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No. 4.

NEW NORTH AMERICAN HOMOPTERA.—NO. VII.

BY E. P. VAN DUZEE, BUFFALO, N. Y.

1. IDIOCERUS AMÆMUS, *n. sp.*

Allied to *I. suturalis*, but smaller. Female of a uniform pale yellow colour, pronotum and scutellum tinged with fulvous or ferruginous, the former with a spot behind the inner angle of each eye and a median vitta, pale. Mesonotum with a black band bordering the scutellum, at least posteriorly; extreme tip of scutellum yellow. Elytra hyaline very slightly tinged with fulvous, becoming smoky toward the apex; nervures pale yellow. Wings hyaline, highly iridescent. Eyes rufous. Oviduct ferruginous.

In this species the front is more strongly narrowed apically with the sides nearly rectilinear beyond the antennæ, not so distinctly arcuated as in *I. suturalis*; and the clypeus is less expanded at apex. The last ventral segment is very feebly rounded behind, not distinctly advanced at the middle as in *suturalis*. In one example the pronotal markings are obsolete and the oviduct pale. Length, 5 mm.

Described from two female examples. One taken near Los Angeles Cal., by Mr. D. W. Coquillett. The other, a more deeply coloured specimen, was sent me by Mr. C. P. Gillette, as an inhabitant of the mountains of northern Colorado. Mr. Coquillett's specimen came labelled *Idiocerus amæmus*, Uhler., a M.S. name which is quite appropriate to this pretty insect.

2. PEDIOPSIS SORDIDA, *n. sp.*

Closely allied to *P. tristis*, but smaller. Male: Greenish grey, closely and coarsely punctured with blackish; punctures on the face irregularly disposed; those of the pronotum deep, elongated and oblique, but rather less conspicuous than in *insignis* and *tristis*; median line distinct. Scutellum pale with the basal angles commonly fuscous. Elytra deep smoky-brown; nervures strong, concolorous. Abdo-

men, breast and legs piceous-brown; the knees, outer edges of the tibiae, broad hind margins of the ventral segments and valve, and the base of the plates, whitish. In pale examples the legs are fulvous and the venter and plates almost uniformly ashen-grey. Length, 4 mm.

Female: Larger. Grey tinged with fulvous-yellow. Elytra concolorous, subhyaline, with inconspicuous nervures, and with the head, pronotum and scutellum irregularly mottled with brown; the basal angles of the latter blackish; punctures concolorous and less distinct than in the male. Legs and all beneath brown, the outer surface of the femora and the tibiae more or less invaded with fulvous; the abdominal segments and genital pieces broadly margined with whitish; or the lower surface may be entirely pale yellow with no trace of the brown markings. Length, 5 mm.

Colorado. Described from two male and five female examples collected among the Rocky Mountains by Prof. C. P. Gillette. This sombre species seems to be very unstable in its colouring, varying from a uniform pale yellow beneath to deep brown banded and marked with whitish. The females are well distinguished by a peculiar dusky mottled appearance above and the evenly punctured head; and the dusky basal angles of the scutellum in both sexes.

3. *AGALLIA CONSTRICTA*, n. sp.

Closely allied to *A. 4-punctata*, Prov., but smaller and more slender. Length, 3-3½ mm.

This species can best be characterized by a comparison with *4-punctata*. Female: Face a little more elongated than in that species; the front more gradually narrowed to the apex and not so broad at the base of the clypeus; clypeus more narrow and slender; outer edge of the cheek less deeply excavated under the eye, the edge between the eye and outer angle shorter, and the angle less prominent. Pronotum proportionately longer, with the latero-posterior margin distinctly longer and the posterior angles more prominent. Elytra narrower, especially toward the apex, the costa not so strongly arcuated, the apical areoles longer and narrower. Last ventral segment more produced and narrower behind, outer angles much depressed against the base of the pygofers, subtectiform, with a triangular flat basal area. In *4-punctata* there is a small oval depression on either side scarcely invading the basal half of the segment and leaving a central ridge and usually the apical margin

elevated. Pygofers shorter than in *4-punctata* and scarcely exceeded by the oviduct which in its ally is distinctly longer. In the male the front is as strongly constricted below the antennæ as in the female, while in *4-punctata* the constriction is very slight; and the outer angles of the cheeks in the male *constricta* are almost obsolete. Plates more slender than in *4-punctata*, triangular at base, narrow and parallel beyond with their rounded apex not attaining the tip of the pygofers.

Colour and markings substantially as in *4-punctata*: Yellowish testaceous, marked and clouded with fuscous. Sutures of the face, apical disc of the clypeus, an oval mark on the front, a longitudinal line from the basal angle of the front continued over the vertex and to the apex of the scutellum, four spots on the pronotum—two near the apex, and two at the humeral angles—a dot on the vertex against the eye and another on each ocellus, fuscous-brown. Two round spots on the vertex, two more on the disc of the pronotum posteriorly, and the antennal pits, black. Pectoral pieces and legs more or less clouded with brown. Elytra fuscous with palé nervures. Abdomen more or less fuscous or even black in some males, the genital pieces pale.

The colours are paler in the females. Sometimes the fuscous markings are almost obsolete above, but the four black spots on the vertex and pronotum seem to be constant.

New Jersey, Mississippi, Florida. Described from numerous examples received from Mr. Howard Evarts Weed, Prof. J. B. Smith, and others. This appears to be a common species in the Southern States, where it replaces *A. 4-punctata*.

4. AGALLIA UHLERI, n. sp.

Allied to *sanguinolenta* but more slender. Pale greyish-brown tinged with yellow, especially beneath. Two round dots on the vertex, the basal angles of the scutellum and two oblique marks on its apical field, sometimes continued forward as an interrupted median line, a cloud on the pectoral pieces, the tergum, its margins excepted, and sometimes the base of the vertex, black. Front brown, with pale lateral arcs, or pale with brown arcs. Elytra subhyaline, with distinct brown nervures. Front a little longer and narrower than in *sanguinolenta*. Last ventral segment of the female deeply and widely cleft, the lateral lobes rounded. Genital characters of the male about as in *sanguinolenta*. In deeply-coloured specimens the pronotum shows four longitudinal vittæ, the apex of the

head has a brown cloud, the ocelli are rufous and some of the elytral nervures are broadly interrupted with white. Length, about 3 mm.

Colorado, Arizona, California. Described from ten examples representing both sexes. This plain little insect I have received from several correspondents labelled *Agallia venata*, Uhl., and *Agallia enervis*, Uhl., and two highly-coloured examples from California came with the name *Agallia longula*, Uhl. The Californian material was received from Mr. Coquillett; those from Arizona were from the Morrison Collection, and the specimens from Colorado I owe to the kindness of Prof. C. P. Gillette.

Mr. Uhler's M. S. name, *venata*, would be appropriate for this species, but it is too near the European *venosa*. The other names, *enervis* and *longula*, are inapplicable to the more typical examples, so I have taken the liberty of applying to it the name of the well-known scientist who first recognized the species. . .

5. *THAMNOTETTIX ATRIDORSUM*, *n. sp.*

Allied to *Th. inornata*. Female: Pale yellow, washed with green above, especially on the pronotum and elytra. Beneath tawny yellow, or whitish on the venter; disc of the tergum, at least basally, the metasternum and basal segment of the venter commonly, tip of the rostrum, sides of the oviduct and two spots, sometimes coalescing, on the middle of the apical margin of the last ventral segment, black. Elytra subhyaline, a little smoky at apex, in some examples quite strongly washed with greenish; nervures strong, greenish. Wings hyaline, iridescent. Vertex produced and quite strongly angled before, length at the middle twice that next the eye and nearly equal to that of the pronotum; median impressed line distinct to beyond the middle. Front rather broad, showing about six pale brown arcs above. Clypeus scarcely widened toward the rounded apex, sides rectilinear. Cheeks obtusely angled and longitudinally wrinkled externally. Eyes and antennal setæ pale brown. Sides of the pronotum short, carinate. Last ventral segment long and narrow, sides regularly arcuated from the truncated apex to the base. Length, $4\frac{1}{2}$ mm.

Colorado. Described from three female specimens received from Prof. C. P. Gillette. This species is proportionately broader and shorter than *Th. inornata*, the pronotum is shorter and more concave behind and

the elytra are shorter and their nervures stronger than in that species.

Two larger individuals (6 mm. in length), apparently not distinct from the above, are broader with a wider front and a shorter and more obtuse vertex. They are both females.

6. *ATHYSANUS SEXVITTATUS*, n. sp.

Form of *A. comma* nearly. Greyish, tinged with yellow, especially on the head. Vertex with the impressed median line brown; marked either side on the disc with transverse oblong brown spots; apex polished, pale yellow with an elongated black mark on either side reaching over on to the base of the front; ocelli pale with a blackish dash on either side. Pronotum with six longitudinal brown vittæ and a few irregular marks before. Scutellum with two discal dots, two basal spots, and sometimes a double cloud on the apical field, brown. Elytral areoles edged with fuscous; nervures thick, soiled white. Front brown, its broad base and a few broken arcs pale; sutures of the loræ brown. Tergum black at base, the sides and about four apical segments pale, the latter with two broad obscure longitudinal brown vittæ terminating in a black spot either side on the large polished yellowish genital segment, or these vittæ may become geminate by the intrusion of a longitudinal pale line; sides of these pale apical segments with a row of black dots. Venter and disc of the valve dark brown; connexivum, hind edge of the ultimate segment, edge of the valve, plates and pygofer, soiled yellow or clouded with dusky; the pygofer with a large blackish cloud beneath toward their apex. Anterior and intermediate femora twice banded, and the posterior lineated with brown; tibiæ with brown dots. Vertex flat, edge subacute; length on the middle one-third greater than that next the eye. Front regularly narrowed to the apex. Clypeus not widened apically. Pronotum short, hind edge nearly straight, anterior edge feebly rounded. Elytra short ovate, reaching to the penultimate dorsal segment. Valve rather large, obtuse at apex; plates oblong, widened at base, their apex truncated; pygofer large, blunt at apex, surpassing the plates. Length, $3\frac{1}{2}$ mm.

Colorado. Described from two males received from Prof. C. P. Gillette. This species is most nearly allied to *A. comma* in most of its characters, but it has the colours and markings, almost, of *obsoletus* and *extrusus*. Only males are known to me.

THE LIFE HISTORY OF RIVULA PROPINQUALIS, GN.

BY E. PORTER FELT, B. S., FORT PLAIN, N. Y.

This rather common moth seems to have attracted little attention, though the larvæ are voracious feeders. The moths may be seen flying over grass lands in the afternoon and early evening during June, July and August. They are attracted to lights but very little, only a few being taken in the trap-lanterns at* Ithaca, N. Y., in 1889.

The moths deposit their eggs singly, or in scattered clusters of five or six. The eggs are a pale straw colour, and are firmly attached to blades of grass. This insect does not appear to be very prolific: out of seven or eight females under observation, none laid over fifteen or twenty eggs and most of them laid only eight or ten.

The eggs hatch in about five days. The larvæ escape from the egg by eating nearly around the upper surface of the shell and pushing up the lid thus formed. (Fig. 7.)

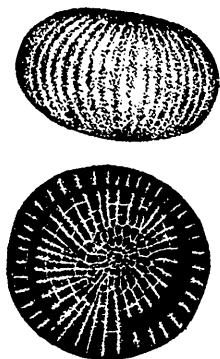


FIG. 7.—Lateral and top view of egg; the latter showing the micropyle and the lid that the larva forms as it makes its way out of the egg. Greatly enlarged.

The remains of the shell are not molested. When first hatched the larvæ are a pale yellowish colour and with long fuzzy hairs on the back; the hairs are longer at the extremities and incline well over the head. The young larvæ begin feeding at once and soon they are a bright green colour. When not feeding the larvæ remain quietly upon the surface of the leaf. In this position they harmonize so well with their surroundings that it is difficult to detect them, even when in plain sight. Frequently the best way to find them is to look for injuries to the grass. When very young the larvæ feed upon the upper surface of the leaf, eating only the soft parenchyma of the leaf. When about two weeks old they greedily devour the whole leaf. Besides eating considerable, the larvæ

also waste much by cutting leaves off as they feed. The larvæ rarely move except in search of food unless disturbed, when they usually drop to the ground.

Larvæ coming from eggs laid in August moult three times before hibernating. When cold weather approaches the larvæ crawl down near the

* The work upon which this paper is based was done at the Insectary of Cornell University.

base of a grass stalk and remain quiet till the warmth of spring arouses them. After their long exposure and fast, their colours are perceptibly duller and the body is much shrunken. The larvæ soon regain their normal size and colouring. In the spring there are at least two moults. The larvæ pupate the latter part of June. The pupa state lasts about five days. The pupæ are bright green, striped with white. They lie in loose white cocoons, which are attached to blades of grass.

The moths that emerged the latter part of June laid eggs. The larvæ from these eggs completed their growth about July 13, and July 20 a second generation of moths emerged, the round of life being completed in thirty days. It is probable that a third generation occurs in the month of August. At least it is possible and in harmony with what is known, because the moths are quite common in August, and there is no evidence to show that the moths live more than two weeks.

Egg.—A pale straw colour; form an oblate spheroid; short diameter, .36 mm.; long diameter, .42 mm. There are numerous ridges; micropyle complex. (Fig. 7.)

Larva, first stage.—Head diameter, .2625 mm.; body diameter, .1875 mm.; length, .9375 mm. Head cream coloured; body a pale yellow. There are several rows of minute tubercles on the body, and from each tubercle a light-coloured hair grows. The hairs are longer at the extremities of the body, and give the larvæ a fuzzy appearance. There are five pairs of prolegs, occurring on the seventh to tenth and thirteenth segments inclusive.

Larva, second stage.—Head diameter, .3875 mm. The body is more hairy and the colour a deeper green.

Larva, third stage.—Head diameter, .6875 mm. The body is a bright green, and the hairs are relatively shorter than in the preceding.

Larva, fourth stage.—Head diameter, .849 mm. The larva has two prominent dorso-lateral ridges, which are marked with white stripes.

Larva, fifth stage.—Head diameter, 1.2 mm. Markings the same as in the preceding.

Larva, sixth stage.—Head diameter, 1.8 mm. The larva has two narrow creamy-white subdorsal stripes in place of one broad one; hairs dark coloured.

Pupa.—Length, 9 mm. Colour bright green with two white stripes on the dorsum, extending from the head to the tip of the abdomen.

Cocoon.—Very thin, loose and white.

NOTES ON THE LIFE HISTORY OF ARGYRIA NIVALIS, DRURY

BY E. PORTER FELT, B. S., FORT PLAIN, N. Y.

This moth was rather common at Ithaca, New York, in 1892 and 1893. The moths fly in the afternoon and early evening of the latter part of June and most of July. They are attracted to lights to some extent, but those taken are mostly males. The eggs are laid in clusters upon blades of grass. They are firmly attached to the leaf, and the five or six in a cluster over-lap more or less.

The eggs hatch in ten or twelve days. The young larvæ were placed in a cage containing grass, clover and considerable moss. They soon disappeared, and subsequent observation proved they had constructed cylindrical nests in the moss. The nests were composed of bits of moss and were smoothly lined with silk. Some of the nests were perpendicular, others were horizontal. The larvæ devoured all the moss before any perceptible amount of grass was eaten. After the grass was eaten they began on the clover, and soon not a green thing was left in the cage.

When about a month old the larvæ are 2. cm. long, and their nests are three to four centimetres long. At this time the nests are mostly above the surface of the ground. There seem to be no indications of more than one generation a year. They probably hibernate in their nests as larvæ, and in the spring complete the round of life much as do some species of *Crambus*.

Egg.—Yellowish-white, flattened, oval, 1.2 mm. by .87 mm. Shell finely reticulated. (Fig. 8.)

Larva, first stage.—Head diameter, .33 mm.; body diameter, .27 mm.; length, 1.65 mm. Head and thoracic shield jet black. Body a straw colour with a broad transverse carmine stripe on the fifth and seventh segments. Spots of the same colour occur on the eleventh and twelfth segments, and also just above each pair of legs. Five pairs of prolegs, occurring on the seventh to tenth and thirteenth segments inclusive.

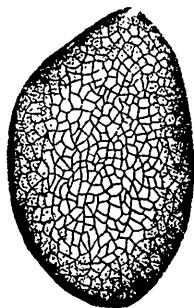


FIG. 9.—Egg and micro-pyle. Greatly enlarged.

PREPARATORY STAGES OF CATOCALA RÉTECTA, GROTE.

BY G. H. FRENCH, CARBONDALE, ILL.

Egg.—Diameter, .035 inch by .02 inch high. Low conoidal, so much flattened as to be somewhat lens shaped, ribbed longitudinally with 37 striæ, 18 of which reach the micropyle, the striæ marked transversely with shallow cross striæ. Colour, dull olive. Duration of this period, 221 days.

Young larva.—Length, .13 inch. Of the usual shape, that is cylindrical with the head broader than the body, and the first two pairs of prolegs short and not used in walking. Pale-yellow or brownish-yellow, the anterior part of the body darker than the posterior, head and top of joint 2 dark brown. Duration of this period, 5 days.

After first moult.—Length, .20 inch. Same shape as before. Head and a small place on the top of joint 2 black. Body pale dull-green; three reddish purple stripes or lines on each side; piliferous spots small, a short gray hair from each one. Duration of this period, 6 days.

After second moult.—Length, .35 inch. Body striped with alternate stripes of white and purplish-black, three white lines on each side outside of the dorsal stripe, this stripe being made up of a narrow line each side of a more or less clearly defined blackish centre. The white on the sides in lines about a third as wide as the dark, all greenish tinged. Head black, with no markings unless it be indistinct mottlings at the upper part; piliferous spots small, black; venter sordid white with black spot in the centre of each joint. Duration of this period, 8 days.

After third moult.—Length, .65 inch. Of the usual shape, a slight fringe on each side. Colour dark; three stripes on each side and one dorsal, made up of two black lines enclosing a pale centre that is composed of a pale lilac-gray line with a central broken black line, the dorsal line containing very little of the central black; the stripes separated from each other by a narrow light stripe that is slightly creamy, with a little pale lilac mottlings in places, the light stripe lighter than the light lines in the dark stripes; a stigmatal stripe that is made up of the ground colour of the venter mottled with black, though not heavily; venter sordid white with a black patch in the centre of each joint; lateral fringe white, not very heavy; head black, with a few whitish lines that do not reach the apex, some of them broken; legs pale, mostly pale reddish, the anal and last prolegs darkest. Duration of this period, 5 days.

After fourth moult.—Length, .85 inch. Marked and striped as before, but the lines broken into dots, and the light a pale green in the pale stripes and a pale greenish-lilac in the darker stripes; head with no green; joints 2 and 13 with very little green; fringe more copious, about 15 to each joint on each side; head about as before; piliferous spots pale orange, the posterior pair of dorsals to each joint more or less black, these on the posterior part of the body wholly black, while on the anterior part of the body only a part of each spot black; the lateral spots similar. Duration of this period, 6 days.

After fifth moult.—Length, 1.25 inches. Striped with dorsal, suprastigmatal and substigmatal pale, and subdorsal and stigmatal dark stripes, the ground colour a pale whitish with a slight greenish tinge; the dorsal stripe is made up of two broken purplish-black lines that make a series of ellipses, the whole stripe making from one to two ellipses on each joint, and in these ellipses there is a broken line of purplish-gray outside the general black line; the separation between the stripes is a broken purplish-black line, that is much broken into dots in pale examples and less so in dark ones. The make up of the suprastigmatal stripe is two dark broken lines alternating with three broken pale ones, this scarcely distinguishable in the paler forms; piliferous spots orange, a brown hair from each; head striped with black and sordid white; venter white, with black patch on each joint. Duration of this period, 6 days.

After sixth moult.—Length, 1.90 inches. Ground colour pale green, rather dull, with a slightly pinkish tinge over joints 5 to 8 and the anterior half of 9 and a little over 11 to 12. General colour rather a dark gray; stigmatal and subdorsal stripes and the central part of the dorsal mottled with black, with broken black bordering lines, the black in dots and elongated dots that easily group into rows; central part of suprastigmatal like the dorsal only not quite so distinct black, each with a row outside the central black of dull reddish that is between a reddish-brown and purplish-red; substigmatal stripe with a dark lower part and a paler upper part containing its reddish line; joints 2 to 4 and posterior part of 9 and anterior part of 10 with all the mottlings black, so that these parts are darker than the rest of the body, especially is this the case with joints 9 and 10; posterior part of joint 12 slightly elevated; piliferous spots, dorsal and part of upper row of lateral red with whitish tips, the others mostly whitish with a little red at base; head with a black stripe

from above the antennæ and eyes one each side to the apex where it is a little more purple, mottled slightly with whitish, the rest of head dull dark lilac with whitish stripes that are as usual moniliform, with a dull purplish-orange stripe across these on the apex; venter white with a black patch in each joint; fringe rather copious, whitish with a faint lilac tint. These characters will answer for the mature larva, with the addition that at the time of pupating it was 2.50 inches long. Duration of this period, 21 days.

Chrysalis.—This is of the usual shape of the genus. Length, 1.10 inches; diameter, .34 inch; length from head to end of wing and tongue case, .70 inch, these extending to posterior part of joint 5; cremaster slender, ending in two small hooks, with a few more small ones at the base. Colour chestnut-brown, covered with a white powder. Duration of this period, 28 days.

The eggs were obtained September 11, 1892, from a moth in confinement, one of the darkest of the forms of *Retecta*. Two were carried through to the imago state and produced moths that were not so dark as the parent, though not quite so light as some of the lightest forms, about half way between *Retecta*, as Mr. Hulst describes it in *Buffalo Bulletin*, vol. 7, page 53, and his *Luctuosa*. In *CAN. ENT.*, vol. 24, page 19, I have referred to these two forms, stating that I regarded them as only one species from my observations of them in the field. My raising intergrades from the dark form shows that they are identical. The fact is the early fresh specimens are a combination of the light form and intergrades with some dark forms, while later as they become worn the dark forms predominate. I want to say again that *Flebilis* is not a variety of *Retecta*, but a smaller species and an insect of different habits from *Retecta*, although feeding on the same food-plant. I have taken hundreds of them and have never seen one grading towards *Retecta*. In fact it is one of our most constant species.

The total period of the preparatory stages of *Retecta* were 306 days, but this would of course vary with the deposition of eggs of different examples in the woods. The food-plant is hickory. The one described through its changes emerged July 22, 1893. My field notes record the capture of *Retecta* in 1892 from August 5th to September 24th, which will give a fair range of its appearance here.

NOTES ON PIERIS AND ANTHOCHARIS.

BY HARRISON G. DYAR, NEW YORK.

After reading Mr. J. W. Tutt's note on page 47 of CAN. ENT., I have looked over many of our species of *Pieris* and *Anthocharis* with the following result:—Our genus *Pieris* is probably entirely pure and congeneric with the European. The majority of our species of *Anthocharis* are congeneric with *Euchloe cardamines*, as figured by Mr. Tutt, but some species are different and should be removed from the genus. I have not examined seven of the species given in Prof. Smith's list, but those which I have seen separate in synoptic form as follows:—Mr. Tutt's nomenclature of the veins differs from that in use here, as will be seen by a comparison of my figures (Figures 9 and 10) of *Anthocharis sara* with the figures on page 47 of CAN. ENT.

§1. *Fore-wings with 11 veins.*

Veins 6 to 8 on a stalk; vein 9 absent; veins 10 and 11 arising from discal cell.

Vein 8 very short—nearly absent.

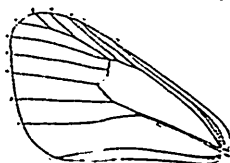


FIG. 9.

Pieris monuste, *P. beckerii*,
P. sisymbri, *P. occidentalis*,
P. protodice, *P. napi* vars.
hulda, *oleracea* and *venosa*,
P. rapæ, *Nathalis iole*.

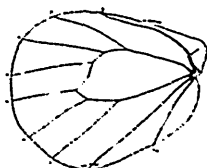


FIG. 10.

Vein 8 moderately long.

Neophasia menapia, *Tachyris ilaire*.

Anthocharis lanceolata, *A. cethura*.

Veins 6–10 on a stalk; vein 9 absent; vein 11 from discal cell.

Anthocharis genutia.

§2 *Fore-wings with 12 veins.*

Veins 6–10 on a stalk; vein 11 from cell.

Anthocharis ausonides, *A. olympia*.

A. coloradensis, *A. hyantis*, *A. creusa* [1].

Veins 6–9 on a stalk; veins 10 and 11 from cell.

Anthocharis creusa [2], *A. sara*, *A. julia*, *A. Morrisoni*, *A. stella*.

NOTES ON PARNASSIUS CLODIUS.

BY JOHN B. LEMBERT, YO SEMITE, CALA.

After a journey of ten miles over snow and snowbanks from four to eight feet deep, I arrived in the latter part of June, on my summer and fall collecting ground on the Fuolumne Meadows, which lie on the edge of the area wherein the high Sierra species of Lepidoptera are most numerous. The *Parnassius* was one of the first I began to collect, as the butterflies had just commenced to issue, and were flying in the grassy and shaded timber-covered portions of a rocky side hill slope. After they were out a day or so they began to settle down on flowers to feed, and were then less difficult to catch. The first day I only caught three, and kept on adding a few more to that number every day. Towards three and four p. m. they camp for the night on low bushes and a low growing sedge (*Carex filifolia*) and rise only when disturbed by ants or the collector on his return towards camp. I have in this way taken a great many females. On the 6th of July a ♀ after a hard chase up a rocky elevation lit on the sand and walked upon a *Phlox cæspitosa* and deposited an egg; she then flew to another and deposited an egg there also. I dug up both plants and put them in a box, placing the insect in same box, but when I got to camp she was missing. On July 10th I secured an egg that a ♀ laid on *Carex filifolia*. The same ♀ attempted to oviposit on so slender a plant of *Gayophytum diffusum* that it bent backwards down on the ground, which caused her to fly on others with the same result. Shortly after I saw several ♀'s do the same thing. One female being driven into a bush by a ♂, as soon as he left, she flew in a direct line to a large boulder, and tacked an egg on its side. I marked the spot and secured the egg, only to be crushed before I got home the next day, and the one on the carex was also lost. Towards the latter part of July a ♀ took to ovipositing on the *Pinus Murrayana* burrs lying on the ground, and then on carex. Not being able to find the eggs on the burrs, I threw them away. Not long after another ♀ did the same thing, and finally alighted on a piece of rotten wood. After she flew away these burrs gave the same results as the preceding ones, and on the rotten wood I could see nothing but a small crevice; but on breaking the crevice open I found the egg. This unravelled the mystery why I could not find the eggs on the pine burrs.

NOTE ON THE PROPOSED NEW GENUS CALOTARSA.

BY C. H. TYLER TOWNSEND, JAMAICA, W. I.

On pp. 50-52 of the present volume of this journal, I described the new genus and species *Calotarsa ornatipes*, which I then supposed to be an anomalous syrphid. I am now convinced that it is a platypezid. At the time of writing the paper, which was sent in in the fall of 1892, I overlooked the ciliate alulae of the wings, the apical spur of middle tibiae, and the similarity of venation with the Platypezidæ.

I was led to place it in the Syrphidæ from its extreme resemblance in structure and coloration to that family, the only venational character in which it was actually aberrant being the open apical cell. There is no doubt now, however, of its true position. Credit is due to Mr. Coquillett for suggesting to me *in litt.* its affinities with the genus *Platypeza*, to which he referred it, at the same time raising the question as to whether it could be possible that the peculiar tarsal appendages were of extraneous vegetable origin. I am very certain that the appendages of the hind tarsi are not of extraneous origin. They are exactly similar to each other on both the right and left tarsi. As to the validity of the genus, it is, barring the neurulation, quite as unique as before supposed. It is much larger than any known Platypezidæ, which range from 1½ to 3 mm., or at most 4 mm., and its colouring is quite different from what is usual in that family. It does not agree in the structure of its hind legs with *Platypeza*, to which genus it most nearly approaches in venation. In *Platypeza* the femora, tibiae, and tarsi are evenly widened and thickened in the hind legs. In *Calotarsa* the hind femora and tibiae are hardly at all widened or thickened, while the tarsi are greatly widened, flattened and winged. It is also removed from *Platypeza* s. str. in certain neurulation and antennal characters, for which see description, and in the prominent hypopygium. It may be looked upon as a gradation between the two closely related families, the Syrphidæ and the Platypezidæ, clearly located in the latter but with a leaning in the direction of the Pelecocerini tribe of the former.

NOTE.—Since writing the above, Prof. J. M. Aldrich has sent me drawings of the tarsi and wing of a similar species of *Calotarsa*, which he caught on a window at Brookings, So. Dakota. The specimen is a male, and less than 5 mm. long. From the drawings I believe it to be a distinct species. The venation is quite the same, except that the posterior branch of fourth vein does not quite reach the wing margin, which I am inclined

to consider a good specific character, following Schiner as Prof. Aldrich suggests. The tarsi differ in four main points: The third tarsal joint is not so widened; the expanded base of the appendage of first joint is wider and shorter, not so narrowed; the two black disks of appendage of third joint are not circular, especially the terminal one which is pointed-oval, and the membraneous expansion of the same appendage occupies a reversed position on the main stalk, being on the anterior side of it, instead of on the posterior as in *ornatipes*. It is to be hoped that Prof. Aldrich will publish the drawings of his species, together with a description of it.

NOTES ON NOCTURNAL LEPIDOPTERA.

BY A. R. GROTE, BREMEN, GERMANY.

AGROTIS ALBALIS.

My types of *albalis*, now in collection Brit. Mus., belong to a western species showing a characteristic white downy surface of the primaries, obscuring the ornamentation. My single type of *cloanthoides* in coll. Graef. belongs to a smooth-winged form with distinct, sordid or brownish-black *Cloantha*-like markings. It does not appear that *albalis* has an European representative, while *cloanthoides* is not unlike *Agrotis signifera*, of which latter it may be the American representative. In his revision Prof. Smith unites *albalis* and *cloanthoides*, apparently on the evidence of a worn example labelled *albalis* in the Bailey collection, and which he claims to be really *cloanthoides*. Thus it seems that the *albalis* of the revision is virtually *cloanthoides*, and Mr. Smith does not know in that work the true *albalis*. I have a recollection of the rubbed specimen in the Bailey collection which is labelled *albalis*; but whether it is one of the original lot or whether I named it during a visit to Albany, I cannot now say. Probably the former, and that I did not recognize it as distinct. When I described *albalis*, I did not know yet *cloanthoides*, and so it might be that a worn specimen of *cloanthoides*, with the markings lost, might have been wrongly labelled by me, escaping special notice among several *albalis*. But now in the synonymic catalogue Mr. Smith has seen my types and the real *albalis*, and considers *cloanthoides* as at least a good variety. In my opinion there is little doubt that the two are specifically distinct. Apparently Prof. Smith does not recognize colour as a character of a true variety, and when a form intergrades with the type he refuses

the varietal name. So he will not recognize red *specialis* as entitled to a varietal name in contradistinction with olive-coloured *Wilsonii*, and yet a more glaring contrast in appearance can hardly be found. It is generally characteristic of varieties that they intergrade, and of species that they do not. Non-intergrading varieties would seem to be on the road to species.

AGROTIS SEMICLARATA.

I believe, eventually, that this form will be found to represent a distinct species from my *A. vancouverensis*. The hind wings beneath are distinctly half-pale. Mr. Smith says: "The figure in the Illustrated Essay is very characteristic and recognizable, and renders determination easy. Butler says it is the ♀ of *vancouverensis*, but I have seen both sexes of the form." Well, if Mr. Smith has seen both sexes of *semiclarata*, how can it be treated as a mere synonym of *A. vancouverensis*, Grt.? One would think that it must be a variety at least. I expect, indeed, that time will show that *vancouverensis* (= *agilis*?), *semiclarata*, *clodiana*, all three thrown together as one in the Revision, will prove to be, as I stated originally, three distinct species. In several cases its author has been obliged to change his decisions. This happens not unfrequently in this world when one has little consideration.

AGROTIS DOCILIS.

I had only a single ♀ type of this species expanding 48 mil., from Professor Snow, Colorado. This is referred as a variety to *perexcellens*, Grt., in the Revision, p. 144. Prof. Smith says: "*Docilis* is based on a large specimen in which lilac predominates. The fine series before me proves its identity with the normal form of *perexcellens* in which the pale colours are gray and yellowish." I have not the slightest hesitation in accepting this reference as correct. I say in my description: "Large sized, resembling *perexcellens* (etc.) in the markings. Lilac gray over blackish fuscous," etc., Bull. Geol. Surv. VI., 259. I never had but the one specimen, and if a specimen of another species of *Agrotis* bears the label "*docilis*" it is the result of accident, at the moment unexplainable by me. At the time, and just because I only had the one specimen, I had my doubts about its distinctness, but the colour was so different that I concluded I had to do with another species. *Docilis* should thus be referred as a colour variety of *Perexcellens*.

NORTH AMERICAN THYSANURA—V.

BY ALEX. D. MACGILLIVRAY, ITHACA, N. Y.

In a previous paper there were given analytical tables to the genera of the families Aphoruridæ and Poduridæ; in the present paper will be found a table to the families and a table to the genera of the Entomobryidæ. The Smynthuridæ and Papiridæ are each represented by a single genus.

The families recognized can be separated by means of the following table:—

- A. Furcula* wanting.....*Aphoruridæ*.
 AA. Furcula present.
 B. Furcula attached to the ventral side of the antepenultimate abdominal segment.....*Poduridæ*.
 BB. Furcula attached to the ventral side of the penultimate abdominal segment.
 C. Abdomen elongate, cylindrical, much longer than broad.....
*Entomobryidæ*.
 CC. Abdomen globular, but little longer than broad.
 D. Terminal segment of the antennæ long, ringed*Smynthuridæ*.
 DD. Terminal segment of the antennæ short, with a whorl of hairs
*Papiriidæ*.

ENTOMOBRYIDÆ.†

Antennæ with from four to six segments; eyes present or wanting; postantennal organ wanting; abdomen cylindrical, much longer than broad; tarsi with two-claws; furcula always present, attached to the penultimate abdominal segment.

- A. Body naked or clothed with hairs.
 B. Antennæ four-jointed.

*Furcula is the name used by Tullberg for the ventral spring, the basal segment is the manubrium, the middle segment the dentes, and the apical segment the mucrones.

†Schott describes the following new species from California, and adds several European species:—*Entomobrya nivalis*, Linn, p. 16. *E. multifasciata*, Tullb = *D. decemfasciata*, Pack, p. 17. *E. marginata*, Tullb, p. 17. *Sira purpurea*, Schott, p. 17. *Drepanura californica*, Schott, p. 19. *Orchesella rufescens*, Lub., p. 21. *Isotoma viridis*, Bour. var. *aquatilis*, Lub. = *I. tricolor*, Pack, p. 22. *I. palustris*, Muller, p. 22. Also the following Poduridæ and Aphoruridæ:—*Achorutes viaticus*, Tullb., p. 23. *A. armatus*, Nic. = *marmoratus*, Pack, p. 23. *Xenylla maritima*, Tullb., p. 24. *Lipura inermis*, Tullb. = *L. fimetaria*, Pack, p. 24.

Schott Beitrage zur Kenntniss Kalifornischen Collembola, Bihang Kongl. Svens. Vet. Akad. Hand. Bd. 17. Afd. IV. No. 8, pp. 1-24, 1891.

- C. With a single eye-patch on each side of the head.
 D. Third and fourth abdominal segments subequal above.
 E. Dentes not extending beyond the ventral tube . . . *Isotoma*, Bourl.
 EE. Dentes extending beyond the ventral tube . *Corynothrix**, Tullb.
 DD. Fourth abdominal segment three or four times longer than the third.
- E. Mucrones falcate, not with an anteapical tooth. . . *Drepanura*†, Schott.
 EE. Mucrones not falcate, with an anteapical tooth.
 F. Eyes arranged promiscuously, not in two straight longitudinal and four transverse rows. *Entomobrya*, Rond.
 FF. Eyes arranged symmetrically, in two straight longitudinal and four transverse rows. *Salina*, MacG.
 CC. With two eye-patches on each side of the head . *Sinella*, Brooks.
 BB. Antennæ six-jointed. *Orchesella*, Temp.
 AA. Body clothed with flattened scales.
 B. Antennæ four-jointed.
 C. Apical segments of antennæ ringed.
 D. Eyes present, twelve, six on each side of the head. *Tomocerus*, Nic.
 DD. Eyes wanting. *Tritomurus*, Frau.
 CC. Apical segments of antennæ simple, not ringed.
 D. Eyes wanting. *Beckia*, Lub.
 DD. Eyes present, sixteen, eight on each side of the head.
 E. Mesonotum simple, head exposed. *Seira*, Lub.
 EE. Mesonotum projecting over the head and in part concealing it. *Lepidocyrtus*, Bour.
 BB. Antennæ five-jointed.
 C. Eye spot with a single ocellus; apical segment of the antennæ ringed. *Templetonia*, Lub.
 CC. Eye spot with eight ocelli; apical segment of the antennæ simple. *Strongylonotus*, MacG.

*Tullberg erected this genus for the reception of a species from Nova Zembla. *C. borealis*, Tullb. The characters separating it from *Isotoma* are certainly superficial.

†As the description of this genus may be inaccessible to many, it is appended: "Mesonotum non prominens. Segmentum abdominale quartum triplo vel quadruplo longius quam tertium. Antennæ dimidia parte corporis breviores, quadriarticulatae, articulo secundo et tertio inter se fere aequalibus, quarto omnium longissimo. Ocelli 16; 8 in utroque latere capitis. Pili clavati praecipue in regione cervicis et in segmentis apicalibus stipati. Mucrones furculae parvi falciformes. Squamæ? Type, *Drepanura californica*, Schott.

*Salina**, gen. nov.—Eyes sixteen, arranged in two straight longitudinal and four transverse rows; antennæ four jointed, twice as long as the head, segments subequal; tarsi with two claws; third and fourth abdominal segments unequal; body naked. Type, *Salina Banksii*, sp. nov.

Salina Banksii, sp. nov.—Light olive; a line between the antennæ, the eye spot, a line down each side of the body, blackish-purple; underneath olive; antennæ purplish, with a dark ring at the apex of the three basal segments, segments much lighter at base, hairy; legs long, slender, light olive washed with purplish, densely covered with long bristles; claws short, blunt, without teeth, inner half the length of outer, tenant hair wanting; furcula long, slender, white, bristly; the mucrones small, divided, the upper part bowed, the end truncated, and with two notches, the lower rounded, ovate. Length, 1.25 mm.

Habitat: Florida, (Nathan Banks, collector).

Named after my friend, Mr. Nathan Banks, of Sea Cliff, Long Island, New York.

Strongylonotus†, gen. nov.—Ocelli sixteen, eight on each side of the head; antennæ five-jointed; tarsi with two claws; mesonotum projecting over the head; third and fourth abdominal segments unequal; body covered with scales. Type, *Strongylonotus Summersii*, sp. nov.

Strongylonotus Summersii, sp. nov.—Head small, white, eye spot black; antennæ long, slender, densely covered with long hairs, attached to the head at the apex of the eye spot, first and second segments subequal, white, third segment subequal to the second, much narrowed towards the apex, white, apex with a purplish ring, fourth segment subequal to the third, the basal half expanded, ovate, light purplish, the apical half dumb-bell shaped, with the sides distinctly hollowed out, black, appearing as a distinct segment, apical segment two-thirds the length of the fourth, black, basal two-thirds dumb-bell shaped, not so distinctly so as the apex of the fourth, apical third enlarged at base, pointed at apex, slightly incurved on the outside; side of the mesonotum, the most of the second and all of the third abdominal segments, and a broad band across the apex of the fourth, purplish; legs long and slender,

*Derived from the name of a village.

† στρογγύλος, rotundus; νωτος, dorsum.

densely hairy, similar to those of *Salina Banksii*, white, except the apex of the hind coxæ, and the hind femora, except at apex, purplish-black; claws slender, outer one-fourth longer than inner, with two teeth, inner more slender than outer, without teeth; tenant hair present; abdominal segments unequal, first indistinct, second and third subequal, fourth eight or ten times longer than third; furcula white, long, stout, densely hairy beneath, reaching beyond the ventral tube; manubrium broad, with a purplish stripe down each side, reaching about the middle of the fourth abdominal segment, with several spines at apex; dentes about as long as the manubrium, smooth, lateral hairs twice the length of ventral, serrate beneath; mucrones one-half longer than broad, with a stout terminal hook and a basal denticle. Length, 3.5 mm.

Habitat: El Pilar, Venezuela. (Summers, collector).

Named after Prof. H. E. Summers, of Champaign, Illinois.

SMYNTHURIDÆ.*

The following table will probably be found useful in separating the species of *Smynthurus*. All the species are included except *quadrisignatus*, Pack., which is not certainly known and not sufficiently characterized to be placed from the description:—

- A. Abdomen not with a dorsal spine.
- B. Furcula not with laterally developed bristles.
- C. Abdomen not black with white spots.
- D. Fourth segment of the antennæ not ringed. *minutus*, n. sp.
- DD. Fourth segment of the antennæ distinctly ringed.
- E. Fourth segment with six sub-segments. *hortensis*, Fitch
- EE. Fourth segment with more than six sub-segments.
- F. Fourth segment with eight sub-segments. *ferrugineus*, Pack.
- FF. Fourth segment with more than eight sub-segments.
- G. Fourth segment with nine sub-segments.
- H. Size small; colour deep delicate roseate. *roseus*, Pack.
- HH. Size moderate; colour black with lighter markings *elegans*, Fitch.
- GG. Fourth segment with ten sub-segments. *arvalis*, Fitch.
- CC. Abdomen entirely black with four small dorsal white spots.

*Schott adds the following:—*Smynthurus eisenii*, Schott, p. 7. *S. luteus*, Lub., p. 11. *S. niger*, Lyb., p. 12. *S. plicatus*, Schott, p. 13.

- D. Head between the antennæ wholly black . . . *quadrimaculatus*, Ryder.
 DD. Head between the antennæ black with
 two white spots *sexmaculatus*, Harvey.
 BB. Furcula with a row of long bristles on both sides of the dentes,
 fan-like *spinatus*, MacG.
 AA. Abdomen with a dorsal spine *floridana*, MacG.

Smythurus minutus, sp. nov.—Black and yellow; head yellow, except behind and the eye spots, which are black, black extending around on the side of the face below the eye spots; eye spot narrowly encircled with yellow; on each side below the eye spot, three clear spots arranged in a transverse line; a black speck, ocellus-like, on the vertex between the antennæ; antennæ reaching beyond the apex of the thorax; basal segment black, globular, one-half the length of the second; second segment subequal to the third, yellow, petiolate at base, naked; third segment about one-half the length of the fourth, enlarged at middle, yellow, with a few scattered hairs; fourth segment yellow, blunt at tip, moderately hairy, not ringed; thorax black, except a small part of the sternum, which is yellow; legs short, stout, yellow; claws short, outer claw about as long as the tibia is broad, sinuate beneath, with a single tooth, inner claw two-thirds the length of outer, broad, stout, with a single tooth above; three tenent hairs present; abdomen black, except a yellow spot on the underside of the anal tubercle, naked, except a few bristles on anal tubercle; furcula slender, slightly hairy beneath; manubrium reaching the middle of the anal tubercle; dentes subequal in length to the manubrium; mucrones one-third the length of dentes, simple, pointed, with a slight hook at apex, with a high power appearing very finely serrate. Length, 1 mm.

Habitat: Ithaca, New York.

Collected by Mr. R. H. Pettit under pieces of wood in a plant jar in the University Insectary.

PAPIRIIDÆ.*

Papirius purpureus, sp. nov.—Blackish purple; head between the antennæ washed with yellowish, second segment of the antennæ (remainder wanting) and the claws white or transparent; the remainder of the body, including the entire furcula, blackish purple; basal article of the antennæ very short, one-third the length of the second; legs long, slender,

*Schott adds a single species, *Papirius maculosus*, Schott, p. 14.

hairy ; claws short, stout, outer broadly rounded, with two teeth, one at middle, the other at base, inner claw nearly as long as outer, more slender, with two bristles at tip ; tenant hairs present ; abdomen slightly hairy, more abundant at apex, anal tubercle with a few scattered fringed clavate hairs ; furcula long, slightly hairy above ; manubrium extending half its length beyond the apex of the abdomen, stout ; dentes subequal to the manubrium in length, narrowed beyond the base ; mucrones one-fourth the length of the dentes, apex blunt, slightly serrated at middle Length, 3 mm.

Habitat : Sea Cliff, Long Island, New York. (Banks, collector).

Readily recognized by the purple legs and furcula.

Papirius olympius, sp. nov.—Reddish, spotted with dark brown, in young specimens purplish ; eye spot black ; vertex covered with stiff bristles ; a longitudinal brown band extending from the back of the head to the eye spot, another in the middle of the vertex, extending down the middle of the front ; antennæ nearly as long as the body, purplish, hairy, basal segment light at base, dark at apex, one-fourth the length of the second, second one-half the length of the third, third segment slender, with seven sub-segments at apex, fourth segment with six sub-segments ; abdomen and thorax with two sinuate brown bands on each side of the dorsum, the middle ones meeting at the apex and base of the thorax, and on the basal half of the abdomen, also a band extending from this basal transverse band of the abdomen along the middle of the back towards the head, bilobed in front, a triangular spot just before the apex of the abdomen and promiscuous mottlings on the side, brown ; body covered with broad flattened hairs ; legs long, slender, spiny, reddish ; claws long, outer three times as long as the tibia is broad, with two teeth, inner two-thirds the length of outer, with a hair at apex reaching beyond the apex of the outer claw ; tenant hair wanting ; furcula slender, long ; manubrium short, two-thirds the length of the dentes ; dentes with a row of long hair-like spines along each side of each member ; mucrones about one-fourth the length of the dentes, serrate beneath. Length, 2–3 mm.

Habitat : Olympia, Washington. (Kincaid, collector).

BOOK NOTICES.

THE INTER-RELATION OF INSECTS AND FLOWERS.—During the last eight years there have appeared from the pen of Mr. Charles Robertson, of Carlinville, Ill., several most interesting articles on the inter-relation of insects and flowers. The titles are as follows:—

Botanical Gazette.

- 1886. Notes on the pollination of *Asclepias*.
- 1887. Insect relations of certain *Asclepiads*.
- 1887. Fertilization of *Calopogon parviflorus*.
- 1888. Effect of the wind on bees and flowers.
- 1888. Zygomorphy and its causes: I—III.
- 1889-93. Flowers and insects: I—XI.

Trans. Am. Ent. Soc.

- 1889. Synopsis of North American species of *Oxybelus*.
- 1891-93. Descriptions of new species of North American Bees.

Trans. St. Louis Acad. of Science.

- 1891, 1892. Flowers and insects: *Asclepiadaceæ* to *Scrofulariaceæ*.—*Umbelliferæ*.—*Labiataæ*.

Mr. Robertson began in 1886 to study the visits of insects to flowers, and by his persevering observations he has succeeded in collecting an enormous number of facts which he has published mostly in the *Botanical Gazette*, and in the *Transactions of the St. Louis Academy of Science*. He has studied the subject especially from a botanical point of view, and has given particular attention to the attractions offered to insects by the flowers of different species of plants, to the peculiarities of arrangement of their different parts, to their coloration, and to the modifications which many flowers seem to have undergone from their being constantly frequented by certain species of insects. Such studies have nevertheless an immediate bearing on entomology, as they give us at the same time an insight into the purposes of insects in visiting flowers, into their habits of feeding and collecting either nectar or pollen, or both at once, and into the intelligence they display in order to attain their end. The close attention thus necessarily given to insects has had besides the natural result of causing Mr. Robertson to discover that many of those insects which he was observing in his locality, Carlinville, Ill., had not even been described. Therefore, he found it "necessary at first to pay particular

attention to collecting and determining the insects." He was helped in this work by specialists in Diptera and Coleoptera, and had himself to work out and describe many species of Hymenoptera: 10 out of 14 species of *Oxybelus*, 28 out of 30 of *Andrena*, and at least 30 other species of Andrenidæ. The descriptions of these have appeared in the Trans. Am. Ent. Soc., 1889-1893.

The two great agencies of cross-fertilization of flowers are the wind and insects; hence Mr. Robertson has thus been led to notice some interesting facts concerning the effect of wind on bees and flowers. (Bot. Gaz., XIII., 1888, p. 33).

The first papers by Mr. Robertson are on the pollination of *Asclepias*, the flowers of which are most interesting in their peculiar adaptation for cross-fertilization by the agency of insects. Their structure and the great difficulty the smaller insects have in effecting pollination, lead Mr. Robertson to believe that "bumble-bees have had most influence in modifying the flowers, and they are the most common visitors after the hive bees. Hive bees, it is to be remembered, do not belong to our fauna."

Our space is too limited to allow us to follow the writer into what he has observed in all the different orders and species of flowering plants studied; but the names of all the insects observed visiting the flowers are given, as well as tabular data of the respective number of visitors of the different classes—Hymenoptera, Diptera, Lepidoptera, Coleoptera and Hemiptera.

As an instance, it may be mentioned that on the flowers of *Ceanothus Americanus* there were seen 48 species of Hymenoptera, 45 of Diptera, 2 of Lepidoptera, 13 of Coleoptera, and 4 of Hemiptera; and considerations are given, as in the case of all other blossoms treated of, on the arrangement of the flowers, their form, colour and other peculiarities of structure, some of them exceedingly minute, in which close and patient observation often succeeds in discovering most wonderful purpose and design for insuring cross-fertilization. These investigations are of great interest, and we commend them to the attention of Entomologists and Botanists as a fertile field of useful special study. Our idea in mentioning these excellent articles of Mr. Robertson's is to draw to this subject the attention it deserves from Entomologists, who from their place of publication might not be aware of their existence.

J. A. GUIGNARD AND J. FLETCHER.

BUTTERFLIES FROM CHINA, JAPAN AND COREA. By John Henry Leech, B. A., F. L. S., &c. In parts, 4to, 642 pp., 43 Plates; R. H. Porter, London, Dec., 1892—Jan., 1894.

The fifth and last part of the letter-press of Mr. Leech's work has just been issued, and is accompanied by the statement that five plates of *Hesperiidæ* and a supplemental plate will shortly follow, completing the work. Presumably, these plates will be accompanied by the letter-press of the title page, preface, and index, with which the work will be ready for the binder. As to the typography of the book, it must be said that it leaves nothing to be desired. The paper is luxuriously heavy; the type is beautifully clear and large; and the text conspicuously free from errors of a minor character, such as occasionally appear even in the most carefully edited works. The scholarship and taste of Mr. Leech and ... accomplished secretary, Mr. Richard South, are reflected in the execution of the literary portions of the work. The plates, which are from drawings by William Purkiss, and are executed by chromo-lithography by William Greve, of Berlin, are without doubt the finest examples of this form of work which have as yet graced any similar publication. While a preference is by many accorded to figures lithographed and afterwards coloured by hand, and the most exquisitely perfect illustrations have been produced in this way, and while the results of chromo-lithography as ordinarily employed in scientific illustration have generally been more or less marred by striking crudities, these plates before us are most marvellous illustrations of the capabilities of the chromo-lithographic process, when employed by those who are masters of the art. The plates are almost perfect facsimiles in form and colour of Mr. Purkiss's exquisite drawings, and the student of Chinese and Japanese lepidoptera may well rejoice upon having at his command such an infallible guide to specific identity as is found in these beautiful illustrations. The only adverse criticism which the mechanical and typographical execution of the work admits is on the score of the bulk of the letter-press which will necessarily be bound up in one volume. The heavy paper employed results in the production of a book which as a manual of reference promises to be somewhat uncomfortably "fat."

The title of the book indicates the consciousness of the author that in our present state of knowledge any effort to deal with the lepidopterous fauna of the great regions covered by this work must at best be attended by imperfections. There are wide areas in China in which little

or no attempt has yet been made to make collections, and it must necessarily be many years before it can be asserted that our knowledge of the faunistic resources of Central Asia is complete. In his classification, Mr. Leech follows the order now almost universally recognized by writers in England and on the continent as most natural. He erects, so far as the writer has been able to observe, no new genera, and while giving us a large number of new species, appears to have pursued a conservative course in this regard, which is to be commended. To the student of Asiatic lepidoptera, the work is simply indispensable, and will remain a lasting monument of the energy and scientific accomplishments of its learned and enthusiastic author.

W. J. HOLLAND.

SCIENCE GOSSIP. New Series: Vol. I., No. 1, March, 1894. London: Simpkin Marshall, Hamilton, Kent & Co.

After the lapse of a few months the old established and deservedly popular magazine, "Hardwicke's Science Gossip," re-appears under the above title, with a change of editor and publisher, but, we are glad to find, with no serious change of plan or scope or style. The new editor, Mr. John I. Carrington, was for thirteen years editor of the London *Entomologist*, and also connected for a long time with the *Field* newspaper as a contributor to its Natural History Department; he has associated with him a long list of able assistants, and we may feel every confidence that the new series of the magazine will be as useful and entertaining as any of the preceding volumes. The first number now before us contains many interesting papers, including two on entomological subjects: British Dragon-flies and Roosting Butterflies, the latter with two pretty illustrations. We can heartily commend this publication, and trust that many of our readers will subscribe to it and receive a monthly store of delight.

MYRIAPODES DES ENVIRONS DE GENÈVE PAR ALOIS HUMBERT. Genève et Bale: Georg & Cie, 1893.

We have to thank M. Henri de Saussure, the editor and publisher of this posthumous work, for this handsome addition to the library of our Society. It is a quarto volume, well printed and illustrated with a portrait of the late M. Humbert, and fourteen beautifully executed plates of Myriapods and their structural details. To any one interested in the study of these rather neglected creatures, this work must be perfectly invaluable.

EIGHTH REPORT OF THE INJURIOUS AND OTHER INSECTS OF THE STATE OF NEW YORK FOR THE YEAR 1891. By J. A. Lintner, Ph. D., State Entomologist, Albany, 1893.

Anything published by Dr. Lintner is sure to contain much valuable information and to be highly interesting, whether the subjects treated of are new to us or not. The report before us fully supports this statement. It treats of a large number of insects, injurious or otherwise, and gives in most cases a life history of each, including the author's own observations, which are always accurate and clearly detailed. Attention may especially be drawn to the accounts of the Raspberry Geometer (*Synchlora glaucaria*), the Birch-leaf Bucculatrix (*B. Canadensisella*), and the Pear-midge (*Diplosis pyrivora*). An appendix contains some very interesting popular lectures on Economic Entomology, which are well worth perusal. The only drawback to the report is the late date of its publication, which is more than two years after the observations recorded in it were made.

REPORT OF THE ENTOMOLOGIST AND BOTANIST (James Fletcher, F. R. S. C., F. L. S.), Central Experimental Farm, Ottawa, 1894.

Mr. Fletcher's reports are always interesting and valuable, and the present record of the chief insect attacks of last year and his observations upon them, is not less so than its predecessors. The season of 1893, as far as destructive insects were concerned, was only remarkable for the superabundance of locusts (grasshoppers) and the consequent damage inflicted upon oats and many other field and garden crops. Other attacks were for the most part of the familiar kinds which we have always with us; these are briefly mentioned in the report, while more attention is paid to the serious injury caused to grain crops in Manitoba and the Northwest by cut-worms, the ravages of locusts, granary insects at the Chicago Exhibition, the Horn-fly, etc. Very interesting accounts are also given of *Silpha bituberosa*, which attacks vegetables in the Northwest Territories, and *Polyphylla decemlineata*, which was very injurious to shrubs of various kinds in a nursery at Victoria, B. C.

In the botanical section of the report there are two papers especially noteworthy, those, namely, on grass for the protection of shores and harbours, and on the "Tumble-weeds" of the Northwest. The pamphlet is illustrated by a handsome full page picture of Mr. Fletcher's grass plots at the Experimental Farm, which are full of interest to every visitor, and thirty wood-cuts. It is gratifying to observe how steadily the author's reputation is growing, and how highly his work has come to be appreciated from one end of the Dominion to the other.

CORRESPONDENCE.

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GENERA OF THYSANURA.

Sir,—The recent changes in the generic names of Thysanura (Vol. xxv., p. 313 et seq., vol. xxvi., p. 54) suggest a few comments.

Lipura and *Anoura* are changed because preoccupied in Mammalogy. I do not find these names in Flower and Lydekker's recent work, and it may be that they do not represent valid genera of Mammals. But on p. 314, Mr. Macgillivray states that both *Anurophorus* and *Adicranus* have for their type *Podura fimetaria*, which belongs to *Lipura*, Burm. Why, therefore, is the new name *Aphorura* proposed for *Lipura*, when two names, neither apparently preoccupied, already exist?

Anoura, it appears, had also been used for a genus of Echinoderms previous to the publication of the Thysanuran genus.

Triena had been used three times before the genus of Thysanura was named, so it will doubtless have to be changed, as Mr. Grote indicates. But can the name *Macgillivraya* be used? I find in Scudder's Nom. Zool. a genus *Macgillivraya*, Forbes, 1851, belonging to the Mollusca.

What is the date of *Lubbockia*, Haller? Apparently 1880. But I find in Scudder's work a genus *Lubbockia*, Claus, of Crustacea, dating from 1862. T. D. A. COCKERELL, New Mexico Agric. Exp. Station.

ERRATA.—Can. Ent., p. 32, line 4, for PROSOPOPHARA read PROSOPOPHORA. Can. Ent., p. 36, line 6, for "the ridiculous" read "be ridiculous." Can. Ent., p. 38, line 22, for Coleopterous read Coleophora.

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CALOTARSA ORNATIPES.

Sir,—Professor Townsend has been misled by certain resemblances in referring his new genus *Carlotalarsa* (CAN. ENTOM., XXVI., p. 50), to the Syrphidæ, where it certainly would be an anomalous form. It belongs among the Platypezidæ, and is apparently synonymous with *Platypeza*, though it may be new. The family receives its name from the peculiar structure of the tarsi. There have been three genera with terminal arista described from North America belonging among the Syrphidæ—*Ceria*, *Pelecocera*, and *Callicera*. (See SNOW, Kans. University Quarterly, Vol. I., Part I., 1892). S. W. WILLISTON, Lawrence, Kansas, Febr. 9, '94.

Mailed March 31st.