Strong attachment of male to female *Walckenaera unicornis* (Araneae: Linyphiidae)

by Stanley Dobson

On 18th May 1985, whilst searching through tussocks of marram grass, *Ammophila arenaria*, at Gibraltar Point, Lincolnshire, I saw a small spider, which later proved to be a female *Walckenaera unicornis*, dragging something as it ran. Now it is not uncommon to see spiders carrying prey, but I had never before seen prey being dragged, which is what at first I thought was happening; however, on getting the spider into a tube and examining it through a hand lens, the 'prey' turned out to be a male of the same species with a palp inserted and being towed by this means only. It was quite passive with all appendages, apart from the one palp, folded closely to its body and was obviously very strongly attached, despite having been dragged over a rough surface when found, sucked into a pooter, blown into a tube and suffered the gyrations of the female dashing up and down the confined space. After about ten seconds, it broke free and immediately became a normal, active individual, apparently none the worse.

There is, of course no way of telling whether the behaviour of the male was due to sheer persistence or whether it really had difficulty in disengaging itself.

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A Shoe-box in a Cellar in Rochdale (British Fossil Scorpions)

by Paul A. Selden

About three hundred million years ago a scorpion died in Rochdale. It had been living on the forest floor, perhaps feeding on cockroaches and other insects much as its descendants do today, but perished when the nearby river broke its bank and flooded the forest, entombing the scorpion in silt. As the carcass decayed, so iron salts accumulated around it, later hardening to form an ironstone nodule. Almost three hundred million years later, the light of day again shone on the scorpion when its nodule was split apart by Mr H. Howard, an amateur fossil collector. His collection of fossils from the brick pit at Sparth Bottoms, Rochdale found its way to Rochdale Museum where Mr F. Holt recognised the arthropods and sent them to Dr Henry Woodward in the British Museum in London. Dr Woodward passed the arachnids, including the scorpion, on to Dr R. I. Pocock, the eminent arachnologist at the Zoological Society of London. The scorpion gained its long-awaited fame when Pocock described it as a new species, *Eobuthus holti*, and figured it in his monograph (Pocock, 1911). Pocock obviously thought Holt was the collector, but by the time the mistake, was realised the manuscript had gone to press and Mr Howard is only now receiving his overdue recognition.

Petrunkevitch was the next arachnologist after Pocock to study fossil scorpions, but the type specimen of *Eobuthus holti* could not be found on his visit to Europe and nor could Kjellesvig-Waering find it on his visit in preparation of his monograph (in press). However, Fiona Mackenzie, assistant curator in the Rochdale Museum, telephoned me recently with the news that she had found two halves of an ironstone nodule from Sparth Bottoms containing a fossil scorpion, together with some other specimens, in a shoe-box in the basement of Rochdale Museum. One glance at this specimen next to Pocock's figure was sufficient to confirm that this was indeed the lost holotype of *Eobuthus holti*.

Fossil scorpions are relatively common in British Carboniferous rocks, far more abundant than, for example, spiders (see Selden, 1984), and a complete list of British scorpions known to me is given below:

**Paleophonus caledonicus* Hunter	Silurian, Lesmahagow, Scotland (Scot.)
Dolichophonus loudonensis Laurie	Silurian, Pentland Hills, Scot.
Archaeoctonus glaber (Peach)	Carboniferous (Carb.) Dumfriesshire, Scot.
Eoscorpius sparthensis Baldwin & Sutcliffe	Carb., Rochdale, England, (Eng.)
**E. dunlopi* (Pocock)	Carb., Airdrie, Scot.
**Alloscorpius wardingleyi* Woodward	Carb., Rochdale, Eng.
**Benniescorpio tuberculatus* (Peach)	Carb., Fifeshire, Scot.
**Trigonoscorpio? sutcliffei* (Woodward)	Carb., Rochdale, Eng.
Buthiscorpius buthiformis (Pocock)	Carb., Rochdale and Coseley, nr Dudley, Eng.
**B. major* Wills	Carb., Notts, Eng.
Lichnoscorpius minutus (Petrunkevitch)	Carb., Coseley, Eng.
**Lichnophthalmus pulcher* Petrunkevitch	Carb., Co. Durham and Barnsley, Eng.
**Typhlopisthacanthus anglicus* Petrunkevitch	Carb., Coseley, Eng.
Compsoscorpius elegans Petrunkevitch	Carb., Coseley, Eng.
**C. elongatus* Petrunkevitch	Carb., Coseley, Eng.
**Typhloscorpius distinctus* Petrunkevitch	Carb., Coseley, Eng.
**Europhthalmus longimanus* Petrunkevitch	Carb., Co. Durham, Eng.
**E.* cf. *longimanus* Petrunkevitch	Carb., Coseley, Eng.
**Europhthalmus?* sp.	Carb., Barnsley, Eng.
Eobuthus rakovnicensis Fritsch	Carb., Rochdale, Eng.
E. holti Pocock	Carb., Rochdale and Nottinghamshire, Eng.
Pareobuthus salopiensis Wills	Carb., Shropshire, Eng.
Centromachus euglyptus (Peach)	Carb., Dumfriesshire, Scot.
Mesophonus perornatus Wills	Trias, Bromsgrove, Eng.
**M. bromsgroviensis* Wills	Trias, Bromsgrove, Eng.
**M. gracilis* Wills	Trias, Bromsgrove, Eng.
**M. opisthophthalmus* Wills	Trias, Bromsgrove, Eng.
**M. pseudogracilis* Wills	Trias, Bromsgrove, Eng.
M. pulcherrimus Wills	Trias, Bromsgrove, Eng.
M. pulcherrimus var. *immaculatus* Wills	Trias, Bromsgrove, Eng.
various juvenile *Mesophonus* 'spp.'	Trias, Bromsgrove, Eng.
Spongiophonus pustulosus Wills	Trias, Bromsgrove and Birmingham, Eng.
Wattisonia coseleyensis Wills	Carb., Coseley, Eng.
Paleomachus anglicus (Woodward)	Carb., Birmingham and Nottinghamshire, Eng.
Praearcturus gigas Woodward	Devonian, Herefordshire, Eng.
Gigantoscorpio willsi Størmer	Carb., Dumfriesshire, Scot.
G. cf. *willsi* Størmer	Carb., Berwickshire, Scot.
Brontoscorpio anglicus Kjellesvig-Waering	Silurian, Birmingham, Eng.

*Denotes names suppressed or transferred to other genera by Kjellesvig-Waering (in press); some unmarked species transferred to other genera by Petrunkevitch are reinstated by Kjellesvig-Waering and herein.

Additionally, unidentifiable scorpion remains are known from most British coalfields, and furthermore, a number of new British species, including one from Rochdale, are described in Kjellesvig-Waering's forthcoming monograph.

Notice that no fossil scorpions are recorded in Britain between the Trias and the present day (a living colony exists in Kent: Wanless, 1977). There are a number of reasons for this: first, scorpions live principally in warm climates and Britain has been drifting northwards out of low latitudes since the Trias; second, there are few terrestrial deposits known in Britain later than the Trias; third, and most interesting, is that scorpions were apparently far more diverse and abundant in the Carboniferous (32 families recognised by Kjellesvig-Waering, in press) than today.

Scorpions are important components of the terrestrial fauna in hot climates and were far more so in late Palaeozoic times. New techniques for extracting arthropod remains from coals and other terrestrial sediments are yielding abundant scorpion fossils which will ultimately tell us a great deal about the lives of these fascinating arachnids in the heyday of their long history.

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Aulonia albimana (Walckenaer) (Araneae: Lycosidae) found again in Britain

by D. J. & M. J. Roberts

Paul Hillyard arranged with the Ministry of Defence to carry out a spider survey of Newtown Rifle Ranges, Locksgreen, Isle of Wight on 11th May 1985 and asked us to participate. Because we had to travel a fair distance, we extended our visit from 8-12th May and were able to do some pitfall-trapping as well as fairly intensive hand-collecting. Dr E. J. Lovell also joined us for a few hours, and between us we recorded 133 species. The area includes saltmarsh, deciduous woodland and an extensive area of unimproved herb-rich neutral grassland. It was only when we examined our material at home that we recognised two juvenile *Aulonia albimana* which had been collected by sieving moss/grass clumps. We knew exactly where the specimens had been taken: from a spot which received only perfunctory attention just before we left for home! We realised that we would obviously have to go back and look for adults. As we were in Dorset for the excellent symposium on spider ecology at Furzebrook, we took the opportunity to revisit the Isle of Wight on 29th June. We very quickly found a pair of adult *Aulonia* in a tiny hollow in the soil, at the base of dense grass stems, in the same spot as we had taken the juveniles.

The only known locality for *Aulonia* in Britain was a gravel pit near Dunster, Somerset. Unfortunately, the habitat there has been destroyed and the species was feared extinct from the British Isles. Parker and Coleman (1973) raised the possibility of some association between the spider and foliaceous lichens, and for this reason we spent some time looking in lichen-rich areas. We found no *Aulonia* but added *Agroeca striata* Kulczynski to the species list. In Germany, Job (1968) observed *Aulonia* making a very flimsy sheet-web with a tubular retreat in moss. We had no chance to confirm this, and in any case were concerned not to disturb the habitat unduly.

It does seem quite possible that, on Newtown Ranges, *Aulonia* is confined to one very small area. This roughly rectangular area is sheltered from the wind on three sides and has the fourth side (facing S.S.E.) open to the sun; a trench running along this open side probably discourages trampling. The site, fortunately, is inaccessible to the general public.

Aulonia may occur in other parts of the island, including neighbouring M.O.D. and National Trust lands. Possibly this note will encourage others to look for it.

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Transpiration in Ultra-Violet Light from a Scorpion

by C. Constantinou & J. L. Cloudsley-Thompson

It has long been known that scorpions fluoresce very strongly when exposed to ultra-violet light (Cloudsley-Thompson, 1978). The region of the integument in which this property resides has been shown to be the hyaline exocuticle (Constantinou, 1984). No explanation has yet been proposed of the function of fluorescence, but the following experiment suggests that the chemical responsible may be related in some way to the reduction of water loss by cuticular transpiration.

Water loss from a living adult specimen of *Androctonus crassicauda* (Olivier) weighing 5.57 g (collected by J. L. Cloudsley-Thompson in Kuwait in April 1983) in dry air (over anhydrous calcium chloride) at 23°C was assessed by weighing, over a period of 3 days in darkness. The mean rate of water loss was 0.69(±0.11 SE) mg h^{-1}. The scorpion was then placed in ultra-violet light ($700 \mu W cm^{-2}$) and its rate of water loss again measured by daily weighings over a period of 15 days. The mean rate of water loss throughout this period was 1.38(±0.08) mg h^{-1} after which time about all the scorpion's fluorescence had been lost. From these results it appears that the scorpion lost water at a considerably greater rate when in ultra-violet light than when in darkness, other conditions being the same.

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