

DYFED INVERTEBRATE GROUP



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LEPIDOPTERA

BATH WHITES *Pontia daplidice* AT MANORBIER, PEMBS. IN 1945 - A. d'A. RUCK

The extraordinary immigration of Bath whites in the British Isles in 1945 began on 12 July when several specimens were seen along the coast of East Sussex. Two days later the main wave of migrants reached most of the southern coastal counties and began to spread northwards, eventually reaching as far north as Rutland on 25 July. There were few records of confirmed breeding but it is evident that a successful brood enabled Bath whites to be observed until 18 October when four were seen in County Kerry, Eire. A total of some 700 adults were reported during the season, vastly exceeding the previous annual maximum of thirty-five in 1871. It is thought that the immigrants originated from North Africa or Spain, where 1945 saw the longest drought for 150 years and presumably forced the butterflies (along with many other migrant species seen that year) to disperse in order to find suitable breeding conditions elsewhere.

In 1945 I was stationed at the Army camp at Manorbier, Pembrokeshire (21/0797) and at 12.30 pm on 25 July I was leaving my office for lunch when I noticed a flutter of white on the side of the path between the huts. It looked unusual and, as I looked a little closer, I suddenly realised what it must be. I quickly ran to my quarters near the sea at the other end of camp to get the camera I had by special permission. As there was a fresh south-easterly wind blowing, I went out onto the rough grassland on the cliff-tops and was astonished to see ten Bath whites. Some were feeding on the thistles, hawkweeds and knapweeds but the majority were resting low down on the grass. The light was not too good and the flowers were blowing about so I took a whole film of twelve exposures in the hope that one or two would be acceptable. While I was photographing I saw five more individuals come in from the sea and all of these settled down in the grass on arrival as if exhausted. I can still remember my excitement when I was taking the film out of the developing tank that evening - forty-four years ago but one does not forget an event like that!

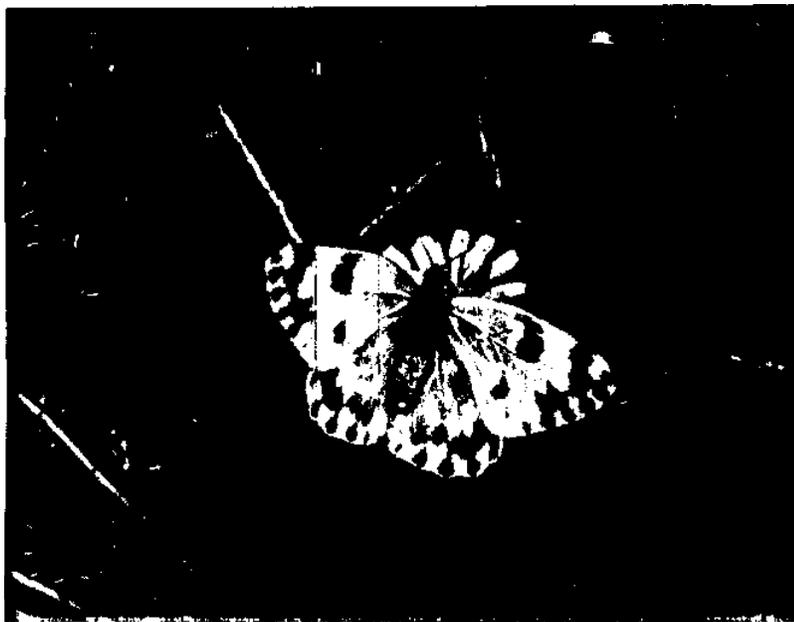
Although more Bath whites must have reached Welsh shores that summer, this appears to have been the only sighting reported. I sent an account of my observations to Capt. Dannreuther who co-ordinated the records of immigrant Lepidoptera at the time. However, he wrongly estimated my report of "several" as referring to four individuals (Dannreuther 1946) and this was erroneously mapped as a singleton in the recent summary of the Bath white in Britain (Bretherton & Emmet 1989). Condry (1981) referred correctly to the sixteen individuals seen on that memorable occasion. A male Bath white was seen in Monmouthshire in 1946 (Russell F. Bretherton, pers. comm.) but there have been no further reported sightings in Wales. The species has rarely been seen in the British Isles since 1950 with only about a dozen specimens reported.

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Historic photographs of Bath whites at Manorbier, 1945. [Andrew Ruck]

CARDIGAN ISLAND (22/160515) AND ITS INVERTEBRATE FAUNA - A Dyfed Invertebrate Group Site Assessment - AP FOWLES, AO CHATER, DC BOYCE & KM CATLEY

Cardigan Island lies off the south-western tip of Ceredigion, separated from the mainland by a narrow channel only 200 metres wide at low tide. It is a small island, about 600 metres long and 400 metres broad at the eastern end, consisting of some fifteen hectares of rank grassland on the plateau, which rises to a summit of 52 metres a.s.l. Sheer cliffs of Ordovician slates surround most of the island which, apart from a small dew pond, is entirely dry with no streams or surface-flushing. There is little information available on the early history of the island but an aerial photograph taken in January 1979 (Jones & Simpson 1980) reveals enclosures and boundary banks which are thought to be "reminiscent of the clavicula of Roman marching camps". The same photograph also clearly shows plough-lines that cross the island diagonally from NNW to SSE; however, Horsfall-Turner (1903) described Cardigan Island as providing untilled pasture for Welsh mountain sheep and it is thought that the only time the island has been ploughed was sometime around the 1930's.

There are two other major events in the island's history which have had significant bearings on its ecology. On 15 March 1934, the 6500-ton liner S.S. Herefordshire ran aground on the north-west corner of the island, where she remained for several days before sinking slowly into the sea. It is almost certain that this led to the introduction of brown rats as they escaped the sinking ship and their numbers rapidly grew to reach a population estimated in excess of a thousand animals. This probably spelt the end for the small colony of breeding puffins and perhaps also for Manx shearwaters, although this latter species had never been recorded as a resident. Following the extermination of the rats in 1969 by M.A.F.F., there have been high-profile attempts to persuade these two species to occupy artificial burrows, successfully culminating in the discovery of a shearwater egg in 1984. The other significant event was the introduction of 8 Soay sheep onto the island in 1944 (Lockley 1960) by the West Wales Field Society (now the Dyfed Wildlife Trust) (Lockley 1960). At the time, Soay sheep were an endangered rare breed and the flock was established in the interests of their conservation. The sheep population has fluctuated dramatically over the years but currently numbers around 110 and as they are no longer a threatened breed their future on Cardigan Island is a matter of continued debate. What is clear is that the sheep have not made any impact on the mattress of rye-grass Lolium perenne which dominates the plateau and there is a subjective feeling that they prefer to graze the narrow fringe of maritime grassland, causing considerable erosion to the shallow soils in the process.

The Dyfed Wildlife Trust purchased the island with a grant from the World Wildlife Fund in 1963 for a grand total (including legal fees) of £444/11/-. Their period of ownership has seen an increase in the diversity of breeding seabirds, with species such as razorbills colonising the island following the extermination of the rats. However, there has also been a dramatic increase in the number of nesting gulls - standing at 700 pairs of herring gulls, 400 lesser black-backed and 20 greater black-backed in 1986-87 (Davis 1989). It is probable that the manuring effect of the gulls' presence has contributed to the luxuriance and spread of the rye-grass sward and with no burrowing vertebrates in residence there is little bare ground available on the plateau to enable other plants to compete with the suffocating mattress of grass. Recent surveys have given strong indications that the flora of Cardigan Island is steadily deteriorating and with it the foodplants and micro-habitats of a host of coastal invertebrates.

The entomological history of Cardigan Island begins with Bill Condry's visit in July 1961 (Condry 1961), recounting the occurrence of grasshoppers, woodlice, ladybirds and, more specifically, meadow browns Maniola jurtina, small coppers Lycaena phlaeas, graylings Hipparchia semele and six-spot burnets Zygaena filipendula. In 1975 June Chatfield recorded seven species of land molluscs, all of which are widespread and common species of grassland habitats (Rees 1983). Visits by Arthur Chater in 1977 and 1983 added the common snail Oxychilus cellarius to the list and identified the occurrence of five species of woodlice. He also commented on the extraordinary abundance of common earwigs Forficula auricularia (Chater 1983), a phenomenon common to many of the British offshore islands.

On 17 June 1989, several members of the Dyfed Invertebrate Group visited Cardigan Island for six hours with the intention of providing further information on the invertebrate fauna of this little-studied part of Ceredigion. This was during the long dry spell of early summer and whilst it made the visit more enjoyable it also meant that many invertebrates had probably retreated within the soil to escape desiccation. By the end of the day a total of eighty-two species had been recorded (bringing the island total to ninety-four), the bulk of the records being provided by the three ground-active groups of beetles, bugs and spiders. Groups such as molluscs and woodlice that are very sensitive to humidity levels were generally scarce, although the striking absence of empty snail shells suggests that they may have declined even since June Chatfield's visit in 1975.

Initial investigations of the Lolium sward suggested that this was an extremely poor habitat for invertebrates. This was not entirely expected as it had been thought that the dense leaf-litter might have given invertebrates shelter from the heat of the sun but very little was revealed by sieving and efforts for the rest of the day concentrated chiefly on the narrow fringe of maritime grassland. The most productive area was a north-west facing cliff slope near the pond. Many of the spiders recorded on the island were found here amongst tussocks of cock'sfoot Dactylis glomerata, presumably favouring the more-shaded aspect. This habitat also produced typical coastal ground-beetles such as Amara ovata and A. tibialis, whilst Bembidion harpaloides appeared to occur more frequently than is usually the case on coastal cliffs. Other coastal species found along the northern cliffs of the island included the rather local click-beetle Agrypnus murinus, the weevil Otiorhynchus rugifrons and the bristly millipede Polyxenus lagurus. Several adult Eristalinus aeneus hoverflies were seen around a brackish pool halfway up the cliff-face; this is an uncommon species with few Ceredigion records which breeds amongst the algal fringe of such habitats. The dried-up pond was briefly explored, yielding many specimens of the common water-beetle Helophorus brevipalpis, the shore-bug Saldula saltatoria and a single specimen of the ground-beetle Acupalpus dubius, an infrequently recorded wetland species in Ceredigion.

An hour spent low down on the cliffs in a bay on the southern side produced many of the species seen on the northern cliffs but opportunity was also taken to investigate the invertebrate inhabitants of deserted gulls' nests. This proved to be very productive and a range of beetles characteristic of such habitats were found, many of them being recorded for the first time in Ceredigion. Sage (1977) has already indicated the wealth of species that are dependent on the niches provided by gulls' nests and corpses on Skomer and it was pleasing to find a similar situation on Cardigan Island. The more habitat-specific members of this community included Necrobia violacea (found beneath a gull corpse), Paralister purpurascens, Omosita discoidea, Trox scaber and Creophilus maxillosus.

Despite the drought conditions, which undoubtedly hampered our survey effort, it is reasonable to assume that Cardigan Island has a depleted invertebrate fauna in comparison with the mainland cliffs. However, the adjacent Gwbert cliffs are entomologically one of the most interesting parts of the Ceredigion coastline and could act as a reservoir for colonisation by the more mobile species if the range of habitats were to improve on the island. In particular, the existence of bare patches of friable soil on the plateau would be of especial value for both plants and invertebrates in the process of establishing themselves within the Lolium sward and this would be a prime management recommendation for invertebrate conservation. Obviously, this is a point which has occupied the thoughts of many management committees over the years and it is a problem with no easy solution. The grassland habitats of the island are now so artificial, and indeed damaging to the future wildlife interest, it would seem that a management strategy has to be implemented which reduces the dominance of Lolium as soon as possible.

It has been stated (Bossom & Patterson 1982) that no irreversible steps should be taken in terms of management without comprehensive monitoring. Unfortunately, as with all grassland habitats, neglect is one of the most irreversible steps that can take place and, while the management of the island is being continually discussed, the diversity of its flora and fauna is in steady decline. The isolation of islands which gives them their special charm and

character also means that local extinctions take on a major significance. The flora and fauna that occurred on the island before it became separated from the mainland will be permanently diminished by those species which now find the Carreg Lydan channel an impenetrable barrier to recolonisation. Bio-geographical studies are, of course, part of the unique fascination of island ecosystems and the loss of resident species hampers our understanding of the distributional processes following the last glaciation. Action must be taken to halt the deterioration of the island's habitats and the simplest way to do this would appear to be to introduce a grazing animal which creates bare ground on the deeper soils and which will exert grazing pressure on the Lolium mattress. It is the opinion of the DIG members that carried out this survey that the introduction of rabbits to Cardigan Island would be of major benefit to the conservation of its wildlife. We are in agreement, therefore, with the recent proposals to introduce rabbits (Baines 1989) and feel that this action should be taken immediately before any further deterioration of the island's wildlife interest takes place.

ACKNOWLEDGEMENTS

We are extremely grateful to Mick Baines (the Secretary of the Cardigan Island Management Committee) for ferrying us to & from & around the island. Ian Francis instigated the visit and, along with Mick Baines and Lin Gander, assisted with the collection of specimens.

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INVERTEBRATES RECORDED FROM CARDIGAN ISLAND (22/160515).

THYSANURA

Petrobius brevistylis - 1989.
Petrobius maritimus - 1989.

ODONATA

Enallagma cyathigerum - 1989.

ORTHOPTERA

Chorthippus brunneus - 1983.

DERMAPTERA

Forficula auricularia - 1983, 1989.

HEMIPTERA

Aphrodes albifrons - 1989.
Aptus mirmicoides - 1989.
Megopthalmus scabripennis - 1989.
Nysius thymi - 1989.
Orthotylus ?ericetorum - 1989.
Philaenus spumarius - 1989.
Saldula saltatoria - 1989.
Streptanus sordidus - 1989.

SIPHONAPTERA

Ceratophyllus vagabundus - 1989.

LEPIDOPTERA

Hipparchia semele - 1961.
Lycaena phlaeas - 1961.
Maniola jurtina - 1961.
Ochlodes venata - 1989.
Zygaena filipendula - 1961.
Autographa gamma - 1989.

DIPTERA

Chloromyia formosa - 1989.
Eristalinus aeneus - 1989.

HYMENOPTERA: Formicidae

Lasius alienus - 1989.
Lasius niger - 1989.
Myrmica ruginodis - 1989.
Stenamma debilis - 1989.

COLEOPTERA

Loricera pilicornis - 1989.
Bembidion harpaloides - 1989.
Calathus melanocephalus - 1989.
Agonum albipes - 1989.
Amara ovata - 1989.
Amara tibialis - 1989.
Harpalus affinis - 1989.
Acupalpus dubius - 1989.
Helophorus brevipalpis - 1989.
Helophorus nubilus - 1989.
Helophorus rufipes - 1989.
Paralister purpurascens - 1989.
Anotylus complanatus - 1989.
Othius melanocephalus - 1989.
Xantholinus linearis - 1989.
Xantholinus longiventris - 1989.
Philonthus sordidus - 1989.
Staphylinus olens - 1989.
Quedius tristis - 1989.
Creophilus maxillosus - 1989.
Sepedophilus nigripennis - 1989.
Tachinus signatus - 1989.
Oligota pusillima - 1989.
Trox scaber - 1989.
Agrypnus murinus - 1989.
Athous haemorrhoidalis - 1989.
Agriotes obscurus - 1989.
Selatosomus incanus - 1989.
Necrobia violacea - 1989.
Omosita discoidea - 1989.
Rhyzobius litura - 1989.
Coccinella 11-punctata - 1989.
Cylindrinotus laevioctostriatus - 1989.
Gastrophysa viridula - 1989.
Crepidodera ferruginea - 1989.
Apion radiolus - 1989.
Otiorhynchus rugifrons - 1989.
Hypera arator - 1989.
Ceutorhynchus contractus - 1989.
Ceutorhynchus timidus - 1989.

MYRIAPODA: DIPLOPODA

Polyxenus lagurus - 1989.

ISOPODA: Oniscidea

Ligia oceanica - 1983, 1989.
Oniscus asellus - 1983, 1989.
Philoscia muscorum - 1983, 1989.
Porcellio scaber - 1977, 1983, 1989.
Trichoniscus pusillus - 1983.

ARANEAE

Amaurobius fenestralis - 1989.
 Enoplognatha ovata - 1989.
 Erigone atra - 1989.
 Erigone dentipalpis - 1989.
 Harpactea hombergi - 1989.
 Lepthyphantes tenuis - 1989.
 Lepthyphantes zimmermanni - 1989.
 Meioneta saxatilis - 1989.
 Meta menardi - 1989.
 Pachygnatha clercki - 1989.
 Tetrax denticulata - 1989.
 Xysticus cristatus - 1989.

OPILIONES

Mitopus morio - 1989.

MOLLUSCA

Arion intermedius - 1975.
 Candidula intersecta - 1989.
 Cochlicopa lubrica - 1975.
 Deroceras reticulatum - 1975, 1989.
 Lauria cylindracea - 1975, 1983, 1989.
 Nesovitrea hammonis - 1975.
 Oxychilus alliarius - 1975, 1989.
 Oxychilus cellarius - 1983.
 Vitrina pellucida - 1975.

DYFED SITE REPORT - Number Seven - THE STRADEY ESTATE, CARMARTHENSHIRE
 (22/488016) - I K MORGAN

Situated on the western outskirts of the town of Llanelli in SE Carmarthenshire, the Stradey Estate holds several habitats of entomological value, including varied woodlands and acidic pastures. The woodland habitats include semi-natural oakwoods occupying the deep dingles of Cwm Mawr (22/48025) and Cwm Dulais (22/489029) and there are long-established amenity plantings of both deciduous and coniferous species around Stradey Castle (22/491016) and elsewhere; there are also substantial conifer plantations in the north of the Estate. In some areas, notably around Cencoed-uchaf (22/481033) and just south of Five Roads (22/486046), wet acidic, often Molinia-dominated grasslands provide a contrast and a home for a different invertebrate community.

Most of the valley sessile oakwoods have, in the past, been heavily coppiced, with the latest rotation perhaps taking place earlier this century. Consequently, in these areas, there is little timber - apart from occasional trees - of great size or antiquity. The deadwood coleopterous fauna in these old coppice woods is therefore poor and the combination of heavy shading in summer and a calcifuge ground flora means that the rich butterfly fauna found in coppice woodland on more calcareous sites is absent. The wet bottoms of these valleys, based on heavy sticky boulder clay is, in part (especially NW of Cwmbach, 22/485021), occupied by alder Alnus glutinosa - tussock sedge Carex paniculata carr; such habitats are known to be good for their tipulid (cranefly) faunas but no adequate survey of this group has been undertaken in Stradey Woods.

Around the fringes of these wooded dingles, and especially on the southern flanks of Cwm Mawr, there is much secondary downy birch Betula pubescens woodland, this being especially noticeable in late winter when the twigs attain a purplish hue, whilst upstream, in the small Pennant Sandstone gorge (22/478029) SW of Cencoed-uchaf, evidence that the woodland hereabouts is ancient is provided by a population of the wild service tree Sorbus torminalis. It would be worth checking leaves of this species for the larvae of the Nepticulid or leaf-mining lepidoptera, two rare species of which are associated with S. torminalis; itself rather a rare tree.

As already mentioned, many of the woodlands around Stradey Castle are plantings, made principally in the late eighteenth and the nineteenth centuries; prior to this, much of the area must have been open and Indeed I recall seeing an old illustration* which shows 'the

* I believe this was a general sketch of Llanelli town, looking westwards; the date and source of which I have unfortunately forgotten.

Graig' (the prominent hill overlooking the Castle), devoid of trees except above Stradey Home Farm (22/488013) where in fact native oaks - of reasonable dimensions - still grow. The plantings comprise an array of deciduous and coniferous species but venerable beeches Fagus sylvatica are a notable feature; these old beeches are a most valuable contributor to the Estate's deadwood community and species recorded include the beetles Rhizophagus dispar, R. nitidulus, Pyrochroa serraticornis, Rhagium mordax, Rhinosimus ruficollis, R. planirostris and Melanotus erythropus - all species dependent on deadwood or living under bark. The larvae of the local, old woodland, fly Xylophagus ater, which breeds in dead deciduous trees, has also been found in Stradey Woods.

In recent years there has been little extensive management - apart from the removal of the occasional tree and small plantings - in the planted amenity areas around the Castle. This has meant that many parts of the woods were dark and sunless in summer - exacerbated by rampant growths of invasive Rhododendron ponticum and Prunus laurocerasus, but recent thinnings will enhance the invertebrate interest, allowing light to penetrate the woodland floor to the advantage of flowers and nectar-seeking butterflies and hoverflies. However, the few already existing sunlit clearings or pathways can be interesting places, concentrating in limited areas various nectar, pollen and sun-searching species. For example, the hoverfly Xylota segnis and its less common relatives X. sylvarum and X. florum bask, aculeate-like, on sunlit leaves whilst Chalcosyrphus nemorum maintains territories on fallen beech and oak trunks. Once, in 1986, the very uncommon and beautiful large soldier-fly Stratiomys potamida was caught in such a situation. Another area has provided records of the impressive black-and-orange crane fly Ctenophora bimaculata which has a substantial ovipositor, used for egg-laying in dead wood.

The bee-mimic syrphid Criorhina berberina has been noted on several occasions (it likes Rhododendron-blossom!), whilst in early spring the larger C. ranunculi has been captured, high up on willow Salix cinerea flowers. Myathropa florea has been observed ovipositing in a dead tree stump. Two local Cheilosia spp. have been recorded at Stradey Woods - vulpina, a southern species, and scutellata whose larvae are believed to develop in Boletus fungi; the very effective wasp mimic Chrysotoxum cautum occurs around scrub at the wood margin.

In early spring, before the trees come into leaf, the lack of sunshine is not so much of a problem and many common species of hoverfly such as Eristalis pertinax, Syrphus torvus and Platycheirus albimanus take advantage of the early flush of lesser celandine Ranunculus ficaria, wood anemone Anemone nemorosa, snowdrops Galanthus nivalis and later, bluebells Hyacinthoides non-scriptus. With these common hoverflies, may be found the so-called 'bee-fly'* Bombylius major, an adroit hoverer in front of flowers, (though the very observant will note that it 'hangs-on' with its front legs!); its larvae develop in the underground nests of solitary bees and wasps. A male Chelostoma florissomne (det, G G Else), collected at Stradey Woods on 15/6/1985 provides one of only two Welsh records for this species; this small, dark bluish bee nests in minute holes in timber such as those excavated by the so-called 'furniture beetles' Anobium sp.

The limited amount of privet Ligustrum vulgare that grows on the gravels which underlie the flat land around Stradey Castle provides larval sustenance for the privet hawk moth Sphinx ligustri that occurs here in season. The moths generally have been very inadequately surveyed - copper underwing Amphipyra pyramidea and slender brindle Apamea scolopacina are the only two mention-worthy species noted so far - but it is intended to undertake more comprehensive survey work in future seasons.

In contrast, the butterflies are well known, with the white-letter hairstreak Strymonia w-album being the rarest species recorded - but not since 1976 when it was noted at bramble blossom besides the road (22/487015) that links Cwmbach with Pwll. Silver-washed fritillaries Argynnis paphia are only occasionally seen in the woods around the Castle but more regularly on the wooded parts (22/480028) of Cencoed-uchaf; pastures in the wood-edged corner at 22/478029 sometimes hold marbled whites Melanargia galathea. Purple hairstreaks Quercusia quercus are probably widespread, and commas Polygonia c-album are quite common.

Groves of young sycamore Acer pseudoplanatus hold the pretty orange ladybird Halyzia 16-guttata which is to be found under its leaves where it feeds on mildews; spring and autumn are good times to locate this species. All three British 'scorpion-flies' Panorpa spp. have been recorded in the woods (bramble brakes are a favoured haunt), including the rarely-recorded P. cognata; the 'stings' of these scorpion-flies are, in fact, male genitalia.

There are few mossy-golden saxifrage Chrysoplenium oppositifolium flushes in the wooded dingles so a good old woodland mollusc fauna is apparently absent, though Zenobiella subrufescens has been recorded in Cwm Mawr. Such Chrysoplenium tangles provide the normal wet home for the local woodland millipede Craspedosoma rawlinsii, but one found in March 1989 was climbing a beech tree, not far - admittedly - from a wet area.

Away from the woods, the wet rushy and heathy pastures near Cencoed-uchaf provide a great deal of interest for the invertebrate enthusiast. In the late Middle Ages, the general area westwards from Cencoed was known as 'Mynydd-y-Rhos' (Rees, 1933), a reflection of how once-extensive the sedgy or heathy 'rhos-pastures' must have been. Now only residual areas of 'rhos' remain the best of which being an enclosure east of Cencoed-uchaf farm (22/485032), here soft rush Juncus effusus pasture with whorled caraway Carum verticillatum and devil's-bit scabious Succisa pratensis grades into a heathier element with heather Calluna vulgaris, cross-leaved heath Erica tetralix, creeping willow Salix repens, tormentil Potentilla erecta, sedges and other acidic vegetation.

There is a small bog with Sphagnum moss, much cotton grass Eriophorum spp. and some cranberry Vaccinium oxycoccos; invasion of this enclosure by various woody species is a current problem. There is a healthy colony of both small pearl-bordered Boloria selene and marsh Eurydryas aurinia fritillaries, and moth trapping in 1989 indicated a varied and substantial population of species that one would expect in such an area, though no scarce species were recorded. Britain's largest horsefly Tabanus sudeticus (it grows to about 2.5 cm), is regular here and on other rushy pastures at Cencoed-uchaf during the summer. On a flowery bank near this field in August 1985, the Red data Book bee Andrena congruens (det. G R Else) was caught, new to Wales, the nearest known population being in Gloucestershire.

On the western side of Cencoed-uchaf there is a small, wet flushed area (22/479023) which holds the keeled skimmer dragonfly Orthetrum coerulescens, a local species characteristic of southern wet heaths; it is always a pleasure to watch, in July, the females dipping their abdomens into wet runnels to oviposit amongst the yellow-flowered bog asphodels Narthecium ossifragum that adorn such sites. This wet flushed area is surrounded by a compact area of unimproved acidic/neutral grassland and here mother shipton Callistege mi and burnet companion Euclidia glyphica moths fly in summer, with a few small pearl-bordered and the odd marsh fritillary. Once, on 2 June 1976, a pearl-bordered fritillary Boloria euphrosyne was also closely observed at this site.

Orthetrum coerulescens occurs too at a small 'kettle-hole' bog (formed by the melting of a large mass of ice) at 22/480036; the water beetles at this site may repay investigation at a later date. The best coerulescens colony occurs SE of Bryn-du (22/478041) where, in spite of attempts at drainage, a fine little flushed bog occurs with a wealth of plant and animal life. On the dry, gravel-based hill ('Cae-banadl' = "broom field") at 22/479034 near Cencoed, the nationally-scarce robberfly Asilus crabroniformis has been seen, whilst on the flanks of this pasture green hairstreaks Calophrys rubi sometimes occur; nearby tree tops (the hill provides a good vantage point) regularly hold purple hairstreaks.

Gratitude is due to Mr David Mansel-Lewis for access permission to survey the wildlife of the Stradey Estate and to examine old Estate documents held at the County Archivists Office, Carmarthen. Readers are reminded that access permission should be sought, either via the author, or through the Stradey Estate Office, New road, Llanelli, Dyfed. Thanks are also due to my friend P M Pavett for help in surveying (and identifying) the Coleoptera associated with dead wood at Stradey.

A SURVEY OF THE INVERTEBRATES OF SKOMER ISLAND (12/725095) BY THE USE OF PITFALL TRAPS - RG LOXTON.

This survey was carried out to increase the knowledge of the island's invertebrates and to compare the fauna found in several different terrestrial habitats. Pitfall trapping has severe limitations such that no absolute quantitative comparison of the fauna can be made between habitats but, nevertheless, a preliminary overview can be obtained. The traps were set in position in May 1988 and thereafter maintained by Ian Clowes and Madelaine Prangley until the beginning of September. Three traps were set at each of eight sites on the island and material was collected at roughly weekly intervals. In addition, a number of species were collected by hand during my three days on the island in May, including a number of species which were not caught in the pitfall traps. The traps sampled areas in the centre and along the cliff-tops of the north of the island and covered the following habitats:

- (1) A dry, rabbit-grazed field in the centre of the island.
- (2) Rank, tussocky grassland in a field from which rabbits are partially excluded.
- (3) Cliff-top vegetation dominated by sea campion Silene maritima.
- (4) Grassy cliff-slope with many Manx shearwater burrows.
- (5) South-facing slope covered in bluebells Hyacinthoides non-scripta and bracken Pteridium aquilinum.
- (6) A patch of dense heather Calluna vulgaris on the island plateau.
- (7) Mono-dominant purple-moor grass Molinia caerulea.
- (8) Bare muddy ground on the margin of the North Pond.

With the help of specialist expertise, the most abundant ground-active groups of invertebrates were identified to species-level, comprising the woodlice, millipedes, centipedes, spiders, ground-beetles and ants. Given the widely-recognised limitations of pitfall trapping, it is not possible to analyse the results statistically with respect to the habitats sampled. However, some general trends are apparent. Ground-beetles, for example, are caught more frequently in dry, open habitats than amongst dense vegetation, a result which is to be expected for a group of highly-mobile predators. The uniform area of Molinia was extremely poor in terms of both species and individuals for all of the groups sampled and the same is also true of the pond margins, although this latter site contained a specialised fauna with many species not represented elsewhere. At first sight, the rabbit-grazed fields near the farm do not seem to be the most promising of habitats but on the basis of the results it proved to be the most productive. The partial exclusion of rabbits in site 2 had the effect of reducing the number of species caught whilst favouring the abundance of selected species. On Bardsey Island, heather and gorse habitats which are sheep-grazed and occasionally burnt are among the richest habitats for ants and spiders but, on Skomer, the dense heather was rather poor for invertebrates, probably due to the effects of shading.

Although the results of this survey cannot be reliably used to assess the value of different types of habitat on Skomer for invertebrates, a lot of valuable information has been provided on the occurrence of species on the island. It is perhaps worth mentioning a few of the more interesting species.

Six species of woodlice were trapped during the survey. They included 140 specimens of Armadillidium pulchellum, most of which were taken in the cliff-top samples but the species was present in all habitats apart from the pond margin and the dense Molinia. It is an uncommon species, chiefly of coastal habitats in western Britain, and is only rarely found with its congener A. vulgare. On Skomer the two species occurred together in several sites, allowing possibilities for the study of the interaction of the two species.

None of the centipedes, millipedes or harvestmen were of particular interest, although several new island records were made. Nine species of ants were captured and they provided the most exciting record of the survey. A single female Myrmica (=Sifolinia) karavajevi was trapped in the rabbit-grazed field, a site which produced a total of six species. M. karavajevi is a social parasite living permanently in the nests of other Myrmica species and in Britain it has been recorded from the nests of M. sabuleti and M. scabrinodis. These hosts are widely

distributed in a variety of short-turf habitats but M. karavajevi has only previously been found in four British localities, all of which are heathlands in southern England. The last British record was at Avon Common in South Hampshire in 1971 but it may be under-recorded to some extent as it bears a close resemblance to its hosts. Both of the potential hosts occur on Skomer and further observations on the occurrence of M. karavajevi would be of great value.

The remaining two groups studied provided the bulk of the species with a total of 84 spiders and 37 ground-beetles. Neither group produced any outstanding rarities but the carabid Acupalpus dorsalis is regarded as being a nationally scarce species occurring on the margins of freshwater habitats. Four specimens were taken at the edge of the pond and this site also produced five individuals of the rather local Stenolophus mixtus. The ground-beetle fauna of the grassland sites was composed of a typical assemblage of species, though with a striking abundance of Synuchus nivalis (172 specimens caught) and twelve specimens of Stomis punctatus. Both of these species are widely distributed but uncommon in Britain.

*

A full report of the study has been deposited with the Dyfed Wildlife Trust and a copy left with the warden of Skomer Island. I would like to acknowledge my gratitude to Simon Hoy, who identified and enumerated all of the ants for me, and to Cedric Collingwood who confirmed the identification of Myrmica karavajevi; to Dr Tony Barber who kindly performed the same service with the centipedes; to Kefyn Catley who checked some of the spiders for me; and to Stephen Evans who encouraged me to undertake this study. I am also indebted to Ian Clowes and Madelaine Prangley who collected the samples. Finally, my most sincere thanks to Steve and Anna Sutcliffe for all their help, encouragement and splendid hospitality on my all-too-short visit in May 1988.

HYMENOPTERA

THE WOOD ANT Formica rufa IN CEREDIGION, VC 46 - AO CHATER & RA SPENCER

The purpose of this note is to describe the distribution of the wood ant in Ceredigion, to provide a baseline for monitoring it in the future, and to try and stimulate more active conservation of these interesting creatures.

The wood ants of Ceredigion are all Formica rufa, which is widespread throughout England and Wales, being generally most abundant in the south. In Wales, most of the recent records are from the middle and north, as are those of the only other Welsh wood ant, F. lugubris, a more Boreal species which also occurs in northern England, Scotland and southern Ireland and reaches its southern limit in Britain near Rhayader (Barrett 1979). The ecology of the two species in North Wales and Shropshire is discussed in detail by Hughes (1975). F. rufa builds large mound nests of leaves, twigs etc. and develops an extensive system of foraging trails, both on the ground and up trees, often extending 50 or 100 metres from the nest. The nests are often in groups and are normally in sites which are warm and sunny, well-drained and in, or within easy-reach of, woodland. In Ceredigion the species is confined to the northern part of the District, where c.94 nests have been seen in the period 1984-1989 in the following five areas.

Map 1. Furnace (22/685951). Nests have been known here since at least 1956 when Miles (1956) recorded one on a rock overlooking the pool below the waterfall (AOC remembers a nest or nests being here probably at least five years earlier). Miles (1962) later reported the disappearance of this nest but, since 1984, thirteen nests have been seen in the vicinity. Most are in sessile oak, beech and larch woodland, and several are close to gardens and cause considerable inconvenience to the neighbouring householders. At Foel-fach this was compensated for by the frequent sight of green woodpeckers feeding on the ants in the nest

(WM Condry, pers. comm.). In the winter of 1987/88, when much of the mature larch wood north-east of Foel-fach was felled by the RSPB, the ants' nests involved were fenced off for protection, although in the event the trees around them were not felled. Hughes (1975) correlates wood ant distribution in England and Wales with that of coppice woodland, which in turn he relates to the distribution of the pre-Industrial Revolution iron-smelting industry and that industry's need for charcoal. He observes that the populations here at Furnace, as at Dol-goch in Merioneth, "are on the sites of nineteenth century industrial activity near heads of water which once drove mills and smelters". In Ceredigion, as indeed in much of Wales, other and earlier activities such as lead-mining also led to coppicing for charcoal (Linnard 1982: pp67-78). It is of some interest that Ceredigion's best-known early industrial site, the Dyfi Furnace, should also be the site of one of its few wood ant colonies. The Dyfi Furnace was a smelting works for lead and silver in the mid-seventeenth century (Rees 1968) and a century later became an iron smelting works. An etching of 1813 (Woods 1813, reproduced in Boon 1981) shows the surroundings largely treeless and very much less-wooded than now, but the woodland may then just have been coppiced.

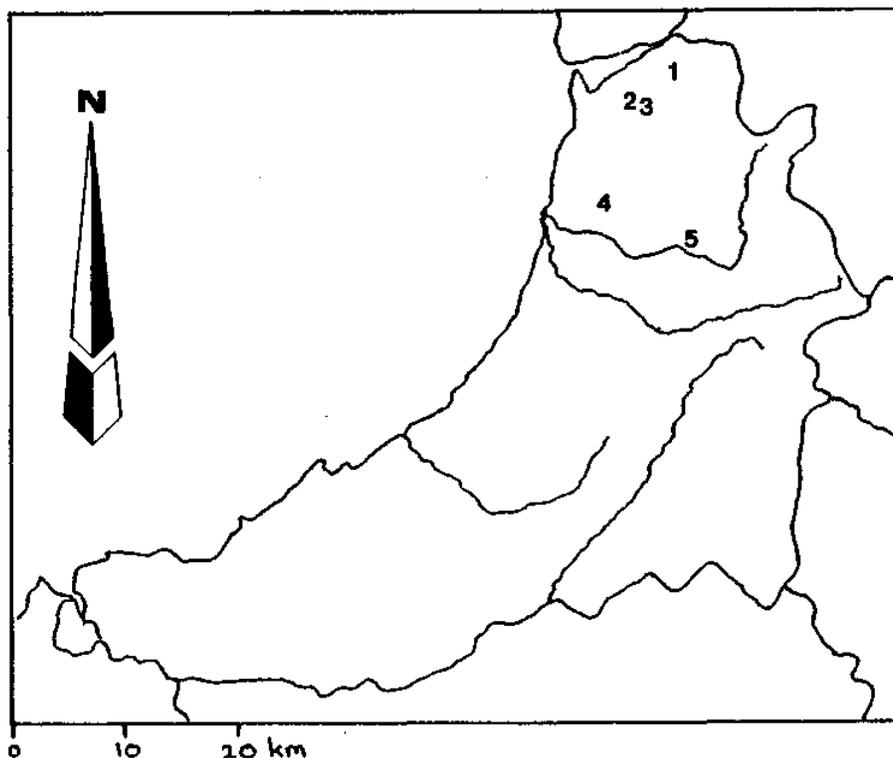
Map 2. Llancynfelyn (22/652923). This is by far the largest colony of nests in Ceredigion, with 56 nests counted in May 1988 and 37 in April 1989. Wood ants were first noticed here in 1986. Most of the nests are on an east-south-east facing slope along a 100 metre length of the 2-3 m wide scrub fringe of formerly coppiced sessile oakwood on a rocky mound 350 m west of Dolclettwr. In places the nests merge together to form a virtually continuous strip. In the summer of 1989 the scrub fringe, of sparse blackthorn, dog rose, gorse, bramble etc., much interrupted by stock moving between the wood and the adjacent pasture to the east, was flail-cut and most of the nest-mounds destroyed. The scrub had presumably protected the nests from stock-trampling and it remains to be seen what the long-term effect of the scrub-clearance will be. There are also several nests in a clearing in the oakwood, two on the west facing hedgebank of the lane alongside, one on the east bank of this lane, and one in bracken at the edge of a similar wooded mound 100 m north of the B4353 road.

Map 3. Tre'r-ddol (22/662925). The largest nest in Ceredigion was first noticed here by R Bamford (pers. comm.) about 1980 in a Forestry Commission western hemlock plantation in Coed Pant-glas-mawr above the A487. In April 1988 this nest covered an area of 5 x 2 metres, with an outlier 1 x 0.7 m, and was very shaded but active. It was on the west bank of an old sunken path with a few oaks and hazels nearby, in the narrow ride c.7 m wide alongside the path, with tall hemlocks on both sides. In April 1989 the nest was still active, with small groups of ants visible, but when visited in July 1989 it appeared lifeless and collapsed and is now deserted, presumably because it has been shaded out. A much smaller, active nest was found in September 1988, 500 m away on the bank of the road up the north side of Cwm Clettwr, among bracken by a conifer plantation and a sessile oakwood, but this too was deserted and gone a year later.

Map 4. Gogerddan (22/634837). For some years a series of nests has been known on the north verge of the Penrhyn-coch road 500 metres east of Plas Gogerddan. Eight nests were seen here in 1989, seven underneath tall Corsican pines at the edge of a small copse and one in the hedgebank by a garden further west. These nests, being conspicuous to passers-by, are often disturbed or partially destroyed and several nests are frequently damaged when the verge is mown.

Map 5. Cwm Rheidol (22/703795). *Formica rufa* was first recorded in Ceredigion from Devil's Bridge in September 1943 (Richards 1944). This may possibly have referred to the sites described below, as no other records have been made from the immediate area of Devil's Bridge. Hughes (1975) made a fruitless search of "the south facing oakwoods of the Rheidol valley" and reported that "wood ants are unknown to Nature Conservancy staff acquainted with the relict oakwoods of the gorge". However, Salter (1936) swept the chrysomelid beetle *Clytra quadripunctata*, an obligate commensal in wood ant nests, from oaks at the Rheidol Falls in June 1935 (specimens in the Salter collection, National Museum of Wales, fide DC Boyce), and this by implication is the earliest indication of *Formica rufa* in Ceredigion. At that date the south facing slope of the valley here was entirely covered in sessile oak coppice. Nests now occur within 300 metres of the Rheidol Falls, and the most easterly are only 3

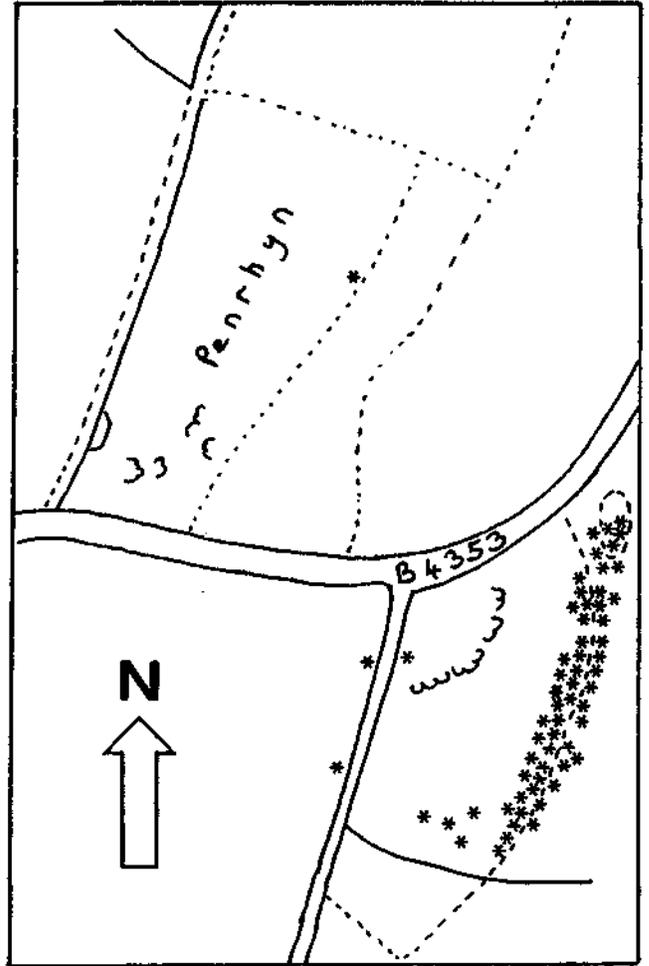
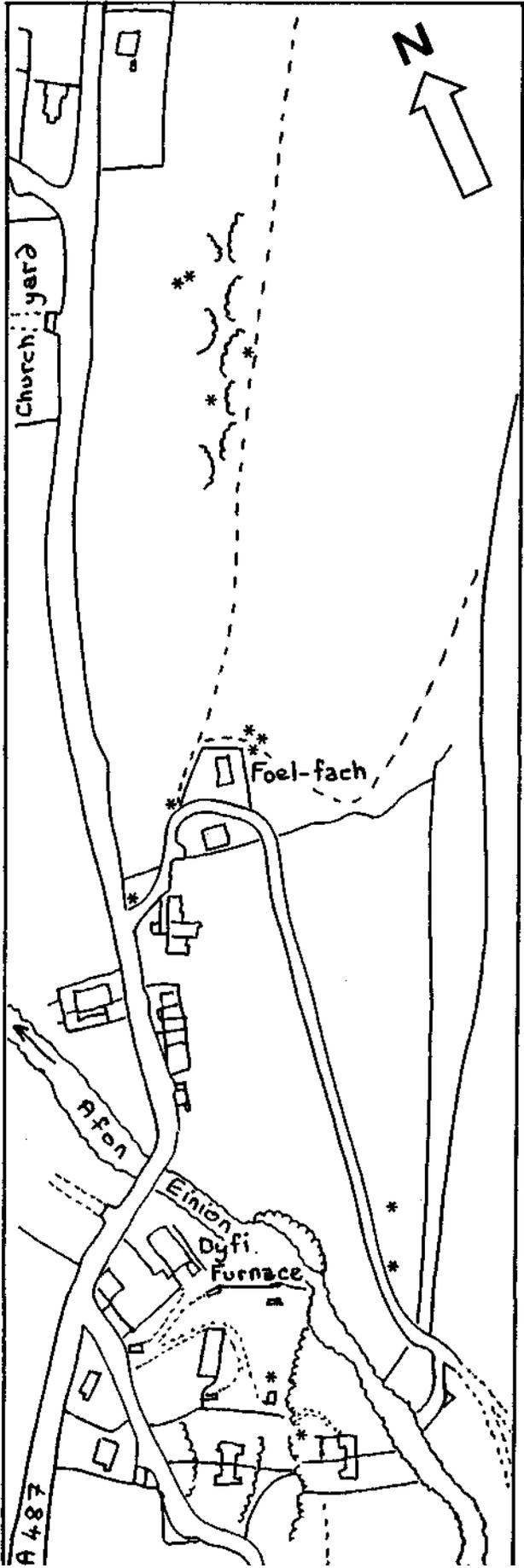
kms west of Devil's Bridge. Ten nests were seen in this valley in 1988 and 1989, along 1.7 km of the south and south-west facing slopes, in both sessile oakwood and conifer plantation. The most easterly are two nests, 7 m apart, on the track of an old leadmine leat at the top of a small clearing in ungrazed, formerly coppiced, sessile oakwood near the west end of the Coed Simdde-lwyd Dyfed Wildlife Trust Reserve. JN Hedger (pers. comm.) remembers active nests in the same wood, but higher up the slope, in the late 1970's. A 1978 report by R Osborne for the Nature Conservancy Council mentions active nests at the east end of this wood (c.22/722787) but these have not been seen again, despite several searches. Most of the other nests in Cwm Rheidol are alongside the Forestry Commission track in the Coed Dol-fawr conifer plantations, trails from them conspicuously crossing the road opposite each nest. One large nest though, spilling 3 m or more down a shaley slope in deep shade, and very active, is just above the sloping footpath 250 m west-north-west of Dol-fawr, close to a clearing formed by mine-spoil. Another nest is astride the fence among bracken at the bottom edge of a larch plantation just above the public road 150 m west-north-west of Dol-fawr.



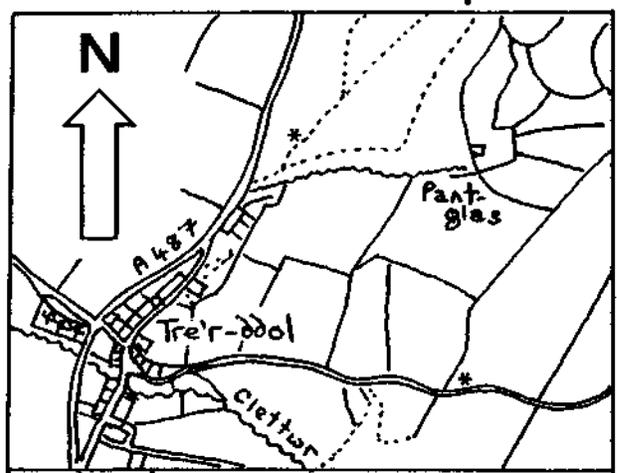
Map of Ceredigion showing the location of site maps 1-5.

Other records. Richards (1944) records *Formica rufa* in the Llyfnant valley in Montgomeryshire, and Hughes (1975) recorded it "in protected oak scrub...in the Llyfnant valley", but without specifying which county. There are no definite records from the Ceredigion side of the valley, most of which is north facing. From much further south in Ceredigion there is a record, dating from the early 1950's, reported in Thomas (1962), of *F. rufa* from the stomach contents of trout and/or salmon parr from a one mile stretch of the Afon Teifi centred on Pont Llanio (22/652569). Whether wood ants ever nested near here is unknown.

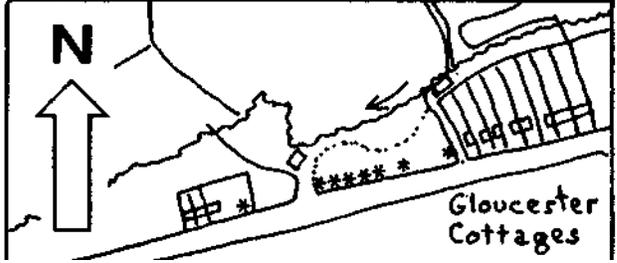
Formica lugubris. This species, which can tolerate lower temperatures and thus more shade and higher altitudes than *F. rufa* (Hughes 1975, Collingwood 1979), may be expected to appear in Ceredigion. The most likely sites would be in upland areas of conifer plantation.



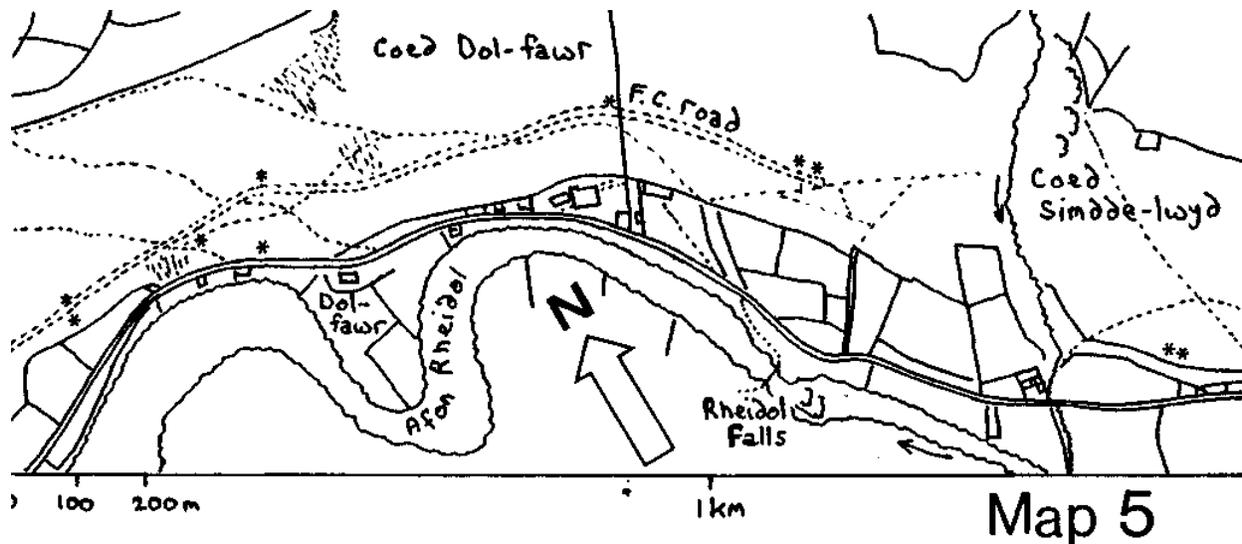
0 100 200m Map 2



0 100 200m Map 3



Gloucester Cottages



Comment and conservation. The wood ant nests in Ceredigion range from 17 - 100 metres a.s.l., and all are closely associated with oak coppice or conifer plantation. All are on slopes facing from west-north-west through south to east-south-east (five on WNW facing slopes, 2 on W, 8 on SW, 4 on SSVV, 14 on S, 3 on SE, and 58 on ESE). Although 94 nests have been noted between 1984 and 1989, the normal number of active nests in any one year is probably 60-70. Most of the nests are rather small and only fifteen are two metres or more across.

In the light of a statement by Hughes (1975) that in north-west Wales "even at warm sites near the coast, *F. rufa* populations consist of just a few mounds of loose aggregation", the large colony at Llancynfelyn with its closely-crowded nests is of unusual interest. The chief cause of desertion of nests at the Ceredigion sites seems likely to have been shading out by tree growth and perhaps also by bracken, and half the known nests were accidentally destroyed by the scrub-cutting at Llancynfelyn in 1989. It is not known yet whether the total number of nests in the District is increasing or decreasing. Only about 10% of the currently active nests are on land with any formal conservation status, most of those at Furnace being on land owned by the RSPB, and the two in Coed Simdde-lwyd being in the DWT Reserve there. The effect of the recent felling of much of the mature larch woodland at Furnace remains to be seen, but the temporary opening up of the area may well be beneficial. The Coed Simdde-lwyd nests are presumably dependent on the sunlight available in the clearing at the edge of which they are situated, one of the very few in this extensive wood, and the rest of the formerly coppiced wood seems likely to become less and less suitable for colonisation as growth continues. The maintenance or enlargement of this particular clearing, and the construction of others or the revival of coppicing, would seem essential to the conservation or spread of wood ants in this Reserve.

Elsewhere in Dyfed, *F. rufa* has only been reported from three localities in Carmarthenshire, one of which at least (near Llanelli) no longer contains active nests. The species has apparently never been recorded from Pembrokeshire. Apart from their intrinsic interest, wood ants' nests support a wide range of predators, commensals, parasitoids and parasites (Donisthorpe 1927, Brian 1977). These have scarcely been studied yet in Ceredigion and the only records are of the staphylinid beetle *Zyras humeralis* and the chrysomelid *Clytra quadripunctata* from the Llancynfelyn site in Spring 1988 (DC Boyce, pers. comm.) and Salter's 1935 record of the latter species from Cwm Rheidal mentioned above. The ants themselves have a profound effect on the ecology of the extensive territory around each nest. In several countries of Europe wood ants are legally protected because of their value in pest control on forest trees.

Acknowledgements. We are grateful to Adrian Fowles for references, records and other information, and to Roy Bamford, David Boyce, William Condry, Ian Francis, Chris Fuller, Ruth Griffiths, John Hedger and John Henderson for records old and new.

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FIELD MEETING - ABERGORLECH, BRECHFA FOREST (22/586337) VC44, 19 AUGUST 1989 - I K MORGAN

Abergorlech, chosen for the DIG late summer field meeting, comprises substantial plantings of spruce Picea sp., pine Pinus sp and larch Larix, and with a deep dingle clad with oak Quercus petraea - ash Fraxinus excelsior woodland. Running parallel with this wooded valley is a broad vehicular trackway, open to the sun and vegetated with a mostly calcifuge flora that includes heather Calluna vulgaris, tormentil Potentilla erecta, wood sage Teucrium scorodonia, foxglove Digitalis purpurea and bramble Rubus fruticosus agg.; scrub of western gorse Ulex gallii and a little hazel Corylus avellana with young trees of rowan Sorbus aucuparia and birch Betula pubescens also occurs.

One purpose of the Abergorlech meeting was to survey for syrphids associated with conifers - notably Megasyrphus annulipes (known from neighbouring Ceredigion) and the bumble bee mimic Eriozona syrphoides. In fact one of the earliest British records of the latter was from the not-to-distant Caeo Forest (22/74), (Cull, 1971). Alas neither species was noted on the day of the field meeting!

Abergorlech is the only known confirmed site for the wood ant Formica rufa in Carmarthenshire, another site is reputed to be in the extensive Crychan Forest, but it is not clear whether the wood ants at this latter locality are in Carmarthen or Breconshire. At least, seven nests of Formica were counted at Abergorlech, more than previously thought. Although no myrmecophilus species such as the attractive chrysolid Clytra quadripunctata were found, the author - encouraged by the other DIG members present - did closely examine one nest. In the warm sunshine the fumes of the formic acid, squirted defensively by the ants, was very marked.

About thirty species of hoverfly were recorded during the meeting, including a female Neocnemodon by Ann and Steve Coker; other noteworthy syrphids were Sphegina clunipes, Xylota coeruleiventris, Arctophila fulva, Sphaerophoria scripta (rather rare inland) and Leucozona laternarius. The last-named species is distinctly rare in Dyfed with only a few records, in contrast to the other two Leucozona species which are common. Didea fasciata has also been recently recorded at Abergorlech, though not on the day of the meeting.

Several butterfly species were seen, including commas Polygonia c-album and a holly blue Celastrina argiolus, whilst a robust caterpillar of an elephant hawk moth Deilephila elpenor, seen crossing the trackway, provided interest on a day not noted for an abundance of records. However, a reconnaissance visit to Abergorlech on 21 June, did produce two noteworthy moths - a northern spinach Eulithis populata (whose larvae feed on bilberry Vaccinium myrtillus) and a beautiful snout Hypena crassilis, a species said to be characteristic of old woodland.

The small orthopteran Tetrix undulata was frequently found on the bare forest trackway and the attractive, if not rare, woodland jumping spider Evarcha falcata was also noted.

Lastly, a visit to a shaded, rocky streamside bank south of Gwernogle to see the Cornish moneywort Sibthorpia europaea again did not bring results but compensation was provided when, nearby, the uncommon conopid fly Conops strigatus was taken by John Ellis.

Thanks are due to S & A Coker, J R Ellis and A P Fowles for contributing records.

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