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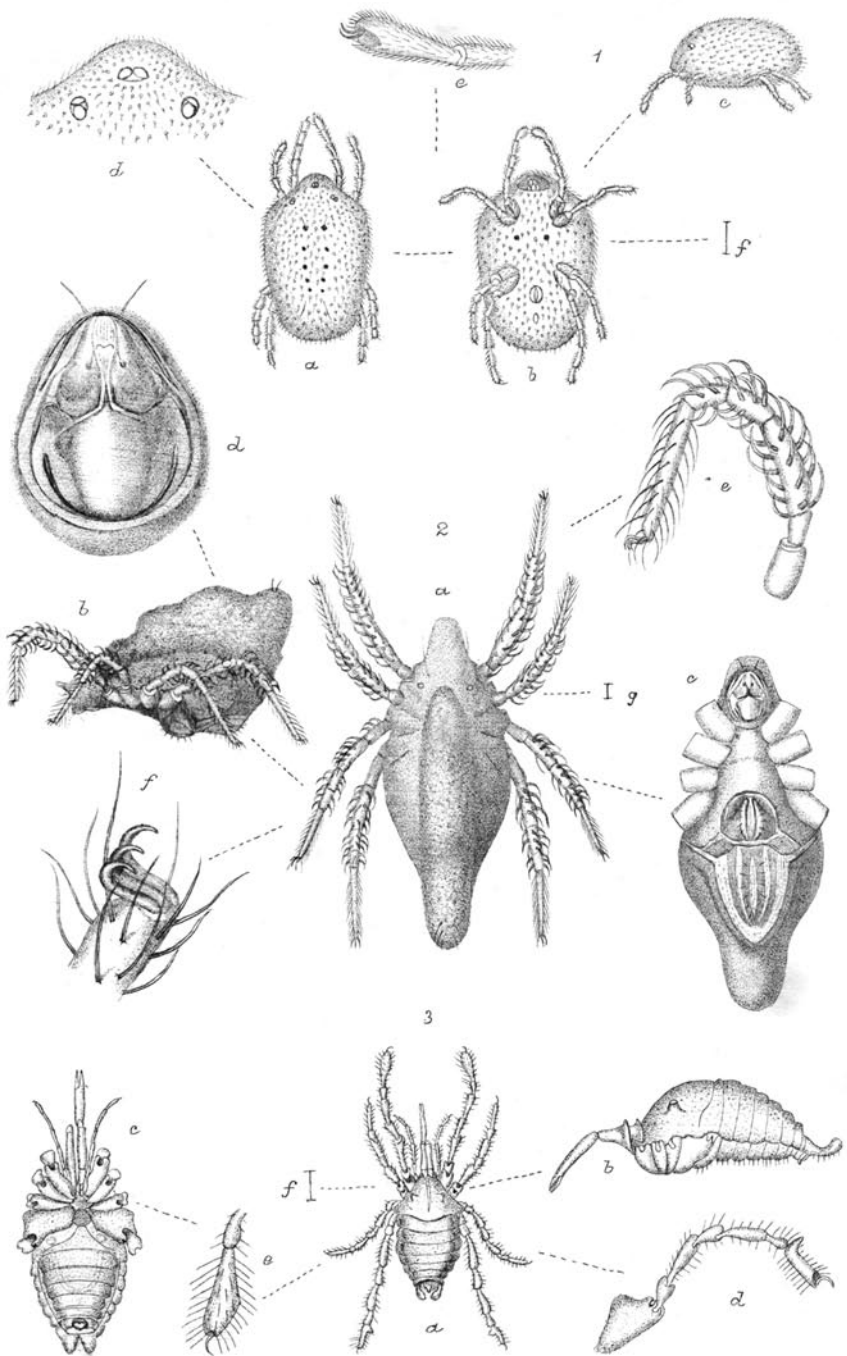
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- Fig. 3.* The nervous ganglia and ring, much enlarged. A, superior ganglion; B, inferior ganglion.
- Fig. 4.* *a*, groups of brightly coloured fatty globules forming the contents of the diverticula of the intestine; *b*, portion of the vascular trunk, much enlarged.
- Fig. 5.* Portion of the invaginated proboscis, much enlarged. *a*, external gelatinous layer; *b*, internal muscular layer; *c*, cavity continuous with that of the proboscis-sac; within these the invaginated portion of the proboscis with the layers reversed; *b*, internal muscular layer; *a*, external gelatinous layer; *d*, central tube filled with dark amorphous matter (from the proboscis-sac?).

LIII.—On three new and curious Forms of Arachnida. By the Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S., Hon. Memb. N.Z. Inst.

[Plate XIII.]

THE three singular Arachnids described in the following pages belong to widely separated localities. The *first* (*Calyptostoma Hardii*, upon which I have based a new genus of the family Trombidides in the order Acaridea) is a British form, discovered by Mr. James Hardy (of Old Cambus, Berwickshire) on Cheviot Hill, Northumberland, and sent to me among numerous examples of spiders. The *second* (*Westwoodia obtecta*) is of the order Phalangidea, and appears to me incapable of inclusion in any family or genus hitherto characterized; it is altogether one of the most remarkable Arachnids that have lately come under my notice: owing, however, to the minuteness of the creature itself (less than 1 line in length), and the necessarily still more minute and curiously concealed mouth-parts, the special structure of these important features is uncertain; and their minuteness also almost precludes the possibility of satisfactory dissection. Probably, when in use, the parts of the mouth (the palpi and falces at least) could be extruded; so that we must await the examination of living specimens for further knowledge of their structure. This minute Arachnid was received from Otago (New Zealand), where it was found by Capt. F. W. Hutton, and kindly sent to me among other examples of this class. The *third* is also of the order Phalangidea, family Cyphophthalmides (Joseph), genus *Cyphophthalmus* (ejusd.), of which it is a very distinct new species; it was sent to me, among numerous other new and rare Arachnids, from Ceylon, by Mr. G. H. K. Thwaites. For this, which in its general appearance bears a strong resemblance to some forms of Hemiptera heteroptera, I propose the name of *Cyphophthalmus cimiciformis*.



Order ACARIDEA.

Family Trombidides.

Gen. nov. CALYPTOSTOMA.

Characters of the Genus.

Body oblong oval, rather broader before than behind (the fore part somewhat obtusely subangular), upper surface very convex; epidermis continuous, without any contractions or foldings to indicate the limits of the cephalothorax, caput, or abdomen.

Mouth-parts apparently very minute, concealed in a deepish circular cavity at the extremity of the fore part.

Eyes six in number, in three pairs, forming a triangle on the upperside of the fore part of the body; the apex of the triangle (being the most obtuse of its angles) directed forwards: the eyes of each pair are contiguous to each other, and seated on very slight tubercles.

Legs short, slender, 7-jointed; the legs of the first and second pairs and third and fourth pairs, respectively, on either side, have their basal joints in contact with each other, describing nearly a square on the under surface of the body, towards the fore part; their relative length appears to be 4, 1, 2, 3, though those of the fourth and first pairs are very nearly of the same length, and those of the third pair but little, if any thing, shorter than those of the second. Each tarsus terminates with two curved claws, which spring from a cleft at the extremity of its upperside.

The *genital aperture* (♀) is placed just behind the basal joints of the third and fourth pairs of legs.

Calypstoma Hardii, sp. n. Pl. XIII. fig. 1.

Adult female, length 2 lines.

The colour of this interesting Acarid is a uniform reddish yellow (which, however, may possibly, in life, have been a bright red), the legs and genital and anal apertures being light yellow-brown; the whole epidermis, which is of a somewhat coriaceous nature, is thickly covered with minute round punctures, connected, in somewhat regular series, with slight groovings or wrinkles of the skin; and from each puncture there issues a short, strongish, curved, pale amber-coloured diaphanous bristle. Ten small dark red-brown points, or spots, in so many very slight depressions of the surface, and forming two longitudinal lines, occupy the median line of the upper surface; from behind each of the last two of these points runs a short oblique line or very slight indentation. The underside has two small

dusky red-brown spots, one a little way behind each of the basal joints of the second pair of legs. The genital aperture has a somewhat corneous appearance; it is of an oval form, convexly prominent, and divided longitudinally by a gaping incision; not far behind it is the anal orifice, which is of the same form and character externally as the genital aperture, though not a fourth of its size.

The *eyes* (seated as above described) are very distinctly visible: those of the foremost pair (forming the apex of the triangle in which the three pairs are placed) are of a triangular shape, closely contiguous to each other, and smallest of the six; those of each lateral pair are also contiguous, on a distinct tubercle, the posterior eye of each being the largest of the six; they are of a pale dull amber-colour, and margined with red-brown.

The *legs* are furnished with short hairs; the basal joints are the strongest; the next are very short, and turned on the outer side: the tarsi, metatarsi, and femora of each pair are of very nearly equal length; the tarsi of the first pair are rather dilated towards their fore extremities, and are (like those of the other three pairs) cleft at the fore extremities on the upperside, two apparently simple terminal curved claws springing from the cleft.

The *palpi* are very minute, and, with the other parts of the mouth, placed at the bottom of a deep circular pit or cavity at the extreme fore end of the body; being thus minute, and sunken below the surface, as well as covered with the hairs fringing the cavity, their form and structure could not be ascertained with the magnifying-powers at my disposal.

Two examples (both females) of this remarkable Acarid were received, among numerous spiders, from Mr. James Hardy, of Old Cambus, Berwickshire, by whom they were found (probably among moss) on Cheviot Hill. It is unlike any thing I have ever seen before; and Dr. L. Koch agrees with me in the opinion that it is new to science. The curious position of the parts of the mouth, with the eyes and other characters, necessitates the formation of a new genus for its reception. It is with much pleasure that I connect the name of Mr. Hardy with this interesting addition to the known species of our indigenous Acaridea.

Order PHALANGIDEA.

Fam. nov. *Crotonoides*.

General appearance somewhat Acarideous, the caput, thorax, and abdomen being so united as to make their junc-

tions imperceptible. Legs nearly equal in length; thorax and abdomen surmounted by a large, somewhat irregular elongated hump or eminence, sloping upwards from the fore to the hinder part.

Habit of life and habitat unknown.

Gen. nov. WESTWOODIA.

Characters of Genus.

Cephalothorax and *abdomen* with no apparent divisional marks, but elevated gradually to a considerable height at the posterior extremity of the latter.

Eyes two, one on either side, just above the basal joints of first pair of legs.

Mouth-parts very minute, closely compacted, and almost entirely concealed within an oval corneous cavity beneath the caput, just in front of the first pair of legs. Genital aperture of considerable size, close behind the basal joints of the fourth pair of legs. Anal orifice (?) of still larger dimensions, a little way behind the genital parts, at the lower extremity of the hinder part of the abdomen.

Legs 6-jointed, articulated beneath the cephalothorax, but with no distinct sternum; relative length 1, 4, 2, 3, but not greatly differing in actual length; tarsi rather long, undivided, and terminating with three claws of equal size, and, apparently, side by side, *i. e.* not divided into a superior pair and a single inferior claw.

Westwoodia obtecta, sp. n. Pl. XIII. fig. 2.

Adult female, length rather less than 1 line.

Looked at from above, this curious Arachnid is of an elongated oval shape, but in profile it is of a triangular form, and nearly black colour mixed with dark red-brown; the fore extremity of the caput projects forwards, and is of a flattened oblong form; the upperside of the abdomen, which is not distinguishable from the cephalothorax, is much elevated, rising gradually from the thoracic region to its highest part at the hinder extremity; the surface is uneven and rough, and the upperside of the abdomen has a laterally crushed appearance, which, however, may be from accidental pressure; it was so covered with debris of an earthy nature, that its texture and clothing were not distinguishable, except a few curved, pale, bristly hairs on the highest (posterior) part of the abdomen: the underside shows a subtriangular space, on either side of which the legs are articulated; behind the legs are two large, oval, rather convex, corneous, red-brown prominences;

the foremost of these is immediately behind the basal joints of the fourth pair of legs, and is divided longitudinally by a gaping incision; the posterior one is much the largest, and has several longitudinal incisions, of which the central one appears to be the true orifice. This latter I take to be the anus, the former the genital aperture.

The parts of the mouth (falces, maxillæ, palpi, and labium) are exceedingly minute, and packed away within a large oval cavity beneath the caput and close in front of the basal joints of the first pair of legs. The details of the form and structure of these parts are incapable of satisfactory observation by even a lens of high magnifying-power; there appears, however, to be a labium of considerable size, with two pointed oval parts in front of it, which I take to be the forcipate extremities of the falces. No palpi could be discerned.

The *eyes* are two in number, small, and widely separated from each other, in a transverse line near the hinder part of the caput, just above the basal joints of the first pair of legs.

The *legs* are short and strong, and do not differ much in their length; those of the first pair appear to be rather the longest, then those of the fourth pair, and the third pair rather the shortest. The separate joints were (some of them at least) scarcely discernible, owing to the spines and bristles with which they are furnished being almost completely matted with earthy particles; but there appear to be six joints, of which the terminal one is long, nearly cylindrical in form, and undivided, but probably representing the ordinary tarsal and metatarsal joints, and ending with three rather long and somewhat S-curved diaphanous claws, placed side by side in close contiguity to each other, besides numerous bristles and hairs of a similar nature; the uppersides of some of the other joints are furnished with blunt spinous tubercles surmounted by a curved bristle.

A single example of this remarkable Arachnid was received in 1874 from Otago, New Zealand, where it was found by Capt. Hutton, who kindly sent it to me among some spiders from the same locality. Although, for the reasons mentioned above, I am unable to give a satisfactory description of some important portions of structure, yet the mere position of the mouth-parts, as well as other points in the external structure, is amply sufficient for the characterization of a new and very distinct genus of a new family of Phalangidea.

It is with great pleasure that I confer upon this genus the name of Professor Westwood, to whom the entomological world is indebted for the knowledge of so many strange and singular forms of the Articulata.

Family **Cyphophthalmides**.Genus **CYPHOPHTHALMUS** (Joseph).*Cyphophthalmus cimiciformis*, sp. n. Pl. XIII. fig. 3.Length $1\frac{3}{4}$ line, breadth nearly 1 line.

Nearly the whole of this Arachnid is of a dull amber-colour, the legs and falces being rather paler than the body, the fore part of which (the cephalothorax) is the darkest, the colour of the palpi being palish yellow; the entire surface (including the legs and falces) is completely covered with shallow punctures, giving it a somewhat rugose appearance, with a shining look in different lights; the under surface, as well as the legs and palpi, is furnished with fine hairs; but the upper surface has few or none (perhaps rubbed off).

The form of the cephalothorax and abdomen is oval, the former, however, being of a somewhat subtriangular shape; they are only distinguishable from each other by a transverse suture; the abdomen consists, on the upperside (which with the cephalothorax is considerably convex), of eight segments, of which the last is divided into two roundish caudal prolongations. The segmental plates of the underside, which is much more flattened than the upper, are similar in number; the posterior one contains the anal orifice, which is of a transverse oval form and a little prominent; the inferior segmental plates are quite separate from the superior (see fig. 3, c), the latter forming a strong projecting lateral marginal ridge: in front of and adjoining the foremost inferior segment is a small, subtriangular, dark reddish-brown corneous plate, the fore side of which is free; this plate is no doubt the covering of the genital aperture, which, as far as concerns the external appearance, is probably similar in both sexes. Immediately in front of this is a small sternal point, at which the basal joints of the legs meet; directly in front of this, between the basal joints of the first pair of legs, are two pairs of very small, but prominent, white maxillary organs; the foremost pair of these is the largest; the hinder extremities of the basal joints of the second pair of legs are a little prominent, and appear to subserve the part of a labium, and to form the hinder boundary of the mouth. These maxillary organs seemed to be independent of the ordinary maxillæ, *i. e.* the basal joints of the palpi; but the mouth-parts are so crowded together behind the basal joints of the first pair of legs, that, without very careful and skilful anatomy, their structure and position can scarcely be ascertained. The spiracles (two in number) are

very indistinct, one on either side of the first segment, underneath the fore extremity of the abdomen.

The *cephalothorax*, united to the abdomen as above mentioned, slopes forward by an even curve slightly steeper than that of the abdomen.

The *eyes* are two in number, and seated on two blunt, conical, tubercular eminences, one on either side of the upper fore part of the caput; they are rather small and indistinct, being coloured like the surrounding surface.

The *legs*, consisting of seven joints, are moderately long and tolerably strong, their relative length being 4, 1, 3, 2, the difference between 3 and 2 being exceedingly small, if any; the basal joints are strong, those of the fourth pair inordinately so, showing in this feature an affinity to *Gonyleptes*: the tarsi end with a single, strong, curved, simple claw, and are much longer than the metatarsi; they are undivided, those of the fourth pair having a conical protuberance at their base on the upperside, and those of the first pair being strongly protuberant or tumid on their undersides near the middle.

The *palpi* are moderately long, slender, and destitute of any terminal claw; the radial is longer than the cubital, which last is of the same length as the digital joint.

The *falces* are long, three-jointed; the basal joint short, with a small eminence on the upperside: the second joint strong and rather long, but not so long as the third; it is of a somewhat subconical form, with a small protuberance at its base on the upperside, in contact with that on the first joint: the terminal joint is long (longer than the two others together); it tapers slightly towards the fore extremity, which terminates with a small denticulate forciple.

A single example of this curious and distinct species was received from Mr. G. H. K. Thwaites, by whom it was sent to me from Ceylon.

Three species only (including the present) are yet known of this genus:—one, *C. duricorius*, Joseph (from the Luëger Cave in Carniola), upon which it was founded by Herr Gustav Joseph; another, *C. corsicus*, Sim., from Corsica; and the present, from Ceylon. It appears to me questionable how far the genus *Stylocellus* (Westwood) is distinct from *Cyphophthalmus*. I have not yet had an opportunity of examining *S. sumatranus*, Westw., the type of *Stylocellus*; but, from the description and figures of it ('Thesaurus Entomologicus Oxiensis,' 1874, p. 200, pl. xxxvii. fig. 7), there would seem to be no sufficiently distinctive characters for the foundation of a separate genus.

EXPLANATION OF PLATE XIII.

- Fig. 1. *Calypstoma Hardii*: *a*, magnified view, from above; *b*, ditto, underside; *c*, ditto, in profile; *d*, fore part more enlarged, showing the eyes; *e*, tarsus of leg of first pair; *f*, natural length.
- Fig. 2. *Westwoodia obtecta*: *a*, magnified view, from above; *b*, ditto, in profile; *c*, underside, with legs truncated; *d*, oval cavity containing the mouth-parts, highly magnified; *e*, leg of first pair; *f*, terminal claws of ditto; *g*, natural length.
- Fig. 3. *Cyphophthalmus cimiciformis*: *a*, magnified view, from above and behind; *b*, ditto, in profile, with legs and palpi partly removed; *c*, ditto, underside; *d*, leg of fourth pair; *e*, tarsus of leg of first pair; *f*, natural length.

LIV.—*North-Sea Dredging*. By JOHN LECKENBY, F.G.S.,
and J. T. MARSHALL.

THE Dogger bank and its slopes have always been considered (and deservedly) the El Dorado of conchologists; and having made three dredging-cruises there, twice in 1868 and again in August of this year, with results satisfactory to ourselves, and, we hope, of interest to conchologists generally, we are induced to publish a list of those species which have occurred to us, premising that only those are enumerated which have been met with out at sea, between 20 and 90 miles from land, in depths ranging from 7 to 50 fathoms.

The Dogger bank occupies the centre of the North Sea, is 200 miles in length and from 30 to 50 broad, commencing about 60 miles from the Yorkshire coast, and intermediate between the shores of England and Denmark. Its average depth is 15 fathoms, though in a few places it is only 7, with pits of deep water here and there, the most notable of which are the Great and Little Silver Pits and the Well Pit. The Bank gradually slopes into deeper water ranging from 40 to 50 fathoms; and it is here that the rarer species of *Fusi* &c. are found, the fauna on the Bank itself corresponding to that found in shallow water near the shore.

Our dredgings were carried on in a cutter of 45 tons, chartered at Scarborough, with a crew of five Naval-Reserve men.

We have adopted the nomenclature of Jeffreys's 'British Conchology,' and have marked with an asterisk those which have not been before recorded.

Scarborough, October 1875.