XXXIV. *Notes on the Thysanura.*—Part II. By JOHN LUBBOCK, *F.R.S., F.L.S., F.G.S.*

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SMYNTHURIDÆ.

THE Linnean Society has already done me the honour of publishing some notes on the much-neglected *Thysanura*. In the present paper I propose to place on record the species I have met with since, and which are twenty in number; these indeed do not, in all probability, amount to one-tenth of those which will hereafter be discovered, but it is at least something to have made a beginning.

PAPIRIUS NIGROMACULATUS, n. s. (Pl. LIX. fig. 4). Yellow; eyes, ocelli, and a black patch on the posterior part of the back black. Large specimens are a little mottled on the back with light brown, and on each side there is a pale band, which surrounds the black patch, and then passes forwards and outwards. Legs and belly pale. Antennæ a little darker, except at the base.

Length $\frac{1}{20}$ th of an inch.

Found, in spring and summer, under dead pieces of wood in Kent. Common.

In the form of its different organs, this species much resembles *P. Saundersii*. The two black spots, which I suppose to be ocelli, are more distinct.

The antennæ are very like those of that species. The mandibles have respectively five and six teeth.

The anterior legs and feet very closely resemble those of *P. Saundersii*, and the posterior feet differ slightly, if at all. The filament (*c*), however, appeared to be shorter, and the inner claw had only one tooth on the outer margin. Still *P. Saundersii* itself varies in this respect, and one specimen of the present species had a second very minute tooth.

The saltatory appendage offers no special peculiarity.

SMYNTHURUS AUREUS, n. s. (Pl. LIX. fig. 1). Yellow, with black eyes. Antennæ four-jointed; basal segment shortest, terminal segment longer than the other three.

Under side of body pale; saltatory appendage white. Body with a few scattered hairs, which are longer and more numerous towards the posterior extremity.

Length $\frac{1}{30}$ th of an inch.

Found in the same places as the last.

Common from February to June.

The four segments of the antennæ increase in length progressively from the base to the apex, each being about twice as long as the preceding. The long apical segment has whorls of short hairs, but no distinct evidence of segmentation. The eyes are

situated, as usual, on a black ground; and near the central line, a little in front of the antennæ, is a black double spot, which looks like the seat of two ocelli. At the same time I did not obtain by dissection any further evidence that these spots were really in any way connected with vision.

The two claws are simple, but they differ in form (Pl. LIX. fig. 2) from those of any other species which I have examined. The feet also are provided (perhaps to make up for the simplicity of the claws) with four or five tenent hairs.

The saltatory appendage is somewhat like that of *S. Buskii*, but less hairy, being indeed almost naked; the terminal lamellæ, however (Pl. LIX. fig. 3), are different in form. There are no tenent hairs.

I at first supposed that these specimens might be the young of some already described species; but I have never found any larger ones, and they differ in form as well as in colour from all the other representatives of the genus.

SMYNTHURUS FUSCUS, Lat. This species, which is probably the same as that mentioned by Templeton under the name of *S. ater*, is the only one hitherto recorded as occurring in England (Sam. Ent. Compend., p. 141).

PODURIDÆ.

This family comprises those species of the old genus *Podura*, in which the mouth has mandibles, and the body is elongated, with a more or less developed saltatory appendage at the posterior extremity.

Before proceeding to describe the species which have come under my notice, it may be convenient that I should give a short description of the genera into which they are distributed.

1. ORCHESELLA, Templeton. Segments of the body unequal in size, more or less thickly clothed by clubbed hairs. Antennæ long, six-jointed. Eyes six in number on each side, arranged in the form of an S.

The structure of the antennæ makes this genus very easy to recognize.

2. DEGEERIA, Nicolet. Segments of the body unequal in size, more or less thickly clothed by clubbed hairs, and sometimes also provided with scales. Antennæ longer than the head and thorax, filiform, four-jointed. Eyes eight in number, on each side of the head.
3. TEMPLETONIA, n. g. Segments of the body subequal, clothed by clubbed hairs, and provided with scales. Antennæ longer than the head and thorax, five-jointed, with a small basal segment, and with the terminal portion ringed.
4. ISOTOMA, Bourlet (*Desoria*, Nicolet). Four anterior abdominal segments subequal, two posterior small; body clothed with simple hairs, and without scales. Antennæ four-jointed, longer than the head; segments subequal. Eyes seven in number on each side, arranged in the form of an S.
5. MACROTOMA, Bourlet (*Tomocerus*, Nicolet). Abdominal segments unequal, with

simple hairs and scales. Antennæ very long, four-jointed, the two terminal segments ringed. Eyes seven in number on each side.

6. LEPIDOCYRTUS, Bourlet (*Cyphoderus*, Nicolet). Abdominal segments unequal, with simple hairs and scales. Antennæ long, four-jointed. Eyes eight in number on each side.
7. PODURA. Abdominal segments subequal; hairs simple, no scales. Antennæ four-jointed, shorter than the head. Eyes eight in number on each side. Saltatory appendage of moderate length.
8. ACHORUTES, Templeton. Abdominal segments subequal. Antennæ short, four-jointed. Eyes eight in number on each side. Saltatory appendage quite short.

These two latter genera, or subgenera, differ only in the form and size of the caudal appendage, a point, however, of special importance in this group of animals. Templeton, indeed, calls the fork "obsolete;" but it is present, though small. We thus pass naturally to the *Lipuridæ*, in which it is altogether absent. This small family contains as yet only two genera, *Lipura* (Burmeister), in which the mouth is composed of the same parts as those in the preceding genera, and *Anoura* (Gervais), in which the mandibles and maxillæ disappear.

ORCHESELLA.

ORCHESELLA FILICORNIS, Temp. My specimens were not so green as those of Templeton, and in the colouring of the antennæ they agreed more closely with his figure than with his description. The two small basal segments and the small fourth segment were black; the third had the basal half brown, the apical white; the fifth, on the contrary, was palest at the base; the two terminal segments were pale, but not greenish. Body black, more or less weakened by greenish brown; the mesothorax has two pale oval spaces converging in front, and leaving a triangular central space, and the margins dark; the metathorax and first abdominal segment have also on each side a pale band, which are, as it were, continuations of those on the mesothorax. Posterior half of second abdominal segment white, with a greenish tinge. Third abdominal segment very dark, especially in front, and with a lunate greenish patch at the centre of the posterior margin. Fourth abdominal segment with a white lateral spot at the posterior margin. Legs annulated with light and dark brown.

The abdominal hairs are, in Templeton's figure, curved backwards; in my specimens they stood out straight.

Length $\frac{1}{7}$ th of an inch.

Common throughout the year, under logs of wood.

ORCHESELLA FASTUOSA, Nicolet. M. Nicolet's description of this species is as follows:—"Corps cylindrique; moitié supérieure du second article des antennes, quatrième segment du corps et deux bouquets de poils à l'extrémité postérieure du sixième d'un blanc très-pur. Les deux segmens thoraciques bruns, avec quatre taches obliques et une ligne médiane d'un beau jaune clair au premier, et d'un jaune foncé

au second segment. Premier segment de l'abdomen brun, avec trois taches et une bordure postérieure jaune foncé. Cinquième et septième segments d'un noir foncé. Tête très-noire, ainsi que le premier, la moitié inférieure du second et le troisième article des antennes. Les suivants sont bruns et gris. Pattes brunes à la cuisse, grises à la jambe et annulées de jaune. Queue d'un brun pâle."

In my specimens, the fourth segment of the body was greenish, and darkened gradually in front. The thoracic markings were less distinct: the patches were yellowish; the anterior pair, however, with white hairs. The first abdominal segment is but obscurely marked with yellow, and the yellow band along the back is scarcely perceptible.

My specimens, therefore, do not exactly agree with Nicolet's description, and are, indeed, in several respects intermediate between the *O. fastuosa* of Templeton and *O. cincta* of Nicolet. The white patch on each side of the sixth segment of the body, which, though sometimes very faint, was always recognizable, induces me to identify them with *O. fastuosa*; but I should be by no means surprised should that species eventually be considered as being merely a variety, perhaps geographical, of *O. cincta*. I am also very much disposed to regard *O. filicornis* as a pale variety of the same species: I have found almost all of the intermediate links.

It occurs with the preceding.

ORCHESELLA RUFESCENS, Linn.

The markings of my specimens of this pretty species do not exactly agree with those described by Bourlet. My specimens were yellowish, with reddish-brown markings. The principal one was a brown band, which began at the anterior end of the mesothorax on each side, not far from the middle line, and passed backwards and slightly outwards over the four following segments, dying away at the third abdominal; the fourth and fifth abdominal segments are somewhat darker than the others.

The first, third, fourth, and basal half of the second antennary segments are light reddish brown; the rest of the antenna is paler. Eyes black.

The body is rather narrow, and much less hairy than in the other English species.

I only found three or four specimens of this pretty species. They occurred with the preceding, in spring.

ORCHESELLA PILOSA, n. s. (Pl. LIX. figs. 5, 6, 7.) Yellowish grey, sometimes with a tinge of green; the body mottled, and the legs annulated with brown or black. Basal segment of the antennæ pale; second, third, and fourth brown or black, but generally pale at the two extremities; the two terminal segments pale, tinged with brown. Eyes on a black patch. Head and thorax with numerous clubbed hairs; abdomen more sparingly covered. No scales.

Length $\frac{1}{5}$ th of an inch.

Common in Kent, throughout the year, under logs of wood.

I at first supposed that this species was the *O. villosa* (Nicolet); but the coloring of the legs and antennæ is altogether different. Nicolet also describes his species as having scales, which are "incolores, irrégulières et striées."

The labrum is somewhat broader at the base than at the free extremity, which ends in three not very well-marked lobes on each side; there is also a curved row of teeth, which, however, do not meet in the middle, nor project beyond the edge.

The mandibles (Pl. LIX. fig. 6) are powerful, and have respectively four and five teeth, which are strong, though not very sharp. In general form, and in the position and arrangement of the molar surface, they are formed on the type common to the *Poduridæ*.

The maxillæ also resemble in general outline those of the allied species. At their extremity is a row of five processes. The three outer ones have the form of strong teeth; the two inner ones are pointed, tongue-shaped processes, serrated on their inner margin. At the side of these are two other lobes: one of these is long, narrow, pointed, and generally lies, as it were, across the top of the organ; it is serrated at its free extremity on the inner edge. The other lobe is large, and ends in a tooth pointing inwards; the outer border is arched, the inner straight. It is, however, by no means easy to make out these different processes in a satisfactory manner.

The appendage, which for the present I will call the palpus, is quadrate, but rounded off at the angles, and tapers slightly towards the apex. The apical margin is somewhat concave. The palpus has on one side a small process, which terminates in a stout bristle. At the base of the process is another stout seta, in addition to which the organ bears three smaller hairs.

The second pair of maxillæ are membranous, have the apical margin excavated, with a tooth at the inner angle.

The eyes are arranged as usual in the genus, and are pretty even in size. The antenna, which is inserted just in front of the "quadrilateral," must somewhat obstruct the field of view.

The foot (Pl. LIX. fig. 5) of the anterior leg possesses, as usual, a tenent hair and two strong claws. The larger claw has a strong spine on the outer margin near the base, and two smaller ones on the inner margin, which are situated at almost equal distances from one another and from the two extremities. Near the tip is sometimes an indication of the third spine which we find in *O. cincta*.

The small claw is lanceolate and simple. Near the base, however, and on the inner margin, is the rudiment of a tooth; but in many cases it is very difficult to perceive.

All the three legs are alike, so far as the constitution of the foot is concerned.

The caudal appendages end in a claw (Pl. LIX. fig. 7), which is curved downwards and has on the under surface a strong tooth. To see this properly, however, the organ must be seen from the side.

In this species I have found *Gregarinas*. They were of two forms, either round or elliptic. The latter appeared to be generally, if not always, united in pairs.

DEGEERIA.

DEGEERIA NIGROMACULATA (*Podura nigromaculata*, Temp.). Body fusiform, pale greenish yellow or stone-colour. Head rounded, with a black fascia anteriorly, including the eyes. The posterior ends of the second, fourth, and fifth segments with a

more or less triangular black patch on each side of the middle line; posterior margin of the fifth segment black; posterior half of the sixth segment with a black patch, which is broad and more or less divided in front; posterior half of the seventh segment black; posterior segment brown. Along the sides are black patches, expanded sometimes into an almost continuous black band.

Length $\frac{1}{15}$ th to $\frac{1}{10}$ th of an inch.

Under logs of wood in Kent, throughout the year.

In other specimens the markings on the second and fourth segments are scarcely visible. The anterior part of the body is paler, the posterior part yellower, and the markings of a richer brown.

The antenna is, in reality, five-jointed; but the basal segment is very small. The apical segment is not distinctly ringed, as is the case in the following genus.

The mandibles have four or five teeth.

The tarsus is provided with a tenent hair and two claws, as usual. The large claw has two teeth on the under side. The small claw is unarmed.

DEGEERIA NIVALIS, Nicolet. Nicolet's description of this genus is as follows:—"Tête et corps d'un gris-jaunâtre; ce dernier oblong, avec une bande transversale noire au bord postérieur de chaque segment et une ligne également transversale de taches irrégulières et de même couleur presque au milieu du sixième. Une petite tache noire en forme d'ancre sur la tête. Yeux noirs. Les deux premiers articles des antennes sont jaunes, les deux derniers gris foncé. Sixième segment du corps aussi long que les trois qui le précèdent pris ensemble. Pattes jaunes, et queue entièrement blanche."

He also describes two varieties.

My specimens, however, while agreeing in the general distribution of colour, did not exactly agree with any of these. The body, at the sixth abdominal segment, was as broad as in front; the black patch on the head was sometimes absent; the transverse dark line was often incomplete in the centre on the first and second abdominal segments, and the same was the case with the anterior band of the fourth; the fifth was dark behind; the antennæ were grey; and, finally, the anterior half of the head had a dark border. The species of this genus vary, however, a good deal in the distribution of the markings, and I am therefore unwilling to describe mine as new, especially as, in some respects, they appear to be intermediate between *D. nivalis* and *D. nigromaculata*.

The saltatory appendage scarcely reaches to the ventral tube.

Length $\frac{1}{13}$ th of an inch.

Found in some numbers during April and May, under logs of wood.

DEGEERIA CINCTA, n. s. Body fusiform, dark brown; posterior part of head and of mesothorax, as well as the anterior portion of the fourth abdominal and the two posterior abdominal segments pale yellowish.

The antennæ have the two first segments pale at the base, dark at the apex, third segment dark, apical rather lighter. Legs yellowish; saltatory appendage white.

This species most nearly approaches the *D. platani* of Nicolet, but may be at once distinguished by the colour of the first abdominal segment, which in the latter species is pale.

It has no scales. Each leg has a tenent hair; and the large claw is provided with two teeth. It occurs on the bark of trees, and under logs of wood.

Length $\frac{1}{10}$ th of an inch.

Found during spring and summer, in Kent and Lancashire.

DEGEERIA PLATANI, Nicolet. M. Nicolet's description of this species is as follows:—

“Corps écailleux, à reflet argenté, un peu plus fusiforme que celui du précédent, à tête plus petite et plus allongée, ayant les angles postérieurs arrondis. Poils noirs. Tête et premier segment thoracique d'un jaune-orange assez foncé, et bordés antérieurement de noir; second segment noir. Premier segment abdominal d'un jaune-orange-pâle; les deux suivants noirs, et séparés par une ligne transversale très-fine du même jaune et bordant le segment antérieur. Le quatrième segment, également orange-pâle, porte une large tache irrégulière noire sur son milieu, et une ligne transversale de même couleur à son bord postérieur. Anus et bord postérieur de l'antépénultième segment également noirs. Antennes, pattes, dessous du corps et queue d'un jaune-pâle très-léger, les premières un peu plus foncées et annelées de noir ou de gris; souvent un anneau noir à l'extrémité des cuisses postérieures.

“Longueur environ 2 millimètres. Se trouve sous les écorces du *Platanus orientalis*; assez commun en été; vit solitaire.”

I found my specimens in June, on the bark of beech, in company with *Psocus*, &c.

TEMPLETONIA, n. g.

Body long, cylindrical, provided with clubbed hairs like those of *Degeeria* and *Orchesella*, and also with scales. Segments eight in number, subequal. Head direct, or nearly so. Antennæ longer than the head, five-jointed; the basal segment short, the three following subequal, the apical ringed. Basal part of the saltatory appendage more than half as long as the two terminal lamellæ.

This genus is proposed for the reception of Templeton's *Podura nitida*, which is not very rare in Kent. The structure of the antennæ is alone sufficient to distinguish it from all the other *Poduridæ*. They have five segments, of which the first is quite short, the three following are cylindrical and subequal, while the terminal is ringed and shows, therefore, some approximation to a character hitherto peculiar to *Macrotoma*. It differs also from *Isotoma* in the peculiar form of the hairs, in the presence of scales, and in the form of the saltatory appendage, while agreeing with it in the general form of the body. On the other hand, while agreeing with *Degeeria* in the tegumentary appendages, it differs in the form of the body-segments. At the same time, it is more nearly allied to *Degeeria* and *Isotoma* than to the other allied genera, though in the position of the head it makes some approach to *Lepidocyrtus*, and in the termination of the antennæ to *Macrotoma*. On the whole, therefore, this genus presents us with a most interesting combination of characters.

TEMPLETONIA NITIDA (*Podura nitida*, Templeton). Templeton's description of this species (*l. c.* p. 94) is as follows:—"Body obovate, smooth, shining; head globular, a little produced anteriorly; eyes reddish brown. Thoracic and abdominal rings pale, with innumerable reddish-brown streaks and spots, especially basally, and two or three strong hairs in the middle; a collar of similar hairs encircling the neck, and minute ones over the whole body. Antennæ and legs pellucid.

"Length .09 inch. Common at Cranmore, in the grove."

This species I have found in Kent, several times during the spring, though never in any great numbers. When alive, they were silvery white, so that at first sight they might easily be mistaken for specimens of *L. argentatus*; when, however, they had been for some few days in spirits of wine, the reddish spots mentioned by Templeton made their appearance.

ISOTOMA.

ISOTOMA FULIGINOSA (*Podura fuliginosa*, Templeton). Templeton's description of this species is as follows:—"Body subcylindric, greenish black. Head subtriangular. Antennæ not much longer than the head; joints nearly equal. *First thoracic ring* much larger than the succeeding; third abdominal also very large; a black line down the middle of the back. Legs short, tapering, pale greenish.

"Length .05 inch.

"A few specimens at Cranmore, under the bark of a rotten tree."

My specimens did not exactly agree with this description. Mr. Templeton seems to me to have misunderstood the structure of the thorax, as the mesothorax is larger than the following segment, and the prothorax is scarcely visible from above. The abdominal segments in my specimens were less unequal; they had bluish lights; the antennæ were dark; and there was no black line down the middle of the back. The length of the head was only $\frac{7}{800}$ ths, while that of the antennæ was $\frac{12}{800}$ ths, or nearly double; but this proportion does not differ much from that shown in Templeton's figure. The first and third segments of the antennæ also are rather shorter than the second and fourth. The saltatory appendage was white; but I hesitate, in spite of these differences, to form a new species, looking rather upon my specimens as a dark variety. The feet had sometimes one, sometimes several, tenent hairs. The caudal fork was short, and did not reach nearly to the ventral tube.

January to April.

I did not find them very often, but generally in considerable numbers.

ISOTOMA ANGLICANA, n. s. (Pl. LIX. fig. 8.) Colour purplish greenish brown. Eyes on a black patch. Under side of head and thorax the same tint as the back, but slightly paler. Anterior abdominal segments browner; saltatory appendage gradually passing into white towards the extremities. A few scattered pale spots, and one or two pale lines, along the side. Basal segment of the antenna rather shorter than the other three, which are nearly equal in length. Body covered with short hairs and some longer setæ, especially on the thorax and the posterior abdominal segments.

Length $\frac{1}{8}$ th of an inch.

Found during winter and spring, under logs of wood.

Some specimens, however, are paler and more reddish brown, wanting, apparently, the dark green; others are more green, from a deficiency of brown.

Can this be the *Podura viridis* of Linnæus? According to Bourlet, this is a variable species, with somewhat the same range of colour as in my specimens, which, on the other hand, were hairy and marked by a few spots; while Bourlet says, "Peu de villosités," and "sans tache." The *I. pallida* of Nicolet, which he considers as synonymous with *I. viridis*, has the eyes much lighter.

The body is about two and a half times as long as the antennæ. The mandibles have respectively four and five teeth. The maxillæ are short and stout.

The three feet are similar; they have no tenent hair; the large claw has an external tooth, and two small ones on the inner edge. The small claw has a single tooth on the outer margin.

The saltatory appendage reaches forward as far as the ventral tube.

ISOTOMA LINEATA, n. s. (Pl. LIX. fig. 9.) Colour dirty green, with a dark band running down the back, and a spot of the same colour on the head. Eyes situated on a black patch. Under side of body somewhat paler; saltatory appendage nearly white. First abdominal segment decidedly narrower than the two preceding segments. Basal segment of the antenna rather shorter than the other three, which are nearly equal in length. Body covered with short hairs, and with one or two longer ones towards the posterior extremity.

Length $\frac{1}{10}$ th of an inch.

Found throughout the year, under logs of wood in Kent.

This is perhaps the *I. Nicoletii* of Gervais (Aptères, pl. 50. fig. 12). In that case the figure given by the eminent French entomologist is a very bad one, since the legs and antennæ are much too long in proportion, and the body is represented as having ten segments. This latter characteristic, however, must be a mistake. From *I. riparia*, Nic., it differs not only in colour, but also in the presence of the long scattered hairs.

The body is about two and a half times as long as the antennæ, which also (Pl. LIX. fig. 9) are rather stout in proportion.

The mandibles have respectively four and five teeth.

The maxillæ seemed to me to have seven processes—an inner single one, and on the outer side two rows, each consisting of three. The outer processes are the largest.

The tarsi of the three pairs of feet are similar.

There is no tenent hair; the outer claw (Pl. LIX. fig. 10) is unarmed on the inner side; the small claw has a peculiar notch, rather than tooth, on the upper side. The saltatory appendage, when turned forwards, reaches to the ventral tube.

I have also some specimens of another species of *Isotoma*, which in many respects resembles the *I. virescens* of Nicolet.

In colour it is much like *Orchesella pilosa*, having dark markings on a greenish-grey ground, and black eye-patches. The legs are light grey, the antennæ a shade darker.

The hairs are quite short and inconspicuous. The basal segment of the antennæ is shorter than the others, and the third is shorter, though scarcely so, than the second and fourth. The filaments are about half as long again as the basal part of the caudal appendage.

I found this pretty little species, on a hot summer's afternoon, running about in great numbers on a gravel walk.

MACROTOMA.

MACROTOMA PLUMBEA. (Pl. LIX. figs. 11-14.) Colour, with scales, leaden; without them, yellow, with pale lateral markings on the mesothorax. Antennæ longer than the body. Anterior abdominal segment a little narrower than those on each side of it; fourth abdominal segment cylindrical, but more curved at the posterior margin than in Nicolet's figure. There is also a pale narrow line running down the back to the hinder end of the third abdominal segment. *Legs hairy and scaly throughout*, at least except the tarsus.

One of the mandibles has five teeth, the other four.

The three pairs of feet are very similar to one another, though in my specimens the extremity of the small claw seemed to be more elongated in the posterior foot (Pl. LIX. fig. 13) than in the other two. The tarsus is, as usual, provided with a tenent hair and two unequal claws. The tenent hair is large and strong. The larger, outer claw has three equidistant spines on the under margin. The lesser claw has a very small spine on the outer margin.

The two branches of the caudal appendage have on their upper side, near the base, a row of about nine small, simple, black spines, the hindmost of which is affixed rather further from the side than the others (Pl. LIX. fig. 11). The largest spine is $\frac{2}{1000}$ ths of an inch in length, the diameter of the branch being at that place $\frac{7}{1000}$ ths of an inch.

MACROTOMA MINOR, n. s. (Pl. LIX. fig. 15.) Like the preceding in general outline and colour; it is, however, smaller. The antennæ are shorter than the body, which, *without* the scales, is of a dull leaden colour. The anterior segment has the usual pale, oblong, elongated markings. The large claw at the extremity of the tarsus has six minute teeth on the under side. The black spines on the second segment of the saltatory appendage are much larger than in *M. plumbea*, and some have lateral projections.

Under logs of wood, with *M. plumbea*, throughout the year. This species seems very indifferent to cold; I found it common all through the winter, even during sharp frosts.

The largest specimens are as much as $\frac{1}{5}$ th of an inch in length; but the majority are smaller.

The first abdominal segment is shorter than the two on each side. The mandibles have, respectively, four and five teeth. The processes at the end of the maxillæ are not exactly like those of *M. plumbea*.

The anterior feet have, besides the usual tenent hair, on the under side of the large

claw, five or six small teeth; the lesser claw is lanceolate in form, but with the lower margin straighter than the upper one, and has a single, very minute tooth on the upper side. The second and third pairs of feet much resemble the first; but the small spine on the lesser claw of the third pair is rudimentary or altogether absent. On the basal part of the caudal appendage are, as in *M. plumbea*, nine black spines. In that species, however, they are simple and short, while in the present they are much longer. The four first form a somewhat curved line; the remaining five are arranged in a straight row, and have small processes at the side; the apical spine and the penultimate are the largest.

The form and arrangement of these spines, and the structure of the feet, satisfactorily distinguish this species from the preceding. If in *M. minor*, which is smaller than *M. plumbea*, these caudal spines had been smaller than in that species, and the spines on the feet had been less numerous, we might well have supposed that these differences depended on age, and were therefore of no value as specific characters. I was, indeed, for a long time disposed to consider *M. minor* as being merely the young stage of the larger *M. plumbea*; but the large specimens are comparatively so rare, that, for this reason alone, such an opinion seemed to me untenable. This is, I think, confirmed by the structure of the feet and of the caudal appendage.

With the specimens above described are others which are narrower, and, without the scales, of a yellow colour. When placed in spirits, also, these two forms behave differently; the first swell, and the intersegmental membranes are more or less exposed, while the other variety retain their original form. The structure of the antennæ, the feet, and the caudal appendages is, however, so similar in the two forms, that I do not feel justified in separating them specifically.

LEPIDOCYRTUS.

LEPIDOCYRTUS ARGENTATUS, Bourlet? (Pl. LIX. figs. 16, 17.) Body cylindrical, the third segment decidedly narrower than the second and fourth; silvery, with brilliant metallic reflexions. Eyes situate on a black patch. Antennæ and legs grey, the latter paler than the former; basal segment of antenna short, second and third equal, and about two-thirds as long as the apical. Caudal appendage pale, reaching to the ventral tube. Thorax with a tuft of short hairs in front; posterior segments of abdomen with long, scattered setæ, some of which are waved.

Length $\frac{1}{12}$ th of an inch

Occurs all through the winter, from November, and perhaps earlier, to April, under logs of wood in Kent.

The mandibles have respectively four and five teeth. The labrum is pear-shaped. The feet have each a single tenent hair of the usual form. The large claw has two small teeth on its under side. The small claw is lanceolate. The first abdominal segment is decidedly narrower than those on each side of it.

It may well be doubted whether this is really the *L. argentatus* of Bourlet, his description being very brief and unsatisfactory. He says, "Thorace minus elato, corpore squamis

argenteis," adding, in French, "Même taille que le précédent, thorax moins relevé et tête moins inclinée que chez le (*Lepidocyrtus*) *curvicollis*, corps revêtu en entier d'écailles d'un blanc argenté reflétant quelquefois une légère teinte cuivreuse; pubescence blanche, assez longue." He gives, however, no statement of the degree in which the thorax of *L. curvicollis* projects over the head. So that, in fact, my reasons for identifying my specimens with those of M. Bourlet are reduced to the silvery tint and the pubescence. Unsatisfactory as this is, I thought it better than to burden science with a new name, perhaps unnecessarily.

LIPURIDÆ.

LIPURA.

LIPURA AMBULANS (*Podura ambulans*, Linn.). White. Prothorax short, but visible from above. Body covered with short scattered hairs. Legs short. At the posterior extremity of the abdomen are two hooks, which are curved upwards. The skin is granular.

Common.

Length $\frac{1}{16}$ th of an inch.

Nicolet states that in this species the spiracles are easily visible, and in pl. 4. fig. 4 he gives a figure of them, showing four pairs, situated on the back of the four first abdominal segments. I can only say that I have been unable to find any trace either of spiracles or of tracheæ.

He also describes the eyes as twenty-eight in number, fourteen on each side, arranged in two parallel rows of seven, behind the antennæ. In the specimens I examined I could not see these eyes.

LIPURA CORTICINA (*Adicranus corticinus*, Bourlet). This species much resembles *Isotoma fuliginosa*, and lives in similar situations. It is black in colour, somewhat paler on the under side. The eyes are dark. The body is covered with pubescence; and there are a few longer hairs, especially towards the posterior extremity.

Found a few specimens in May, under bark.

Length $\frac{1}{15}$ th of an inch.

ANOURA.

ANOURA MUSCORUM, Templeton. "Body subcylindrical, turned posteriorly, and ending with two mammillæ, dark purplish. Head short, triangular; eyes not remote from the base of the antennæ, which are very short, and have the first joint very large, the succeeding successively diminishing in size, last acuminate. Legs pale blue. Rings with strong spiny hairs in rows along the back; hairs usually arising in pairs. Length .07 of an inch." (*Templeton*.)

My specimens were of a dull purple, irrorated thickly over a grey ground, and with the under side paler. They were tuberculated, so as at first sight to resemble even more

strongly Nicolet's figure of *A. tuberculatus*. On the other hand, the body was shorter and thicker. The hairs were also arranged more nearly in accordance with Templeton's description, but were more numerous and less conspicuous than in his figure. The saltatory appendage is altogether absent.

In winter and spring, under prostrate boughs and logs of wood, in Kent.

ANOURA GRANARIA, Nicolet. "Omnino alba. Corpore, antennis pedibusque subtilissime granariis." (*Nicolet, Ann. Soc. Ent. France, 1847, p. 387.*)

I found a few specimens of this species near Liverpool, in the month of May.

DESCRIPTION OF THE PLATE.

PLATE LIX.

- Fig. 1. *Smythurus aureus*.
 Fig. 2. " " Foot, × 250.
 Fig. 3. " " Saltatory appendage, × 125.
 Fig. 4. *Papirius nigromaculatus*.
 Fig. 5. *Orchesella pilosa*. Foot, × 250.
 Fig. 6. " " Tip of mandible, × 250.
 Fig. 7. " " End of saltatory appendage, × 250.
 Fig. 8. *Isotoma Anglicana*, × 30.
 Fig. 9. " *lineata*, × 30.
 Fig. 10. " " Foot, × 250.
 Fig. 11. *Macrotoma plumbea*. Base of saltatory appendage, × 60.
 Fig. 12. " " Tip of maxilla, × 250.
 Fig. 13. " " Foot, × 250.
 Fig. 14. " " End of saltatory appendage, × 250.
 Fig. 15. " *minor*. Foot, × 250.
 Fig. 16. *Lepidocyrtus argentatus*. Labrum and palpus, × 250.
 Fig. 17. " " Foot, × 60.