

vein, the teeth advancing towards each other. The outer line is very sinuate, widening in the middle and thence sending a linear sinuate line to the inner angle of the wing. Close to the outer edge of the wing, and opposite the rounded bend in the outer band is a round, white spot. A minute white spot on the inner angle. Hind wings with a large, black, oval discal spot; beyond, an indistinct black line, and beyond this a broad, white band, widening outwards in the middle and connected with a round, marginal, white spot; another white spot on the inner angle. These markings are distinctly repeated on the under side of the wings.

Length of body, .35; fore wing, .47 inch. Behrens.

[While correcting the proofs of this article, I was informed by Prof. Zeller of Stettin, in time to make the change in the proof, that the *Choerodes ægrotata* (Guen.), which I had sent to him under a different *ms.* name, supposing it to be undescribed, is the *Tetracis ægrotata* of Guenée. It agrees with his description, but his determination of the genus misled me, and I am fortunate in being set right by so critical a lepidopterist as Prof. Zeller.]

## NEW OR RARE AMERICAN NEUROPTERA, THYSANURA, AND MYRIAPODA.

BY A. S. PACKARD, JR., M.D.

My apology for presenting these isolated descriptions is, that they add considerably to our knowledge of the geographical distribution of these groups of insects in North America, and may serve to stimulate observers to look more carefully for the species of the less familiar groups of insects.

### NEUROPTERA.

#### *Amphientomum Hagenii* n. sp.

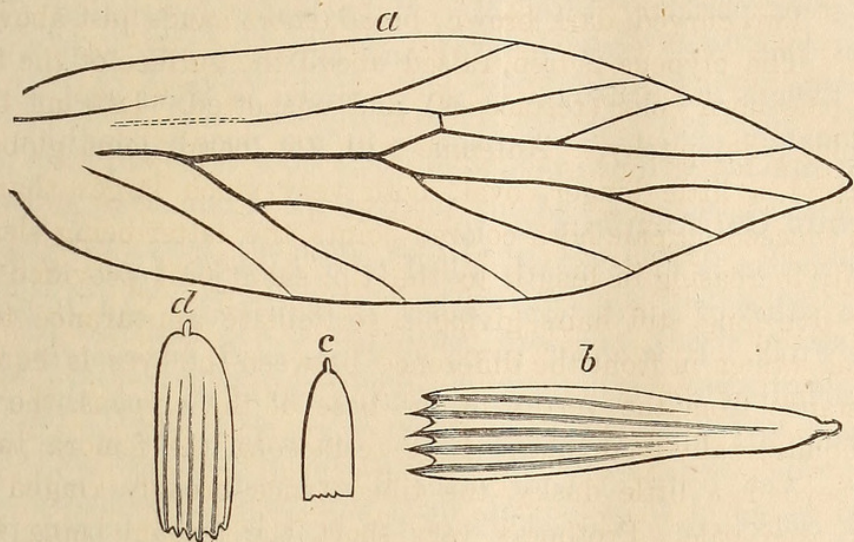
The body, generally, is of a pale, yellowish horn color. Head of the same color, with a few scattered hairs. Eyes full, round, prominent, subglobose. Ocelli arranged in a very low, flat triangle; the anterior one being on a line with the front edge of the eyes. Behind each of the two basal ocelli, is a blackish brown line, so doubled as to form three sides of an oblong square, with the open side facing the anterior ocellus, the inner sides meeting midway between the ocelli. A dark brown, narrow line extends from eye to eye, passing upwards in the middle, between the anterior and the other two ocelli. A



dark, broad line extends from the eyes to the clypeus. The anterior ocellus is surrounded with black, and there is a pair of divergent dark brown lines, a little curved, sending a branch up to the anterior ocellus. Two curved, dark brown, broad, short bands just above the clypeus. The clypeus is free, raised above the surface of the front, and is pale horn color (testaceous), and unspotted. Labrum black. Mandibles pale, pitchy. Antennæ with the basal joint globular; the second a little longer, oval, both very much larger than the sixteen succeeding pale horn-colored joints, the latter being slender, gradually increasing in length to the tip, each joint provided with four or five long, stiff hairs, giving a verticillate appearance to the antennæ. Seen in front the difference between the eyes is equal to the distance from the vertex to the base of the clypeus, the front being equilaterally triangular. Legs testaceous, the femora pale at base; beyond, a little dusky, the tibiæ twice broadly ringed with dusky; tarsi pale. Prothorax very short, the tergum being transversely linear; mesoscutum cordate. Abdomen pale, almost whitish. Upper wings regularly oval lanceolate, the tips being acute, but not prolonged; densely covered with hairs and scales, with the fringe long on the outer half of the wing, and increasing in length towards the tip so that the outline of the fringe is oval. Under the microscope the wing membrane is covered with numerous dots, arranged in irregular wavy rows, the dots much thicker along the edges than elsewhere. In the middle and along the costa the hairs are developed into regular flat scales, like those of the Lepidoptera, and the Lepismatidæ and Poduridæ, varying greatly in form, some being long and narrow, with acute teeth on the outer edge, and a rather large point of attachment; others broad and short, with blunt teeth, and others more regular in outline; all with shaded lines proceeding from each tooth and fading out towards the base of the scale. (See figure, *b, c, d*, drawn to the same scale with the camera.) The wings are glistening gray, and spotted irregularly with dark towards the tips. Venation: in the fore wings (*a*) a minute, almost obsolete costal vein, four subcostal venules; the main vein at the origin of the second branch anastomoses with the median vein, forming a long, narrow discal cell; at one-third the distance between the anastomosis and the tip of the wing it sends off a third branch nearly equalling in length the two basal ones; the median vein has five branches; after sending off a branch to anastomose with the subcostal vein, it subdivides, the upper branch again subdividing midway between the tip and the



anastomosis. On the basal fifth of the vein a branch arises, which subdivides, forming the fourth and fifth median venules. A straight,



submedian vein is present. Hind wings similar in form to the fore pair, but a little narrower; a slightly marked subcostal vein, ending opposite the origin of the first and upper branch of the median vein. The median vein subdivides into five branches, the three basal, lower ones arising at nearly equal distances apart, and of nearly the same length; the first and upper one arising on the outer fourth of the wing; a slightly marked submedian vein. The wings are folded at a low angle over the back.

Length of body, .10; of body with the wings folded, .14 inch.

I first observed this insect under the loose bark of a stump, moving in groups of several, running swiftly when disturbed, like other Psoci, to a place of concealment, at Brunswick, Maine, early in July. I also found a specimen Sept. 1st, in Salem, Mass.

Dr. Hagen, the founder of this genus, kindly drew my attention to the great interest attaching to the discovery of this insect in this country, indicating the genus, and that the species was undescribed. In his paper in the "Entomologists' Monthly Magazine," he describes this and the allied genus *Perientomum*, and describes of the present genus two species from amber, two from Zanzibar in gum copal, and three living forms from Ceylon.

***Psectra dipterus* Burm.**

I took a specimen of this exceedingly rare Hemerobiid insect, at Brunswick, Maine, Sept. 16th. On showing it to Dr. Hagen, he



considered it as the same as the European insect. It is very rare in Europe, one specimen only having occurred in England, two or three in Germany, and one in Siberia, as Dr. Hagen informs me.

It agrees perfectly with Mr. McLachlan's description (Trans. London Ent. Soc. 1868, p. 170) and agrees pretty well with his figure, though the abdomen in my specimen is blunt and rounded. Unfortunately my single specimen is in too poor a condition to be figured.

**Boreus Californicus** n. sp.

This species is more nearly allied to *B. hyemalis* Linn. of Europe, than to either of our eastern species, *B. nivoriundus* and *B. brumalis* of Dr. Fitch. It is about twice as large as *B. nivoriundus*, the female, including the ovipositor, measuring .20 of an inch, the ovipositor being .07 inch in length, while the male is .16 of an inch in length. The body in both sexes is greenish black, with slight metallic reflections. The middle of the beak is light brown, pitchy, the base and tip being black. Antennæ and palpi black. The membranous area behind the head and below the protergum is dark horn color. The wing pads of the female are rounded semi-elliptical. The rudimentary wings of the male are dark horn color, darker at tip; they extend to the base or middle of the fourth abdominal segment. Legs dark horn color, a little darker at the joints; the tarsi a shade darker, with the terminal joint blackish. The ovipositor is dark horn color, black at base and tip, or entirely blackish beneath. The whole body is covered with minute white hairs.

In a pair preserved still sexually united, the abdomen of the male (beneath the female as usual in this genus) is considerably elongated, directed upwards perpendicularly, and held between the blades of the ovipositor which gape open widely, the male abdomen reaching into the very base of the ovipositor.

Several specimens in the Museum of the Peabody Academy of Science were received, together with valuable collections of other insects, from Mr. Junius Holleman, who collected them near Fort Bidwell, Siskiyou Co., Cal., Dec. 11th. They were observed walking on the snow in the morning, disappearing when the sun shone brightly at noon.

It represents in California the European *B. hyemalis*, rather than our two eastern species, and is another interesting example of the European facies of the Californian insect fauna.



## THYSANURA.

**Campodea Americana** n. sp.

This species is closely allied to the European *C. succinea* Nicolet, but seems to differ in the body being very transparent, and of the same color as the appendages; like that species the anal appendages are 14-jointed. It is throughout of an amber yellow color. The antennæ have the basal joint short and about one-fifth broader than the succeeding ones, and is short, about one-half as long as broad, being obliquely truncated, the outer side being the longer. The anal appendages are long and hairy, the joints gradually increasing in length until the terminal one is lanceolate oval, and nearly as long as the 10th abdominal segment is broad; between their bases is the broad triangular 11th tergite. The hairy, single-jointed tarsus is as long as the tibia, and ends in two rather long curved claws. The prothorax is considerably narrower than the head; it is about one-half as long as broad, sublunate, much rounded behind; the mesothorax is as round as the head, well rounded in front, and very free from the prothorax, under which it moves; the hinder edge is square, slightly rounded; metathorax square in front, a little rounded behind, especially on the sides.

Abdominal segments very equal in length, with the sides a little produced posteriorly, terminating in a bristle. The abdominal lateral locomotive spines are slender, acute, 2-jointed, the basal joint a little longer than broad; the second joint moving like a finger backwards and forwards, acting both as abdominal supports and as locomotive organs. The head and body are covered with fine yellowish hairs.

Length .12 of an inch.

I found these specimens in Salem, under a stone in damp soil early in April. This is the first occurrence of any of this family (*Campodeæ* of Meinert) in the United States. A species of *Japyx* (*J. Saussurii* Humbert, Rev. et Mag. Zoologie 1868, p. 345,) was discovered in Mexico by Prof. Sumichrast, and it should be looked for in Texas and the neighboring states.

## MYRIAPODA. (PAUROPODA.)

**Pauropus Lubbockii** n. sp.

While looking over a chip with Myriapods and Poduras on the under side, brought in from the grounds of the Museum of the Peabody Academy, at Salem, Nov. 10, 1870 (while the present article



is going through the press), by Mr. C. A. Walker, I detected a lively little yellowish white creature, which immediately suggested Sir John Lubbock's *Pauropus*. A closer examination showed that it was indeed a species of *Pauropus*, very closely allied to *P. pedunculatus* Lubbock, and intermediate in the form of the antennæ, between that species and *P. Huxleyi* Lubbock. It may be called *Pauropus Lubbockii*, in honor of the original discoverer of this remarkable type of Myriapods. No more interesting articulate, as Lubbock remarks, has been discovered for many years; and the occurrence of a species in America is worthy of note. Lubbock (Trans. Linn. Soc. xxvi, p. 181-190, 1867,) has given a detailed description of the genus, and an able discussion of the value of the group which it represents, which he considers as an order equivalent to the Chilopods on the one hand, and the Chilognaths (Diplopods) on the other, and for it suggests the name *Pauropoda*.

It differs from other Myriapods in having but nine pairs of legs, and bifid antennæ terminating in singular sensory appendages. The mouth-parts resemble those of the Chilopods in a rudimentary condition, and there are no tracheæ. The species are of remarkably small size, though shown by Lubbock to be mature, as he found spermatozoa developed in them. The young have but three pairs of legs, as do the young of other Myriapods so far as is known. "This little genus, therefore," as Lubbock remarks, "does not possess the characteristics of either order of Myriapods, but forms a link not only connecting the Chilopods and Diplopods together, but also bridging over to a certain extent the great chasm which separates them from other Articulata."

*P. Lubbockii* differs chiefly from *P. pedunculatus* Lubbock, to which it seems more nearly allied than *P. Huxleyi*, in the multiarticulate process on each branch of the bifid antennæ being of nearly equal length. The bulbous termination, somewhat resembling the end of a tenant hair on the feet of the Poduridæ, and other insects, is not globose, but subconical, the base being swollen. The form of the antennal joints and their hairs, and the third multiarticulate appendage to the fourth joint, is the same as in *P. pedunculatus*. The form of the ringed, pyriform organ, situated between the two appendages of the fourth antennal segment, closely resembles that of *P. Huxleyi*; the organ being sessile and much smaller than in *P. pedunculatus*. In other respects, such as the form of the body and the blunt hairs scattered over it, the legs, and claws, and the median appendages at the



end of the terminal segment of the body, our species agrees closely with *P. pedunculatus*. It is of a decided yellowish tint, and .03 of an inch in length. It is very active in its motions, and like the Poduridæ, which apparently respire through the skin, soon dies on being deprived of moisture.

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Section of Microscopy. May 11, 1870.

Mr. E. Bicknell in the chair. Eight members present.

Mr. G. F. Childs was elected a member of the Section.

Mr. Stodder exhibited a section of Tiger wood from Brazil. The wood was very hard, many of the cells being entirely filled with incrustations deposited in layers. The medullary rays were quite small and also filled with a deposit which could easily be dissolved by alcohol; the medullary rays also contained large quantities of crystals, which were formed more sparingly in the other portions of the wood. He also exhibited living spores of *Equisetum*.

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May 18, 1870.

Vice President C. T. Jackson, in the chair. Forty-four persons present.

Dr. Thomas M. Brewer exhibited a nest of the Baltimore Oriole (*Icterus Baltimore*) from Florida, composed of Spanish moss, (*Tillandsia usneoides*) verifying the position of Audubon who has both figured and described the oriole's nest as composed of this plant. He said it had since been



Packard, A. S. 1870. "New or rare American Neuroptera, Thysanura and Myriopoda." *Proceedings of the Boston Society of Natural History* 13, 405–411.

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