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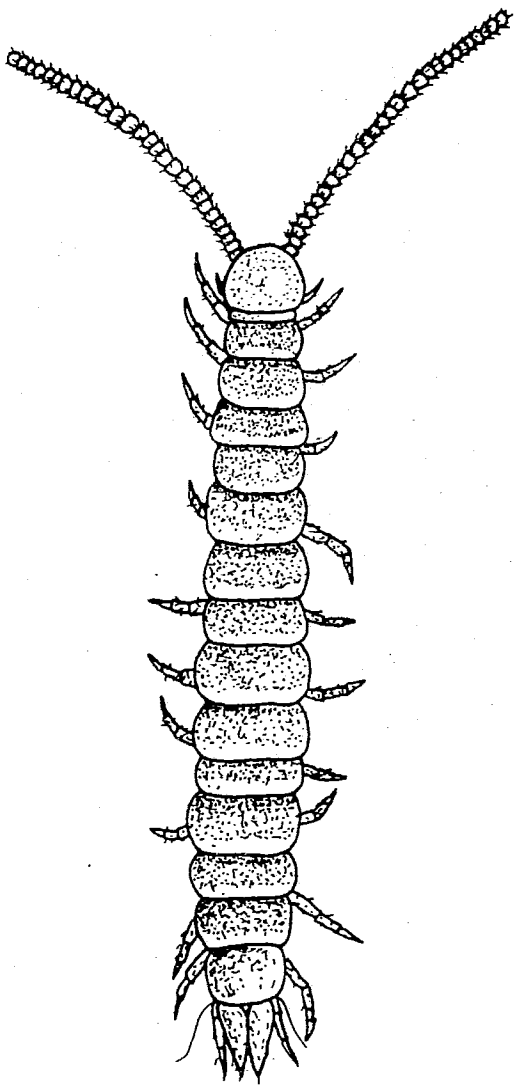
BULLETIN of the BRITISH MYRIAPOD GROUP

Edited for the Group by:

A.D. Barber
and
J.G. Blower



Volume 5

April 1988

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BRITISH
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Bulletin of the British Myriapod Group 5 (1988)

EDITORIAL

Each volume of the Bulletin has its own characteristic flavour; this one has three tasteful contributions from John Lewis: a third account of the fauna of northern France (with Desmond Kime), a most novel compilation of interesting observations on chilopod ecology from all over Europe, and the description of a new species of centipede, from Britain. Dr. Lewis adds three short notes to MISCELLANEA, by way of seasoning.

MISCELLANEA is evidently a useful new feature; there are twice as many notes in this issue compared with its first appearance in volume 4. Volume 5 will perhaps be remembered mainly for its inclusion of a paper on Symphyla by Steve Hopkin and Andy Roberts. There is a nice paper by Helen Read, the first fruits of her research at Bristol where she succeeded Dr. Hopkin, and, incidentally, got a Doctorate - congratulations. Adrian Rundle is still not satisfied with the British list as it is, and continues to add to it. Lastly, but not least, we are pleased to include a thorough and extensive survey of south west Wales by Ian Morgan.

Whilst we have not yet aspired to a commemorative issue of postage stamps, the inclusion of a drawing of Oxidus gracilis on the presentation pack of stamps issued for the bicentenary of the Linnean Society is worth (modestly) noting as was the media attention given to one of our smaller groups and to one of the larger stimulating influences within BMG. Volume 5 should appear for the annual field meeting with BISG at Newbridge-on-Wye. The provisional Atlas of Centipedes is also expected to appear, followed closely by the Millipede Atlas. 1988 looks like being a noteable year for BMG and BMS. We already have several papers we are holding over to volume 6; we would welcome copy spread over the rest of this year rather than in the first quarter of the next.

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TYGARRUP JAVANICUS (ATTEMS) A GEOPHILOMORPH CENTIPEDE NEW TO THE BRITISH ISLES.

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In 1967 A.J.R. collected two specimens of a small mecistocephalid centipede from the Palm House of the Royal Botanic Gardens at Kew. These proved to be Tygarrup javanicus (Attems), a relatively well known species first diagnosed as Mecistocephalus spissus Wood, by Attems (1907), but subsequently (Attems, 1929), assigned by him to a new species of Chamberlin's genus Tygarrup. Attems' original material was collected in Java. The species has since been reported from Indochina (Attems, 1938 and 1953), the Seychelles (Demange, 1981) and Cambodia and Vietnam (Titova, 1983). The British specimens are here described.

Family Mecistocephalidae

Tygarrup javanicus (Attems, 1907)
Mecistocephalus spissus, Attems, 1907 (nec Wood). Mt. Mus. Hamburg 24: 95, figs. 8 and 9.
Tygarrup javanicus, Attems, 1929, Das Tierreich 52: 152.

Material examined: Two specimens sieved from peat in plant bed no. 5 Palm House, Royal Botanic Gardens, Kew, Richmond, Surrey. 8.2.1976. Grid. ref. TQ (51) 187769.

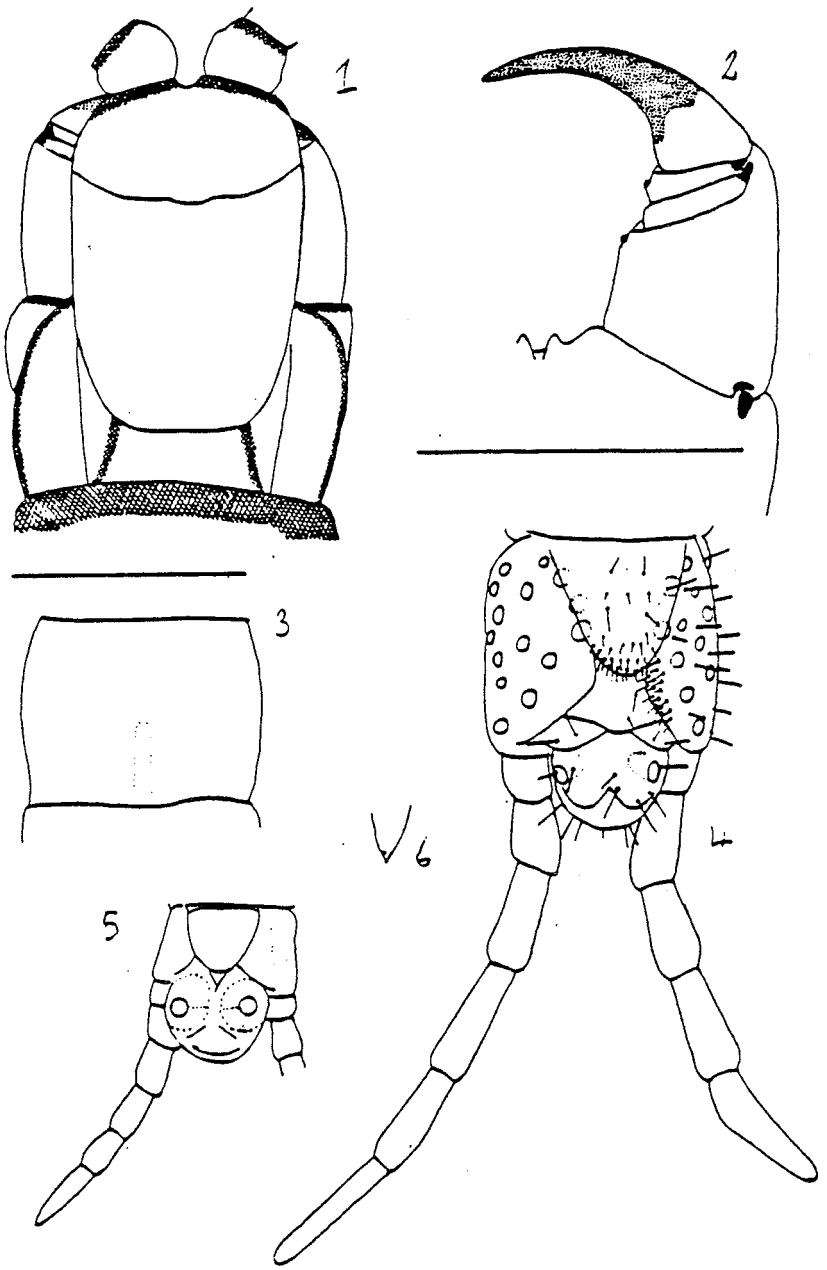
Description of specimen 1. Female, body length 14mm, 45 pairs of legs (the typical number for the species). Head capsule and first segments brownish orange, trunk pale yellow. Lateral patches of darkly pigmented tissue visible through the cuticle on the anterior segments.

Head capsule longer than wide (ratio 1 : 0.79), Frontal suture present (Fig. 1). Attems (1929) states that it is very clear: in this specimen it is best seen with dim illumination. The head capsule and mouthparts of this specimen have not been dissected so it has been impossible to check a number of characters of the ventral cephalic region. The following description of these structures has been taken from Attems 1929: Fore clypeus divided medially by a smooth region of cuticle, very narrow but deeper laterally. The hind clypeus very large. Titova (1983) notes that there are 6 - 7 seta on each side at the boundary of the fore and hind clypeus. The mid-part of the labrum is short and wide, ending in a short peg. The side parts internally with inwardly projecting teeth, described by Demange (1981) as slender hairs directed into the buccal cavity. Mandible with 6 well developed comb plates plus a further two with rudimentary spines. The first with five large pointed teeth which are much stronger than those of the other comb plates. A large pointed tooth present on the stem of the mandible.

In specimen 1 the anterior wall of the prehensorial coxosternum bears a pair of teeth, one each side of a median notch (Fig. 2). The basal segment bears a small tubercle, smaller than that figured by Titova. The femuroid is without teeth but the tibioid has a small tooth.

A band of areolate cuticle along the anterior border of sternites 1 - 10. The scattered pores noted by Titova are not visible.

The median longitudinal thickenings of the sternites termed Sternitleiste by Attems and Rhachides by Crabill are only faintly visible in the cleared specimen. They are present on sternites 2 - 16 and unforked anteriorly (Fig 3).



Legends to Figures

Specimen 1. Fig. 1. Dorsal view of head capsule and prehensorial segment.
Fig. 2. Ventral view of right prehensor. Fig. 3. Ventral view of sternite 7.
Fig. 4. Ventral view of terminal segments.
Specimen 2. Fig. 5. Ventral view of terminal segments. Fig. 6.
End of tarsus of terminal leg.
Scale line = 0.5 mm in all cases.

Terminal segments: Last sternite subtriangular (Fig. 4), the rounded posterior border and somewhat swollen internal lateral borders of the coxopleura of the terminal legs moderately densely setose. The coxopleura with 14 - 16 pores opening on their ventral and lateral surfaces. Demange (1981) states that there are two large pores under the border of the last sternite, Titova, that there is a pair of larger ones at the edge of each sternite. In this Kew specimen there are two on the left and three on the right. They are not noticeably larger than some of the other pores. The female gonopods are triangular and widely separated. A large pair of anal pores is present. The right terminal leg lacks an apical claw and is terminated by a small hyaline conical projection.

Description of specimen 2. Stadium adolescens I, body length 6.75 mm, 45 pairs of legs. This specimen is clearly referable to Tygarrup javanicus. Rachides are present on sternites 2 - 15. The specimen shows a number of juvenile characteristics: the tibioid lacks a tooth and there are no pores on the coxopleura of the terminal legs, however, the anal glands and anal gland pores are very large (Fig. 5). As in the larger specimen, the terminal leg is terminated by a small hyaline conical projection (Fig. 6).

Discussion

Titova (1983) has some first class figures of this species. She notes that Tygarrup javanicus is a somewhat variable species "which seems to be quite widespread, partly perhaps through human agency".

Acknowledgments

One of us, J.C.E.L., is supported by the Royal Society Research in Schools Committee and wishes to thank them and Dr. D.J. Stradling for their encouragement and support.

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CENTIPEDES AND MILLIPEDES FROM FINISTÈRE, BRITTANY

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Details are here given of two collections made in Brittany by J.G.E.L. and Mrs. Sheila Lewis. The centipedes have been identified by J.G.E.L. and the millipedes by R.D.K.

The 1985 collection

1 km north of Palude near Roscoff, VU29, 10.viii.85, Rock crevices in upper part of barnacle zone, Fucus spiralis, Littorina saxatilis and Lasaea rubra present: Hydroschendyla submarina (Grube). 3 females, 2 immature in same crevice, all with 49 pairs of legs.

1.5 km w of Mespaul, VU28 11.viii.85, Base of wooded bank in lane: Glomeris marginata (Villers), Leptoiulus (belgicus?) immature. Lithobius forficatus (Linn.), 3 specimens, Lithobius crassipes C. L. Koch, 2 specimens.

Between Plouvorn and Plouzévédé, VU28, 12.viii.85, Oak litter. Ommatoiulus sabulosus (Linn.), Cylindroiulus punctatus (Leach), Lithobius crassipes.
Under bark of standing dead oak sapling: Ommatoiulus sabulosus, Cylindroiulus punctatus, Proteroiulus fuscus (Am Stein). Lithobius melanops (Newport), three specimens, Lithobius crassipes, 5 specimens, Brachygeophilus truncorum (Bergso and Meinert).
Under stones by wooded roadside: Lithobius crassipes, 2 specimens, Lithobius piceus L. Koch.

Plouvorn, VU28, 12.viii.85, Beech/Chestnut litter by Plan d'Eau: Glomeris marginata, Cylindroiulus punctatus, Chordeuma sp. Immature. Lithobius crassipes, Arctogeophilus (=Gnathomerium) inopinatus (Rib.) Male, 17.5 mm, 41 pairs of legs. Brolemann (1930) gives 39 pairs of legs in both sexes.

Guiclan, VU27, 13.viii.85. Under log by road: Cryptops parisi Brolemann, length 17mm.

4 km NNE of St Thegonnec, VU37, 14.viii.85, under ivy litter, side of road after heavy rain. Lithobius forficatus, 5 specimens, Lithobius crassipes, 3 specimens.

5 km NNE of St Thegonnec, 14.viii.85, in chestnut litter, oak/chestnut forest: Lithobius piceus, Lithobius calcaratus C. L. Koch, 8 specimens, Lithobius crassipes, 3 specimens. Lithobius microps var caernensis Eason (lacks spines on legs), Brachygeophilus truncorum.
In very rotten log: Lithobius forficatus, 5 specimens, Cryptops hortensis Leach, 6 specimens, Brachygeophilus truncorum, 4 specimens.
Under pieces of bark in oak litter: Lithobius calcaratus, Lithobius crassipes, Geophilus carpophagus Leach, 2 males, each with 47 pairs of legs. Brachygeophilus truncorum.

Carentec, VU39, 15.viii.1985, Rock crevice top third of barnacle zone: Hydroschendyla submarina, 12 specimens 47 and 49 pairs of legs.

La Villeneuve 1.5 km S.E. of St Pol de Leon, VU29, 15.viii.1985, very old strand line, probably HWS. In pebbles and sand with rich humus about 6 cm below surface of pebbles: Strigamia maritima (Leach) 15 specimens (5 females with 47 - 51 pairs of legs, one male with 47 pairs of legs). Geophilus fucorum seurati Brolemann, 5 specimens, one male with 53 pairs of legs, one female and two immatures with 57 pairs of legs, one damaged specimen. These appear to be identical with British G. fucorum seurati as described by Lewis (1962). In layer of pebbles and clean sand below the humus rich area in which the Strigamia were found and the fifth at the boundary of this and the humus rich zone. Strigamia maritima, 3 specimens under boulders in Atriplex zone a little higher up the shore.

The 1986 Collection

Landivisiau, VU27, on D35 by motorway, 1.viii.86, under lump of sandy soil by hedge at edge of field of oats: Polydesmus augustus Latzel, Haplophilus subterraneus (Shaw).

Pont Coblant on Brest/Nantes Canal (R. Aulne) 4 km S. Pleyben on D785, VU23, 2.viii.86, litter and slates under horse chestnut by towpath: Leptoiulus kervillei (Brolemann), Glomeris marginata, Cylindroiulus punctatus, Lithobius forficatus. Cryptops hortensis, 5 specimens, the smallest, length 7.5 mm, moulting.

1 km NE of Pont Coblant under slates: Lithobius forficatus, 2 specimens, Lithobius piceus, Necrophloeophagus longicornis (Leach), 2 specimens, females with 53 and 55 pairs of legs. Brachygeophilus truncorum.

4 km S of Brasparts, junction of D785 and D14, VU24, 2.viii.86, in sandy soil with stones, base of cliff by road: Nanogona polydesmoides (Leach), Lithobius forficatus, Cryptops parisi, 2 specimens.

3 km E of Pont Coblant on river Aulne (Brest/Nantes Canal), VU23, 3.viii.86, in soil under slates, edge of oak/beech/sweet chestnut wood, Glomeris marginata, Cylindroiulus londinensis (Leach), C. punctatus. Lithobius forficatus, Lithobius crassipes, Lithobius piceus, Cryptops parisi, Haplophilus subterraneus, one female, 81 pairs of legs and poorly developed virguliform fossae, 5 males with 77, 79 and 81 pairs of legs, all lacking virguliform fossae.

6.5 km W of Chateaulin on D887, 200m, VU13, 4.viii.86, litter pine/oak wood: Cylindroiulus punctatus, Tachypodoiulus niger (Leach), Haplophilus subterraneus, Arctogeophilus inopinatus. Under bark of dead pine trees: Lithobius forficatus, 3 specimens, Lithobius crassipes, Lithobius muticus C. L. Koch, (this specimen is atypical with 4 + 4 forcipular coxosternal teeth (Fig. 1) rather than 2 + 2) Lithobius borealis Meinert, Lithobius melanops, Lithobius microps Meinert. Cryptops hortensis, 7 specimens, one of 14 mm with at least 7 young at adolescens 1 stage, one of 13.5 mm with 7 foetus stage larvae. Strigamia acuminata (Leach) with 41 pairs of legs. In very rotten branch in litter: Haplophilus subterraneus.

6 km W of Landévennec, 1 km S. of coast, 76m. UU94, 6.viii.86, under bark of dead pine tree, pine wood: Cylindroiulus punctatus, Proteroiulus fuscus. Lithobius forficatus, 2 specimens, Lithobius crassipes.

E end of Anse de Polmic about 5 km W of Landevennec, on boundary of UU94 and VU04, 6.viii.86: On rock under shingle, top of shore with Ligia oceanica: Strigamia maritima, a group comprising 5 males with 45 pairs of legs, one male and one female with 47. In rock crevice, Verrucaria zone, one adolescens (S. maritima) with 47 pairs of legs.

W end of Anse de Caon, 3 km SW Telgruc sur Mer, UU94, 6.viii.86, under shingle or on shingle covered rock with Ligia oceanica: Strigamia maritima, 8 specimens, 3 males with 49 pairs of legs, one female with 49, 4 with 51 pairs of legs. A further 34 specimens, 29 of them adolescens 1, 47 - 53 pairs of legs. Rock crevice in Barnacle zone: Hydroschendyla submarina, 12mm, 51 pairs of legs.

Pte de Grottes, Anse de Morgat, nr Crozon, UU84, 7.viii.86, rock crevice, mid barnacle zone: Hydroschendyla submarina, 3 specimens.

1 km N of Telgruc sur Mer, UU94, 7.viii.86, Oakwood, in humus: Cylindroiulus punctatus, Polydesmus sp. (immature), Lithobius muticus, 3 specimens, Lithobius calcaratus, Cryptops hortensis. Under rotting grass by road: Cylindroiulus londinensis, Lithobius forficatus, Lithobius calcaratus, 2 specimens. In rotten stump in willows, low lying part of wood: Glomeris marginata, Lithobius forficatus, Cryptops hortensis, 5 specimens, Schendyla nemorensis, Strigamia crassipes (C.L. Koch), 2 specimens, both adolescens 1, 49 and 51 pairs of legs. Geophilus carpophagus, female, 49 mm, 51 pairs of legs.
In mole hill, hay meadow: Necrophloeophagus longicornis, female, 49 mm, 51 pairs of legs.

5 km up road from Sizun to Landivisiau, VU16, 9.viii.86, rotten stump under oak/beech, side of track: Ommatoiulus sabulosus, Cylindroiulus punctatus, Glomeris hexasticha intermedia Latzel, Polydesmus sp. (immature). Lithobius piceus, Lithobius crassipes, 2 specimens, Geophilus carpophagus, male 41.5 mm, 47 pairs of legs.

Discussion

The present collection contains no unexpected species.

The low leg numbers exhibited by the population of Strigamia maritima from the Anse de Polmic (45 - 47) as compared to the range of 47 - 53 from other localities is worth noting. Lewis (1962) suggested that differences in leg numbers between different populations from Southern Britain probably represented genetic differences between the discontinuous populations of the species. It is not unlikely that populations in small bays may sometimes be wiped out be severe weather conditions. Recolonisation by a single female might give rise to population with a limited range of leg numbers.

Acknowledgements

One of us, J.G.E.L. is indebted to the Royal Society Research in Schools Committee for their support and to Dr D.J. Stradling for his advice and encouragement.

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J. mar. biol. Ass. U.K., 42, 655-664

Figure 1. Forcipular coxosternal teeth of Lithobius muticus from 6.5 km W of Chateaulin.

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ECOLOGY AND DISTRIBUTION IN LITHOBIOMORPH AND GEOPHILOMORPH CENTIPEDES: GLEANINGS FROM THE SEVENTH INTERNATIONAL CONGRESS OF MYRIAPODOLOGY HELD AT VITTORIO VENETO IN JULY 1987.

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During the Congress a number of participants reported on the ecology of lithobiomorphs and to a lesser extent of geophilomorphs and additional information was added in general discussion. An attempt is made here to draw together the information which might be of interest to those working on the North European fauna.

Lamyctes fulvicornis

This is an unusual species. In the laboratory it goes through its full developmental cycle in less than one year (G. Andersson). In D.D.R. was found to be a pioneer species on mine sites and disappeared as woodland matured except in a steadily eroding site (W. Dunger and K. Voigtlander). Enghoff (in discussion) reported that it increased in a number of disturbed sites in Sweden. Dunger (in conversation) expressed the view that it was a grassland species but did not think that its surface activity was limited to August and September as in England. B. Meidell reported that L. fulvicornis was the only species found in bogs in the Faroes.

P.M. Johns expressed the view in discussion that it was an Australian species introduced into Europe with exotic plants in the first half of the nineteenth century and pointed out that it reproduced sexually in Australia. He suggested that European biologists had underestimated the number of introductions from the Antipodes.

Ecological succession

Dunger & Voigtlander's conclusion that Lamyctes fulvicornis is a pioneer species in mine sites in DDR has been mentioned above. It is followed by Lithobius forficatus and L. microps and then L. melanops, crassipes and calcaratus. Lithobius mutabilis and piceus had not colonised the soils of brown coal heaps after 33 years. Geophilus electricus, Necrophloeophagus longicornis and Schendyla nemorensis are very late colonisers of mixed deciduous woodland.

T. Poser described the effect of varying the depth of litter in a 150 year old beech wood in which Lithobius mutabilis was the most common species and L. crassipes the second most common followed by L. piceus and L. curtipes. When all the litter was removed L. crassipes was the only lithobiomorph remaining due to its habit of feeding on tree trunks. Strigamia acuminata increases in deep litter but soil-dwelling geophilids are more abundant in the areas without litter.

Distribution

Lithobius curtipes is the only lithobiid found in Taiga in Russia (N. Zalesskaja) but is also found in the Anatolian Peninsula (Zapparoli).

B. Meidell and T. Solhoy reported that the record of Pachymerium ferrugineum from the Faroes referred in fact to Strigamia maritima. Meidell registered some scepticism about the record of Pachymerium from the south coast of England.

R.M. Shelley discussed allopatric/parapatric mosaic complexes of species in millipedes. Such patterns are not seen in British centipedes. W. Shear commented that the sympatry seen in continental lithobiids was probably the result of recolonisation after the ice age: centipedes may show mosaic distributions in unglaciated areas.

Acknowledgements

I attended the Seventh Congress of Myriapodology with a grant from the Royal Society Research in Schools Committee which is gratefully acknowledged. I also wish to thank Dr. D.J. Stradling for his advice and support.

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RECENT RECORDING OF MYRIAPODS IN SOUTH-WEST WALES

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Introduction

Until recently, the centipedes and millipedes of south-west Wales have been relatively poorly recorded, with the slight exception of Pembroke (VC 45) which has been popular with the holidaying naturalist. This is reflected in the number of centipede records previous to 1984 from the three vice-counties that now make up Dyfed (Table 1). There are a few recent records for the area, for example, Barber and Kime (1974), and the Biological Working Group for Wales contributed some records about the same time.

It was against this background that the present author started to make collections of myriapods in the area early in 1985. The collections were initially mainly in Carmarthen (VC 44) but later covered Pembroke (VC 45), Cardigan (VC 46) and to a lesser extent Glamorgan (VC 41) and Brecon (VC 42). More recently, some help has been provided by A.O. Chater (AOC) and A.P. Fowles (APF) in VC 46 resulting in several new county records.

Up to February 1988 over 900 specimens have been collected (mostly by selective hand-searching), comprising approximately 290 centipedes and over 610 millipedes; at least 67 of these are new county records and 8 are new to Wales. Pitfall trapping (part of a NCC-funded survey) by Chris Bray on a number of Pembrokeshire and Cardiganshire coastal heathlands produced three new county records; these myriapods have not been included in the totals given above, nor in the species totals that accompany the following species accounts, because of the different technique of sampling.

The records held at the Biological Records Centre (BRC) at Monks Wood have not been consulted; the following account refers almost exclusively to the 1985-1987 recording period. The new county records are summarised in Table 2 and are itemised in an Appendix. The number of species now known in each of the five vice counties of south-west Wales are given in Table 3.

Table 1

Centipede records previous to 1984

(source: Barber, 1986)

County	Vice county	Records previous to 1984	Records previous to 1960
Carmarthen	44	2	nil
Pembroke	45	49	2
Cardigan	46	10	3

Table 2
New County Records in south-west Wales, 1985 - 1987

Vice-county:	(41)	(42)	44	45	46
Chilopoda	0	2	14	4	6
Diplopoda	5	2	19	5	9

Table 3
Number of species of Myriapoda in south-west Wales

Vice-county	Chilopoda	Diplopoda
(41) *	23	24
(42)	16	15
44	24	31
45	19	19
46	16	22

* updated using information supplied by J.G. Blower, 1987

As well as providing records for the centipede and millipede recording schemes, much useful ecological data has been obtained and a number of nationally scarce species have been recorded, some occurrences representing notable extensions of range, e.g. the millipedes Nopoiulus kochii, Leptoiulus belgicus, Thalassisobates littoralis, and the centipedes Hydroschendyla submarina and Lithobius tricuspis.

The Species List

In the following list, details of habitat and microhabitat in which the species occurs are summarized, but it must be remembered that in some instances the sample size is often small - therefore any general statements should be regarded as provisional. Only the data from the three vice-counties of Dyfed (VC 44, 45 and 46) have been added to give the records totals. The status of each species in VC41 and VC42 is shown in parenthesis, though some interesting records from these latter vice-counties are mentioned in the main text. Vice-county occurrences are based on information published in the British Myriapod Group Newsletter (1983 etc.); those marked by an asterisk (*) being new records for the county during the survey period 1985 - 1987.

C H I L O P O D A

GEOPHILOMORPHA
Himantaridae

Haplophilus subterraneus (Shaw) 17 records, VC44, 45, 46 (also VC41, 42).
Under logs, stones etc. in leaf litter and rich soil, woodland and gardens.

Hydroschendyla submarina (Grube) VC44*, 45.
One record only during the survey period - under rocks just above H.W.M. Wharley

Point 22/340093, 5.9.1986. Barber (1987) quotes Lewis (1962) as being 'doubtful' regarding the Pembs. record for this uncommon species; the authenticated Carms. specimen must now lend support for its occurrence in neighbouring VC45.

Schendyla nemorensis (C.L. Koch) 12 records VC44, 45, 46 (also VC41).
The records are usually for dry situations - limestone scree, cliffs, rubble, dry woods and grassland.

(S. peyerimhoffi Brol. & Rib. (VC41).
Could well occur in coastal parts of VC's 44, 45 or 46 as it has been recorded on more than one occasion by J.G. Blower on the neighbouring Gower Peninsula (Barber, 1987)).

Geophilidae
Strigamia crassipes (C.L. Koch). 4 records, VC44*, 46*.
Too few records to comment on habitat requirements. Three records were under logs in woodland, the fourth at the junction of woodland and a coastal cliff.

S. acuminata (Leach). 7 records, VC44*, 45*, 46* (also VC41*, 42).
Only seven records, it may be of interest to note that all were from wet localities - damp woodland, wet scree, Carex pendula litter in alder (Alnus glutinosa) carr, etc.

S. maritima (Leach). 6 records, VC44*, 45, 46*.
All records are from under rocks at or near H.W.M. on the coast, the Carms. sites at the edge of muddy estuaries, the Cards. site on coastal shingle.

Geophilus carpophagus Leach. 9 records VC44, 45, 46 (also VC41, 42).
Mostly under logs and leaf litter in acidic woodland, also one record from an upland corrie. Large urban forms have been noted near Llanelli (21/59).

G. electricus (L.) VC46*
Only one record of what is regarded as an uncommon species - under a stone, cliff-top grassland, Clarach Bay 22/586843, 18.2.1987.

(G. osquidatum Brolemann. VC41 (in Barber, 1983)).

G. insculptus Attems. 8 records, VC44*, 45, 46 (also VC42*).
The records are as follows: leaf litter in acidic woodland (4), suburban hedgerow (2), litter in an old orchard (1).

Necrophloeophagus longicornis (Leach). 9 records, VC44, 45, 46 (also VC41, 42).
Under stones, logs etc. in a variety of situations and habitats.

Brachygeophilus truncorum Bergsoe & Meinert. 14 records, VC44, 45, 46 (also VC41, 42).
Under wood, leaf litter and stones; mostly woodland and scrub.

SCOLOPENDROMORPHA
Cryptopsidae
Cryptops hortensis Leach. 25 records, VC44, 45, 46* (also VC41, 42*).
In a wide range of sites especially synanthropic and woodland; only a few records for acidic upland areas.

Cryptops parisi Brolemann. 3 records, VC 44* (also VC41)
Noted in three man-influenced localities in south-east Carms., under rubbish in an old limestone quarry at Maesdulais, Drefach 22/517 145, 23.9.87; under rubbish on rank grassland at Ty'r fran, Llanelli 22/513 015, 2.1.1988; and under leaf litter in suburban scrub, Stradey 22/496 014, 9.1.1988. All specimens were larger than typical C.hortensis.

LITHOBIMORPHA
Lithobidae
Lithobius variegatus Leach. 39 records, VC44, 45, 46 (also VC41, 42).
Common and easily recognized hence the comparatively large numbers of records. Usually in woodland or scrub (including coastal woodland where it can occur with L. pilicornis and occasionally on waste ground with L. forficatus; one atypical record was from a sparsely-vegetated stoney beach far from woodland or scrub (two juveniles).

L. forficatus (L.) 24 records, VC44, 45, 46 (also VC41, 42).
Common in disturbed, open habitats - wasteground, farmyards, towns etc; occasionally in open woodland and other semi-natural habitats such as coastal cliffs. Also, perhaps surprisingly, three widely-separated records for acidic upland grassland (isolated from habitations) and several occurrences in pitfall traps on the extensive raised bog of Cors Fochno (Borth Bog , A.P.F. pers. comm.)

L. melanops Newport. 16 records, VC44*, 45*, 46 (also VC41*, 42).
Typically in dry habitats - dune grassland, coastal cliffs, old quarries on the Carboniferous limestone outcrop walls and also one indoor record. Occasionally in dry woodland, especially under bark.

L. borealis Meinert. 3 records, VC44, 45, 46* (also VC41, 42).
Two records from valley oak woodland and the third at the edge of a conifer plantation on moorland.

L. macilentus L. Koch. 2 records, VC44*, 45* (also VC42).
Both records are from localities on the Carboniferous limestone - one an inland ashwood, the other coastal cliffs.

L. tricuspis Meinert. VC44* (20.10.1987).
One recent record of this rare lithobid - a female under a piece of wood, in an overgrown acidic pasture (with scrub and woodland nearby) at Capel Hendre, 22/593117. Otherwise, this species is only known from parts of south Devon and one locality on the Isle of Wight (Barber, pers. comm.). It will be of interest to see whether this species is found elsewhere in winter-mild south-west Wales.

L. pilicornis Newport. 2 records, VC44*, 45 (also VC41).
Coastal woodland and scrub. Some specimens collected at Craig Ddu (22/31) were large (40mm +).

L. calcaratus C.L. Koch. 6 records, VC44*, 45*, 46* (also VC42).
Two records of this blackish lithobid from river shingle, two acidic grassland, one under stones in a disused limestone quarry and another in a pitfall trap on Cors Fochno raised bog in Cards. (APF).

L. crassipes L. Koch. 4 records. VC44, 45 (also VC42).
Two records from an upland corrie (Bannau Sir Gaer, 22/72 and 22/82), the third from leaf litter in a valley oakwood and another from the edge of an upland conifer plantation.

L. curtipes C.L. Koch. 2 records, VC44* (also VC42).
Both records refer to under stones in exposed upland grassland situations at 560 and 600m altitude.

L. microps Meinert. 28 records VC44, 45, 46 (also VC41, 42).
Usually in dry situations - duneland, wasteground, urban areas etc. but also in dry coastal woodland. One record from a pitfall trap on the raised bog at Cors Fochno. (APF).

Henicopidae
Lamyctes fulvicornis Meinert. 3 records, VC44*, 45*.
Most often seen in late summer and autumn; it is probably under-recorded, as the author has, in the past, probably overlooked the species due to confusion in the field with Lithobius microps. One record from damp acidic pasture, another from the wet floor of an abandoned limestone quarry, and the third from grassland near a pond (all under stones).

D I P L O P O D A

POLYXENIDA
Polyxenidae
Polyxenus lagurus (L.). 4 records, VC44*, 45, 46.
Recorded four times during the survey period: in a rock crevice on Foel-y-Mwnt (coastal headland) 22/193520, ACC 26.1.1987; in the nest of a wren Troglodytes troglodytes in woodland near Llechryd 22/193436 APF 15.11.1987; and at Ynys lochtyn 22/314551, ACC and APF, 27.12.1987. At this last locality several individuals were found under stones on a rocky seaside headland with a sparse vegetation characterised by maritime lichens and a little red fescue Festuca rubra and thrift Armeria maritima. All these records are in Cards., VC46.

Also, most recently (28.1.1988) new to Carms., VC44, under rocks at Telpyn Point, 22/186072 in a very similar microhabitat to Ynys lochtyn, except that there is only limited development of lichens on the friable coal measure strata that comprise this headland. Survey work on the rocky promontories of Pembrokeshire and Gower (Glam.) should reveal additional occurrences of Polyxenus lagurus.

GLOMERIDA
Glomeridae
Glomeris marginata (Villers). 43 records, VC44, 45, 46 (also VC41, 42).
In leaf litter and humus-rich soil of woodland and scrub, avoiding the more acidic areas. Light brown and yellow forms have been recorded as well as the juvenile variety 'perplexa'.

CHORDEUMATIDA
Craspedosomatidae
Craspedosoma rawlinsii Leach. 6 records VC44, 46* (also VC41*).
This species seems to require wet conditions - the Cards. record was for flushed mossy scree in an ash Fraxinus excelsior - wych elm Ulmus glabra dingle wood. Similarly one of the Carms. records was also in a base-enriched dingle woodland where Craspedosoma was found in a mixture of bryophytes, opposite-leaved golden saxifrage Chrysoplenium oppositifolium and yellow archangel Lamiastrum galeobdolon growing over a very wet flushed slope. On 8.12.1986 mature adults were commonly encountered in such conditions whilst a protracted search was required on 6.11.1987 to turn up one individual (adult o).

Whilst the above two sites both demonstrate a calcareous influence a recent Carms. record was for an acidic oak Quercus sp. and birch Betula pubescens wood next to the R. Aman (22/61); again however this locality was wet. (Likewise the Glamorgan record referred to a wet oak-alder Almus glutinosa wood).

In the region under review this species may prove to be a good contender as an indicator of old woodland.

Nanogona polydesmoides (Leach). 30 records VC44, 45, 46 (also VC41, 42).
The sites where recorded include gardens, scrub and woodland. The preference for a degree of base-enrichment (Blower, 1985) also applies to SW Wales.

Brachychaeteuma melanops Brade-Birks . 3 records VC44*.
Recorded three times in the Llanelli area of south-east Carms. - under stones in gardens at Erw las, Llwynhendy 21/537993, 30.12.1987; under Reynoutria japonica leaf litter at Ty'r fran, 22/513015, 2.1.1988; and under a stone in a garden at Stradey 22/495013, 16.1.1988.
An aid to the field identification of Brachychaeteuma is the pure white colouration and the chordeumatid comma-like posture which the animals adopt when disturbed. Immature polydesmid stadia - with which they occur under stones etc. - are creamier in colour and have an elongate pose when disturbed.

Chordeumatidae
Chordeuma proximum Ribaut. 76 records, VC44*, 45*, 46* (also VC41, 42).
A common autumn to spring millipede in leaf litter and under wood etc. Most common in scrub and woodland but also in hedgerows, wasteground and gardens where leafy humus accumulates.

Melogona gallica (Latzel). 12 records, VC44, 45, 46* (also VC41*, 42*).
Found mostly in winter in leaf litter and humus-rich soil, usually in more base-rich sites than C.proximum e.g. slightly-flushed areas under Fraxinus or Corylus in valley oakwoods; occasionally under stones etc. on the Carboniferous limestone outcrop.

M. scutellare (Ribaut). 3 records only, VC44*, 46* (also VC41).
The localities comprise: an ashwood slope in Cards; sandy stream deposits (with evidence of calcareous enrichment) at the base of a deep wooded dingle, and in rich alluvium in a coastal garden (last two sites, Carms,). Both species of Melogona are probably under-recorded as the author has, in the past, confused them in the field with immature Chordeuma.

JULIDA
Nemasomatidae
Thalassisobates littoralis (Silvestri). VC44*
Several found under old clothing on the tideline at Penrhyngwyn, Machynys 21/517974 on 12 Sept. 1986. The site is a gritty beach (old industrial slag etc.) with coarser rocks, muddy areas and saltmarsh nearby.

Nemasoma varicorne C.L. Koch . 5 records, VC44, 46 (also VC41, 42).
Typically under bark in woodland, but very much scarcer in the region than the following species.

Blaniulidae
Proteroiulus fuscus (Am Stein). 27 records, VC44, 45, 46 (also VC41, 42).
Found under bark, also under stones or logs etc. (where a thin layer of humus has accumulated) and sometimes in soil.

Choneiulus palmatus (Nemec). VC44* (also VC41).
One site - Bynea 21/555990 (3.5.1987). This locality is extensive area of waste ground adjacent to saltings; there is sparse growth of grass, spring ephemerals and other dry ground plants on the ironworks slag-based soil, with larger stones providing shelter for invertebrates including the isopod Armadillidium nasatum with which Choneiulus was first found at this site under a stone near H.W.M.

Nopoiulus kochii (Gervais). 5 records, VC44*.
Found under a stone at the above C. palmatus site on 7.10.1987 (a ♀) and also an abandoned railway-line at Llanelli 22/501001 (a ♂), under an old railway sleeper embedded in a gritty slag-derived soil, 14.10.1987; the creamy-white colouration was noticeable in the field.

J.G. Blower writes of this latter ♂, "The gonopods are quite distinctive and I can see the details without dissection." These specimens represent the fourth and fifth authenticated British records.
Further records are: under stones at Machynys 21/512981, 2.1.1988; under leaf litter on rank urban grassland, Ty'r fran, Llanelli 22/513015 (again 2.1.1988); and under stones on derelict industrial land at Sandy 22/497005, 9.1.1988.
Thus this species has been noted in five separate 1km squares (three 10km squares) in industrial south-east Carms.

Blaniulus guttulatus (Fabricius). 21 records, VC44*, 45, 46 (also VC41, 42).
Under stones, logs etc. on richer, less acidic soils, both in woodland and more open habitats.

Archiboreiulus pallidus (Brade-Birks). (VC41*).
One record only - under logs in an ashwood on Carboniferous limestone, Cheriton, Gower, 21/452932, 27.5.1985).

Julidae
Cmmatoiulus sabulosus (L.). 54 records, VC44, 45, 46 (also VC41, 42).
Most commonly encountered (and often in very large numbers) on the extensive dune systems of the region, where, in spring-summer, large numbers can be found wandering on the open sands and dunes, many perishing in the hot sun if shelter is not reached.
The species also occurs in dry, rocky, woodland, old walls and dry coastal sites generally.

Tachypodoiulus niger (Leach). 49 records VC44, 45, 46 (also VC41, 42).
Although common, T.niger avoids acidic areas being found in gardens, ashwoods (or other base-rich woodland) and duneland. The species' well known wandering ability has been noted in the region, it often being found high up in trees.

Cylindroiulus londinensis (Leach). 2 records VC44*, 46*.
A rare and apparently ecologically - restricted beast in the region with only two records. The first record was at Cwm Llyfnant, Cards. on 5.1.1987 (A.O.C.); here it was recorded at two sub-sites (i) in litter in a slope alder wood, 22/711974 and moss-covered scree under ash and wych elm 22/719975. C. londinensis was recently (2.11.1987), found in thick bryophyte mats growing on flushed, sandy alluvium at the bottom of a deep wooded dingle (Allt Penrhiwlas, 22/333268). The specimen collected at this locality was a large female 41.5 x 4.45mm (kindly measured by J.G. Blower).

C. caeruleocinctus (Wood). VC44*, 45.
Closely related and similar morphologically to the previous species and again apparently rare - with only one recent occurrence - in the region; Penybont 22/305273 under hazel Corylus avellana in a valley-side copse. Blower (1985) states, 'usually found in calcareous soils under cultivation'.

C. vulnerarius (Berlese). one record VC46* (also VC41).
A male collected in deciduous woodland by APF at Llechryd, Coedmore 22/193463 on 15.11.1987. It was dull mid-brown in colour - "rather more sclerotised than others I have seen" (J.G. Blower, pers. comm.).

C. punctatus (Leach). 50 records, VC44*, 45, 46* (also VC41).
Common under bark and woody humus generally, in woodlands etc.

C. latestriatus (Curtis). 28 records, VC44*, 45, 46* (also VC41).
The 'dry-ground Cylindroiulus', common on duneland, wasteground, stoney headlands and sometimes coastal woodland. Inland on disused limestone quarries and stabilised river shingle.

C. britannicus (Verhoeff). 9 records, VC44, 46* (also VC41).
Under logs and bark in woodland and hedgerows: perhaps under-recorded being initially confused by the author with Cylindroiulus latestriatus.

Julus scandinavius Latzel. 24 records VC44, 45, 46 (also VC41, 42).
and
Cohyiulus pilosus (Newport). 69 records VC44, 45, 46 (also VC41, 42).
The relative habitat preferences of these two species are not yet certain in the region, both favour woodland conditions though J. scandinavius can often be found away from woodland - in gardens or waste-ground for example. During the period of survey, Julus was normally found in less acidic circumstances than Cohyiulus - a reversal of the situation suggested by Blower (1985).

Leptoiulus belgicus (Latzel). 6 records, VC44* (also VC41*).
So far, only found in man-associated habitats in south-west Wales:-

(i) Llwynhendy, 21/59 (a) gardens at Erw Las, 21/537993, 14.9.1986 etc. frequen
(b) garden at Parc Gitto, 21/537996, autumn 1986 occasiona

(ii) Waste ground at Bynea 21/555988, Oct 1987 etc. abundant

(iii) Old limestone quarry, Pistyll, Llandybie, 22/623127, 16.9.1987 one only

(iv) Also recently recorded in Glam. at Loughor 21/568985, occurring commonly in leaf litter of Japanese knotweed Reynoutria japonica on waste ground and scrub near houses, 22.11.1987.)

(v) Again very common in leaf litter of Reynoutria at North Terrace, Dafen 22/528014, 3.1.1988.

All the above localities except (iv) - Glamorgan, are in Carms.

The animals tend to become more noticeable as they attain maturity in the very early autumn, and they persist to at least late winter, being found under stones or other garden/wasteground debris.
At site (i) (a) above, Leptoiulus can be found in cavities of fallen apples, the holes having been initiated by the pest slugs Milax budapestensis and Deroceras reticulatum, though it is not known whether Leptoiulus is actively feeding in these apple holes or merely sheltering.

Brachyiulus pusillus (Leach). 12 records, VC44*, 45*, 46 (also VC41*).
Uncommon in dry situations such as coastal cliffs, wasteground, gardens and the limestone outcrop.

POLYDESMIDA

Polydesmidae

Polydesmus angustus Latzel. 38 records, VC44, 45*, 46 (also VC41, 42).
Typically encountered in woodland, often acidic such as the many oak-birch-rowan Sorbus aucuparia woods of the region. Far less often recorded away from woodland or scrub than P. gallicus.

(P. inconstans Latzel.(VC42*).
One record only - garden and greenhouse at Ty Mawr Mill 22/991570, 15.3.1986, where it is probably an accidental introduction amongst the extensive plant stock brought in by the owner, a keen gardener.
Davis & Jones (1978) state that it is a characteristic myriapod in the Derbyshire Carboniferous limestone quarries,but all searches on the limestone outcrop of south-west Wales have proved negative. Likewise,although Fairhurst (1979) found P.inconstans regularly in damp areas dominated by sea buckthorn (Hippophae rhamnoides) at Gibraltar Point Nature Reserve on the east coast of England, searches in the extensive growths of sea buckthorn on the south Carms.dunelands have failed to reveal this millipede.)

P.gallicus Latzel. 24 records,VC44*,45*,46* (also VC41).
Recorded in more open habitats than P.angustus - limestone cliffs,quarries, duneland,waste ground and gardens provide the typical habitat.It does,however, occur at times in woodland.
It is interesting to compare this species' apparent preference in south-west Wales for open habitats in contrast to the more restricted woodland habitats (Kime,1978) and wet areas (Blower,1985) in south east England; presumably this is a reflection of the preference shown by P.gallicus to the milder,wetter, 'Atlantic' conditions of Wales.

P.denticulatus C.L.Koch. 5 records,VC44*,45,46 (also VC41).
Of the only five records - indicating the comparative scarcity of this diplopod - two sites are old deciduous woodland,a third was under rocks in a mountainside corrie (with,however,relict elements of woodland herbaceous vegetation). The fourth site was a rather recent (50 yrs) pine plantation on duneland,whilst the fifth was on river shingle (APF).
C.Bray in his pitfall study on Pembs. and Cards. coastal heathy pastures, had P.denticulatus quite regularly in his pitfall traps - 33 P.denticulatus for 12 P.angustus and only one P.gallicus.

Brachydesmus superus Latzel. 14 records,VC44*,45*,46 (also VC41).
In woodland and scrub generally,particularly on the less base-defficient soils.

Macrosternodesmidae

Macrosternodesmus palicola Brolemannn. VC44*
One record only - in the soil on a base-flushed slope with dogs mercury (Mercurialis perennis) and wild garlic (Allium ursinum)in an ashwood at Cwm Cych,22/290354,5.1.1987.

Ophiodesmus albonanus (Latzel). VC44* (also VC41).
Recorded only once in the present survey - in calcareous humus under stones in the Carmel Carboniferous limestone ashwoods,22/601165,29.4.1987.

Paradoxosomatidae

(Oxidus gracilis (C.L.Koch). (VC41*)
This species can be found quite commonly in the heated greenhouses at Singleton Park,Swansea,21/628926,its only known Welsh site.)

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APPENDIX 1

NEW COUNTY RECORDS OF MYRIAPODA IN SOUTH-WEST WALES, 1985-87 (VC41,42,44,45 & 46)

(all records I.K. Morgan unless otherwise stated)

*W = new to Wales

CHILOPODA			
Haplophilus subterraneus	VC46 Cards	22/588794	under rubble, grassland, Crugiau, A.P. Fowles, Feb 1987.
Hydroschendyla submarina	VC44 Carms	22/340093	under rocks, maritime cliffs, Wharley Point, 5.9.1986.
Strigamia crassipes	VC44 Carms	22/303105	under logs, seaside woodland, Laugharne, 13.4.1985.
	VC46 Cards	22/193463	Llechryd, Coedmore, APF, 15.11.87
S. acuminata	VC44 Carms	21/49-01-	under logs, mixed woodland, Stradey Woods, 5.3.1987.
	VC46 Cards	22/745780	wet scree, ash-oakwood, Coed Rheidol, A.O. Chater, 8.12.1986.
S. maritima	VC44 Carms	22/30-09-	under rocks near HWM, Ferryside 5.3.1985.
	VC46 Cards	22/577797	under rocks, shingle beach, Tan-y-bwlch, APF 5.4.1987.
Geophilus electricus	VC46 Cards	22/586843	under stone, cliff-top grassland Clarach Bay, 18.2.1987
G. insculptus	VC44 Carms	22/629333	under stone, oak copse, Talley, 9.4.1986.
	VC42 Brecs	22/847161	under stones, Craig-y-Nos, 18.1.88
Cryptops hortensis	VC42 Brecs	22/757128	under leaf litter, oakwood NW of Waun-lwyd, 11.5.1985.
	VC46 Cards	22/585767	under garden debris, NE of Chancery APF, Feb 1987.
C. parisi	VC44 Carms	22/517145	under rubbish, Maesdulais quarry, Drefach, 23.9.1987.
Lithobius melanops	VC44 Carms	22/36-01-	under stone, small dune area, Ferryside, 5.3.1985.
	VC45 Pembs	22/128396	under logs, dry oakwood, Pengelli. 9.8.1986.
	VC46 Cards	22/625754	under river shingle, Afon Ystwyth, Llanilar, APF, 15.2.1987.
L. borealis	VC46 Cards	22/711976	mossy scree, valley ash-wych elm wood, Cwm Llyfnant, AOC, 31.12.86
L. macilentus	VC44 Carms	22/669191	under rocks etc. limestone ashwood Carreg Cennen, 9.4.1985.
	VC45 Pembs	11/985944	under stones, limestone sea-cliff Stackpole, 13.9.1986.
L. tricuspis *W	VC44 Carms	22/593117	under wood, rough pasture, Capel Hendre, 20.10.1987.
L. pilicornis	VC44 Carms	22/325102	under wood, scrub woodland on sea-cliff, Craig Ddu, 4.4.1985.

L. calcaratus	VC44	Carms	22/590163	under stone, old limestone quarry, Carmel, 11.4.1986.
	VC45	Pembs	12/764263	Waun fawr, C. Bray, July-Aug 1986.
	VC46	Cards	22/695716	river shingle, Afon Ystwyth, Llanilar, APF, 22.2.1987.
L. curtipes	VC44	Carms	22/737189	under stone, upland limestone quarry, Foel Fawr, 30.4.1986.
Lamyctes fulvicornis	VC44	Carms	22/517145	under stone, wet floor of limestone quarry, Maesdulais, 23,9,1987.
	VC45	Pembs	22/366528	Rhos Pil-bach, CB, July-Aug 1986.
DIPLOPODA				
Polyxenus lagurus	VC44	Carms	22/186072	under rocks, Telpyn Point, 28.1.1988.
Craspedosoma rawlinsii	VC41	Glam	21/583956	under leaf litter, wet alder-oak wood, NW of Cefn Gorwydd fawr, Gowerton, 22.5.1985.
Brachychaeteuma melanops	VC44	Carms	21/537993	under stones, gardens, Llwynhendy, 30.12.1987.
Chordeuma proximum	VC44	Carms	22/644215	under leaf litter mixed deciduous wood, Coed Tregyb, 7.10.1985.
	VC45	Pembs	22/171073	under leaf litter oakwood W of Amroth 17.3.1986.
	VC46	Cards	22/669940	under leaf litter, roadside copse, SW of Penrhyngerwyn, 29.10.1985.
Melogona scutellare	VC44	Carms	21/537993	in soil, garden, Llwynhendy, 5.1.1987.
	VC46	Cards	22/450421	under leaf litter, ashwood, SW of Capel Dewi, 23.3.1986.
M. gallica	VC41	Glam	22/741057	Ynysmendwy, 18.12.1987.
	VC42	Brecs	22/847161	under stones, Craig-y-Nos, 18.1.1988.
	VC46	Cards	22/585767	under leaf litter, garden next to dingle woodland, NE of Chancery, 19.12.1986.
Thalassisobates littoralis	VC44	Carms	21/517974	under rags etc. foreshore, Penrhyngwyn, Machynys, 12.9.1986.
Choneiulus palmatus	VC44	Carms	21/555990	under stones, industrial waste ground, Glynea, Bynea, 3.5.1987.
Nopoiulus kochii *W	VC44	Carms	21/555988	site as above, 7.10.1987.
Blaniulus guttulatus	VC44	Carms	22/641169	under leaf litter etc. mixed deciduous wood, Coed Llandyfan, 17.12.1985.
Archiboreoiulus pallidus *W	VC41	Glam	21/452932	under logs, ashwood, Cheriton, Gower, 27.5.1985.
Cylindroiulus londinensis	VC44	Carms	22/333268	in moss etc. base of deep wooded valley, Allt Penrhiwlas, 5.11.1987.
*W	VC46	Cards	22/719975 to 711974	steep valley woodland, Cwm Llyfnant, AOC, 5.1.1987.
C. caeruleocinctus	VC44	Carms	22/305273	under wood etc. hazel copse, Penybont, 23.9.1985.
C. vulnerarius	VC46	Cards	22/193463	Woodland, Llechryd, Coedmore, APF, 15.11.1987.

C. latestriatus		VC44	Carms	22/365065	under logs, dunes, Tywyn Point, 9.2.1985.
		VC46	Cards	22/577797	under stones, beach, Tan-y-bwlch, APF, 5.4.1987.
C. britannicus		VC46	Cards	22/451443	under leaf litter, oak-ashwood, E. of Allt-yr-Odyn, 21.3.1986.
Leptoiulus belgicus		VC41	Glam	21/568985	under leaf litter, waste-ground/ scrub, Loughor, 22.11.1987.
	*W	VC44	Carms	21/537993	under stones, etc. garden, Llwynhendy, 14.9.1986.
Brachyiulus pusillus		VC41	Glam	21/512855	under Festuca, cliff grassland, Oxwich Point, Gower, 12.2.1987.
		VC44	Carms	22/444075	under stones in rocky woodland, Cwm Clydach, 12.2.1985.
		VC45	Pembs	22/063221	under garden stones, NW of Rhyd-y-Brown, 16.3.1987.
Polydesmus angustus		VC46	Cards	22/477517	under leaf litter, roadside copse, Llaethliw, 18.12.1985.
P. inconstans	*W	VC42	Brecs	22/991570	under stones etc. garden Ty Mawr Mill, 15.3.1986.
P. gallicus		VC45	Pembs	22/063221	in leaf litter, garden, NW of Rhyd-y-Brown, 16.3.1987.
		VC46	Cards	22/631836	under stones, nursery bed, Plas Gogerddan, 12.3.1986.
P. denticulatus		VC44	Carms	22/404015	under log, pine forest on dunes, Pembrey Forest, 28.4.1985.
Brachydesmus superus		VC44	Carms	22/535131	under stones, scrub on old limestone quarry, NE of Garn Fawr, 22.2.1985
		VC45	Pembs	12/763261	Waun-fawr, C. Bray, July-Aug 1986.
Macrosternodesmus palicola		VC44	Carms	22/290354	under leaf litter/soil, ashwood, Cwm Cych, 5.1.1987.
Ophiodesmus albonanus		VC44	Carms	22/601165	under stone, ashwood, NE of Carreg-wenlais, 29.4.1987.
Cylindroiulus gracilis	*W	VC41	Glam	21/628926	in heated greenhouse, Singleton Park, Swansea, 19.8.1985.

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THE LIFE HISTORY OF CHORDEUMA PROXIMUM RIBAUT FROM A WOOD IN AVON

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Introduction

There are four species within the order Chordeumatidea (family Chordeumatidae) in Britain. The life histories of the two species of Melogona have been described, but there is only limited data for the two species of Chordeuma. Blower (1979) found that Melogona scutellare follows an annual cycle in South Wales and Derbyshire, and David (1984) describes an annual cycle in a French population of Melogona gallica in the Forest of Orleans. Blower (1985) notes that Chordeuma proximum and C. sylvestre appear to be annuals in the south of Britain, but rather limited data for C. proximum in the Forest of Dean was suggestive of a two year cycle. Whilst undertaking a long term pitfall trapping study in various sites in Avon, one woodland was discovered to contain a population of C. proximum. As trapping continued for a year this was a good opportunity to look in more detail at this species.

Haw Wood (ST 558 800) where the collections were made is a mixed deciduous wood containing oak, hazel, field maple and large quantities of brambles. The leaf litter is exceptionally deep, averaging 131 mm in depth. The wood is 3 km down wind of a large zinc-smelting works at Avonmouth and consequently the leaf litter and the mineral soil have greatly elevated levels of zinc, cadmium, lead and copper.

Methods

15 pitfall traps (plastic vending machine cups) were laid in a 5 x 3 grid formation. Each contained 5 ml of a 4% formalin solution to which was added a few drops of detergent to reduce surface tension. They were emptied at fortnightly intervals (weather permitting). Captures from each trap have been combined into trapping occasions for this study. Collecting by pitfall trapping has the disadvantage that animals must be mobile to have a chance of being caught. Captures are therefore the result of abundance and activity. Consequently the younger stadia which, being less active, are less likely to be caught and will be under-represented in the data. However, from those individuals that were captured, stadia V to IX can be characterised and some comments on life history can be made.

Ocular field in Chordeuma proximum

Blower (1984) suggested that the ocular field in Chordeuma spp. is built up by adding a new row of ocelli at each moult as in the Julida. Commencing with two 'rows' containing only one ocellus, a subsequent row of two is added at the moult to stadium IV, a row of three to stadium V, and so on. Ideally an equilateral triangle is built up with one extra ocellus occupying the postero-ventral apex (Figure 1). At some moults the full complement of ocelli will not be added to a row. Blower (1984) suggests that C. proximum is more likely to have incomplete rows than C. sylvestre and illustrates the ocular field of Melogona scutellare in which there is a considerable reduction, no row containing more than three ocelli. Figure 2 illustrates the ocular field from stadium V in C. proximum from Haw Wood. The majority of specimens showed the maximum complement of ocelli up to stadium VIII but a reduction of one in the final row of stadium IX. This final row often consisted of smaller ocelli and the ventralmost ocellus was difficult to see and was squashed in between the ventral margin, the organ of Tomosvary, and the other ocelli. Thus in specimens from Haw wood there does not appear to be a great reduction in the numbers of ocelli.

Table 1

Numbers of Chordeuma proximum caught at Haw Wood

DATE	STADIUM				
	V	VI	VI	VIII	IX
19.12.84	.	.	.	1	.
02.01.85	.	.	.	3	17
23.01.85	.	.	.	1	13
31.01.85	.	.	.	1	19
28.02.85	.	.	.	3	31
14.03.85	.	.	.	1	18
28.03.85	.	.	.	.	4
11.04.85	.	.	.	.	1
25.04.85	.	.	.	.	3
09.05.85	.	.	.	.	17
23.05.85	.	.	.	.	8
06.06.85	.	.	.	.	8
20.06.85	.	.	.	.	.
04.07.85	2	.	.	.	.
18.07.85	.	6	.	.	.
01.08.85	.	.	6	.	.
15.08.85	.	.	11	.	.
29.08.85	.	.	7	1	.
12.09.85	.	.	2	35	.
26.09.85	.	.	1	8	.
10.10.85	.	.	.	1	11
24.10.85	.	.	.	3	40
07.11.85	.	.	.	4	42
21.11.85	.	.	.	7	13
05.12.85	.	.	.	5	3
19.12.85	.	.	.	2	16

Dates given are those when the traps were collected, they were in position for the entire period between collecting times, usually a period of two weeks (including the collection on 19.12.84).

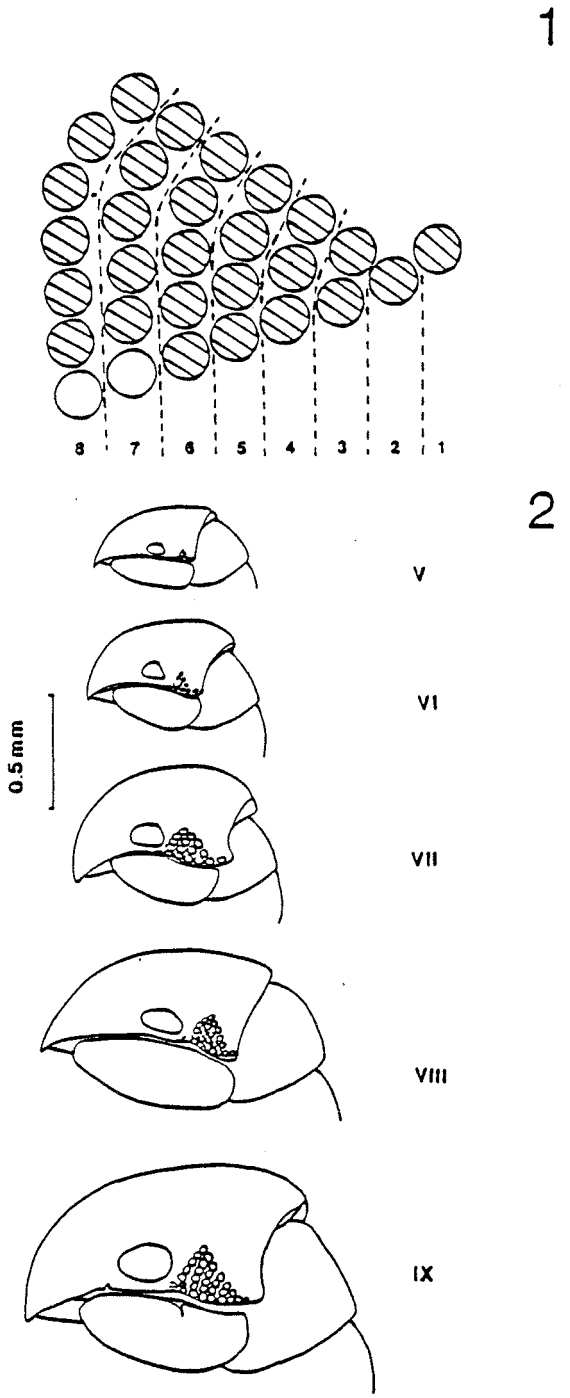

Figure 1.

Diagramatic representation of the ocular field. Ocelli cross-hatched are those always found in animals from Haw wood, those left open are present in some animals, but not in all. Numbers indicate the order in which the rows are added.

Figure 2.

The ocular fields in Chorieuma proximum from stadium V to IX.

Life Cycle

The animals captured were assigned the correct stadium by using the ocular field and the numbers in each stadium are recorded in Table 1 for each trapping occasion. From 4.7.85 the growth of the 1985 cohort of animals can be followed up to maturity in October. In this period, from July to October, there are no adult specimens caught. At all other times of the year there are adults, including some mature males. This is indicative of a single year life cycle.

In order to determine oviposition time, females from various collections were dissected for eggs. A maximum of 54 eggs were found between segments 10 and 28 (30 being the telson) in a female caught on 23.5.85. Whilst large eggs were present in females during the spring, none were found in females caught in October. Very small eggs were noted from animals in November. This confirms the suggestion from Table 1 that oviposition occurs in the spring.

It would appear that the population of C. proximum in Haw wood is annual and there is no indication of a two year life cycle as in the Forest of Dean animals (Blower 1986). In the year of this study (1985) the population was well synchronised, in contrast to C. sylvestre in Cornwall. This species in April yielded adults and newly hatched stadia II and III, and also stadia IV, V, VI and VII, an observation which was presumed to be due to an extended period of egg laying (Blower, 1986). At Haw wood the period of egg laying seems to be more precise.

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Bulletin of the British Myriapod Group 5 (1988)

SYMPHYLA - THE LEAST STUDIED OF THE MOST INTERESTING SOIL ANIMALS

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Introduction - Why Study Symphyla?

There are three principal reasons why Symphyla are of interest to zoologists. First, they can be serious agricultural pests of root crops such as sugar beet (see ADAS leaflet no. 484). Second, no-one has made a serious attempt at studying the distribution and taxonomy of the British representatives of the group since Edwards' (1959) Synopsis, despite the fact that they are one of the most common animals in the soil (Eisenbeis & Wickard, 1987). Third, they have a most bizarre sex life. This involves the female storing the male spermatophores in cheek pouches until she lays her eggs, fertilising them by 'licking' sperm onto the outer surface (Juberthie-Jupeau 1959).

What is known about British Symphyla?

For students of British Symphyla, the only comprehensive key available was published almost 30 years ago by Edwards (1959). His synopsis provided comprehensive illustrated descriptions of 14 species and was remarkable for its attention to detail. Of these 14 species (Table 1), two had been found only in hothouses (Hanseniella caldaria, Hanseniella unguiculata), one had been described by Bagnall from a single damaged specimen collected from Axwell Park, Durham in 1911 (Neoscutigerella hanseni) and two species (Scutigerella lineatus, Symphylella hintoni) were described by Edwards as being new to science.

It is inevitable that the status of some of these species described in pre-scanning electron microscope days should now be open to question, especially as synonymy and taxonomic 'splitting' are rife in the Symphyla. For example, Remy described Scutigerella nodicerca as being new to Britain in the late fifties but recent studies by Scheller (1986) have shown that this 'species' is in fact identical with Scutigerella palmoni which was described in Edwards' synopsis.

In the summer of 1987, the British Ecological Society sponsored a short pilot study (as part of their Small Ecological Projects Grant scheme) to assess the status of Edwards' (1959) key and to examine Symphyla specimens in S.P.H.'s collection, and those sent by members of the British Myriapod Group (BMG) following an appeal in the BMG Newsletter. Andy Roberts (a Reading zoology

Table 1. Checklist of species and status in Britain of Symphyla according to Edwards (1959).

Class Myriapoda	
Order Symphyla (Ryder 1880)	
Family Scutigerellidae (Bagnall 1913)	
Genus *Scutigerella* (Ryder 1882)	
Scutigerella causeyae (Michelbacher 1942)	COMMON
Scutigerella immaculata (Newport 1845)	COMMON
Scutigerella lineatus (Edwards 1959)	COMMON
Scutigerella linsleyi (Michelbacher 1942)	RARE
Scutigerella palmoni (Michelbacher 1942)	COMMON
Genus *Hanseniella* (Bagnall 1913)	
Hanseniella caldaria (Hansen 1904)	HOTHOUSES
Hanseniella unguiculata (Hansen 1904)	HOTHOUSES
Genus *Neoscutigerella* (Bagnall 1911)	
Neoscutigerella hanseni (Bagnall 1911)	RARE
Family Scolopendrellidae (Bagnall 1913)	
Genus *Symphylellopsis* (Ribaut 1931)	
Symphylellopsis arvernorum (Ribaut 1931)	QUITE COMMON
Symphylellopsis subnuda (Hansen 1903)	QUITE COMMON
Genus *Scolopendrella* (Gervais 1840)	
Scolopendrella notocantha (Gervais 1840)	RARE
Genus *Symphylella* (Silvestri 1902)	
Symphylella hintoni (Edwards 1959)	COMMON
Symphylella isabellae (Grassi 1886)	COMMON
Symphylella vulgaris (Hansen 1884)	COMMON

graduate) was employed for six weeks on the grant and was able to mount and examine the specimens by light and scanning microscopy.

Provisional Results and Conclusions

Of the nine species described by Edwards (1959) as being 'common' or 'quite common', we found five, namely Scutigerella lineatus, Scutigerella causeyae, Symphylellopsis subnuda, Symphylella vulgaris and Symphylella isabellae. Scanning electron micrographs of Scutigerella causeyae are presented in Figs. 1 to 5.

Insufficient specimens have been examined so far for other than tentative conclusions to be drawn. However, the following facts have emerged during the study.

1. Scutigerella causeyae is the largest, most common and widespread species and would be the symphylid most people would encounter during casual searches of non-agricultural sites.
2. The only features on which Edwards (1959) separated Scutigerella causeyae from Scutigerella lineatus were:
   (a) males of S. lineatus have a small peg on the inner surface of the trochanter of the first pair of legs whereas males of S. causeyae do not possess this feature.
   (b) S. lineatus reach a maximum length of 4.8 mm whereas the minimum length of S. causeyae is 5.1 mm.

Our studies on Scutigerella causeyae and Scutigerella lineatus have raised several questions. First, it is implicit that under Edwards' scheme, females of the two species cannot be separated except on the basis of their length. We consider length to be an unacceptable diagnostic character as we found several individuals which fitted the descriptions of both 'species' which were between 4.3 and 5.5 mm in length. Second, we could find no unambiguous references as to how one goes about sexing a symphylid (if you know, please write and tell us). The possibility therefore exists that Scutigerella 'lineatus' are males, and Scutigerella 'causeyae' are females of the same species. Further work on specimens from a wider range of sites is needed before this suggestion can be confirmed or disproved.

Extreme caution should be observed before new species are erected based on subtle differences in morphology. Setae may break off and the relative dimensions of structures can alter during preparation and mounting. It is likely that many 'species' of symphylid are not valid and that further studies will reveal synonyms. However, on a brighter note, it is highly likely that several species remain to be discovered in the U.K., one or more of which may be as yet undescribed.

Micrographs at higher magnification are shown of the head (Figs 2,3) and posterior region (Figs 4,5)

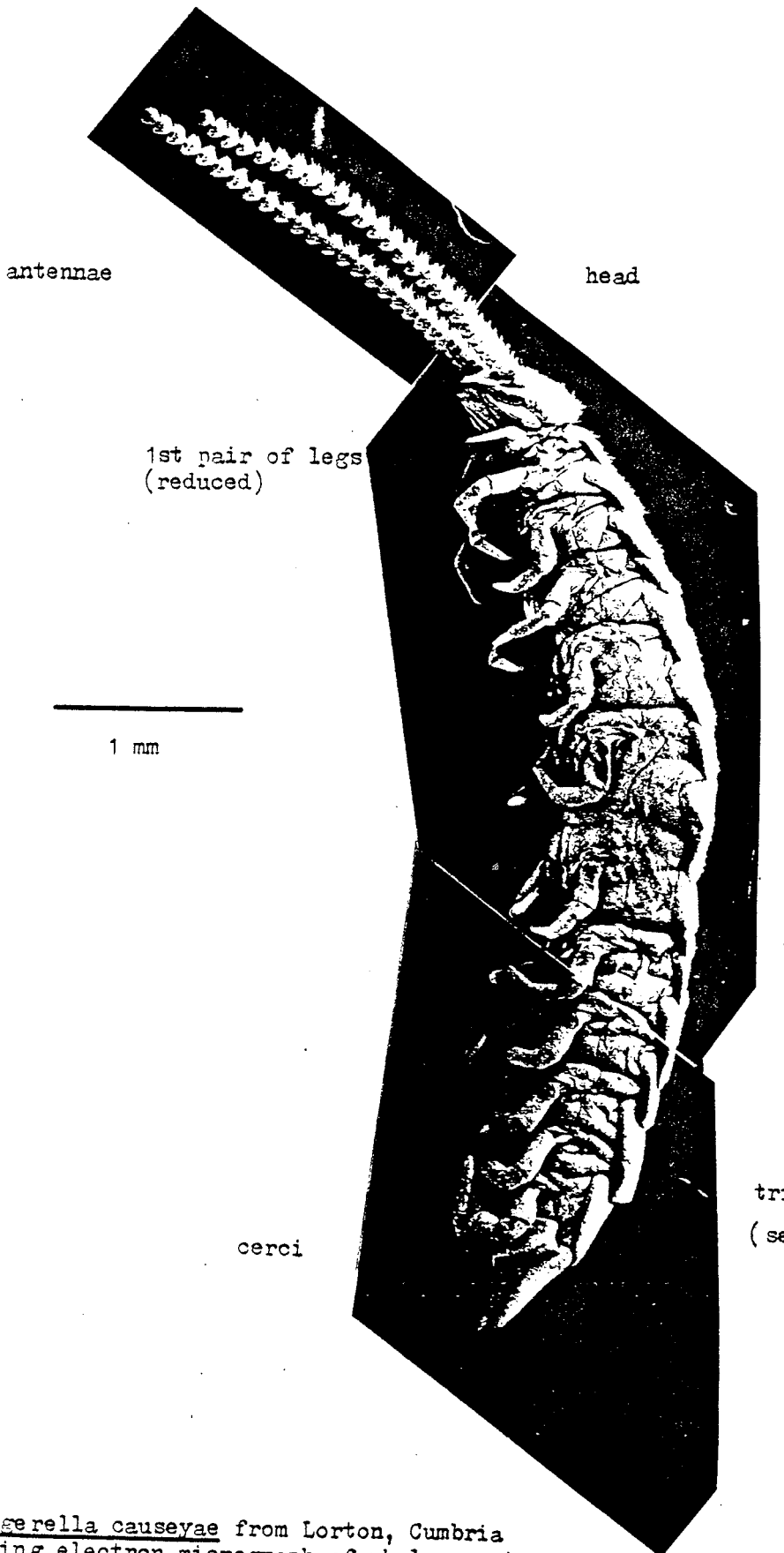

Fig 1. Scutigerella causeyae from Lorton, Cumbria
scanning electron micrograph of whole specimen

The Next Step

There are more than 60 schemes for recording the distribution of animals and plants in Britain and Ireland co-ordinated by the Biological Records Centre (BRC) at the Institute of Terrestrial Ecology's Monks Wood Experimental Station. Most contributors to these schemes are amateurs who possess a specialised knowledge of one or more animal or plant groups. The presence of particular species is recorded in Ordnance Survey 10 km grid squares and are presented as, the by now familiar, 'dot-distribution' maps which have appeared in many publications in recent years. Such information is indispensible for formulating conservation strategies for threatened species. Two of these schemes, for millipedes and centipedes, are run under the auspices of the British Myriapod Group (BMG), a loose assemblage of amateur and professional zoologists with a special interest in many-legged anthropods. A provisional atlas of centipede distribution containing maps produced by BRC is now in press, and several thousand records for millipedes have been collected and will eventually be mapped by BRC in a similar manner. A valuable feature of these schemes is the inclusion of habitat data on recording cards which has enabled the site and habitat preferences of many species to be accurately defined.

The next logical step for the BMG to take is to map the distribution and ecology of one of the other two orders within the Myriapoda, namely the Symphyla (the Pauropoda will have to wait a while!)on the same 10 km square basis (Edwards recorded their distribution by counties based on his records which were the only ones available at the time). However, the identification of Symphyla is difficult (impossible without mounting specimens and examining them with a compound microscope) and the questionable status of some species make it essential that a complete revision of the group be conducted before a recording scheme is instituted.

It is obvious that a study of a few months can only dent the problem of our lack of knowledge of the distribution and ecology of British Symphyla. The BES grant has 'pump-primed' a comprehensive revision of the order in the U.K. which will take several years. It is a tribute to the work of Edwards (1959) that it should take this long before we can consider replacing his scholarly work. Watch this space (in 1998)!

If you are interested in contributing to a survey of British Symphyla, please write in the first instance to Dr. Steve Hopkin at the address given at the head of this article.

Figs 2-5
Details of regions indicated on fig 1

100 µm

Fig 2
Head (postantennal organ arrowed)

10 µm

Fig 3 Postantennal organ
(probably a humidity receptor)

cerci

12th pair of legs

100 µm

Fig 4 Posterior end
(trichobothrial pit arrowed)

10 µm

Fig 5
Trichobothrial pit from which the sensory hair emerges (arrow)

The pit is covered with branching setae, an important taxonomic character

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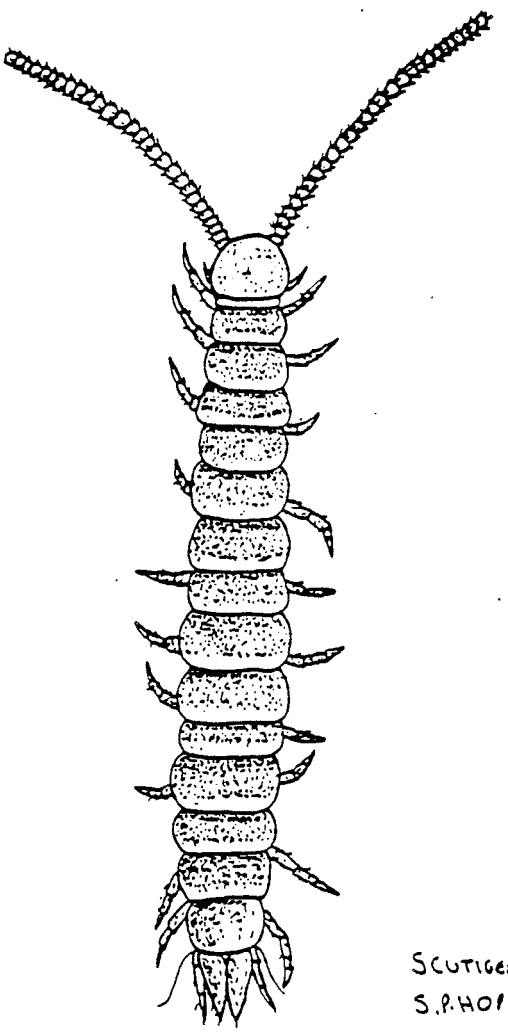

SCUTIGERELLA CAUSEYAE
S.P.HOPKIN 3/3/88
LOATON, CUMBRIA (JULY 1987)

The following note is a summary of a paper presented at the joint meeting of the British Isopod Study Group and the British Myriapod Group at Langford 23rd - 26th April 1987, beautifully illustrated by very helpful diagrams and supported by a poster display of the research site at Foljuif.

CONSUMED AND EGESTED FRACTIONS OF LEAF LITTER CONSUMED IN LABORATORY CONDITIONS BY AN ISOPOD AND THREE SPECIES OF DIPLOPOD FROM A TEMPERATE FOREST ECOSYSTEM

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Jean-Jaques Geoffroy — Ecole Normale Supérieure, Laboratoire de Zoologie, 46 rue d'Ulm, 75230 PARIS 05

Results of a laboratory investigation on the consumption and egestion of leaf litter by diplopods and isopods in a temperate ecosystem are presented. Foljuif is situated about 80km south of Paris. The breakdown of litter by the diplopods Glomeris marginata, Cylindroiulus punctatus and Cylindroiulus nitidus and by the isopod Philoscia muscorum is characterised at the individual level. Ingestion rate (I) and production of faecal pellets (FA) are determined under different temperature regimes and with different qualities of litter (oak, Quercus sessiliflora and hornbeam, Carpinus betulus) from the L and F horizons

The ingested, egested and assimilated fractions vary considerably according to the species of diplopod or isopod and also the species and condition of the litter consumed. At 10°C, the mean annual temperature in Foljuif forest, assimilation efficiencies have been estimated from 16.3 - 78.5 per cent according to the species; the highest assimilation efficiency for hornbeam leaves was observed in C. punctatus (78.5%), and for oak leaves, in Philoscia muscorum (41.5%).

Considering FA/I (rate of transforming litter into faecal pellets), we can say, after Crossley (1977), that Glomeris marginata followed by Philoscia muscorum are the best 'faeces machines' with similar values for hornbeam and oak. G. marginata is the most efficient transformer of litter because it consumes and egests the greatest quantities.

The influence of temperature and the quality of litter on the processes of breakdown and decay have been illustrated in the first place by results obtained with G. marginata feeding on dry or wet hornbeam leaves under a range of constant temperatures, and in the second place, by results obtained with Philoscia muscorum under fluctuating temperature regimes with free choice of leaves for food. At low temperatures, about 5°C, diplopods become inactive whilst the isopod continues to feed.

In the future these results will be used for a global and integrated study on the role played by a functional group of species in a temperate forest soil.

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MISCELLANEA

Scolopendra subspinipes subspinipes Leach in a cargo of bananas.

Mr. D.R. Bird, Curator of the Natural World, Poole, recently sent me a scolopendromorph centipede 80 mm long which he had been sent from a pathology laboratory in a Boscombe (Dorset) Hospital. The specimen proved to be a Scolopendra subspinipes subspinipes.

Attems (1930) gives its distribution as: all tropical and subtropical countries with the exception of the Mediterranean region, especially in the Indo-Australian region: one of the commonest scolopendromorphs. It does not, in fact, occur naturally on the African mainland and appears to be S.E. Asian in origin. Scolopendra subspinipes subspinipes seems to be a wandering species, it sometimes climbs up into long houses in Sarawak (Lewis, unpublished data) and it may climb trees. Such behaviour favours distribution through trading: it may be collected with fruit or climb into packing cases. This specimen was in a case of bananas from Jamaica.

References:

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J.G.E. Lewis - Taunton School, Taunton, Somerset.

Abnormal coxopleural teeth in Lithobius forficatus L.

On May 26 1987 a female Lithobius forficatus was collected from beneath a stone by a walled track at Croydon Hill, near Timberscombe, Somerset. Grid reference 966415, altitude 180 m. The track was lined on one side by beech trees, on the other by pine wood.

The specimen shows an abnormal condition of the left prehensorial tooth plate (Fig. 1) the anterior border of which is concave rather than straight, the three central teeth being very much reduced in size. The specimen shows no evidence of injury and it seems possible that the abnormality may be a developmental one, the growth of the central region of the anterior border of the tooth plate having been inhibited during development.

Lewis (1987) described an abnormal specimen of Lithobius borealis Meinert from Lydeard Hill in Somerset in which the tooth plate was atypical. This, he suggested was a developmental abnormality. Matic (1958) pointed out that developmental differences may be the kinds of differences that are used to separate species.

References:

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J.G.E.Lewis

Additional moult in Lithobius variegatus Leach

Lithobius variegatus breeds when showing 6.5.5.5 or 7.6.6.6 coxal pores (Eason 1964). These stadia were termed maturus and post maturus by Lewis (1965). Eason and Serra (1986) state that the coxal pores are never more than 7.6.6.6 in England but specimens from Co. Mayo on the west coast of Ireland 24 to 30 mm long have numbers ranging from 7.6.6.5 to 8.7.7.6. In Iberian specimens the number can reach 10.9.9.9 suggesting further post-larval stadia in addition to those found in British specimens.

On 4th February 1986 a female Lithobius variegatus was taken under a stone in a quarry in open mixed larch-ash wood 0.2 km east of Hestercombe House near West Monkton, Somerset. Grid Ref: 244288, altitude 90 m. This specimen had 8.7.7.6 pores on the left and 4.7.7.6 on the right and had presumably undergone

an additional moult, it may be that more specimens of this stadium will be found in Devon and Cornwall.

References:

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J.G.E. Lewis

An Interesting Myriapod Site at Carlisle, (VC70) Cumberland.

Bulletin of the British Myriapod Group 5 (April1988)

Addendum : Miscellanea - Abnormal coxal teeeth in Lithobius forficatus L.

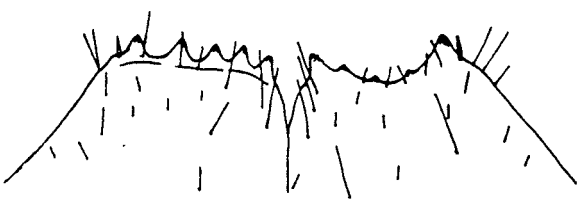

Fig.1. L.forficatus female,Croydon Hill,nr.Timberscombe,Somerset

DIPLOPODA: Nanogona polydesmoides - [illegible]

Brachychaeteuma bradeae - Numerous specimens in the central area under stones and boards in December 1986.

Melogona gallica - 3 adults (2♂, 1♀) amongst wet, undecayed Fagus litter in a depression under trees.

M.scutellare - Abundant under stones and in litter.

Proteroiulus fuscus - Common under the bark of damp dead trees.

Blaniulus guttulatus - Odd specimens under bricks and logs in the central area in summer and December 1986.

Archiboreoiulus pallidus - 1 adult ♂ under a stone in the centre of the wood which had only been placed there 1 year previously.

Tachypodoiulus niger - Few specimens on old greenhouse wall in September 1986.

Cylindroiulus britannicus - As well as occurring under the bark of a damp Ulmus log this species was common under boards on a horse manure heap with much undecayed straw.

C.punctatus - Abundant under bark and in deep litter.

C.vulnerarius - This blind julid was plentiful under a partly buried plastic sheet in the centre of the wood in December 1986.

Julus scandinavius - A species which is apparently rare in this area, the only record being of a single ♂ taken with the last species.

Ophyiulus pilosus - Odd specimens from litter at various times of the year.

Polydesmus gallicus - 1♂, 1♀, in December under an old carpet on the site of the greenhouse.

Macrosternodesmus pallicola - Abundant in December under a board on friable loam in the centre of the wood.

D. Bilton, 55 Beechgrove, Stanwix, Carlisle, Cumbria.

Albino Millipedes

Two albino specimens of Cylindroiulus punctatus were found among approximately 340 individuals of this species, collected in 1981 and 1982 in Brinkenwood in the New Forest, Hampshire (41/274059). One was an eighth stadium female and the other was a ninth stadium animal. They were very pale, with no pigment in the ocelli. I have found no similar specimens of this species from other locations, and have never seen albino forms of other species which are normally pigmented. If anyone else has records or knowledge of albino millipedes, I would be interested to hear about them.

I.M. Jensen, 22 Cardiff Road, Reading, Berkshire.

There have been various records of albino millipedes including a number of albino female Polydesmus denticulatus found by one of us (ADB), and examined by J.G.B., from the Central Cemetery, Plymouth under stones and in litter, 4.vi.87. They were distinctly unusual in appearance. (Eds.)

Spider mimics Millipede

One of the most frequent misconceptions concerning millipedes is that they all have to live permanently in damp conditions. While this is undoubtedly true for most members of the group, some species have evolved a remarkable ability to survive in extremely dry conditions. In the U.K. the bristly millipede Polyxenus lagurus is often found in very dry conditions under bark or crawling over walls in full summer sunlight. While attending the Second International Symposium on Terrestrial Isopods held in Urbino in Italy last September, I was amazed to see large numbers of pill millipedes crawling over the kerbstones at the sides of roads in the town, fully exposed to the hot midday sun. They were identical to British Glomeris except for the presence of prominent red spots on the dorsal surface which made them very conspicuous. This red colouration is presumably a warning to predators that the potentially tasty morsel contains noxious chemicals including a substance called 'glomerin', a sticky secretion which acts as a powerful sedative. Some people have suggested that the red colouration mimics the red hour-glass pattern on the black widow spider but Parker & Cloudsley-Thompson (1986, Newsl. Br. arachnol. Soc. 45, 2-4) have pointed out that the reverse must be the case. Vertebrate predators such as birds and lizards might well be

deterred by the hard cuticle and repugnatorial secretions of a millipede, but a black widow would never get the chance to bite them.

S.P. Hopkin, Department of Pure and Applied Zoology, University of Reading.

Cannibalism in a lithobiid centipede

On 10.8.1987 I was on Caerketton Hill in the Pentlands, VC 83, with my son and my six and a half year old grand-daughter. Prompted by her request, "Can I help you look for beasties, Poppa?", I decided to turn over stones, remnants of a dry-stone dyke, lying in the grass and heather. I took the larger stones, she tackled the smaller ones. As you can guess I found nothing, she uncovered centipedes. Consequently I turned over a medium sized stone and found on it two lithobid centipedes, one about 16-18 mm. long, and a smaller one about 5-6 mm. long. Even as I fumbled for a collecting tube to capture them I saw the larger seize the smaller, which thrashed about convulsively, presumably as poison began to take effect. This smaller one disappeared from my view; it took me some time to realise that the larger animal had so manouvred its prey that it lay along the length of the underside of the body, held by the legs. I had one very brief view. It then ran and before I could move it had slid off the rounded stone and disappeared into the heather. An animal, comparable to the larger specimen, taken at the same time and place has been identified as Lithobius crassipes.

C.P. Rawcliffe, 35 Comely Bank Row, Edinburgh.

Blaniulus guttulatus (Fab.) - An Unexpected Carnivore?

On 18th January 1988 whilst casually searching some leaf litter in the ashwood below Carreg Cennen Castle (Carms. VC44, 22/668189), I noticed two individual Blaniulus guttulatus with the anterior third of their bodies inside the trunk of a larger millipede which had lost the approximately rear half of its body. On closer examination it was noticed that the larger millipede (which was subsequently determined as Ophyiulus pilosus) was still alive, in spite of the blaniulids embedded in the hollowed-out rear end of its remaining trunk. Presumably it was the feeding blaniulids that had eaten away some of the internal parts thus causing the hollowness, and they were continuing to feed on the unfortunate Ophyiulus when I disturbed their feast.

This event reminded me that when I overturned a large bone (with some flesh still adhering to it) some two weeks previous (2.1.1988 at Ty'r fran, Llanelli, VC44, 22/513015, I was surprised to find underneath it a concentration of some two score Blaniulus guttulatus; whereas the surrounding scrub-grassland only had a low density of the species. The unwelcomed effects of the blind blaniulids on horticultural crops is well-known, but the above observations suggest that the diet of Blaniulus guttulatus is not just vegetarian!

I. K. Morgan, Nature Conservancy Council, 16 Barn Road, Carmarthen, Dyfed.

Bulletin of the British Myriapod Group 5 (1988)

from: CAMERON, L.C.R. 1919. Minor Field Sports. London: Routledge

MISCELLANEOUS SPORTS

Millipede Racing

All the sports previously dealt with are outdoor sports, and subject more or less to fine-weather conditions. Millipede-racing is an indoor pastime and may be enjoyed on the inevitable wet day that comes sooner or later during the finest summer. Apart from that it may be described as the most minor of all minor sports; but there is some fun in it not-withstanding, and no element of cruelty to the millipede.

There are many millipedes, but so far as I have discovered only one racing millipede. This is known to naturalists as Julus terrestris and may be looked for and found in large numbers under stones, decaying wood, bark, or the roots of plants, under heaps of leaf-mould, and not infrequently climbing about porches and doors in damp weather. It is a very handsome little beast about an inch in length, being shiny black on the back, and bright silver underneath, with the softest of silken legs of a pale fawn colour. It curls up in a small ring when at rest, and races best on a polished table-top.

All that is required is for each owner to select his Julus terrestris, which are then placed in a row at one end of the table, a barrier or starting gate in the shape of a foot rule being placed before them, and the edge of the table and each side of the "course" blocked with books to prevent their "bolting". Once they start, on the removal of the ruler, they go like steam, with occasional brief pauses for enquiries, probably; and a pool or sweepstakes can be arranged, the owner of the one that reaches the other end of the table first taking the pool. They will sometimes cross and foul one another, and a good plan is to lay down lathes lengthways so that they cannot do this, after the manner in which dog-racing grounds are laid out and with a similar object in view. If it is proposed to keep an outstanding racer it should be placed in a dark box and fed upon bulbs and roots.

(Contributed by S.M. Turk, Shang-ri-la, Reskadinnick, Camborne, Cornwall)

(The species referred to is probably Tachypodoiulus niger - Eds.)

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British Myriapod Survey — C.P. Fairhurst, A.D. Barber

Myriapodology: Retrospect — S.G. Brade-Birks

The distribution of British millipedes as known at the end of 1969 — J. Gordon Blower

Some notes on the Chilopoda of south-east England — A.D. Barber

(frontispiece: The Rev. Canon S. Graham Brade-Birks at the age of 84 years. Portrait by Dr. Hilda Brade-Birks.)

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Recent records of Thalassisobates littoralis — P.T. Harding

The British Chordeumatidae — J.G. Blower

Some notes on Chaetechelyne vesuviana (Newport) — A.N. Keay

Three chilopod species not described in 'Centipedes of the British Isles' — A.D. Barber

The European Myriapod Survey — R.D. Kime

Interim report on the Millipede Recording Scheme — C.P. Fairhurst

Pollution rhymes; Anamorphosis of a Diplopod.

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Poratia digitata, a new British hothouse millipede — J.G. Blower, A.J. Rundle

Trachysphaera lobata (Ribaut), a millipede new to Britain from the Isle of Wight — R.E. Jones, A.N. Keay

Predation and prey in Henia (Chaetechelyne) vesuviana (Newport) — A.N. Keay

Some myriapods from Brittany — A.D. Barber

Geophilus proximus C.L. Koch and other chilopods from the Shetland Isles — A.D. Barber

Centipedes - Progress towards the Provisional Atlas and beyond — P.T. Harding

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An experimental study of the tolerance of Haplophilus subterraneus (Shaw) and Henia vesuviana (Newport) to low humidity levels — A.N. Keay, R.J. Forman

Encounters between the geophilid centipede Henia (Chaetechelyne) vesuviana (Newport) and the Devil's Coach Horse beetle Staphylinus olens (Mueller) S.P. Hopkin, M.J. Gaywood

Displaced ocelli in blaniulid millipedes S.P. Hopkin, J.G. Blower

Centipedes and millipedes collected in Normandy, France. R.D. Kime, J.G.E. Lewis, S.J. Lewis

More myriapods from Brittany J.G. Blower

British Schendylidae A.D. Barber

MISCELLANEA
Myriapods in the Lothians; Recent records of Enantiulus armatus; A secondary sexual character in Lithobius crassipes; Lithobius pilicornis in Yorkshire; Giant Geophilus from Gower.

CORRECTION : Enantiulus armatus (Ribaut)

As indicated in the Newsletter of the British Myriapod group there were errors in the map in our last issue (Bull. Brit. Myriapod Group 4 : 50 : Miscellanea)

Map 1. Enantiulus armatus 10 km distribution map.