergiana Biologica, 53:* 58-89, 245-268.
TOMLIN, J.R.le B. & JOY, N.H. 1908. Two new British beetles. *Entomologist's Monthly Magazine, 44:* 104.
TOMLIN, J.R.le B. & SHARP, W.E. 1912. Supplementary note on *Longitarsus nigerrimus*, Gyll. *Entomologist's Monthly Magazine, 48:* 284-286.
TOTTENHAM, C.E. 1954. Coleoptera: Staphylinidae, section (a) Piestinae to Euaesthetinae. *Handbooks for the identification of British insects, 4* (8a).
TOZER, D. 1947. *Hypulus quercinus* Quens. (Col., Melandryidae) in Hunts. *Entomologist's Monthly Magazine, 83:* 111-112.
TOZER, E.R. 1973. On *Rhizophagus simplex* Reitter and *R. oblongicollis* Blatch & Horner sp. rev. (Col., Rhizophagidae). *Entomologist's Monthly Magazine, 108* (1972): 219-221.
UNWIN, D.M. 1981. *A key to the families of British Diptera.* Taunton: Field Studies Council. 41pp.
UNWIN, D.M. 1984. *A key to the families of British Coleoptera (and Strepsiptera).* Taunton: Field Studies Council. 49pp.
VERDCOURT, B. 1983. Persistence of *Elater* (=*Ludius*) *ferrugineus* L. (Col., Elateridae) in a suburban garden in Windsor. *Entomologist's Monthly Magazine, 119:* 210.
VERRALL, G.H. 1909. *British Flies. 5. Stratiomyidae and succeeding families of the Diptera Brachycera of Great Britain.* London: Gurney & Jackson. 780pp.
VIEDMA, M.G. & GOMEZ-BUSTILLO, M.R. 1976. *Libro rojo de los lepidopteros ibericos.* Madrid.
WAGNER, E. 1973. Die Miridae Hahn, 1831, des Mittelmeerraumes und der Makaronesischen Inseln (Hemiptera, Heteroptera). Part 1. *Entomologische Abhandlungen und Berichte aus dem Staatlichen Museum fur Tierkunde in Dresden, 37* (Suppl.). 484pp.
WAKELY, S. 1955. Notes on collecting in the Isle of Wight. *Entomologist's Record & Journal of Variation, 67:* 79-82.
WALLACE, I.D. 1976. *The taxonomy of larvae of the British species of the family Leptoceridae (Trichoptera), with notes on their general biology.* PhD thesis, University of Newcastle-upon-Tyne.
WALLACE, I.D. 1981. A key to larvae of the family Leptoceridae (Trichoptera) in Great Britain and Ireland. *Freshwater Biology, 11:* 273-297.

WALLACE, I.D. & WIGGINS, G.B. 1978. Observations on the larva and pupa of the caddisfly genus *Hagenella* (Trichoptera: Phryganeidae). In *Proceedings 2nd International Symposium on Trichoptera:* 207-214. Crichton, M.I. (ed.). The Hague: Junk. 359pp.

WALSH, G.B. & DIBB, J.R. (eds.) 1974. *A coleopterist's handbook.* 2nd edition, revised by J. Cooter & P.W. Cribb. Hanworth, Middlesex: Amateur Entomologists' Society. 142pp.

WARREN, M.S., THOMAS, C.D. & THOMAS, J.A. 1980. Preliminary reports of the 1980 Heath Fritillary Survey to the Joint Committee for the Conservation of British Insects.

WARREN, M.S., THOMAS, C.D. & THOMAS, J.A. 1984. The status of the Heath Fritillary Butterfly *Mellicta athalia* Rott. in Britain. *Biological Conservation, 29:* 287-305.

WATERHOUSE, G.R. 1844. Notes on the habits of *Osmia atricapilla. Zoologist, 2:* 403-404.

WELCH, R.C. 1963. *Uleiota planata* (L.) (Col., Cucujidae) breeding in Berkshire. *Entomologist's Monthly Magazine, 99:* 213-214.

WELCH, R.C. 1965. *The biology of the genus* Aleochara *Grav. (Coleoptera, Staphylinidae).* PhD thesis, University of London.

WELCH, R.C. 1972. *Windsor Forest Study.* Duplicated report to Nature Conservancy, Huntingdon.

WELCH, R.C. 1977. Recent Coleoptera records from Huntingdonshire with particular reference to Monks Wood and Woodwalton Fen National Nature Reserves. *Report of the Huntingdonshire Fauna & Flora Society,* No. 29 (1976): 15-18.

WELCH, R.C. 1979a. *Haploglossa picipennis* (Gyll.) (Col., Staphylinidae), *Cryptophagus badius* Sturm and *C. lapponicus* Gyll. (Col., Cryptophagidae) from a sparrow hawk's nest near Aviemore, Inverness. *Entomologist's Monthly Magazine, 114* (1978): 240.

WELCH, R.C. 1979b. New Coleoptera records for Huntingdonshire, with particular reference to Woodwalton Fen National Nature Reserve. *Report of the Huntingdon Fauna & Flora Society,* No. 31 (1978): 20-29.

WELCH, R.C. 1982. *Aleochara villosa* Man. (Col., Staphylinidae) and other Coleoptera from a dovecote at Wytham, Oxford. *Entomologist's Monthly Magazine, 117* (1981): 197.

WELCH, R.C. 1983a. *Bibloplectus tenebrosus* (Reitt.) (Col., Pselaphidae) in East Norfolk and the Huntingdonshire fens. *Entomologist's Monthly Magazine, 119:* 38.

WELCH, R.C. 1983b. *Aleochara inconspicua* Aube (Col., Staphylinidae) in Northumberland and Hertfordshire. *Entomologist's Monthly Magazine, 119:* 197.

WELCH, R.C. 1984. *Stichoglossa semirufa* Er. (Col., Staphylinidae) in Cambridgeshire. *Entomologist's Monthly Magazine, 120:* 98.

WELCH, R.C. & COOTER, J. 1981. *The Coleoptera of Moccas Park, Herefordshire.* Duplicated report. 9pp. + Appendix 27pp.

WELLS, S.M., PYLE, R.M. & COLLINS, N.M. 1983. *The IUCN Invertebrate Red Data Book.* Gland, Switzerland: IUCN. 632pp.

WHICHER, L.S. 1952. *Hister quadrimaculatus* L. (Col., Histeridae) in N. Kent. *Entomologist's Monthly Magazine, 88:* 208.

WHITE, G. 1789. *The natural history of Selborne.* (Many editions).

WILLIAMS, S.A. 1969. *Aegialia rufa* (F.) (Col., Scarabaeidae) in Lancashire. *Entomologist's Monthly Magazine, 104* (1968): 277.

WILLMER, P. 1985. *Bees, ants and wasps. The British aculeates.* Taunton: Field Studies Council. 28pp.

WOLF, H. 1972. Hymenoptera: Pompilidae. *Insecta helvetica, 5.* 176pp.

WOOD, J.H. 1890. *Nepticula torminalis*, a species new to science. *Entomologist's Monthly Magazine, 26:* 209-210.
WOOD, J.H. 1908. Lepidoptera. *Victoria County History of Herefordshire, 1:* 110-168.
WOODROFFE, G.E. 1956a. Some Hemiptera – Heteroptera from Virginia Water, Surrey, including *Pilophorus confusus* (Kb.) (Miridae) new to Britain. *Entomologist, 89:* 84-87.
WOODROFFE, G.E. 1956b. A further note on *Pilophorus confusus* (Kb.) (Hem., Miridae). *Entomologist's Monthly Magazine, 92:* 341.
WOODROFFE, G.E. 1958. A note on *Pilophorus confusus* (Kb.), *Globiceps cruciatus* Reut. and *Adelphocoris ticinensis* (Mey-Duer) (Hem., Miridae) at Virginia Water and *Acompus rufipes* Wolff (Hem., Lygaeidae) at Chobham, Surrey. *Entomologist's Monthly Magazine, 94:* 64.
WOODROFFE, G.E. 1961. Insects on the Oar Stone rock, Tor Bay, S. Devon. *Entomologist's Monthly Magazine, 97:* 96.
WOODROFFE, G.E. 1962. *Pterotmetus staphyliniformis* (Schill.) (Hem., Lygaeidae) – a genus and species new to Britain. *Entomologist's Monthly Magazine, 98:* 214-215.
WOODROFFE, G.E. 1963. The identity of the British *Eremocoris* Fieber (Hem., Lygaeidae). *Entomologist's Monthly Magazine, 98* (1962): 262-263.
WOODROFFE, G.E. 1971. *Globicornis nigripes* F. (Col., Dermestidae) in Buckinghamshire. *Entomologist's Monthly Magazine, 106* (1970): 148.
YARROW, I.H.H. 1954. Some observations on the genus *Bombus*, with special reference to *Bombus cullumanus* (Kirby) (Hym. Apidae). *Journal of the Society for British Entomology, 5*: 34-39.
YARROW, I.H.H. 1955. *Andrena combinata* Christ (Hym., Apidae): a bee new to Britain. *Entomologist's Monthly Magazine, 91:* 234-235.
YARROW, I.H.H. 1968. Recent additions to the British bee-fauna, with comments and corrections. *Entomologist's Monthly Magazine, 104:* 60-64.
YARROW, I.H.H. 1970. Some nomenclatorial problems in the genus *Passaloecus* Shuckard and two species not before recognised as British (Hym. Sphecidae). *Entomologist's Gazette, 21:* 167-189.
YARROW, I.H.H. & GUICHARD, K.M. 1941. Some rare Hymenoptera Aculeata, with two species new to Britain. *Entomologist's Monthly Magazine, 77:* 2-13.
YEO, P.F. & CORBET, S.A. 1983. *Solitary wasps. Naturalists' Handbooks* No. 3. Cambridge: University Press. 65pp.

# INDEX

This index includes all the scientific and vernacular names and synonyms of insects mentioned in the species accounts and lists. Species accounts are indexed in bold.