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YORKSHIRE MILLIPEDES

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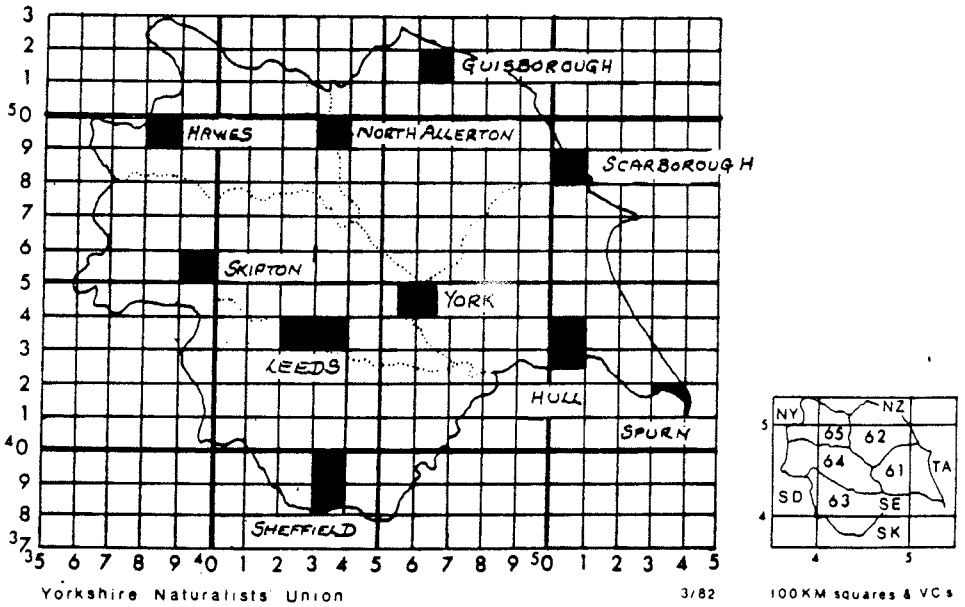
INTRODUCTION

It is hoped this review will bring up to date our knowledge of the millipede fauna of Yorkshire and, at the same time, remove the necessity for future researchers having to repeat the ground work. Detailed data and actual specimens are lodged with various organisations quoted in the text and these may be used for future taxonimic studies. Details of the methods adopted in the present survey (1970-1989) are given to help encourage others embarking on similar regional surveys. Historical details of what transpired previous to 1970 are also considered to be relevant.

Little is included about geology of the country, but all systems from the Ordovician to the Cretaceous (except Devonian) are represented and to some extent this indicates the tolerance of ubiquitous species.

It may be of interest to learn that this survey stemmed from a quite personal individual interest in myriapoda in general and was not initially planned as a deliberate scientific survey. As time went by the 'excitement of the chase' generated more interest which draw in more and more enthusiasts. No apologies are made for the time it has taken to complete the survey (20 years); in retrospect the task has been enormous but the effort is well justified.

YORKSHIRE DEFINED



MAP 1: YORKSHIRE

The boundary shown on the map is the Watsonian County boundary (Dandy, 1969), not to be confused with the quite different Local Government and Parliamentary Constituency Boundaries. The county is defined as being made up of the following 188 10km squares:

34(SD)64-69; 74-79; 84-89; 90-99. 35(NY)80-82; 90-92.
43(SK)19; 28; 29; 38; 39; 48; 49; 58; 59; 69.
44(SE)00-79; 81-89; 92-99.
45(NZ)00; 01; 10; 11; 20; 21; 30; 40; 41; 50-52; 60-62; 70-72; 80; 81; 90; 91.
54(TA)02-09; 12-18; 21-24; 26; 27; 31-33; 41.

Excluded are the following nine land-locked 10km squares each with less than five 1km squares belonging to Watsonian Yorkshire:- 34(SD)54; 55; 73.
35(NY)72. 43(SK)47; 57. 45(NZ)02; 31; 42.

All the coastal/estuarine 10Km squares are included irrespective of the number of 1km squares involved. In the 10Km squares shared with adjacent counties, collecting/recording has been confined to the portions of the 10km squares lying wholly within the Watsonian Yorkshire boundary (Richardson, 1983a).

HISTORICAL

The story can conveniently be divided into four periods:
1878: 1912 - 1921: 1950 - 1969: 1970 - 1989

1878

The first reference to the myripoda of Yorkshire comes in the form of an appeal by H. Franklin Parsons which appeared in The Naturalist under the heading "Neglected Orders" (Parsons, 1878)

> "..... I need only mention Arachnida, Myriapoda, Crustacea and Annelida. Who will take charge of these 'Neglected Orders' and tell us more of their wonderful forms and life histories? ....."

No one took up the challenge.

1912 - 1921

The information collected furing this period was not the result of a systematic investigation, as perhaps envisaged by Parsons, but more a collection of isolated sightings - five people being involved, nomenclature up-dated:-

TABLE 1

YEAR	RECDS	RECORDER	SPECIES	10km Sq
1912	1	R.S.Bagnall	Oxidus gracilis	45/10
1915	1	A.R.Jackson	Polydesmus inconstans	44/14
1916	1	T.Stainforth	Polyxenus lagurus	44/93
1917	1	R.S.Bagnall	Boreoiulus tenuis	43/23
1919	1	J.W.Jackson	Polyxenus lagurus	45/91
1920	5	H.W.Thompson	Glomeris marginata, Julus scandinavius, Blaniulus guttalatus, Cylindroiulus punctatus, Julus scandinavius, Polydesmus angustus	44/05 44/43 44/43
1921	1	R.S.Bagnall	Ophiodesmus albonanus	45/10
	11	5	10 Species 12 records	7
	Map p.		TABLE 2 +	

TABLE 1: Species recorded 1912-21

Bagnall (1918,1922): Jackson, A.R. (1916): Jackson, J.W. (1919): Stainforth, T (1916): Thompson, H.W. (1921).

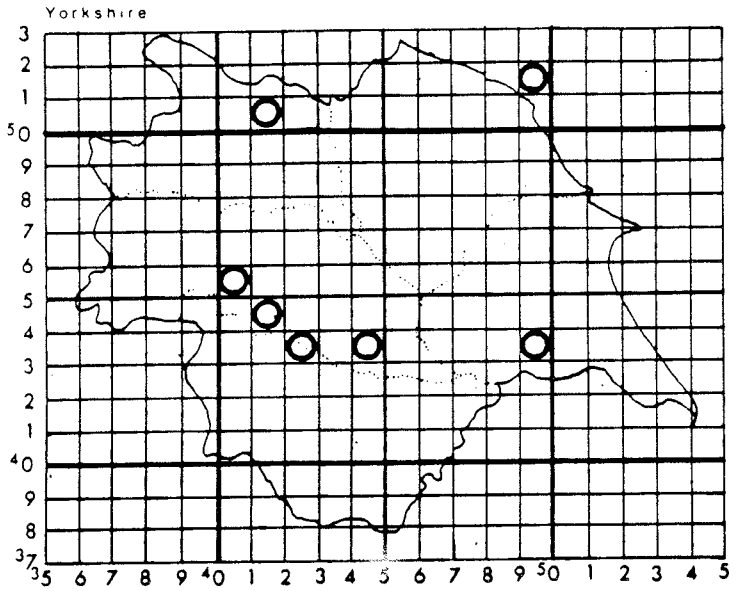
1950 - 1969

The 1952 Naturalist contained an article by Gordon Blower entitled 'British Millipedes with special reference to Yorkshire Species' (Blower, 1952) which contained not only a list of species, but more exciting still a key to identification. On face value the door had been flung wide open for anyone, even with the slightest interest, to take up the study. Blower's gallant attempt to promote interest, particularly amongst Yorkshiremen, fell on deaf ears as had Parson's appeal of 75 years earlier, or was it the 'Wars of the Roses' rearing its head once more? After all the invitation did stem from Manchester in the heart of 'Red Rose' country. The data for 1950-1969 is that of Blower and three of his colleagues: P.M. Butler; P.D. Gabbutt and Miss M.T. Sewell who between them amassed 265 records and raised the number of species for the county from 10 to 29. The era was rounded off by Dr S.L. Sutton's announcement (Sutton, 1969) of the finding of Stigioglomeris crinita bringing the number of records to 269, number of 10km squares visited 18, recorders 5 and species 30. (Table 2)

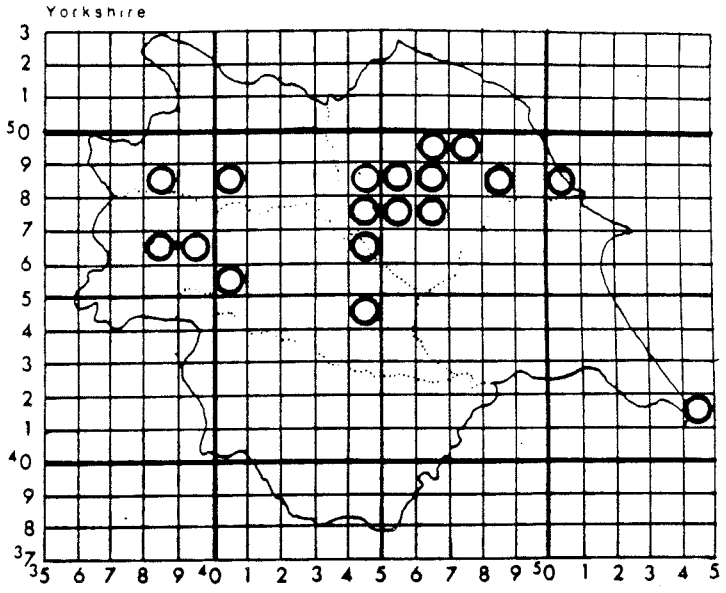
The 1950-1969 records are clear examples of recorder bias - Gordon Blower's contributions centred round the North Yorkshire Moors in V.C 62; Butler, Gabbutt and Sewell in the Malham area in V.C.64.

1970 - 1989

Just how things developed is best illustrated by dividing the survey into its two decades 1970 - 1979 and 1980 - 1989.



MAP 2: Records 1912 - 21



MAP 3: Records 1950 - 69

1970 - 1979

Believe it or not, it was not the inception of the British Myriapod Group in April 1970 that sparked off interest, but a consequence of redundancy. In the summer of 1972, the writer, whilst filling in time between jobs by thumbing through the pages of back copies of the Naturalist, came across Gordon Blower's article on British Millipedes (Blower, 1952). The subject matter looked interesting, the identification key not impossible, a small number of species, and, as a bonus, an order which had been neglected. An additional incentive was the existence within the Yorkshire Naturalists Union of "The Other Arthropods Committee" set up in 1968 (Richardson, 1988) for the purpose of investigating faunal orders frowned upon by the bonafide entomologists. An introduction to both Gordon Blower and Colin Fairhurst followed - the scene was set - there was no turning back.

No particular effort was made to co-ordinate recording although each recorder knew what the other was up to, each worked individually. By the end of the decade 18 people had contributed a total of 1409 records - 91% (1276) of which were the result of the efforts of just four individuals, W.A. Ely (Rotherham); A. Norris (Leeds); D.T. Richardson (Skipton) and C.J. Smith (York). Things were looking up. Every opportunity to advertise what was going on was siezed, particularly in the pages of the Naturalist (Ely (1977a,b), Howes (1973a,b), Richardson (1975a,b,c, 1979a,b,c))

1980 - 1989

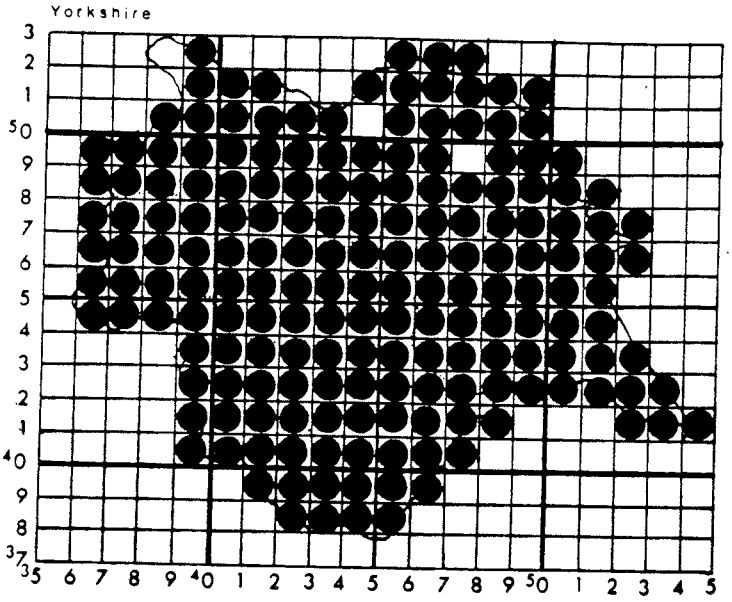
A number of quite different events crystallized the efforts put into work carried out during this decade. An isopod/myriapod workshop run by G.D. Fussey and D.T. Richardson at Leeds University in April 1980 attracted twenty participants most of whom remained with us. To assist co-ordination and communication the "Other Arthropods Study Group Bulletin" was introduced in which were published up-dates of distribution maps, progress reports, details of under recorded 10km squares, collecting techniques, etc., etc. March 1983 saw the introduction of the Yorkshire Naturalists' Union 10km square map card, affectionately known as the 'Doug Richardson card', which provided a visual method of showing species distribution. Maps for each species were prepared and mounted on display boards which were carted round and exhibited at every opportunity - woe betide you if there was not a dot in the 10km square in which you lived. March 1984 saw the introduction of the Yorkshire Naturalists' Union Bulletin a publication designed to take less academic articles than the Naturalist, the Other Arthropods Study Group bulletin was discontinued and communcation transferred to the pages of the new bi-annual publication. As the decade drew to a close the Other Arthropods Committee convinced the powers that be that a pocket sized species field recording card would be of great assistance to recorders and thanks to a generous donation from the Nature Conservancy Council 10,000 Other Arthropods cards were printed - the scene is set to take us to the end of the 20th Century and beyond.

Twenty one people, including members of the British Myriapod Group outside the county, contributed 2518 records during the final decade. 2275 (90%) of the records being the efforts of only four: W.A. Ely (Rotherham) P. Lee (Riddlesden); D.T. Richardson (Skipton) and C.J. Smith (York). (Blower (1985); Lee (1987a,b,c, 1988a,b, 1989); Lee and Richardson (1989); Richardson (1981a,b, 1982a,b,c,d, 1983b,c, 1985, 1987, 1988a,b)

1970 - 1989

Almost 4000 individual records were amassed during this period some may say that for twenty years this is not numerically exciting - a record every other day - but do not forget the size of the county and the fact that the same people were also recording woodlice, centipedes, harvestmen and spiders.

181 (97%) of the county's 188 10km squares had been visited, a far cry from the seven from 1912 - 1921 - we started off with seven squares visited and closed with seven unvisited.



MAP 4: Records Received 1970-89

During this period a further four species were added to the county list bringing the total to 34.

YORKSHIRE

POLYXENIDA

+ Polyxenus lagurus (Linné, 1758)

GLOMERIDA

+ Gloneris marginata (Villers 1789)
* Stygioglomeris crinita Brolemann 1913

CHORDEUMATIDA

* Craspedosoma rawlinsii Leach 1815
* Nanogona polydesmoides (Leach 1815)
* Brachychaeteuma bagnalli Verhoeff 1911
* Melogona scutellare (Ribaut 1913)

JULIDA

* Nemasoma varicorne C.L.Koch 1847
* Proterojulus fuscus (Am Stein 1857)
* Choneiulus palmatus (Nemec 1895)
Nopoiulus kochii (Gervais 1847)
+ Blaniulus guttulatus (Fabricius 1798)
* Archiboreojulus pallidus (Blade-Birks 1920)
+ Boreojulus tenuis (Bigler 1913)
* Ommatojulus sabulosus (Linné 1758)
* Tachypodoiulus niger (Leach 1815)
* Cylindroiulus londinensis (Leach 1815)
* Cylindroiulus caeruleocinctus (Wood 1864)
Cylindroiulus nitidus (Verhoeff 1891)
+ Cylindroiulus punctatus (Leach 1815)
* Cylindroiulus latestriatus (Curtis 1845)
* Cylindroiulus britannicus (Verhoeff 1891)
* Cylindroiulus parisiorum (Brolemann & Verhoeff 1896)
+ Julus scandinavius Latzel 1884
* Ophyiulus pilosus (Newport 1842)
* Brachyiulus pusillus (Leach 1815)

POLYDESMIDA

+ Polydesmus angustus Latzel 1884
+ Polydesmus inconstans Latzel 1884
Polydesmus gallicus Latzel 1884
* Polydesmus denticulatus C.L.Koch 1847
* Brachydesmus superus Latzel 1884
Macrosternodesmus palicola Brolemann 1908
+ Ophiodesmus albonanus (Latzel 1895)
+ Oxidus gracilis (C.L.Koch 1847)

NOMENCLATURE: Blower (1985)

First Recorded
+ 1912 - 1921
* 1950 - 1969
Unmarked 1970 - 1989

TABLE 2 Species recorded for Yorkshire

SPECIES RECORDED

The figures in parenthesis at the end of each species account denotes the number of 10km NG squares in which it has been found.

Polyxenus lagurus

A county rarity, records from two sites only - Brantingham Dale (44/93) April 1916 beneath bark (Stainforth, 1916) and Saltwick Bay (Nab) near Whitby (45/91) 1919 beneath shale fragments (Jackson, 1919). Attempts to re-establish existance at Brantingham Dale have resulted in failure but G.D. Fussey and I.M. Vandell met with more success when in June 1980 they found a very active colony at Saltwick Nab (Fussey and Vandell, 1980). Fussey visited the site again in April 1981 and again found many specimens. An excellent example of well documented records; Jacksons 1919 site description being of sufficient accuracy to enable a successful search to be made some seventy years later.

(2) (MAP 5)

Glomeris marginata

Little doubt this will prove to be ubiquitous. First record: 1920: M.W. Thompson: Bolton Abbey (44/05)

(102) (MAP 6)

Stigioglomeris crinita

This is a species, the finding of which never fails to induce a feeling of excitement. Distincitive it may be but its size <3mm does not assist detection. Evidence from the work done by Bocock, K.L. et.al (1973) shows that it is very much subterranean in its habits and that the only way of establishing its presence or otherwise in an area is to take soil core samples, an exercise which most will recognise is more than time consuming. The first record for the county by S.L. Sutton in 1969 came from soil core samples taken at Bramham Park near Wetherby (44/44) on the magnesian limestone (Sutton 1969) - the other seven were picked up quite at random. Establishing its true distribution within the county will be a lengthy and time consuming exercise.

(6) (MAP 7)

Craspedosoma rawlinsii

With two exceptions where it has been picked up from amongst leaf litter of deciduous woodland all the specimens collected have come from pitfall traps in relatively acid wet areas e.g. Askham Bog near York (44/57-48-) and sites on the North Yorkshire Moors. The indications are that it may well have a north-easterly distribution in the county and favour more acid terrain - time alone will solve this one. A rarity as far as Yorkshire is concerned. First record: 1964: J.G. Blower: Rievaulx area (44/58)

(7) (MAP 8)

Nanogona polydesmoides

More than likely to prove ubiquitous. First record: August 1950: P.M. Butler: Rievaulx area (44/58)

(86) (MAP 9)

DISTRIBUTION MAPS (Maps 5 - 38)

Legend

● 1970 - 1989

◉ Pre 1970 confirmed during 1970 - 1989 survey

○ Pre 1970 not confirmed during 1970 - 1989 survey

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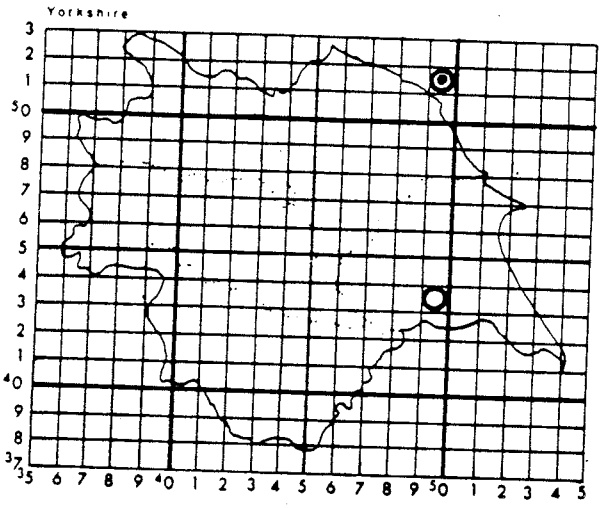

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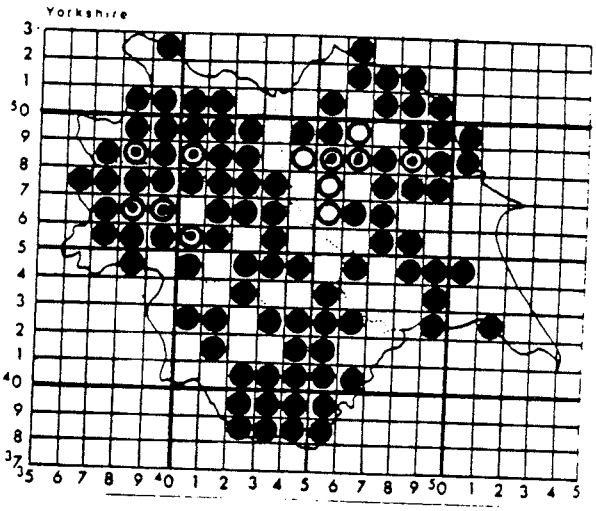

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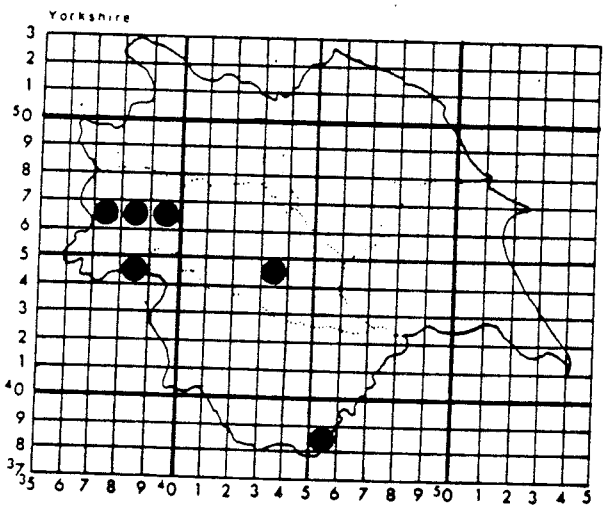

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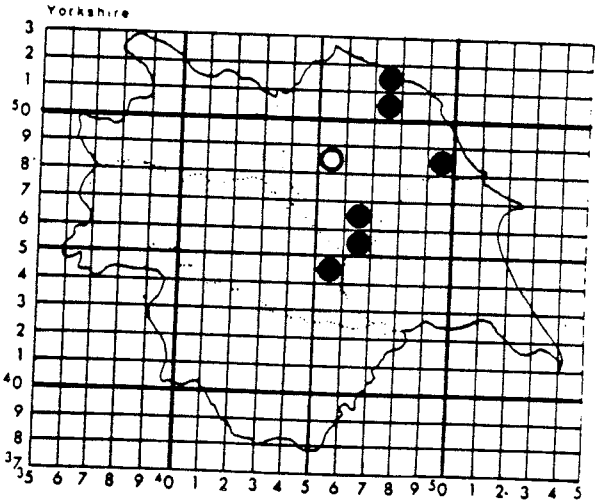

Brachychaeteuma bagnalli

Blower (1986) summarizes our knowledge of the very limited distribution and sites for the species in Great Britain. It is certainly a national rarity and we can perhaps congratulate ourselves in having any records at all for the county. Its small size is not thought to be the reason for paucity of records. First record: April 1956: J.G. Blower: Easingwold (44/57) in a garden: 1961: same site again: June 1986: P. Lee: How Stean Gorge, Lofthouse (44/07) under stone: August 1987: P. Lee: Riddlesden near Keighley (44/04) under stone in garden.

(3) (MAP 10)

Melogona scutellare

Whether or not the map shows the true distribution pattern within the county is open to conjecture. It is a quite small, very active and easily overlooked animal and adults are completely absent during the summer months - how many of us engage in grovelling about on hands and knees amongst wet leaf litter at the height of winter? There seems no reason why its range cannot be extended. In leaf litter, under stones in hedge bottoms, etc. First record: May 1951: J.G. Blower: Rievaulx area (44/58)

(20) (MAP 11)

Nemasoma varicorne

Blower (1952) remarks that it was recorded for adjacent Lancashire and Durham and that it had not been found in Yorkshire. I can distinctly recall my excitement on first finding it in the county in Grass Woods, Grassington (34/96) on the 28th October 1973 - I was then unaware that Gordon Blower had beaten me to the post. Once seen however, never forgotton and from that day on I never again assumed every thin brown sub-cortical millipede was Proteroiulus fuscus - I always hoped they might be Nemasoma varicorne - my caution paid off and it was not long before I became quite expert at recognising which loose bark would house the animals and which would not. It sometimes turned up in pure colonies often containing large numbers of individuals and sometimes mixed with P.fuscus. Its apparent absence from VC.61 is more likely due to the reduced number of trees in this heavily cultivated part of the Vale of York. No males have as yet turned up. First record: Aug 1955: J.G. Blower: Easingwold (44/57)

(38) (MAP 12)

Proteroiulus fuscus

With the exception of Cylindroiulus punctatus by far the most common sub-cortical millipede. No males have turned up. Will prove to be ubiquitous. First record: Sept 1950: J.G. Blower: Thornton-le-dale area (44/88).

(99) (MAP 13)

Choneiulus palmatus

Only two records both of which predate the current survey. Sept 1950 P.M. Butler: Thronton-le-dale (44/88) and Nov 1961: J.G. Blower: Easingwold area (44/57). All the British records are from synthanthropic sites - greenhouses, botanical gardens and the like. Are we now more likely to find it in garden centres now most of our private and municipal greenhouses are gone?

(2) (MAP 14)

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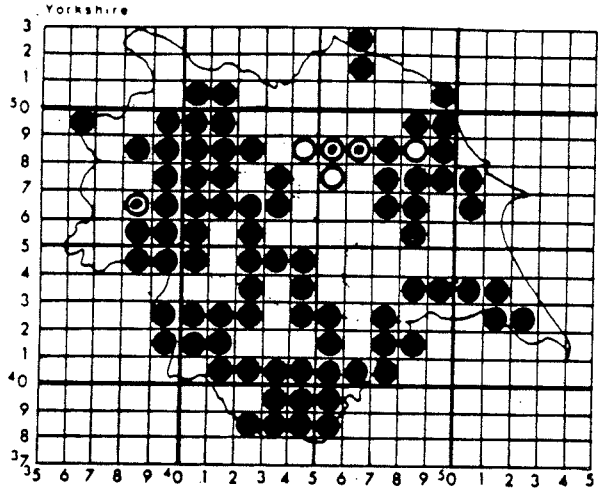

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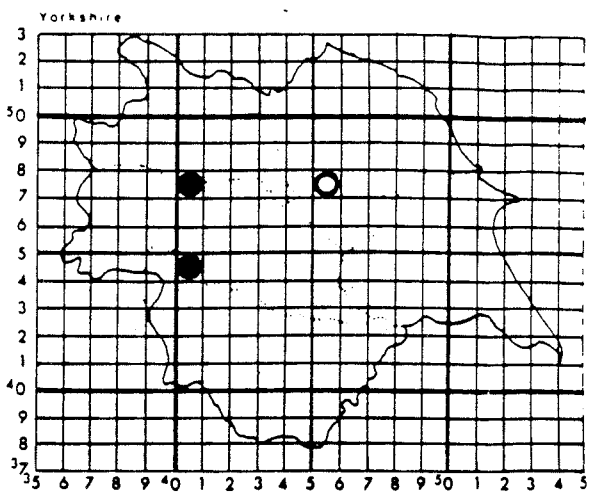

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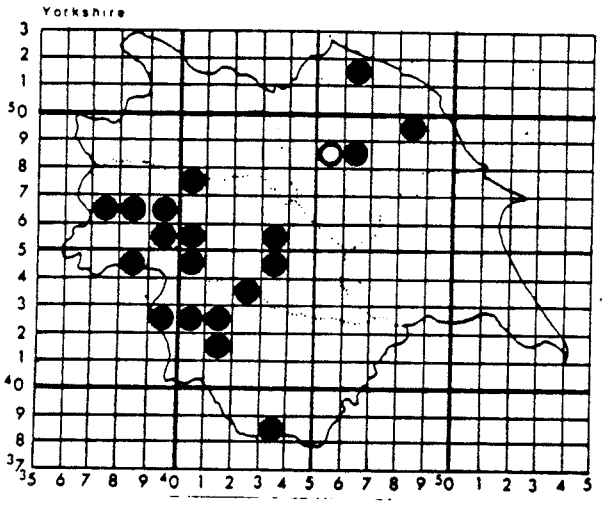

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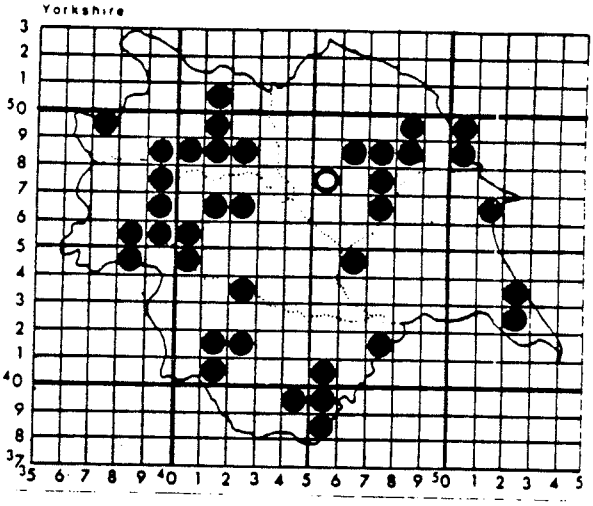

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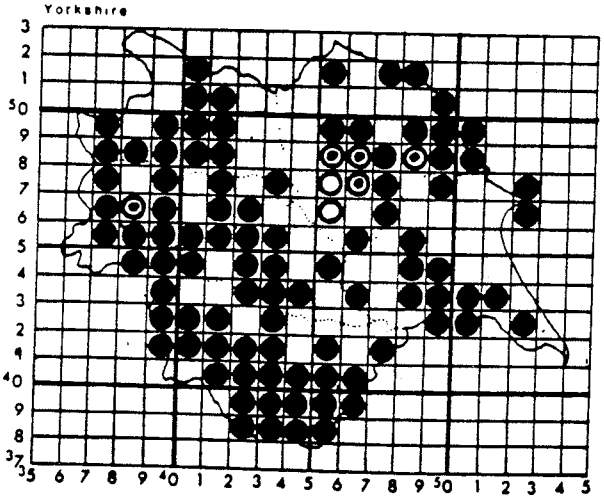

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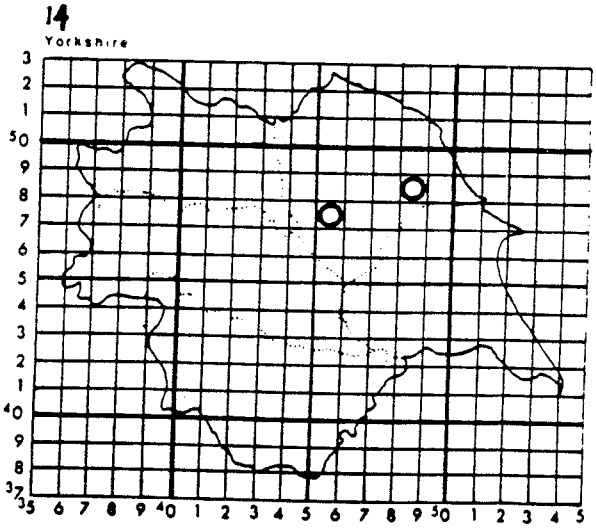

Nopoiulus kochii

Its presence in the county hangs on a thread as a single specimen was identified by Dr C.P. Fairhurst, amongst material collected from under stones in a small disused quarry in Bolton Abbey Woods (44/05) - September 1974 by D.T. Richardson. Further visits to the site have been unfruitful.

(1) (MAP 15)

Blaniulus guttulatus

There is little doubt its presence in the county will prove to be ubiquitous. First record: 1920: H.W. Thompson: Manor Garth Farm, Garforth (44/43)

(34) (MAP 16)

Archiboreoiulus pallidus

By no means as common as B.guttulatus but it can be seem to be well distributed across the country. There is no logical reason why its coverage cannot be extended. First record: July 1950: J.G. Blower: Bolton Bridge (44/05)

(28) (MAP 17)

Boreoiulus tenuis

The smallest of our blind blaniulids which with its orange to orange-red ozadenes may be dismissed as juvenile B.guttulatus unless care is taken to collect and examine specimens. Whilst most of the records are from under stones on base rich soils it is no respecter of altitude being found well above 330m O.D. Scattered distribution with some collector bias at the moment. First record: Oct 1917: R.S. Bagnall: Leeds area (44/23)

(14) (Map 18)

Ommatoiulus sabulosus

This is perhaps our most striking and distinctive species with its two orange to orange-red dorso-lateral longitudinal stripes, so distinctive that the gaps in the map truthfully represent areas from which it is virtually absent. It is perhaps significant that it appears to be absent from the western half of V.C. 63 and parts of South-West V.C. 64. Clay and heavy coal measure soils predominate and there is evidence that the animals prefer light calcareous loams and sandy soils. It is also often found high up on walls and on the lower branches of trees. First record: Aug 1950: J.G. Blower: Rievaulx (44/58) and Ampleforth (44/57)

(66) (MAP 19)

Tachypodoiulus niger

Ubiquitous, immature stadia often quite common and abundant in woodland leaf litter. First record June 1950: P.M. Butler: Spurn (54/41)

(167) (MAP 20)

Allajulus nitidus

A very late addition to the county list. First found under stones on a roadside verge and in an adjacent disused limestone quarry at Threshfield (34/96) in Nov. 1982 D.T. Richardson. A year later it turned up under boulders in a nearby hawthorn scrub on limestone at Skythorns (34/96). It was this latter find which

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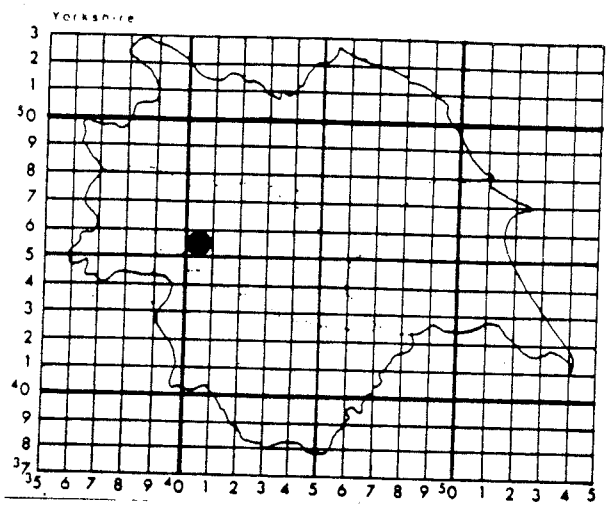

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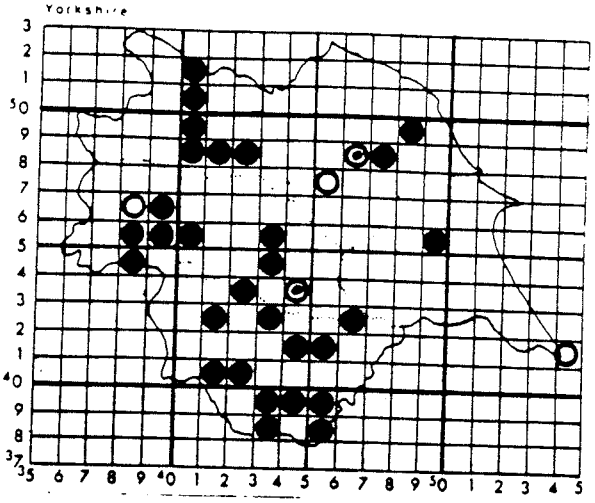

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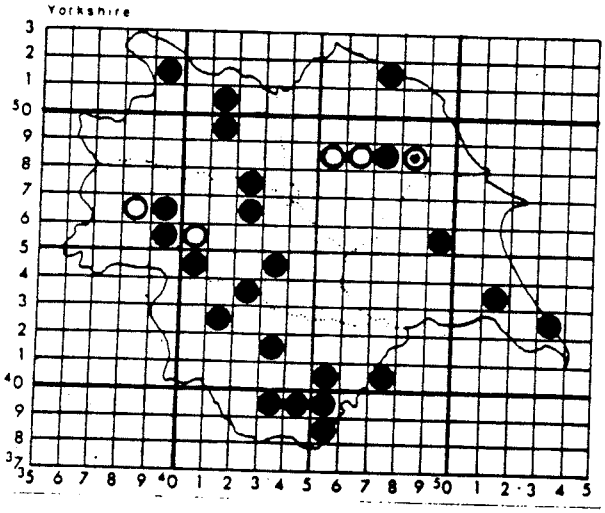

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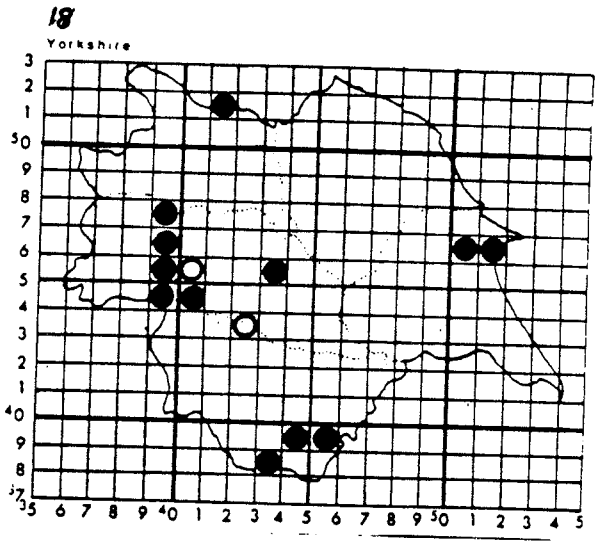

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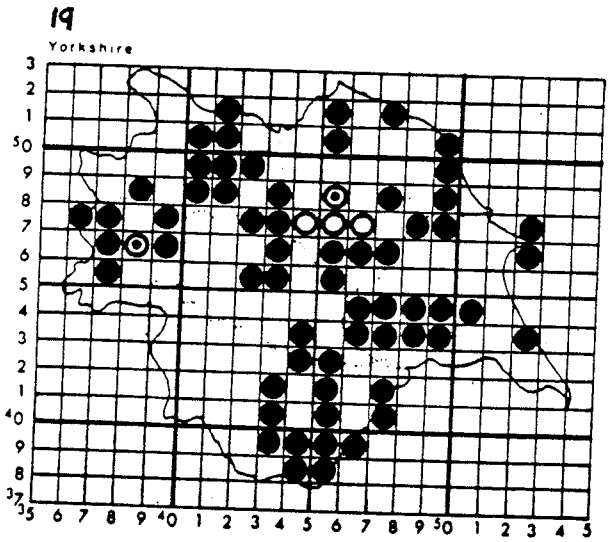

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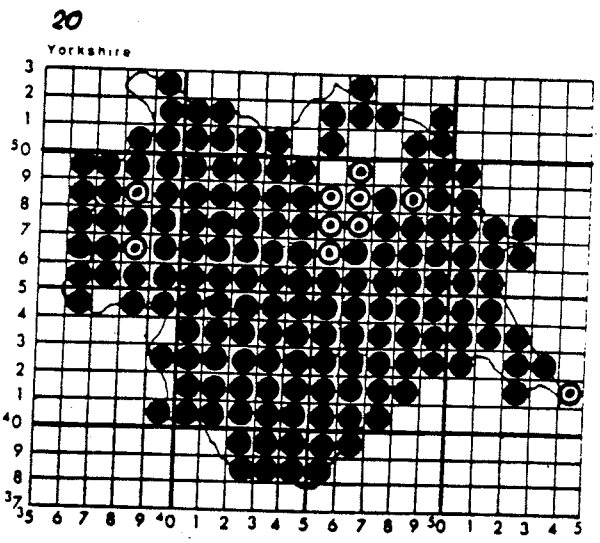


gave a clue to its real habitat - 30 to 100 cms beneath the surface - no wonder we had not come across it earlier. All subsequent specimens came to light only by levering-out deeply embedded boulders by means of a crowbar revealing the animals in grass roots and soil beneath.. If we are to extend our knowledge of its distribution it may mean carrying a crowbar about on field trips - reaction of local farmers to such activities is left to the imagination! So far only on carboniferous limestone.

(2) (MAP 21)

Cylindroiulus londinensis

Certainly a rarity - only three sightings all of which relate to the 1950's period; none have been found during the 1970 - 1989 exercise. April 1951: M.T. Sewell, Farndale area (44/69); Nov 1954 and Aug 1961: J.G. Blower, Helmsley area (44/68). Its distribution within the British Isles is limited to a number of widely scattered sites. There is no way it can have been overlooked for it is one of our largest millipedes. Often under piles of decaying logs.

(2) (MAP 22)

Cylindroiulus caeruleocinctus

As far as the British Isles as a whole are concerned there is a distinct south east distribution pattern. In Yorkshire there is a tendency for it to favour leaf litter in what are considered to be ancient relic woodland. Like C.londinensis it is far too big to have been overlooked and the map may well give a truthful picture reflecting a resticted distribution. First record: Aug 1950: J.G. Blower Rievaulx area (44/58)

(10) (MAP 23)

Cylindroiulus punctatus

The best known, most easily identifiable, and most common sub-cortical millipede. Vast numbers of immature stadia are frequently found in woodland leaf litter. The map tells its own story. First record 1920: H.W. Thompson, Manor Farm, Garforth (44/43).

(159) (MAP 24)

Cylindroiulus latestriatus

Blower (1985) remarks that it has now been recognized in most counties with a coastline but more often than not confined to the coast or a few miles from it. What records we have for Yorkshire seem to be the reverse for it has been found up to 130Km inland. One thing seems to be certain it appears to have a preference for light loam or sandy soils. By no means common. Identification in all cases has been confirmed by examination of genitalia. First record June 1950: P.M. Butler Spurn Head (54/41)

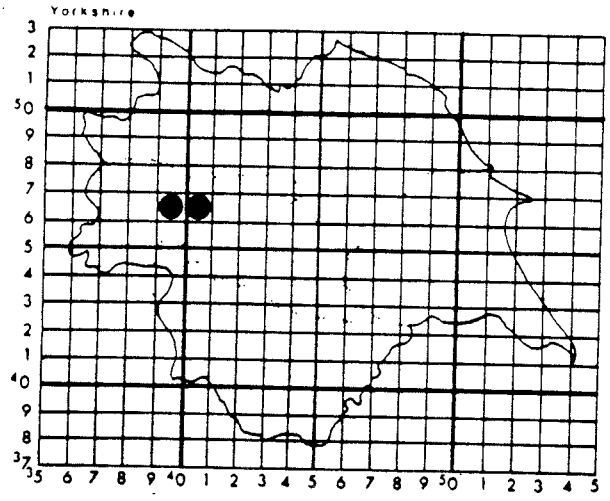
(6) (MAP 25)

Cylindroiulus britannicus

Far more common that C.latestriatus, the scatter of sites across the county rather suggests that given time its presence in most 10Km squares will be established. Under stones, logs, fallen bark, artefacts such as sheets of hardboard and bark of dead standing trees. Identification confirmed by examination of genitalia. First record April: 1951 J G Blower Duncombe Park Helmsley (44/68)

(28) (MAP 26)

21



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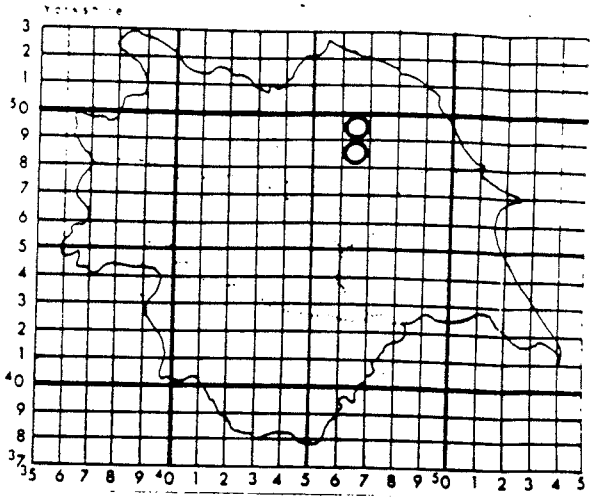

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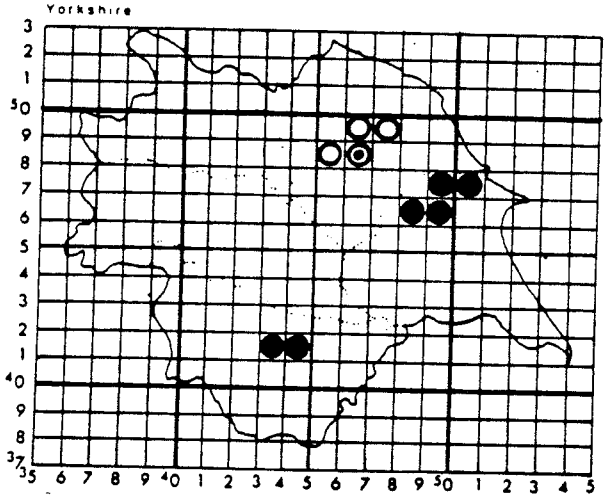

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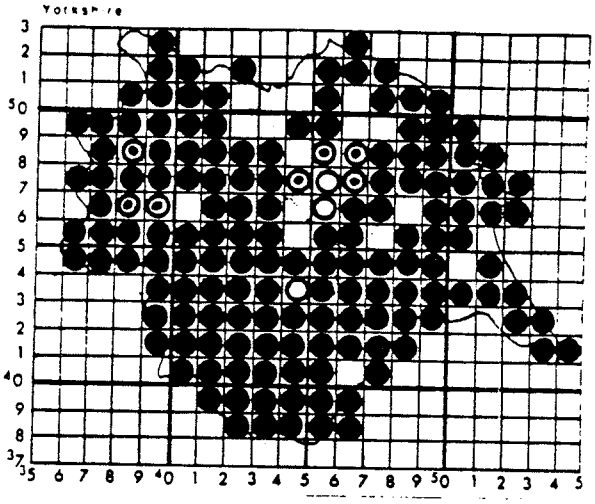

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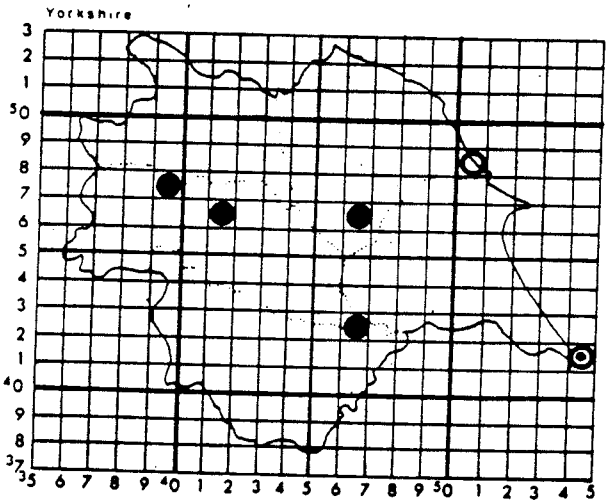

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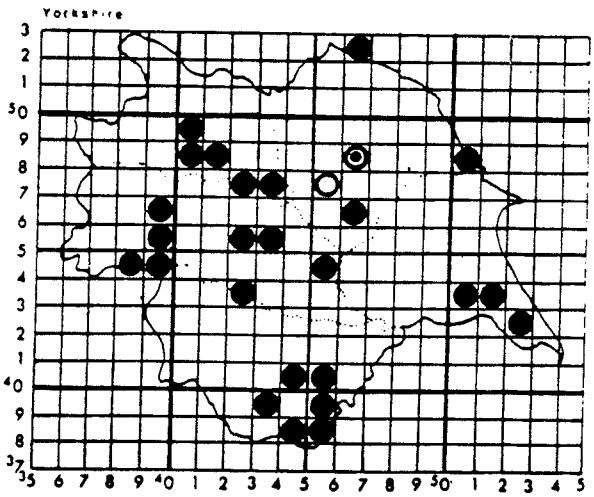


Cylindroiulus parisiorum

Without a doubt a county rarity. Four records only: Sept 1952 and Nov 1961 near Byeland Abbey (44/57) and Aug 1958: Rievaulx area (44.58) all by J.G. Blower. During the current survey Sept 1984: D.T. Richardson, Fountains Abbey (44/26) under stones amongst lead litter in deciduous woodland on magnesian limestone.

(4) (MAP 27)

Julus scandinavius

No reason to suspect that it will not be shown to be ubiquitous. Identifications confirmed by examination of genitalia. First record 1920: H.W. Thompson, Bolton Abbey (44/05)

(79) (MAP 28)

Ophyiulus pilosus

Another species which will without doubt prove to be ubiquitous. All confirmed by examination of genitalia. First record July 1950: J.G. Blower, Aysgarth (44/08)

(74) (MAP 29)

Brachyiulus pusillus

Despite its small size it is a most distinctive animal with its light-coloured dorso-lateral stripes and is too obvious to be overlooked. It is common in many counties of Great Britain and the only conclusions we can come to is that in Yorkshire it is limited to the lighter, more sandy and drier soils of the eastern parts of the county. On one chalk grassland site there were large number in the soils immediately below sheep droppings. A comparative rarity with a limited distribution pattern. First record June 1950: P.M. Butler Spurn (54/41)

(7) (MAP 30)

Poldesmus angustus

Ubiquitous. First record 1920: H.W. Thompson,Manor Farm, Garforth (44/43)

(129) (MAP 31)

Polydesmus inconstans

Certainly not as thick on the ground as P.angustus but fairly evenly distributed across the county. First record 1915: A.R. Jackson, Ilkley (44/14)

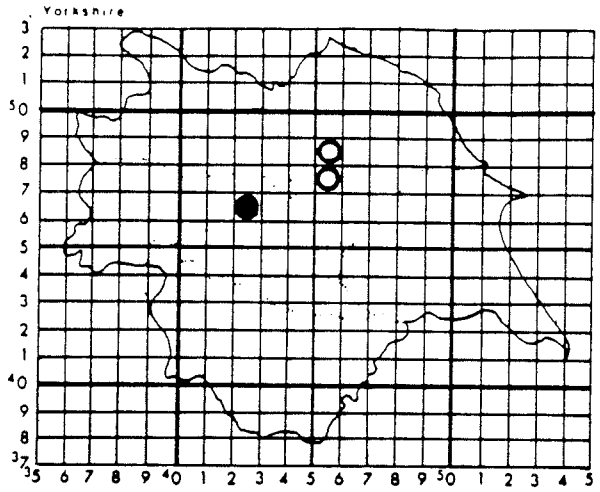
(19) (MAP 32)

Polydesmus gallicus

Another late addition to the county list. These records represent the most northerly records for the species for mainland Britain. One might legitimately ask whether or not this is an example of a species which is the process of extending its range and whether or not the River Tees will act as a barrier to it crossing the borders into County Durham. The majority of the records so far are from the southern part of the county or is this an example of collector bias; after all this is the heart of the W.A. Ely territory. Whilst at the moment it must be classed as somewhat rare, it is interesting to note when found it is often in colonies of considerable numbers. First record March 1986: W.A. Ely, Rotherham area (43/49)

(14) (MAP 33)

27



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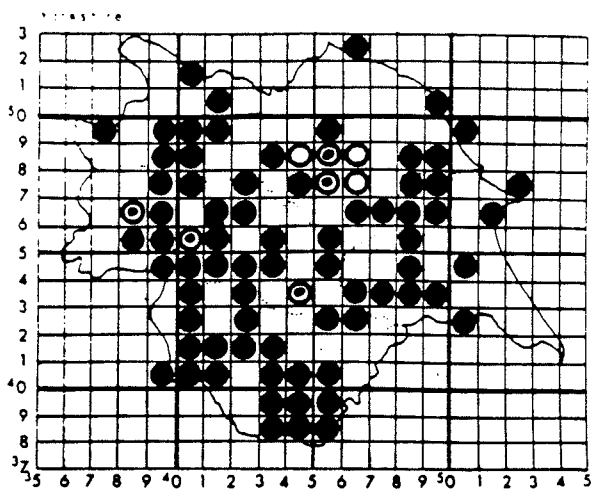

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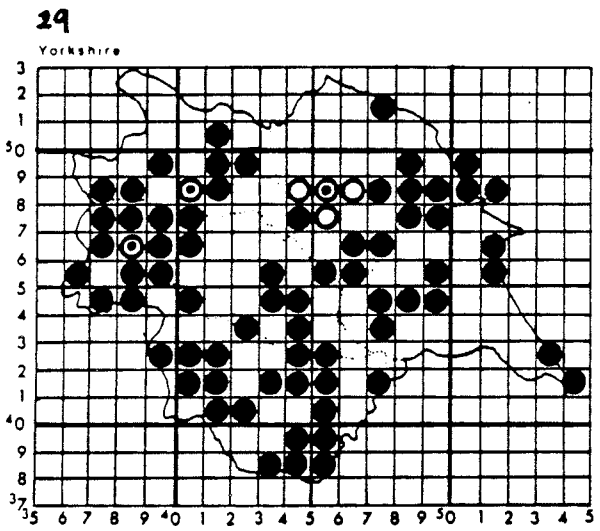

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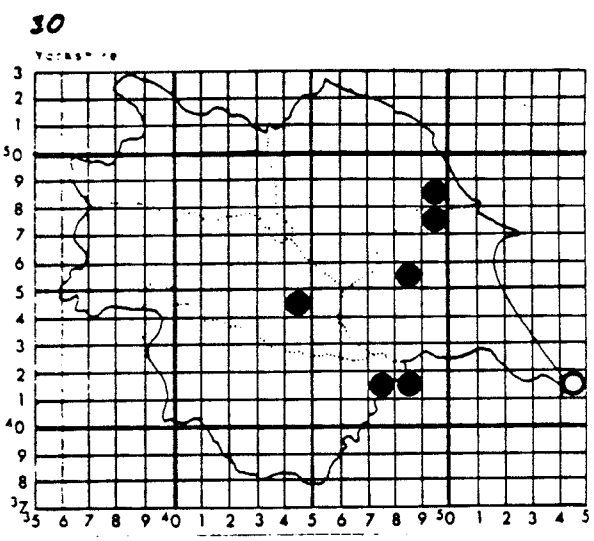

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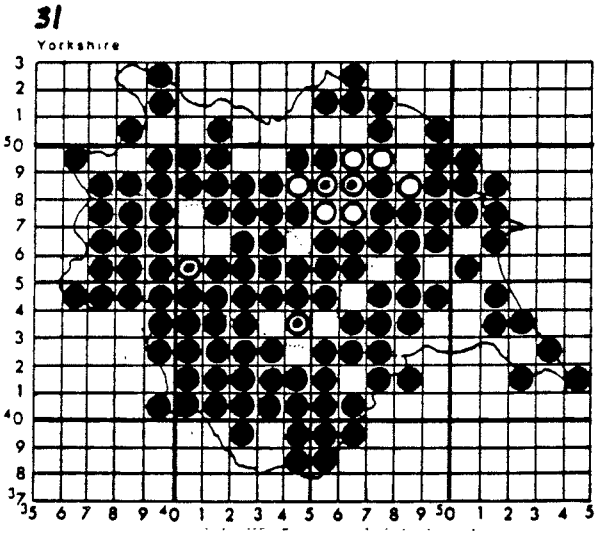

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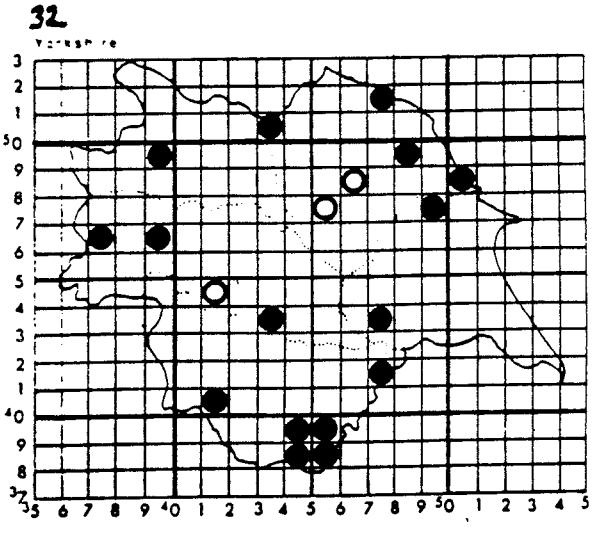

Polydesmus denticulatus

Our 'mystery species'. It has never turned up in any numbers and most of the records can be referred to single specimens found quite at random and whilst some records are from woodland, in our case calcareous, an equal number are from under stones on calcareous grassland. Which is somewhat of a contradiction to the observations by Blower who quotes it as a common inhabitant of often acid oak and mixed deciduous woodlands (Blower 1985). First record August 1954: J.G. Blower, Easingwold area (44/57)

(21) (MAP 34)

Brachydesmus superus

Given its size and the ease with which it can be confused with immature polydesmid species in the field unless extra care is taken, one can with some confidence predict that its distribition within the county will eventually prove to be ubiquious. First record June 1950: P.M. Butler, Spurn (54/41)

(45) (MAP 35)

Macrosternodesmus palicola

Another latecomer to the county list. Its extremely small size has no doubt contributed towards the paucity of records and we have to thank B.M.G. member Paul Lee for having taken a specific interest in the species and rapidly "got his eye in" when it comes to recognising conditions and habitat favoured by this beast. There may be some significance in the fact that so far all the records are from sites with synanthropic associations. First record Oct 1985: P.Lee Riddlesden near Keighley (44/04) - domestic garden.

(8) (MAP 36)

Ophiodesmus albonanus

A rarity, or too small for the average collector to easily see, may well be the question. The first record for the county was way back in 1921 by R.S. Bagnall. Bagnall writes Malton, Yorks (Nr Richmond); Blower interprets this as Moulton, near Richmond (Blower 1952) - it should read Mouldron, near Richmond (45/16-03). No further records were made until July 1988 when P.Lee and D.T. Richardson unearthed specimens from under top-stones on a wall in the grounds of Lotherton Hall Leeds (44/43). All the records are from synanthropic sites. Another species adopted by "hawk-eyed" Paul Lee.

(5) (MAP 37)

Oxidus gracilis

My own feeling is that this should not be represented as a Yorkshire species; it is an introduced one which is totally dependent upon artificial conditions for its survival. In any case it is declining as more and more heated greenhouses, particularly those in municipal care, disappear from the scene. Some may argue 'What about the garden centre?' I would have thought few will provide a permanent home for Oxidus; as stock is changed and moved round too frequently and managers are usually heavy handed with horticultural chemicals. First record 1912 R.S. Bagnall. Ravensworth (45/14-07-) heated greenhouse - no doubt long gone. Up to 1981 there was more than a thriving population under plant pots on gravel-filled staging in the heated "Fern House" at the Univeristy of Leeds Botany Department Experimental Gardens (44/289357) - no doubt still there - particularly as this was the one greenhouse which was never fumigated or treated with chemicals of any kind.

(3) (MAP 38)

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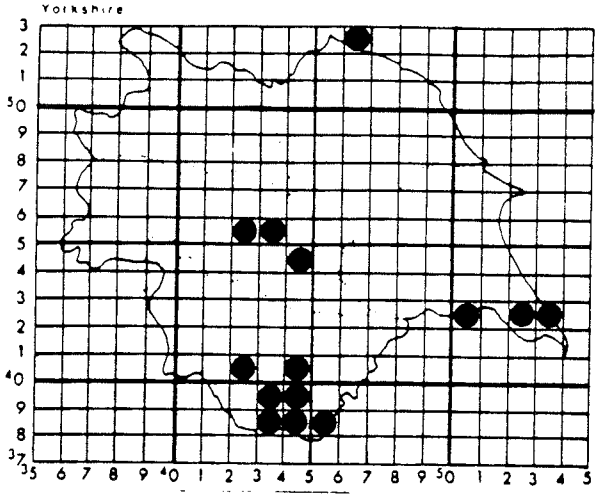

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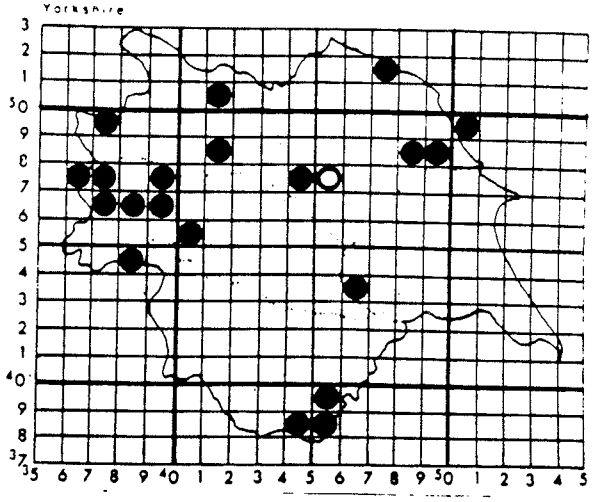

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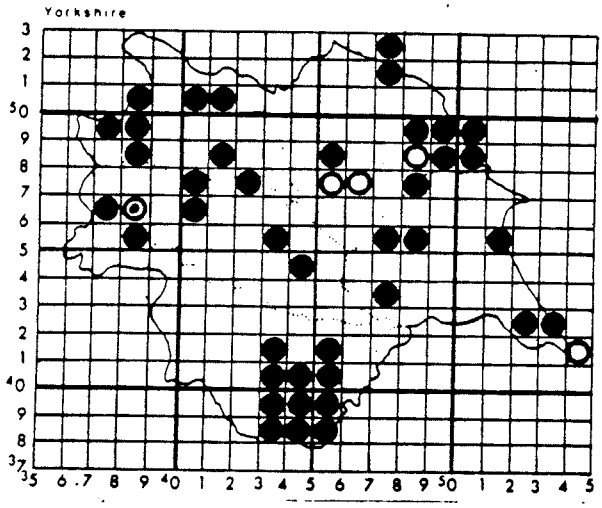

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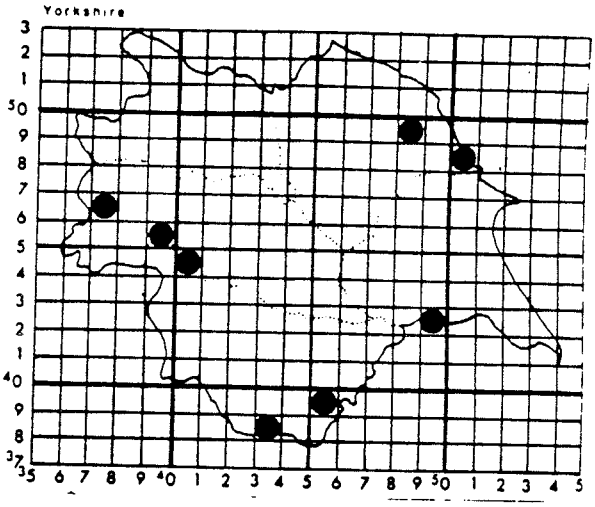

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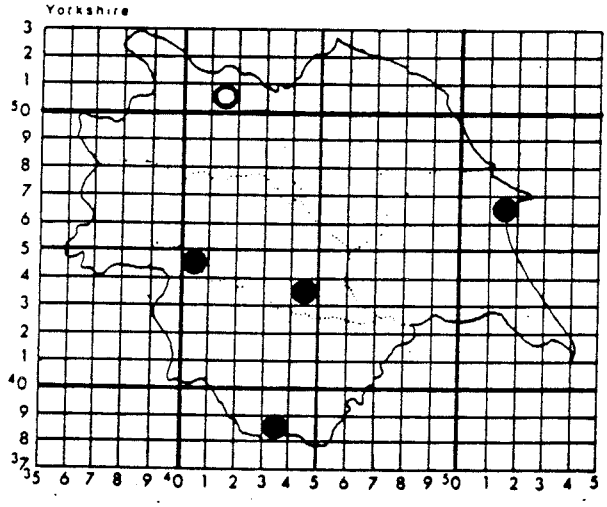

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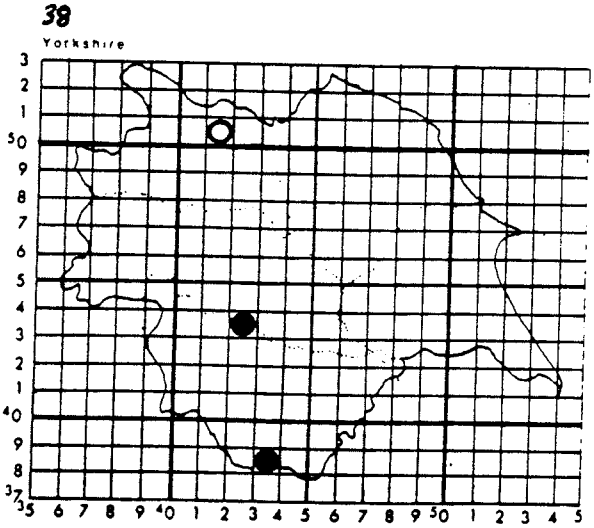

PROBABLES

Those who attend B.M.G. annual gatherings are fully aware that anything can turn up at these meetings - there has not been one yet that has not seen something new added to a county list - why not Yorkshire? Here goes - what are the odds in favour of the following?

Brachychaeteuma bradeae (Brolemann & Brade Birks 1917)

The most recent north of England record for this species was in 1983 from the grounds of St Martin's College, Lancaster, Lancashire (Blower, J.G. 1986). Any reason why it should not turn up in adjacent Yorkshire?

Chordeuma proximum (Ribaut 1913)

Whilst possibly a "rank outsider" one cannot ignore its apparent rapid spread in Carmarthen and Cardigan in South Wales (Morgan I.K. 1986). No harm being aware of such phenomena; be ready should the species appear! (Blower 1985)

Melogona gallica (Latzel 1884)

There seems to be some evidence that this species is gradually extending its range northwards although it is decidedly western. At the moment its nearest approach to Yorkshire is the Delamere Forest in Cheshire (33/57) some 100km to the west and 10km south. Perhaps a remote possibility.

Thalassisobates littoralis (Sylvestri 1903)

Coastline of the Isle of Man, Kent estuary in Lancashire - all warmed by the Gulf Stream and with the characteristics of mud-flats. Whether or not it will turn up in sites like the Humber estuary and the more sandy much colder shorelines of the east coast of Yorkshire is perhaps another question, but one should keep an open mind.

Eumastigonodesmus boncii (Brolemann 1908)

The only claim for inclusion on this list is that the only British record stems from adjacent County Durham (Bagnall 1922), where it was found in association with Macrosternodesmus palicola - as our knowledge of the latter species increases will yet another Eumastigonodesmus come to light? Luck, not expertise, may well be the criteria in this case - not very scientific but it may well prove to be true.

IMPROBABLES

A study of the habitat and distribution data in Blower (1985) leaves little doubt that none of the following species are likely to turn up in Yorkshire:

Adenomeris gibbosa, Mauriès, Polyzonium germanicum, Brandt, Brachychaeteuma melanops, Brade-Birks, Chordeuma sylvestre, C.L. Koch, Cylindroiulus vulnerarius (Berlese), Cylindroiulus truncorum (Silvestri), Entantiulus armartus (Ribaut), Leptoiulus belgicus (Latzel), Leptoiulus kervillei (Brolemann), Metaiulus pratensis, Blower & Rolfe, Unciger foetidus (C.L. Koch), Prosopodesmus panporus, Blower & Rundle, Polydesmus testaceus C.L. Koch.

RECORDS, RECORDING AND RECORDERS

All records have been made in accordance with the guide-lines set out in the "Instructions to Collectors" issued to members of the British Isopod and Myriapod Survey Schemes. Emphasis has been placed on accuracy of identification and it is hoped that no records of doubtful nature have slipped through.

Copies of all records have been transferred to Biological Records Centre on record cards. The writer's own personal records and those of the Yorkshire Naturalist's Union are stored on a 3-card system having a 6" x 4" format which is conveniently stored in standard office equipment. Cards as follows:

1. A Y.N.U. 10Km square map card as illustrated elsewhere in this paper - one for each individual species.

2. A 10Km square card - a single card for each 10Km square on which is entered all the species found in the square. The advantage of this should be quite obvious to anyone working on a 10Km square unit basis.

3. A species, locality, habitat card - again one for each species on which is entered:

   Locality, Habitat, N.G.R., 10km Square, Altitude, Vie County, Date, Collector, Determiner

   A format which allows easy transfer to electronic data base.

The system has proved very effective but like all systems it is not perfect, and if a large number of species have to be dealt with, entries along these lines become very time consuming.

As from 1st January 1990, following the introduction of the Yorkshsire Naturalists' Union "Other Arthropods" field record card, records are being filed on a 10Km square basis sub-divided within each 10km square into 1km square order.

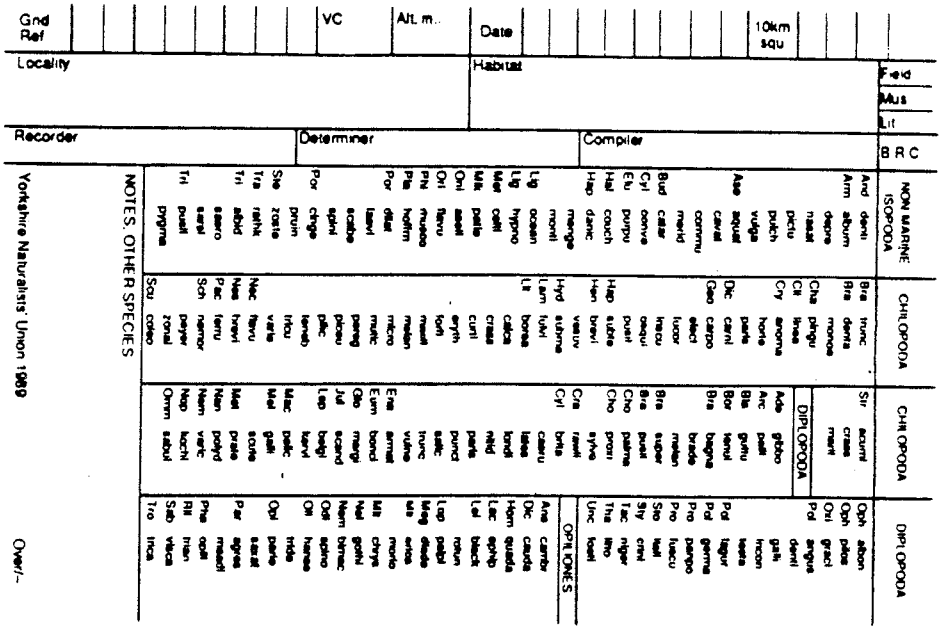

Figure 1: Y.N.U. Record card

The system has been extended to the introduction of a single card for each individual 10km square, these listings providing a rapid method of assessing what has and what has not been found in a 10km square. The main disadvantage is that it is necessary to know the 10 or 1km square in which a site is located in order to run down an individual site; the advantages are that the cards can be filled-in in the field and a lot of information can be stored in a relatively small space. The panel marked BRC is only crossed through after details have been transmitted to Biological Records Centre.

RECORDERS

The following have contributed to the survey, those singled out for special mention are listed elsewhere. Names marked '*' are members of the Yorkshire Naturalists' Union.

Addey, J.E.
* Armitage, J.S.
Barber, A.D.
* Blower, J.G.
Butterfield, J.
* Crawshaw, D.I.
* Denton, M.L.
* Ely, W.A.
Fairhurst, C.P.
Fogan, M.
* Frost, C.
* Fussey, G.D.
Garland, S.P.
Harding, P.T.
Jackson, N.
Keay, A.N.
* Kendall, P.
Kime, R.D.
* Lee, P.
* Lloyd-Evans, L.
Maude, D.
* Norris, A.
Pearce, E.J.
Redgate, N.
* Richardson, D.T.
* Skidmore, P.
* Smith, C.J.
Speck, K.
* Sutton, S.L.
Varndell, J.M.
Whiteley, D

VOUCHER SPECIMENS

The personal collection of the writer consisting of over 1500 tubes mainly Yorkshire material, in 70% alcohol collected between 1973 and 1985 has been passed to Leeds City Museum; access is by arrangement with the museum authorities. This is the only up to date collection of Yorkshire material.

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Gordon Blower and Colin Fairhurst for encouragement and assistance with identification of specimens especially in the early days.

Paul Harding for freely giving access to data stored at the Biological Records Centre.

The Nature Conservancy Council for financial assistance towards printing of the various Yorkshire Naturalists' Union record cards and to the Yorkshire Naturalists' Union itself for support and encouragement.

LOOKING AHEAD

The publication of this paper does not signal the end of the work, in fact it is quite obvious from the distribution maps alone that there are many avenues which can be advantageously explored. Emphasis will be placed on what currently appear to be rare and/or sparsely distributed species - only time will tell whether the pictures currently presented are the correct ones, like Cylindroiulus londinensis and Oxidus gracilis some species may be on the decline, others may not.