Art. XIII.—*On the New Zealand* Pycnogonida, *with Descriptions of new Species.*

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Plates XIV–XVI.

The Pycnogonida form one of the many groups of animals in the New Zealand fauna of which very little is yet known. This is not however to be wondered at, when we consider of how fragmentary a nature the literature of the subject is, and how imperfect our knowledge of the whole group is. Two noteworthy works have however recently appeared, which bring pretty fully together all that is yet known, and at the same time add greatly to the general fund of information. These are "The Report on the Pycnogonida dredged by H.M.S. Challenger," by Dr. P. P. C. Hoek of Leiden, and "Die Pantopoden des Golfes von Neapel," by Dr. Auton Dohrn, both beautifully illustrated. Both works appeared in 1881, but quite independently of one another; and while Dr. Dohrn's work is much the most complete in anatomical detail, it does not help us much in the systematic portion, as the species described are only those new to science which came under the author's observation while working at Naples.

In Dr. Hoek's report a catalogue of all the known species of Pycnogonida is given, and from it we learn that the following species only have been found in the New Zealand seas.

1. *Nymphon compactum*, Hoek.*
2. ,, *longicoxa*, Hoek.*

both dredged from a depth of 1,100 fathoms at a station east of Auckland.

3. *Oorhynchus aucklandiæ*, Hoek,* dredged from a depth of 700 fathoms east of Auckland.

In the New Zealand Journal of Science, vol. i., p. 28, I recorded the occurrence of *Ammothea pycnogonides*, Nob., as common along the East Coast of Otago, but the description of that species is so unsatisfactory, and would apply to so many species of *Ammothea*, that I have re-described it provisionally as *A. dohrni*, and figured it.

I am convinced that a close examination of our seas at moderate depths would reveal a considerable number of new forms, and that the apparent absence of them is chiefly due to their having been overlooked.

In describing the accompanying new species, I need make no apology for giving the characters of the genera, and placing in order all the species now known.

* See N.Z. Journal of Science, vol. i., p. 170-172.

Fam. I. NYMPHONIDÆ.

Mandibles and palpi both present, and strongly developed. Ovigerous legs present in both sexes, and furnished, as a rule, with denticulate spines.

(Only) Genus I. **Nymphon**, Fabr.

Mandibles 2-articulate, cheliform; palpi 5-jointed; ovigerous legs 10-jointed.

1. *N. compactum*, Hoek. (See p. 242.)

2. *N. longicoxa*, Hoek. (See p. 242.)

Fam. II. COLOSSENDEIDÆ.

Mandibles rudimentary or wanting; palpi strongly developed. Ovigerous legs present in both sexes, and furnished, as a rule, with denticulate spines.

Genus I. **Ammothea**, Leach.

Body elongate or disciform, with the segments, as a rule, distinctly separated from one another. Rostrum spindle- or barrel-shaped, usually directed forwards, or sometimes downwards, and generally of considerable size. The abdomen or hind-body is of large size, and usually directed sharply upwards. Ocular-tubercle directed upwards, placed in the centre of the anterior segment.

The mandibles are 2-jointed, but quite destitute of claws. (In immature states they are more or less completely chelate, hence a great confusion has arisen in describing new genera; *Phanodemus*, Costa, *Pephredo*, Goodsir, *Pasithoe*, Goodsir, *Endeis*, Philippi, *Paribœa*, Philippi, *Platychelus*, Costa, *Alcinous*, Costa, and *Achelia*, Hodge, being all probably immature forms of *Ammothea*, as Dr. Dohrn points out.)

Mandibular palpi 8–10-jointed, usually longer than the rostrum, and carried in a bent manner.

Ovigerous legs 9- or 10-jointed, present in both sexes, with or without plumose spines, but without terminal claws.

The legs usually have their terminal claws furnished with secondary claws, and the alimentary cæca reach to the end of their 6th joint.

3. *Ammothea dohrni*, n. sp. Pl. xiv., figs. 5–9.

(*A. pycnogonoides*, Nob., N.Z. Journ. of Sc., vol. i., p. 28.)

Body very small, disciform, lateral processes in close contact. The proboscis is long, cylindrical and directed downwards. The cephalo-thoracic segment is rounded above and slightly elevated; the oculiferous tubercle bluntly conical and bearing 4 distinct eyes on its sides. The abdomen is long and rather slender, and stands in a slanting position from the body. The mandibles are 2-jointed, the last joint being a mere tubercle; they stand nearly erect on the front of the cephalo-thoracic segment. The mandible-palps are rather longer than the proboscis and are 8-jointed; the 1st and 3rd joints are long, the 2nd short, the rest short and

subequal, the four last being furnished with a number of blunt spines; the geniculate appearance of these limbs is chiefly due to the fact of the 6th joint being articulated to the middle of the 5th and at right angles to it.

The ovigerous legs are 10-jointed and smooth; the three last joints become progressively smaller, the last being a minute tubercle; these organs show no trace of denticulated spines.

The legs are about 10 mm. long, and are tolerably stout. The joints are considerably geniculated, so that the limbs cannot easily be extended on a flat surface; their lengths (in the 3rd pair) are as follows:—

1,	2,	3,	4,	5,	6,
3.	5.	4.	12.	12.	13.

the extremities of the joints are all more or less furnished with the characteristic blunt spines, particularly at their apices. The 1st tarsal joint is very short, while the 2nd is rather longer than the 2nd joint of the leg, and has a double row of spines along the inner margin; the claw is about half as long, and is supplemented by two auxiliary claws.

Hab. In rock-pools at Oamaru and near Dunedin, and in Otago Harbour.

4. *Ammothea magniceps*, n. sp. Pl. xv., figs. 1–5; and pl. xvi., fig. 3.

Body moderately robust, distinctly articulated, and with the lateral processes close to but quite separate from one another; total length 7 mm. The rostrum is very large and stout, more than three-fourths as long as the body, very broadly cylindrical or almost barrel-shaped in the anterior portion, with the inferior part chiefly dilated; directed slightly downwards.

The abdomen is about 1 mm. long, slender and cylindrical, and directed obliquely upwards.

The oculiferous tubercle is situated about the middle of the cephalothoracic segment; it is stout, bluntly rounded at the end, but with a posterior notch when seen from the side.

The mandibles are in a very rudimentary condition, their 2nd joint being a rounded tubercle projecting nearly at right angles from the middle of the 1st joint. The palpi are about 4½ mm. long, and are 10-jointed, the 2nd and 4th joints being long, and the others very short; they are all quite destitute of spines.

The ovigerous legs are short (only 3 mm. in length), slender and 10-jointed; the four last joints are each furnished near their distal extremity with an oblique row of 4 or 5 denticulate spines.

The legs of the 3rd pair are 15 mm. long. The following formula represents the relative length of the joints (including the two tarsal joints):—

1,	2,	3,	4,	5,	6,	7,	8,
2.	5.	3.	14.	12.	14.	1.	4.

All the joints are remarkably smooth, and destitute both of hairs and spines. The 2nd tarsal joint is strongly spined along its inner margin, while its outer margin protrudes beyond the articulation of the large claw and its auxiliary claws into a tubercular prolongation, which is beset with several minute spines.

The genital openings on the 2nd joints of all the legs are very small and inconspicuous.

The integument is everywhere covered with minute rounded tubercles.

Hab. A single specimen of this apparently very distinct species was forwarded by Mr. C. Chilton, who obtained it by the dredge in Lyttelton Harbour.

Genus II. **Oorhynchus**, Hoek.

Proboscis ovate, inserted ventrally on the cephalothorax at a considerable distance from the front margin. Mandibles rudimentary; palpi 9-jointed. Ovigerous legs 10-jointed; the four last joints not furnished with one or more rows of denticulate spines.

5. *Oorhynchus aucklandiæ*, Hoek. (See p. 242.)

Fam. III. PALLENIDÆ.

Mandibles strongly developed, cheliform; palpi rudimentary or quite wanting. Ovigerous legs present in both sexes, and furnished with denticulate spines (*Pallene*), or in both sexes and furnished with simple spines (some species of *Phoxichilidium*), or present in the males only (other species of *Phoxichilidium*).

(Note.—In Dr. Dohrn's monograph, a somewhat different classification of these genera is given:—

Phoxichilidium is placed in the family Phoxichilidæ, and is characterized as possessing mandibles furnished with nipping claws, palpi wanting or only present as a rudiment in the male, *ovigerous legs 5–7-jointed, only present in the males, and furnished with simple spines.*

Pallene is placed in the family Nymphonidæ, and is characterized as possessing mandibles furnished with nipping claws, palpi wanting or only present as a rudiment in the male: ovigerous legs present in both sexes, 10–11-jointed, furnished with leaf-like or finely toothed spines on their terminal joints. From this genus again he separates *Neopallene* as follows:—

a. Sexual organs and their genital openings present in the 2nd, 3rd, and 4th pairs of legs (Extremität V.–VII.), wanting in the 1st pair (Extremität IV.); palpi rudimentary in the male ... ... *Neopallene.*

b. Sexual organs and their genital openings present in all the legs; palpi wanting in the male ... ... *Pallene.*

Under this classification, my new species of *Phoxichilidium* (*P. obliquum*) would not come exactly under any of the above genera. I have, however, followed the classification given by Dr. Hoek in his "Report, etc."

Genus I. **Pallene**, Johnston.

Body usually very slender, distinctly divided into four segments; anterior segment usually contracted like a throat behind the insertion of the mandibles and rostrum. The rostrum is short and broad. Abdomen short, erect. The strong mandibles are placed over the rostrum, and are furnished with powerful claws; the palpi are wanting in both sexes.

The ovigerous legs are present in both sexes and are long and 10-jointed; the last four joints are furnished with a row of closely-placed toothed spines.

The legs are very long and slender, and have the 4th joint in the female considerably enlarged for the reception of the large eggs; claws furnished with large secondary claws.

The ovaries occur only in the 4th joints of all the legs but the 1st pair; and the large eggs after ejection from the genital openings are attached in pairs to the ovigerous legs. The development within the egg is very protracted, and the larvæ emerge in a nearly complete form, differing from the adults only in size, and in a few subordinate points of structure.

6. *Pallene novæ-zealandiæ*, n. sp. Pl. xiv., figs. 1–4.

Body slender and very smooth, with a considerable interval between the lateral processes; length 1·8 mm. The cephalic part of the cephalo-thoracic segment is considerably swollen at the insertion of the mandibles. The proboscis is stout and nearly cylindrical in form, ·4 mm. in length, narrowing abruptly to the rounded extremity; mouth-aperture nearly circular. It is inserted on the ventral surface, and projects considerably downwards.

The oculiferous tubercle is short and blunt. The abdomen is short and bluntly pointed, and is directed nearly straight upwards.

The mandibles are robust and rather long; the first joint reaches a little beyond the extremity of the proboscis; the 2nd is somewhat dilated and bears a movable and a fixed claw, which are both narrow, pointed and slightly curved, and are furnished with a row of small denticles on their inner surface.

Ovigerous legs slender, 2·4 mm. long; the first three joints are short, 4th and 5th much longer, 6th only about half as long as the 5th. The four last joints are subequal in length and somewhat curved, and bear 8 (or 7) denticulated spines on their inner margins. On the last joint the spines are all of a uniform oval shape, the last one being placed quite close to the extremity of the joint. The three preceding joints have all the spines of the same oval form, except the last of each series, which is curved outwards and bears 3 or 4 long marginal teeth.

The legs of the 3rd pair are 7·5 mm. long; the relative lengths of the joints being as follows :—

1,	2,	3,	4,	5,	6,	7,
4.	5.	16.	34.	32.	42.	2.

the 4th being much the stoutest. The 4th and 5th joints are sparingly furnished with hairs, the slender 6th joint has a considerable number. The tarsal joints and claws are normal.

Hab. Only one specimen of this elegant species was taken in Otago Harbour (27 feet) by the dredge. From its small size, I am afraid it was immature, but the great enlargement of the 4th joints of the legs would show that it was not far from sexual maturity, although no eggs were seen.

Genus II. **Phoxichilidium**, Milne-Edwards.

Body usually cylindrical, sometimes contracted and disc-like. Proboscis always strong, cylindrical, directed forwards; usually inserted considerably behind the insertion of the mandibles. Mandibles 3- (? 2-) jointed, the last joint with movable claws bent down in front of the mouth. Palpi wanting; represented by a small tubercle on the wall of the anterior segment. Ovigerous legs 5–10-jointed, the last four joints never furnished with denticulate spines; (5–7-jointed, only present in the males, *Dohrn*). Legs having all the joints of normal length; tarsal joint strongly spined on its inner (lower) margin; claws long, subsidiary claws rudimentary or wanting.

The male genital openings occur in the 2nd joint of the 3rd and 4th pairs of legs.

The animals of this genus are distinguished from all other *Pycnogonida* by a peculiar mode of development. The young, immediately on emerging from the egg—at which stage they possess an obtuse pyriform body, with 3 pairs of rudimentary appendages—creep into the cavity of the body of a hydroid polyp (*Hydractinia, Coryne*, etc.) and undergo the rest of their development in this retreat.

7. *Phoxichilidium obliquum*, n. sp. Pl. xv., fig. 6; pl. xvi., figs. 1 and 2.

Body contracted, lateral processes hardly separated; the dorsal portion somewhat elevated; length 5 mm. The proboscis is very stout and cylindrical, and is directed downwards at an oblique angle; its length is about half that of the body.

The abdomen is about 3 mm. long, and stands rather obliquely upwards from the body; it is abruptly truncated at the end, but bears two long spines at the anterior side of its apex.

The front portion of the cephalo-thoracic segment is elevated into a transversely oval hump or cushion on which the oculiferous tubercle is placed. This organ is prominently developed, and runs up on its anterior face to a tolerably acute point; its summit is crowned with numerous short spines.

The mandibles are indistinctly 3-jointed; the first two joints project horizontally forward in front of the proboscis; the 3rd is placed at right angles to the 2nd, and the nipping claws are at right angles to it and work horizontally in front of the mouth. The palpi are represented by a small tubercle at the base of the mandibles on each side.

The ovigerous legs are about 10 mm. long, and are present in both sexes. They are 8- (? 9-) jointed, the four terminal joints being furnished with simple short spines.

The legs of the 3rd pair are 31 mm. long, the relative lengths of their joints being as follows:—

1,	2,	3,	4,	5,	6,	7,	8,
2.	6.	3.	16.	17.	18.	1.	5.

The upper margin of the 2nd tarsal joint protrudes somewhat beyond the articulation of the claws.

The integument of the body and appendages is everywhere more or less furnished with spines of varying size and strength; these are most numerously developed on the mandibles.

Hab. Lyttelton Harbour, taken by the dredge. I am indebted to Dr. R. von Lendenfeld and Mr. C. Chilton for several specimens of this species.

EXPLANATION OF PLATES XIV.—XVI.

PLATE XIV.

Figs. 1-4. *Pallene novæ-zealandiæ.*
1. Body seen from the ventral aspect; 2. claw of mandible; 3. extremity of the ovigerous leg, with toothed spines; 4. claw of leg of 3rd pair.

Figs. 5-9. *Ammothea dohrni.*
5. Body from the dorsal aspect; 6. mandibles; 7. mandible-palpi; 8. ovigerous leg; 9. claw of leg of 3rd pair.

PLATE XV.

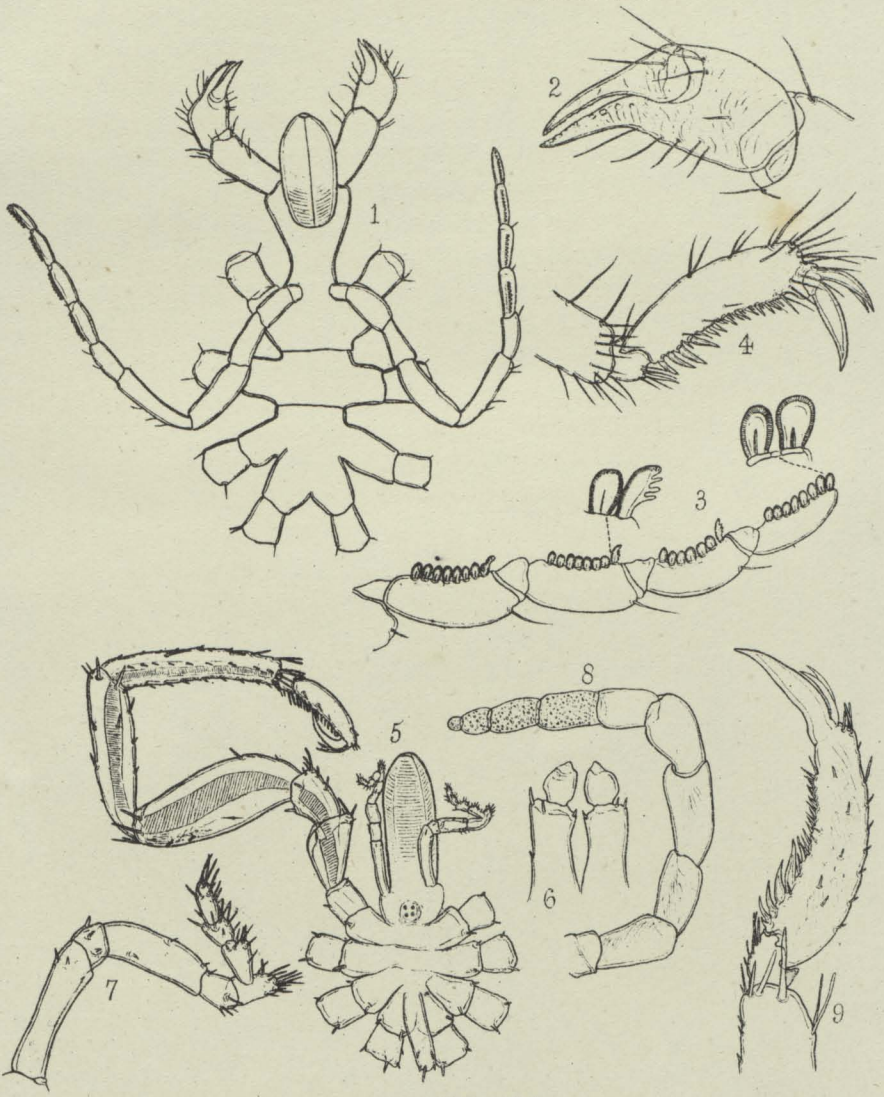
Figs. 1-5. *Ammothea magniceps.*
1. Profile of body seen laterally, with the appendages removed; 2. mandibles; 3. ovigerous leg; 4. terminal joint of ovigerous leg; 5. claw of leg of 3rd pair.

Fig. 6. *Phoxichilidium obliquum.*
Lateral view of body.

PLATE XVI.

Figs. 1-2. *Phoxichilidium obliquum.*
1. Dorsal aspect of body; 2. ovigerous leg.

Fig. 3. *Ammothea magniceps.*
Dorsal aspect of body.



PYCNOGONIDA.

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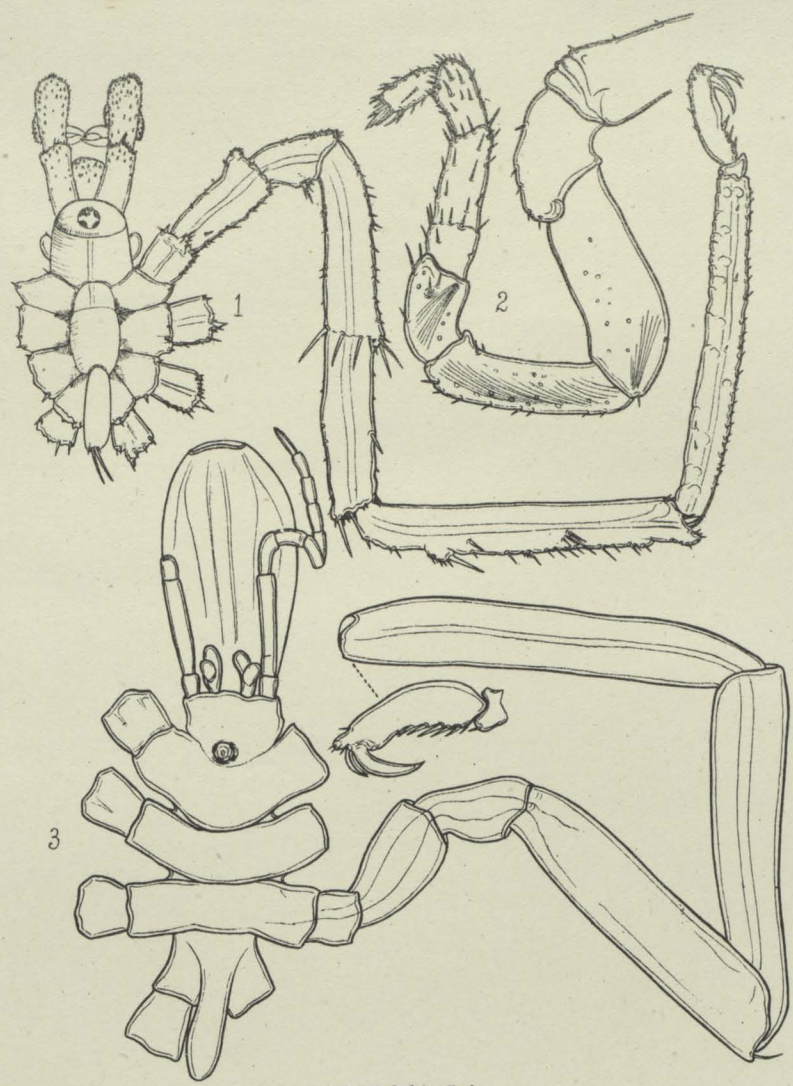

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