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NOTES ON THE OCCURRENCE OF *HEPIALUS THULE*, STRECKER, AT MONTREAL.*

BY H. H. LYMAN, M. A., MONTREAL.

In the part of Mr. Strecker's Lepidoptera, Indigenous and Exotic, dated Feb. 22nd, 1875, is the description, and on the accompanying plate an excellent figure, of this species from a female sent to that author by the late Mr. Caulfield, and which was probably taken in the previous summer. The specimen was found in Phillips Square, which is about two miles from its nearest known locality, by the caretaker, from whom it passed to the taxidermist of the Natural History Society, who gave it to Mr. Caulfield.

From that time I can find no further record of its capture till that given in the Feb., 1884, number of the CANADIAN ENTOMOLOGIST (Vol. XVI., 39), by the late Mr. Bowles, who recorded having received a specimen of it during the previous year, 1883. He also stated in the same note that Mr. J. G. Jack, of Chateauguay Basin, P. Q., had also a very beautiful specimen of this moth, presumably taken in that locality.

In 1889, when looking into this matter, I wrote to Mr. Jack, at Jamaica Plain, informing him that I had found it recorded in the old minute book of the Montreal Branch that he had found the larva of what was probably a large species of *Hepialus* at Chateauguay, and asking him for particulars about this matter, and especially whether he had ever succeeding in rearing the larva to imago, or had taken this species there, and mentioning what Mr. Bowles had published in 1884. To this letter Mr. Jack replied that for two or three years in succession he had found a larva which he believed to be a *Hepialus* in the stems of *Acer Spicatum*, and one in a stem of *A. Rubrum*, and another in that of *A. Pennsylvanicum*; that the stems in which they were found were from one to two inches in diameter; that the borings extended from about a foot above the surface of the ground down into the rootstock, and that the point of exit

* Read before the meeting of the Entomological Club of the American Association for the Advancement of Science, at Madison, Wisconsin, August, 1893.

was usually but a few inches above the surface of the ground ; that the larvæ were searched for and found in late fall or early winter, and that though about a dozen were found he did not succeed in breeding the imago ; and finally that he never took *H. Thule* anywhere, but exchanged with the late Mr. Shaw, of Montreal, for a nice specimen which he afterwards gave to the Museum at Cambridge, Mass.

No further specimens, so far as I have been able to ascertain, were taken till 1885, in which year Mr. Shaw was so fortunate as to secure nine specimens. Mr. Shaw, to the great regret of our members in the Montreal Branch, died in 1886, and I was therefore unable to learn any further particulars from him.

In 1887 I searched in vain for the species, but in 1888 I was successful in discovering it, and took twelve specimens.

The locality where I discovered it, and which was probably the same as where Mr. Shaw had found it, is the brow of the old sea terrace of the post-pliocene period which extends for some miles east and west of Montreal, at a point in the municipality of Côte St. Antoine on the western outskirts of Montreal, and just above the St. Henry Swamp. I only found it in a very limited portion of this locality, not more than 400 or 500 feet in length, and supposed it was restricted to this very small area.

In 1889 I only secured six specimens, though I visited the locality much oftener, and in 1890 one just before starting on a trip across the continent, while in 1891 I only obtained two, and one other was taken by Mr. Winn.

From these facts I feared it was doomed to extinction in this locality, as the Canadian Pacific Railway runs along the brow of the terrace, and the swamp at its base is being drained and cultivated, and will be built over in a few years.

But last year we learned from one of our members that he had taken the species about three miles further west, but on the level swampy tract below the terrace, and some of our members went out on 15th July and two specimens were secured. This year Mr. Winn has traced it out all along this terrace, so that its range is much more extensive than we supposed.

The earliest date upon which I have taken it is 6th July, and the latest upon which I have heard of its being taken is 20th July of this year, but the specimens were worn and ragged.

The species seems to fly only for about fifteen to twenty minutes in

the twilight, as I have never taken it before ten minutes past eight, nor ever after half-past eight. Bright, clear evenings I have found much more favourable than cloudy ones, though I have visited the locality on many evenings without seeing one.

I have never succeeded in seeing where they came from, though I have stood watching intently for them for fifteen minutes or more before they appeared, but suddenly two or three would be in the air together, often out of reach of the net, swinging back and forth in their peculiar oscillating manner, though single individuals have been taken by others while flying along near the ground.

If touched by the net without being caught, they would drop into the grass apparently quite helpless. Six-sevenths of those which I have taken were males, but others have secured a more even division of the sexes.

One of the specimens taken in 1891 was a female, which I kept alive in order to secure eggs. It laid freely an enormous number, and I do not know whether it might not have laid more had it been kept alive longer. It was kept alive for two days in a wooden box, with gauze over the top, and seemed to hang perfectly quiet and to allow the eggs to run from her, as they were not attached, but loose in the bottom of the box. At the end of this time she was found to have been knocking about and spoiling her wings, and so was killed. The eggs were counted very carefully, and were found to amount to the enormous number of 2,151.

The following description was taken :—

Length, .027 of an inch.

Breadth, .022 of an inch.

Even oval, slightly flattened on lower side, perfectly smooth, but dull, like unglazed porcelain.

Colour, a pale honey-yellow when laid, soon turning black.

This female, however, must have been virgin, as the eggs speedily shrivelled, so that I was unable to obtain the young larvæ, or to make any of the experiments which I had contemplated in the direction of placing the eggs upon any likely food-plant. In connection with this subject several questions of great interest arise. It is well known that the moths of this family are very abundant in the Old World, one especially, *Hepialus Velleda*, swarming in Scotland in myriads, yet though we have a great many species on this continent, I do not think that any one can be considered other than very rare, except *H. Mustelinus*, which Packard reported (Proc. Ent. Soc., Phil., III., 394), as not uncommon at

Brunswick, Me., at light, and *H. Argenteomaculatus*, which is stated to be pretty generally distributed, though it is certainly not common in the imago state.*

Now, if the females in this genus produce over two thousand eggs each, it can be easily understood why they are so abundant in Europe, but why are they so rare on this continent?

Mr. D. S. Kellicott, who discovered the larva and pupa of *H. Argenteomaculatus*, found that that species bored in the roots of *Alnus incana*, but came up into the stem when mature, and Prof. J. B. Smith stated that it bred also in oak, willow and poplar. Mr. Kellicott stated in his paper upon this subject, which he read before this club at the Cleveland meeting, that after these nearly mature larvæ had come up into the stem, large numbers of them were destroyed by woodpeckers.

Upon reading this, it occurred to me that possibly this furnished the key to the mystery of the scarcity of these moths on this continent, and I therefore wrote to an ornithological acquaintance to ask if woodpeckers were more abundant on this continent than in the Old World. This gentleman replied that while he had no definite knowledge upon that question, he should judge that we had in Canada ten to twenty times as many woodpeckers to the square mile as they had in England.

I must, however, confess that even if this estimate be correct it is not an entirely satisfactory explanation, as there are on this continent a number of small species in this genus which no doubt feed in the roots of shrubs or herbaceous plants where woodpeckers would not be likely to find them, which are quite as rare as the larger species. I also wrote to Dr. Strecker to learn whether, so far as he knew, Thule had ever been found in any other locality than Montreal, to which he replied as follows:—"Some years since, an example of *Hepialus Thule* was taken somewhere in Wisconsin, I don't recollect where or by whom, but a sketch was sent me at the time for identification, which I immediately recognized as that species."

In regard to the life-history of the species in this genus, the English entomologists to whose works I have access are extremely vague. Stainton, in his Manual I., 109, says of the genus, "Larva feeding on the roots of plants," which leaves it very indefinite as to whether he means in the roots or tunneling in the earth and feeding on the roots. He even says that the larva of *H. Hectus* feeds on the leaves of dandelion, and F. O. Morris says "on the dandelion." Newman, "British Moths," does not commit himself as to *Hectus*, but of most of the others he says "on roots," but of *H. Velleda* he says "in the subterranean rhizome of the common brake, (*Pteris aquilina*)."

In spite of the very loose statements of English entomologists, I think there can be no doubt that the larvæ of this genus are internal feeders, as stated by both Harris and Packard.

*Since writing this paper Prof. J. B. Smith has called my attention to the fact that *H. McGlashani* is very abundant. See Ent. Amer., II., 15.

ON SOME UNDETERMINED BOMBYCES.

BY HARRISON G. DYAR, NEW YORK.

THIA (THELETHIA) EXTRANEA, Hy. Edw.

Mr. Andrew Bolter, of Chicago, has kindly sent me the type of this species for examination. It proves to belong to none of our families of Bombyces, as I had suspected. (See Journal N. Y. Ent. Soc., I., 98). On comparing the venation with *Pseudanaphora arcanella*, Clem.,* I find it to be essentially the same, differing only in details. Vein 2 of the secondaries is more remote from vein 3 in Thia than in Pseudanaphora, the lower fork of the discal vein ends between veins 4 and 5 instead of at origin of vein 4, and veins 5 and 6 arise from a common point instead of being well separated. Vein 8 (costal) present in both, strong, distinct, free, not 'apparently none.' On the fore-wings the venation is very similar in both. The second internal vein (submedian) is weak; the first strongly furcate at base. All the venules free, unbranched. Subcostal vein very remote from the costa, all closely as in Pseudanaphora.

The fore-wings of this little moth are closely and heavily scaled above, glossy black; below of a gray brown, the veins slightly discoloured, the costa and fringe black. Hind-wings nearly hyaline, with but a few scattering scales; the fringe well developed, black.

Body parts black, the tongue pale, contrasting.

As the name Thia has been used before in entomology, the present Tineid genus may be known as *Thelethia*.

CISTHENE (CLEMENSIA) LACTEA, Stretch.

Mr. Beutenmüller has discovered a specimen of this species in the Edwards collection, without label. So far as I have been able to examine it, it does not violate the characters of Cisthene, but its coloration is so different from the other species of the genus that I would prefer to place it in Clemensia, with which it agrees perhaps equally well structurally.

PSEUDOPSYCHE (OEDONIA) EXIGUA, Hy. Edw.

According to the present arrangement, the synonymy of this species is as follows:—

Family, PSYCHIDÆ.

Genus, OEDONIA, Kirby.

*Determined by Prof. C. H. Fernald.

1893, Kirby, Cat. Lep. Het., I. 524.

|| *Pseudopsyche*, Hy. Edw.

1882, Hy. Edw., Papilio, II., 124.

O. EXIGUA, Hy. Edwards.

1882, Hy. Edw., Papilio, II., 125.

No characters have been published which would allow of giving the genus *Oedonia* a family location. Its reference to the Psychidæ is probably due to its colour only. The statement that the pectinations of the antennæ are furcate at the tips I am unable to verify, and I regard it as erroneous. The other characters which have been given are general ones.

I have examined Mr. Neumoegen's specimen, by the kind permission of that gentleman, and present my notes on the venation, as they may be of assistance to some one:—

Primaries.—Vein 1 free, straight, simple, not furcate at base, remote from internal margin; median vein 4-branched, vein 2 arising beyond the middle of cell; all the venules, veins 3 to 11 inclusive, simple, unbranched, arising independently and nearly equidistant from each other from the end of the cell. The cell is oval in shape, pointed at base. Vein 12 from the base of wing, free, about midway between the subcostal vein and costa.

Secondaries.—Three internal veins. (I am unable to make out vein ra positively, owing to the condition of the specimen and to the fact that I cannot bleach the wing. Veins 1b and 1c are present, the latter in the normal position of the submedian fold). Median vein 4-branched, cell closed, the cross vein angulated between veins 5 and 6, with a discal fold from the angulation. Vein 6 arises half way from the angulation to the apex of cell, vein 7 from apex of cell; vein 8 free from base, straight. The frenulum consists of a minute spine, apparently without any costal loop on primaries. The exact location of this genus I will leave to students of the Microlepidoptera. One of the type specimens is in the Edwards collection in the American Museum of Natural History, New York, the other in the collection of Mr. B. Neumoegen.

LIMACODES FERRIGERA, Walker.

Mr. A. G. Butler has very kindly sent me a good coloured figure of the type in the British Museum, and it proves to be *Adoneta spinuloides*, Clem.

GLUPHISIA SEPTENTRIONALIS, Walker.

DASYCHIRA CLANDESTINA, Walker.

Both these names refer to *G. trilineata*, Pack., and both antedate it. Mr. Butler has sent me a sketch of *septentrionalis* and notes on it, and Mr. J. A. Moffat has compared the type of *clandestina* with specimens of *trilineata*, and writes me that "it is, so far as I can make out, almost identical with what we have under the name of *Gluphisia trilineata*." The synonymy will be:—

G. SEPTENTRIONALIS, Walker.

1855, Walker, Cat. Brit. Mus., IV., 1038, *Gluphisia* ?

1882, Grote, check list, p. 18, *pr. syn. trilineata* ?

clandestina, Walker.

1861, Walker, Can. Nat. & Geol., VI., 36, *Dasychira*.

1877, Grote, Can. Ent., IX., 21, *Gluphisia*.

trilineata, Packard.

1864, Packard, Proc. Ent. Soc. Phil., III., 355.

ICHTHYURA APICALIS, Walker.

As suggested by Dr. Packard (Ent. News, IV., 79), this species proves to be *I. vau*. Mr. Butler has sent me a coloured figure of it. The name takes precedence, and we have:—

I. APICALIS, Walker.

1855, Walker, Cat. Brit. Mus., V., 1058.

vau, Fitch.

1859, Fitch, 5th Rept. Nox. Ins. N. Y., 65.

indentata, Packard.

1864, Pack., Proc. Ent. Soc. Phil., III., 352.

ornata, Grote and Robinson.

1868, G. and R., Trans. Am. Ent. Soc., II., 191.

incarcerata, Boisduval.

1868, Boisduval, Am. Soc. Ent. Belg., XII., 86.

Not to mention the synonymy of the paler form.

CERTILA FLEXUOSA, Walker.

I have shown Mr. Butler's figure of this to Prof. J. B. Smith, and he feels sure that it represents *Raphia frater*. This removes the name from the list of undetermined Bombyces.

Mr. Butler deserves hearty thanks for his kindness in assisting us to determine these names.

THE MESILLA VALLEY COTTONWOOD LEAF-MINER
DETERMINED.

BY C. H. TYLER TOWNSEND, KINGSTON, JAMAICA.

Among the first insects which I found upon my arrival in the Mesilla Valley of New Mexico, in March, 1891, was a small sawfly. My notes on this species were made as follows at the time :—

March, 1891.—Specimens of a small yellowish and brownish sawfly were found quite abundant flying everywhere from middle to last of March. They were not found on any plant, but their numbers make it probable that they will turn up as injurious to some plant. Det. by Dr. Riley as *Blennocampa*, nov. sp.

In an article in *Zoe.*, vol. iii., p. 234-6, Oct., 1892, under the title of a leaf-miner of *Populus fremontii*, I described the larvæ, there supposed to be tineid, and gave an account of their great destructiveness to the foliage of these trees in the Mesilla Valley in 1891 and 1892. All attempts to breed the miner were futile.

However, in April, 1893, the trees were watched carefully during the time when the leaves were opening. The result was that on April 9th, adult sawflies were found very numerous on the cottonwoods, flying about and (apparently) ovipositing in the partially opened leaf bunches. The leaves were one-third to one-half opened at the time.

Specimens of these sawflies were captured on the spot. On being carefully compared with the specimens taken in March, 1891, which, as above mentioned, had been determined by Dr. Riley as a new species of *Blennocampa*, they were found to be the same. Dr. Riley has since expressed doubt *in litt.* that the two were the same. Though I did not breed the species, I am sure quite beyond any doubt that the sawflies caught April 9, 1893, are the adults of the leaf-miner referred to as described in *Zoe.* I am quite as certain also of the identity of these sawflies with the *Blennocampa*, n. sp., determined in 1891 by Dr. Riley.

Dr. Riley has given me *in litt.* the MS. name *Blennocampa populi-foliella* to use for this species. I therefore place these notes on record, so that my stand in the matter may be known. It appears that the precise name of the cottonwood of the Mesilla Valley is *Populus fremontii*, Watson, var. *wislizeni*, Watson, as Prof. Cockerell has pointed out to me. (See Bull. 2, Forestry Division, U. S. Dept. Agric., 1889, p. 188).

I should also point out that I found in New Mexico other tenthredinid (?) leaf-mining larvæ in *Populus angustifolia*, in the Canada Alamosa (see Journ. N. Y. Ent. Soc., i., No. 2), which belong to a different genus without doubt.

DESCRIPTIONS OF SOME SPECIES OF COLEOPTERA
OCCURRING NEAR ALLEGHENY, HERETOFORE
UNDESCRIBED.

BY JOHN HAMILTON, M. D., ALLEGHENY, PA.

Preparatory to the publication of a list of the Coleoptera of this vicinity, it has been thought proper to characterize and name the following forms:—

Bembidium postfasciatum.—Coppery-bronzed, dark beneath, elytra pallid, two dark fasciæ. Head convex, impunctate, longitudinally impressed on each side between the eyes, coppery-bronzed; antennæ with three basal joints pale, the others fuscous; thorax quadrate, base and length equal, wider at middle, base truncate, basal striæ double, hind angles rectangular, carinate, dorsal line deep, coppery-bronzed, often tinted green in the basal impressions; elytra pallid, silvery white in life, elongate oval, broadly deeply impressed transversely behind scutellum, deeply striate, striæ dilated before middle and coarsely punctured, punctures finer towards apex, intervals convex, third bipunctate, a broad undulated dark fascia behind middle, another before apex sometimes interrupted at the suture and sides; underside dark, often with a greenish reflection; legs entirely pallid. Length, .18-.21 inch. Characterized from 8 examples. Habitat: Palludial places along streams; not common, but abundant when found. This species has been distributed as a variety of *dorsale*, Say, from which it is abundantly distinct; in that species the head and thorax are brilliant green, the impressions of the thorax less dilated, the striæ of the elytra finer, not dilated near base and with finer punctures, the intervals flat; the fasciæ narrower and less conspicuous, a greenish space around the scutellum and scarcely evidence of a transverse impression.

Platynus parmarginatus.—Elongate, depressed, dark above, antennæ, mouth parts, underside, epipleuræ and reflexed margins of thorax ferruginous, with a tendency to piceous on the abdomen. Head with deep frontal impressions, a little narrower than the thorax within the marginal reflexions; thorax quadrate, widest at middle, narrowed to apex and base by a curved line, anterior angles prominent, obtusely rounded, posterior obtuse, side-margins uniformly and widely reflexed, discal line fine not reaching base, length and greatest width equal; elytra deeply sinuate at apex, striate, intervals convex, the third with four punctures. Length, .30-.38 inch. Characterized from 30 examples. Habitat:

Channels of spring runs on hills dry in summer; not common, but abundant when found. This has been distributed as a variety of *reflexus*, Lec., from which it is very distinct, the latter being much larger, with a more elongate and differently shaped thorax, tripunctate elytra, and piceous underside and legs. *P. cinctus* has the same form of thorax with *parmarginatus*, but the reflexed margin of the thorax is much narrower anteriorly than posteriorly; the thorax of *reflexus* is perceptibly longer, a little coarctate on the sides before base, widest one-third from apex, and may be termed lyriform.

Stenelophus humidus.—Piceous black, shining, basal joint of antennæ and feet pale. Head short, two-thirds as wide as thorax, smooth, antennæ brown except basal joint, very pilose; thorax quadrate, a little narrowed behind, sides curved, basal angles rounded, scarcely obtuse, impunctate, discal line fine, sometimes obsolete, basal impressions shallow, impunctate, often with minute rugæ, lateral edge narrowly ferrugineous; elytra with impunctate striæ, intervals scarcely convex, the third with a minute puncture at apical third, somewhat iridescent, extreme sutural and marginal edge sometimes pale; scutellar striæ at most rudimentary, frequently invisible; in the ♂, middle and anterior tarsi have the fourth joints deeply bilobed. Length, .18–.20 inch. Characterized from 15 examples. Habitat: Grassy swampy places in meadows and about springs. Abundant. Distinct from *S. plebeius*, which it most closely resembles, by its smaller size, less rounded thorax, obsolete scutellar striæ, and other characters seen on comparison. This species has been distributed as *Stenelophus*, N. S.

Soronia substriata.—Oval, length twice the width, much depressed, pubescent, sordid, rufescent.

Head finely punctulate, a transverse row of minute tubercles and some scattering ones, antennæ brown, fourth joint scarcely shorter than third, antennal grooves nearly parallel; thorax two and one-half times wider than long, apex deeply emarginate, base truncate, sides regularly curved, incurved a little at base, side margins widely explanate and moderately reflexed, medial line indistinct, surface not indented, densely finely punctured to the extreme margin, pubescence fine and matted together on the disk with a brown indument producing a granulated appearance; elytra widest at the base, sides forming with those of the thorax, except the sinuation at base, a regular oval curve and with continuous broad reflexed margins, feebly costate or substriate, densely finely punctured, setose,

pubescence dense, very short and matted on the disk with indument, the margins translucent when cleaned; beneath shining, rufopiceous, undermargin of thorax and elytra very broad and smooth, and with the venter very densely, scarcely visibly punctate. The mentum and its appendages are different from those in the other species, but to be understood a figure is necessary; the stria arrangement is more distinct than in *undulata* or the European *grisea*; there is no appearance of maculation except from abrasion. The indument, whether natural or acquired, could probably be removed like that on *grisea* by washing with ammonia, and when cleaned the surface would be rufous. Only two examples occurred in May under maple (*acer rubrum*) bark.

Corymbites elongaticollis.—Black, sericeo-pubescent; head coarsely confluent punctured, front a little depressed, antennæ, ♂ a little longer than head and thorax, ♀ a little shorter, serrate from the second joint, 3rd scarcely longer than 4th, 11th constricted slightly near tip; thorax one-half longer than wide, not very convex, a little roundly narrowed from middle to apex, slightly constricted before the hind angles which are divaricate and carinate, obsoletely canaliculate at base or not, finely and closely punctured especially on the sides, a little shining when the pubescence is rubbed off; elytra not wider than thorax than which they are twice longer, uniformly narrowed from base, striæ of moderate depth, intervals convex and closely punctured with fine punctures causing a rugous appearance, finely sericeo-pubescent; femora and tibiæ piceous; tarsi rufescent beneath, very slender, 1st joint just perceptibly longer than 2nd, 5th as long as 3rd and 4th conjointly; abdomen sericeous, finely densely punctulate, prothorax and side pieces more coarsely. Length, .32-.45 inch. Described from six examples; not uncommon in Western Pennsylvania, and I took an example at Parry Sound, Ontario. It varies greatly in size. In the series it should be placed near *tarsalis* or *mendax*.

Hemiptychus castaneus.—Elongate-oval, widest at base of thorax and elytra, rufocastaneous, pruinously pubescent, excessively finely punctulate; thorax at base sinuate each side of middle, obliquely truncate and separated externally from the base of the elytra by an indentation for the knees of the middle feet, external two striæ finely impressed from the middle continuously around the apex uniting with the short apical impressions of the 1st and 2nd striæ, and in two examples traceable anteriorly to the humerus, from which in one of these is an evident third

stria ending at the middle; as indistinctly punctulate below as above. Length, .05 to .08 inch. Described from 4 examples.

The pubescence is excessively fine, pruinose in appearance and lightly attached; when removed the surface seems highly polished, but with a good glass is seen to be densely punctulate. The smooth species of *Hemiptychus*, while readily separable by the eye, are not easily made known by description.

This species is next to *nigritulus*, the most common near Allegheny and Pittsburg. On *vaccinæ* and other low bushes; June, July; not abundant.

Isomira ruficollis.—Piceous black, thorax, mouth parts, tibiæ and tarsi ferrugineous. Head densely finely punctulate, transversely impressed between the antennæ, antennæ brown, one-third longer than head and thorax, in both sexes, third and fourth joints subequal, each not much longer than one of the following; thorax at extreme apex as wide as long, twice wider at base, very gradually narrowed from base to near apex and then suddenly incurved, margin exceedingly fine, base not or slightly sinuate each side of middle, hind angles slightly acute, dorsal line often scarcely evident, two or more vague discal impressions sometimes present, punctulation exceedingly fine and dense, dull from a dense microscopic pubescence; elytra at base scarcely wider than the thorax, slightly dilating to apical fourth, sutural stria not impressed before middle, 2nd not evident beyond apical 3rd and no traces of the others; closely, moderately, coarsely, uniformly punctuate over the whole surface, each puncture bearing a short inconspicuous hair, shining; underside punctulate like the upper, metasternum and side pieces more coarsely; length, .17-.21 inch. Described from eight examples.

Not rare on bushes near wet places. The elytra at full maturity are shining black, more or less brownish when immature. In some examples there is an undefined dark spot on the disk of the thorax. In this species, as well as in many other *Cistelides*, the antennæ differ much in length among individuals of either sex, also in the length of the joints; and the same is true in regard to the distance between the eyes; therefore, these characters are of little value for the separation of the species.

Acalles curtus.—Inflated, without erect setæ, unicoloured, cinereous. Head and beak, except at tip, finely granulato-punctate, punctures concealed by indument; thorax equally wide at apex and base where the width and length are subequal, one-fourth wider at middle, sides arcuately

rounded, disk notably depressed before the scutellum. Surface, when deprived of concealing indument, granular from the density of the punctuation, and with a polished dorsal line, elytra convex, inflated at middle, measured across the convexity as wide as long, roundly contracted from the middle to base where the width equals that of the thorax, posteriorly strongly declivous, deeply and widely striate, punctures large and distant, intervals convex and narrow with a crenate appearance; legs granulato-punctate and coated like the head and thorax. The punctures contain exceedingly short curved bristles visible only when sought for. Length, .08-.10 inch. Described from 4 examples. Easily known from all our species as yet described, by the absence of erect setæ and patches of scales on the elytra, as well as more globose form. Occurs near Allegheny, Pa., in April, about beech trees (*Fagus ferruginea*), under stones where it has hibernated, but is not often found.

Pachybaia strigapunctus.—Bariform, black, shining, tarsi piceous. Beak polished, slender, long, arcuate; that of ♂ punctate at base and finely irregularly lineate to apex when carefully viewed; that of ♀ scarcely longer, punctate and lineate at base to the insertion of the antennæ; first joint of antennæ nearly three times longer than second, which is one-half longer than third, 3 to 7 equal in length but increasing in thickness, the 7th rather suddenly; thorax wider than long, convergent from base forward, suddenly constricted at apex for the insertion of the head, base with a long scutellar-lobe on each side of which it is slightly sinuate, finely, closely strigate in longitudinal wavy lines, scatteringly punctured especially near the apex, a fine median line from apex to scutellum; elytra a little wider than the thorax, twice longer, widest at middle, finely striate, striæ not obviously punctured, intervals flat, uniseriately punctured, each puncture containing a white scarcely projecting hair or seta; underside, pro- and meso-thorax and legs rather coarsely closely punctured, venter more finely, white setæ of the punctures more conspicuous than above; tibiæ roughly striate and punctured. The ♂ has an acute tubercle before the anterior coxæ, in one example a spine as in some *Centrinus*; the anterior coxæ are not widely separated, the prosternal cavity is well marked but not incised. Length, .12 to .15 inch. Characterized from 3 ♂ and 3 ♀ examples. Occurs in May and June on *Cratægus*, but not abundantly.

Balaninus confusor.—Form, colour and vestiture the same as in *B. nasicus*. Rostrum in both sexes thickened and punctured at base, that of

the female not exceeding three-fourths the length of the body, and the antennal scape equaling the three basal joints. Hind femur with an oblique medium-sized tooth; claws with appendices acute. Length, .24 to .28 inch. Described from 5 ♂ and 5 ♀ examples. The foregoing characters will readily separate this species from any with which it is likely to be confused:—The oblique femoral tooth and acute claw appendix, from *B. nasicus* which it most resembles; the longer antennal scape of the ♀ and the beak thickened and punctured at base in both sexes, from *B. uniformis*; the acute claw appendices, denser vestiture and *nasicus* shape, from *obtusus*. Abundant in western and south-eastern Pennsylvania, West Virginia, south-eastern Ohio, Massachusetts, and North Carolina. Blanchard. For further comparative characters, see CAN. ENT., xxii., 7.

I have obtained this species from the acorns of *Quercus ilicifolia*, but it probably depredates on the fruit of other species of oak. An example was also obtained from one of the large apple-galls of *Solidago nemoralis*; these galls are composed of a compact porous mass caused by the larva of a fly named by Fitch *Acinia solidaginis* (Rep. 1st). The gall contained three coleopterous larvæ after the fly escaped, one of which developed the next year and turned out to be this species. Oviposition on this gall can scarcely have been otherwise than a mistake on the part of the parent.

NOTES AND QUERIES.

BY REV. W. J. HOLLAND, PH. D., ALLEGHENY, PA.

I have just received a specimen of an *Erebus odora*, which was captured last Wednesday evening (Sept. 27th) in the lecture-room of the First United Presbyterian Church, in the city of Allegheny, where its appearance caused no little consternation among the devout "mothers in Israel" who were at prayer meeting, and who thought it was a bat, of which evil things are said by the unsophisticated. It is a male in good case. This is the third specimen I have received this summer. The first was taken about four weeks ago in the cellar of my father's residence in Bartholomew County, Indiana. The second was taken at Jeannette, Pa., near a spring-house. All three specimens are fresh in appearance, as if not long from the chrysalis. Undoubtedly this great moth is more than an occasional visitor from the tropics, and should be reckoned as belonging to our fauna, though scarce. Its capture has been recorded north of the Ohio and Potomac many scores of times, and it has been taken repeatedly in Canada.

Papilio Cresphontes, for the first time, has been taken this summer in the neighborhood of Pittsburgh, and in considerable numbers. One collector obtained four specimens in one locality. The food-plant is *Zanthoxylum* and *Ptelea* in these parts. In Florida its larva is abundant upon the orange and lemon trees.

One of the commonest of our *Papilios* is *Philenor*. Here its larva is found upon *Aristolochia*. In southern Indiana, in Bartholomew county, I have observed it summer after summer, sometimes in immense numbers. It is one of the commonest butterflies there, as here. But, with the exception of one or two specimens of *Aristolochia* growing about verandahs in the village of Hope, I think I may safely say there is not a plant of *Aristolochia* within many miles of the fields in which I have counted the perfect insects by the score. What is the other food-plant upon which the larva feeds? It runs in my mind that I have read that the caterpillar has been found upon the smart-weed (*Polygonum hydro-piper*), but I cannot recall where I have seen this statement made. I have never been able to verify it by observation. Perhaps some reader of the CANADIAN ENTOMOLOGIST may be able to throw light upon the subject.

The banana merchants in our town have proved themselves possessed of curious entomological stores. I have received from them a couple of living tarantulas, and not long ago a living specimen of *Caligo Teucer*, which had emerged from a chrysalis hidden in a bunch of bananas. The insect had been transported by sea and land from either Honduras or some port in the northern portion of South America, a journey of several thousand miles. This reminds me that in several consignments of eastern Lepidoptera I have found our *Danais plexippus*, Linn. One of the sendings was from Borneo, the other from Java. We shall soon hear of its domestication on the mainland of Asia, and it will probably spread all over China and Japan. The insects taken by the U. S. Eclipse Expedition of 1889, at the Azores, numbered among them two specimens of this butterfly. There were only about a dozen specimens of insects taken at the Azores by the industrious naturalists of the party, and I judge that it must be common there. Why we have not yet heard of its domiciliation on the African continent is a mystery to me. It will no doubt get there before long.

I have a specimen of *Limenitis* taken in Warren county, Pa., this summer, which is most remarkable. It has all the markings of *L. ursula*,

but both the primaries and secondaries are crossed by very broad, white bands, as in *L. arthemis*. It is, however, larger than any specimens of *Arthemis* I have ever seen, and exceeds the majority of *L. ursula* in size. It has the white spots in the cell of the primaries which appear in some female specimens of *L. Weidemeyeri*. It is altogether a queer beast combining the characteristics of three of our species. No doubt they all sprang from a common ancestry, and this specimen reveals the force of atavism.

EXOCHILUM MUNDUM, SAY, ATTACKING THE FALL WEB-WORM.

BY A. H. KIRKLAND, ASSISTANT IN THE AMHERST, MASS., INSECTARY.

One hot afternoon in the early part of August, 1893, while out collecting, I found a large web of the Fall Web-Worm (*Hyphantria cunea*, Drury), on a young apple tree. Reaching up to cut off the twigs to which the web was attached, my attention was attracted by an unusual disturbance among the inmates of the web. Closer inspection revealed the fact that a medium-sized Ichneumon fly had intruded within the family circle, and was proving herself a most unwelcome visitor. Tearing into the web with her feet she would force her way along until she arrived under the skeletonized leaves upon which the larvæ were resting and through which they were plainly visible. When her presence was noticed by the larvæ lying on a large leaf nearest the intruder, they raised their heads and swung them rapidly from side to side, and at the same time each one emitted a drop of greenish fluid from its mouth. Meanwhile the Ichneumonid had crept up under the leaf, and bending the posterior segments of her abdomen until the partly exerted ovipositor extended forward between the feet and beyond the head, she poised herself for a moment as if to take aim, then with lightning rapidity she darted her abdomen and ovipositor still farther forward and struck through the leaf into the body of a larva, which at once commenced to writhe and twist as if in great pain. I watched this operation continue for about half an hour and did not observe the Ichneumonid sting any larva more than three or four times, usually but once.

Upon attempting its capture it broke out of the web and flew off. Soon, however, it returned, and after circling about for a short time as if to select a favorable place for renewing operations, it alighted and again forced an entrance into the web. This time my efforts were successful, and my capture, as kindly determined by Prof. Fernald, proved to be *Exochilum mundum*, Say. The larvæ that had been stung were brought to the Insectary for the purpose of obtaining more specimens of this interesting Ichneumonid.

NORTH AMERICAN THYSANURA—IV.

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

Most modern European writers follow Tulleburg in placing all the Collembola in the family *Poduridæ*, and including the *Poduridæ*, *Lipuridæ* and *Anouridæ* of Lubbock in the subfamily *Lipurinæ*. It would seem more natural to restrict the name *Poduridæ* to those genera bearing the saltatory apparatus on the antepenultimate abdominal segment, instead of the penultimate, and then to include those genera in which the saltatorial apparatus is wanting under the name *Aphoruridæ*.*

APHORURIDÆ, NOM. NOV.

Body naked, generally small; antennæ four-jointed; ocelli present or absent; postantennal organ usually present; tarsi with one or two claws; furcula wanting.

The genera belonging to this family can be readily separated by means of the following table:—

- A. Mouth parts not produced cone-like beneath the head.
- B. Tarsi with two distinct claws..... *Aphorura*.
- BB. Tarsi with a single stout claw.
- C. Postantennal organ wanting..... *Bourletia*.
- CC. Postantennal organ present.
- D. Anal spines present; postantennal organ transverse..... *Tullbergia*.
- DD. Anal spines wanting; postantennal organ circular..... *Anurida*.
- AA. Mouth parts produced cone-like beneath the head.
- B. Ocelli present, three on each side of the head..... *Neanura*.
- BB. Ocelli wanting..... *Aphoromma*.

Aphorura, † gen. nov.—Ocelli wanting; antennæ four-jointed; postantennal organ present; ocellate punctures at base of the antennæ present; lower claw of tarsi distinct. Type, *Podura ambulans*, Linn.

Proposed for *Lipura*, Burm., which is preoccupied in Mammology.

Bourletia, gen. nov.—Ocelli sixteen, eight on each side of the head; antennæ four-jointed; ocellate punctures, postantennal organ, anal spines, and lower tarsal claw wanting. Type, *Anurophorus laricis*, Nic.

**Lipura* and *Anura* are both preoccupied in zoology.

†α, priv.; φέρω, ferens; οὐρά, cauda.

Tullberg uses *Anurophorus*, Nic., for this species, but both *Anurophorus* and *Adicranus*, Bourl., have *Podura finctaria*, Linn., as type, which belongs to *Lipura*, Burm. The genus is named for the Abbe Bourlet, a well-known writer on Thysanura.

Tullbergia, Lubbock.—Ocelli wanting; antennæ four-jointed; post-antennal organ present; lower claw of tarsi wanting; anal spines large, stout; body elongate. Type, *Tullbergia antarctica*, Lub.

Anurida, Laboulb.—Ocelli ten, five on each side of the head; antennæ four-jointed; postantennal organ present; ocellate punctures, lower claw of tarsi, and anal spines wanting. Type, *Achorutes maritimus*, Guer.

Anurida maritima, Guer.—Body plumbeous, sparsely covered with long hairs; head triangular, produced between the antennæ, broadly truncate in front, broadly emarginate behind; antennæ shorter than the head, basal segment large, globular, one-half broader than the other segments, second segment a little longer than the first, the third and fourth closely joined, as long as the first and second together; eyes five, two in front and three behind; postantennal organ with seven prominences, arranged in the form of a circle; legs short and stout, covered with long stiff bristles; claws long, blunt, one-half the length of the tibia. Length, 3 mm.

Habitat: Eastern coast of the United States, Europe.

Neanura, gen. nov.—Ocelli six, three on each side of the head; antennæ four-jointed; postantennal organ present or wanting; ocellate punctures, anal spines, and lower claw of tarsi wanting; mouth parts produced cone-like beneath the head. Type, *Achorutes muscorum*, Temp.

Proposed for *Anoura*, Gerv., which is preoccupied in Mammology.

Aphoromma, † gen. nov.—Ocelli wanting; antennæ four-jointed; postantennal organ present; ocellate punctures, anal spines, and lower claw of tarsi wanting; mouth parts produced cone-like beneath the head. Type, *Anoura granaria*, Nic.

PODURIDÆ.

Body cylindrical, naked, usually small; antennæ four or five-jointed; eyes present, with ten to thirty ocelli; postantennal organs usually wanting; tarsi with one or two claws; furcula present, attached to the fourth abdominal segment.

† α , priv.; $\phi\omicron\rho\rho\acute{o}s$, ferens; $\delta\mu\mu\alpha$, oculus.

The genera belonging to this family, as restricted above, can be separated as follows:—

- A. Mouth parts not produced cone-like in front of the head.
 - B. Antennæ four-jointed.
 - C. Tarsi with two claws.
 - D. Abdomen without anal spines.....*Achorutes*.
 - DD. Abdomen with anal spines.
 - E. Abdomen with two anal spines.....*Schoturus*.
 - EE. Abdomen with four anal spines...*Tetracanthella*.
 - CC. Tarsi with a single claw.
 - D. Ocelli twenty-eight or thirty, fourteen or fifteen on each side of the head ; anal spines wanting.....*Podurhippus*.
 - DD. Ocelli less than twenty-eight.
 - E. Anal spines wanting.
 - F. Furcula long, reaching beyond the apex of the abdomen, arcuate.....*Podura*.
 - FF. Furcula short, never extending beyond the apex of the abdomen, not arcuate.
 - G. Legs long, distinctly visible from above.....*Pseudachorutes*.
 - GG. Legs extremely short, not visible from above.....*Brachysius*.
 - EE. Anal spines present.
 - F. With two anal spines.....*Xenylla*.
 - FF. - With more than two anal spines.
 - G. With three anal spines.....*Triana*.
 - GG. With four anal spines.....*Oudemansia*.
 - BB. Antennæ five-jointed.....*Lubbockia*.
 - AA. Mouth parts produced cone-like in front of the head.*Gnathocephalus*.

Achorutes, Temp.—Ocelli sixteen, eight on each side of the head ; postantennal organ wanting ; antennæ short, four-jointed ; body cylindrical, segments sub-equal ; tarsi with two claws ; anal spines wanting.
Type, *Achorutes dubius*, Temp.

Achorutes longispinus, sp. nov.—Body cylindrical, purplish-black, hairy ; head large, rounded in front, truncate behind, prolonged between the antennæ, acutely triangular ; eyes on a small black patch almost directly behind the antennæ in the middle of each lateral half of the head ; antennæ about as long as the head, basal joint globular, minute, incon-

spicuous, set in an excavation beneath the frontal projection, second and third joints subequal, globular, fourth joint elongate, as long or longer than the three basal joints, cylindrical, pointed, the inner side at apex appearing truncated; legs stout; claws large, inner claw more than half the length of outer, outer with a denticle at base; furcula elongate, reaching the hind pair of legs; manubrium large, reaching beyond the apex of the abdomen, sides straight, sub-parallel; dentes elongate, as long as the manubrium, broadest at middle, underside with two or three rows of stiff spines; mucrones short, not longer than broad, with an apical and a preapical tooth. Length, 1-1.25 mm.

Habitat: Alameda, near Las Cruces, New Mexico.

Received from Mr. Theo. D. A. Cockerell, who had received them from Mr. E. VanPatten, "who found them in immense numbers at Alameda."

Schoturus, || gen. nov.—Ocelli sixteen, eight on each side of the head; postantennal organ wanting; antennæ short, four jointed; body cylindrical, segments sub-equal; tarsi with two claws; anal spines present, two. Type, *Podura nivicola*, Fitch.

This genus is proposed for those species at present placed in the genus *Achorutes* and which have anal spines.

Tetracanthella, Schott.—Ocelli sixteen, eight on each side of the head; postantennal organ present; antennæ four-jointed; tarsi with two claws; anal spines present, four, arranged in two rows; furcula short. Type, *Tetracanthella pilosa*, Schott.

Entom., Tidsk., XII., 1891, 191; fig.

Podurhippus, Megnin.—Ocelli twenty-eight or thirty, fourteen or fifteen on each side of the head; antennæ four-jointed; tarsi with a single claw; furcula short, slender; ventral tube tuberculate, bilobed. Type, *Podurhippus pityriasius*, Megnin.

Bull. Soc. Ent. Fr. (5), VIII., 1878, p. cxxxv.; Les Parasites, 1880, p. 104; fig. 42.

Podura Linn.—Ocelli sixteen, eight on each side of the head; post-antennal organ wanting; antennæ four-jointed; tarsi with a single claw; furcula long, slender, arcuate; anal spines wanting. Type, *Podura aquatica*, Linn.

Podura granulata, sp. nov.—Body, legs and antennæ bluish-black;

||σχότος, obscurus; οὐρά, cauda.

antennæ long and slender, longer than the head; head with a quadrangular tubercle between the eyes; thorax slender, much narrower than the head; legs short and stout; claws long and slender, as long as the tibia and tarsus together; tenent hair present; furcula long and slender, reaching the first pair of legs, densely covered with closely placed, blunt, spiny tubercles, the tubercles arranged in transverse rows around the spring, giving the spring a striated appearance with a low objective; manubrium short and stout, apex produced between the dentes broadly triangular; dentes long, slender, a few scattered hairs, and indications of a transverse suture at middle; mucrones short, pointed, with a triangular tooth at base. Length, 1.25 mm.

Habitat: Tennessee.

Collected in great numbers by Prof. H. E. Summers from the surface of thin, slimy mud.

Pseudachorutes, Tullb.—Ocelli sixteen, eight on each side of the head; postantennal organ wanting; antennæ conical, four-jointed; tarsi with a single claw; furcula short, reaching the apex of the abdomen; anal spines wanting. Type, *Pseudachorutes subcrassus*, Tullb.

Brachysius, § nov. gen.—Ocelli sixteen, eight on each side of the head; postantennal organ wanting; antennæ short, not longer than the head is broad, four-jointed; tarsi with a single claw; furcula short, not reaching the apex of the abdomen nor the ventral tube; anal spines wanting; legs short and stout, not reaching the side of the body. Type, *Brachysius dilatatus*, sp. nov.

Brachysius dilatatus, sp. nov.—Bluish mottled with gray; antennæ short, not much longer than the head, first joint very small, second and third subequal, fourth almost as long as second and third together; body long and slender, broader towards the caudal end; legs short and slender, not extending beyond the side of the body; furcula short and slender; anal papillæ small, not divided, covered with stiff bristles. Length, 2 mm.

Habitat: Ithaca, N. Y.

This species has the habitus of those of the genus *Neanura*, but can be readily distinguished by the number of ocelli and by the presence of the furcula.

Xenylla, Tullb.—Ocelli ten, five on each side of the head; postantennal organ wanting; antennæ four-jointed; body cylindrical; tarsi with a single claw; anal spines present, two. Type, *Xenylla maritima*, Tullb.

§βραχύς, brevis; ὕσος, jaculum.

Triena, Tullb.—Ocelli sixteen, eight on each side of the head; postantennal organ wanting; antennæ four-jointed, conical; tarsi with a single claw; furcula extremely small, papilliform; anal spines present, three. Type, *Triena mirabilis*, Tullb.

Oudemansia, Schott.—Ocelli sixteen, eight on each side of the head; postantennal organ wanting; antennæ short, four-jointed; body cylindrical, segments subequal; tarsi with two claws; anal spines present, four, arranged in a circle around the apex of the abdomen; furcula not attaining the ventral tube. Type, *Oudemansia cœrulea*, Schott.

Entom. Tids., XIV., 1893, 174; pl., II., 1-7.

Lubbockia, Haller.—Antennæ five-jointed, longer than the body; all the tarsi with tenent hairs, small on the front and middle pairs; anal spines present, two; furcula small; body cylindrical, segments subequal. Type, *Lubbockia cœrulea*, Haller.

Mittheil. Schweiz. Entom. Ges., VI., 1880, 4.

Gnathocephalus,* gen. nov.—Ocelli sixteen, eight on each side of the head; postantennal organ wanting; antennæ short, conical, four-jointed; body cylindrical; tarsi with a single claw; anal spines wanting; furcula short, not attaining the ventral tube; mouth-parts folded together in the form of a tube and projecting in front of the head. *Gnathocephalus complexus*, sp. nov.

Gnathocephalus complexus, sp. nov.—Body robust, broadest behind, bluish-black, a row of paler spots down each side, and a few scattered hairs on the caudal end; head small, triangular, strongly produced between the antennæ, broadly truncate in front; eye spot small, on a raised tubercle; antennæ slightly longer than the head, basal segment a little longer than broad, broadest at middle, second segment as broad as the first and slightly shorter; third and fourth segments sub-equal, longer than the first and second, and much narrower, the suture between them not distinctly indicated; legs long and slender, with lighter markings and scattered regularly placed bristles; tenent hairs wanting; claws stout; furcula short, stout; manubrium half as broad as the abdomen, nearly as broad as long, slightly incised between the dentes; dentes two-thirds the length of the manubrium, cylindrical, narrowed at apex; mucrones one-half the length of the dentes, slightly arcuate, without teeth. Length, 3-4 mm.

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

*Γνάθος, maxilla; Κέφαλος, caput.

ON THE EUDRIINÆ.

BY A. R. GROTE, A. M., BREMEN, GERMANY.

In an original memoir on the *Zygaenidae*, published by the Essex Institute, Dr. Packard explained the relation of *Castnia* and allied genera to the European genus *Zygaena*, and contended for the solidarity of the group as the equivalent of the large family of *Bombycidae* in the Latreillean sense. The view, advocated by Agassiz, that *form* was a family criterion, not only form in general, but form of parts underlying form in general, obtained. Of a truth Dr. Packard's "family," *Zygaenidae*, contained genera more or less evidently related in one or other of their stages, and the agreement which Dr. Packard found in the form of the clypeus authorized their being brought together in a family group. This view has been followed by me in my papers and lists, and any adverse criticism of my particular course with regard to these insects is consequently ill-founded; while the inherent want of precision which our classifications must present allows of a shifting opinion, within limits, as this or that character appears in turn to be the decisive one, and renders such criticism unnecessary. The tendency of classifiers latterly has turned in the direction of a breaking up of these "families" into smaller groups still called "families," but based rather upon ultimate peculiarity than "form." Under the vague term "Bombyces," the various new families of the Spinner moths are still kept together, in recognition of a less tangible relationship which nevertheless is still held to exist; while the view, that the present representation of these families is the modified survival of the roots of the lepidopterous tree, is being seriously considered by students of phylogeny. Classifiers of the lepidoptera who seize only upon ultimate peculiarities of a common and essential part of the perfect insect, will, in the nature of things, eventually come to grief. Such modifications we may use to separate species, and, when so evident as to be of practical service, in the more artificial region of generic division; but, as we ascend higher, they diminish in importance and are superseded by characters of development, persistent or evanescent, offered in different stages of growth of the species. By these characters indications as to the truer affinities of the insect are given. The time is perhaps going by when lepidoptera are to be solely classified by final peculiarities of the legs, wings or tails of the perfect insect. Still, there will always be those whose observations in these directions will seem to themselves of prime importance, while, in the end, the value

of their observations will be differently expressed in our classifications. The family "*Zygaenidæ*" has shared the fate of disintegration with the family "*Bombycidæ*." Dr. Packard now recognizes three family groups: *Agaristidæ*, *Castniidæ* and *Zygaenidæ*. The sub-family *Eudriinæ*, as I would consider it, the subject of the present notice, belongs, with the sub-family *Alypiinæ*, to the *Agaristidæ*. The present sub-family seems to be exclusively American; at least I have met in literature with but one extra limital form, the African genus *Ovios*, which may possibly belong here. The general form of the perfect insect recalls that of the *Noctuidæ*, so that Hübner considers it one, while Boisduval proposes the genus *Eudryas* for the typical generic group and apparently recognizes its structural affinities to *Castnia*. The larva, as we now know, is closely allied to that of *Alypia*. The genera of the *Eudriinæ* may be briefly distinguished as follows:—

- | | |
|----------------------------------------|-------------------------------|
| 1. Structure of the male wings normal, | 2. |
| Structure of the male wings abnormal. | <i>Euscirrhopterus</i> , Grt. |
| 2. Male antennæ simple, | 3. |
| Male antennæ pectinate. | <i>Ciris</i> , Grt. |
| 3. Front smooth. | <i>Eudryas</i> , Boisd. |
| Front horned. | <i>Copidryas</i> , Grt. |

With regard to the geographical distribution *Eudryas* occurs in North America (east and west coast), and in South America (Paraguay). *Copidryas* in North America (New Mexico, Texas) and in South America.* (? Buenos Ayres). *Euscirrhopterus* is Cuban and *Ciris* is from Texas. With regard to the species, it is not entirely impossible that Walker's type of *Eudryas* *Stæ. Johannis* represents a Florida species else unknown. It is pronounced by Prof. Smith to be an aberration of *E. grata*, and its divergence from the type to have been probably produced by the "vicissitudes of the voyage." The former statement may not improbably be the true solution of the matter, since so prominent an insect should have been turned up by collectors in Florida ere this, one might think. But the cause assigned for such an aberration I am unable to follow, or even to understand. What is meant by "vicissitudes of the voyage?" The pupa (?) could not have suffered shipwreck or been washed ashore! What records are there in literature of extraordinary variations being produced through ordinary transportation by sea? The chances against the

See Papilio 3, 106. Berg's *Platensis*, as I understand his remark as to the front, probably belongs to *Copidryas*.

unprotected survival during the voyage, that this pupa should produce an unique variety, the capture of the perfect moth on a Church step in England, its delivery at the British Museum, taken altogether seem enormous. The fact that the hind-wings are unbanded is paralleled in the case of a new species from South America, which I describe here. According to Mr. Tutt's kind communication: "There is a place in Southwark, one of the London districts close by London Bridge, called "Horselydown," and there is a church there called St. John's. As this is very near the river an imported insect might be found there if we suppose it to escape from the shipping on the Thames. But there is also a place called "Horsley" in Surrey, and there are some well-known "Downs" there which have been entomologically worked over from a long period. But there is no St. John's Church there, and under the theory that Walker named the insect from the Church in England, and not, as I had imagined possible, from the St. John's River, Florida, where Doubleday collected, the Surrey locality must be abandoned. We are, therefore, driven to the conclusion that if the label is genuine, the specimen was really captured at "Horselydown," and that "Horsley Downs" is a mistake for the former on the label. If a normal specimen of *Eudryas grata* had been stated to have been caught in England, while still extraordinary, there would have been nothing so very improbable in the fact, since, according to Wood and other English authors, *Drasteria*, *Eustrotia* and other American moths have been so taken (?); I myself took a specimen of a South American species of Noctuidæ on the Battery in New York. But that this particular specimen should belong also to a very remarkable variety, never observed in America, increases the chances against the story (which may nevertheless be a true one) enormously. *Eudryas*, we may concede, might stand the voyage as a pupa and also escape as a moth in London, but how a *Stæ. Johannis* could have been turned out of a *grata* caterpillar or pupa owing to the "vicissitudes of the voyage" I do not comprehend. The type which I saw in 1868 differed not only from *grata* in its unbanded secondaries, but also by its differently coloured and perhaps marked primaries. While I recognized it as allied to *grata*, I could not help supposing it a distinct species, since I had never known *grata* to vary in that manner. In fact, that it might be a variety did not, I think, occur to me. I did not visit the Museum for the express purpose of studying *Stæ. Johannis*. I took it in rapidly and saw that it was an *Eudryas* and differed from both our common species, *grata* and *unio*, and simply re-

corded the fact that it impressed me as a distinct and even larger species. It may be that we are already in possession of the final solution of this little entomological mystery, and that *Stæ. Johannis* is really an extraordinary variation of *grata*, captured on the Church door of St. John's, in Horselydown, London, England. But it will nevertheless remain an interesting subject until we find specimens in America of the aberration, which ought to occur there also, or until we send *grata* pupa across the Atlantic and observe the effects of the "vicissitudes of the voyage." If any of these latter evolve as *Stæ. Johannis*, the mystery would be solved, and an important phase in the general subject of variation opened up. But I cannot think it. The aberration, if one, must have a cause independent of the mere voyage. Moisture, temperature, might possibly darken the primaries, but how are we to account for the secondaries, which so far from being "suffused," have no band at all, the usual ground colour obtaining over the whole surface? Here is a specimen which on the fore-wings is to show the effects of melanism, and on the hind-wings of albinism. The type of *Stæ. Johannis* is, under the circumstances, one of the most extraordinary specimens, I think, in the British Museum collection, whatever view we take of the matter, and the question before the American collector now is the range of variability in *E. grata*, and whether this shows any steps in the direction of a darkening of the fore-wings and obliteration of the marginal band on secondaries. Thus, quite independent of mere controversy as to the origin of the type, the subject is eminently one for scientific enquiry and experiment.

Eudryas Cypris, n. s.

The hind-wings with the fringes are pale vermilion-red above and below, immaculate, without band or markings. Fore-wings beneath of the same red, immaculate. Above the fore-wings have the main central portion creamy, not pure white as in allies, shading inferiorly to ochrey-olivaceous, and there is an olivaceous shade patch over the median nervules edged outwardly narrowly with whitish and deepening in colour inferiorly. A brownish terminal band, best marked superiorly on costa, and showing a lilac reflection. From opposite the cell to anal angle this band is indented by the pale red terminal edge of the wing. The somewhat olivaceous fringes show a darker median line. The costal edge towards apices is faintly red. The costal and internal shading recalls *grata*, but there is less trace of the reniform than in the N. American form; in *cypris* the traces of the reniform (perhaps variable) are fragment-

ary, as in *unio*. Abdomen red on the sides; venter pale. Antennæ simple. Front not tuberculate. One female from Assumption (So. America, coll. Consul Mangels) in Mus. Bremen.

This species is perhaps a little smaller than *grata*, very different from both N. American species by the darker creamy shade, not white, of the median field of primaries, by the red colour of hind-wings and under-surface, by the red abdomen and unbanded secondaries. It is, in shape of primaries and in their style of ornamentation, nearer *grata* than *unio*. The discovery of a South American representative of *grata*, with unbanded secondaries, is interesting. The latter character is only found in *E. Stæ. Johannis*, where the yellow hind-wings are without band. Although on this account alone the specific value of the latter may not be adequately defended, yet the probabilities in favour of this view may be considered to become somewhat heightened in view of the discovery of the South American species. The terminal bands of the hind-wings in *grata* and *unio* are decidedly characteristic, and one is unprepared for their absence in *Stæ. Johannis*, unwilling to consider so marked a modification merely varietal.

The following is a list of the *Eudriinæ*:—**

- | | |
|-------------------------------------------------|------------------------------------|
| <i>Eudryas</i> , Boisd. | <i>Copidryas</i> , Grt. |
| 1. <i>unio</i> , <i>Hüb.</i> | 5. <i>Gloveri</i> , G. & R. |
| <i>var. brevipennis</i> , <i>Stretch</i> . | 6. <i>platensis</i> , <i>Berg.</i> |
| 2. <i>grata</i> , <i>Fabr.</i> | |
| <i>assimilis</i> , Boisd. | |
| <i>ab?</i> <i>Stræ. Johannis</i> , <i>Walk.</i> | <i>Euscirrhopterus</i> , Grt. |
| 3. <i>Cypris</i> , <i>Grt.</i> | 7. <i>Pocyi</i> , <i>Grt.</i> |
| <i>Ciris</i> , <i>Grt.</i> | <i>disparilis</i> , H.—S. |
| 4. <i>Wilsoni</i> , <i>Grt.</i> | |

The North American *Agaristidæ* apparently fall into two sub-families, the *Eudriinæ*, above catalogued, and the *Alypiinæ*, containing *Alypia*, *Androloma*, *Pseudalypia*, *Edwardsia*, and *Psychomorpha*. The *Castniidæ* are apparently not represented in the North American fauna. The *Zygenidæ* are now restricted by Dr. Packard so as to include *Horama*, *Burtia* and allies, with *Ctenucha* and *Scopsis* in one sub-family group, while *Proeris*, *Harrisina* and their allies fall into the typical sub-family, being more intimately related with the European *Zygena*, a genus not represented with us. From this it will appear that a belief in the stability of the rearrangement of the *Zygenidæ* in the Philadelphia List will probably prove illusory. The genus *Octa*, *Grt.*, should be removed to the *Tineidæ*, as indicated by Zeller.

**For a list of our species consult also *Papilio* I., 177. I have never seen a Californian specimen, and am quite doubtful as to *brevipennis* being a variety of *unio*. *Stretch's* figure and description were made from an imperfect example. The Cuban *E. Pocyi* was subsequently described by Herrick Schaeffer as *Heterandra disparilis*: on comparison of the dates of issue of the two publications, which appeared nearly at the same time, the Philadelphia paper has priority.

LIST OF COLEOPTERA TAKEN AT SPARROW LAKE, ONT.

BY JOHN HAMILTON, M. D., ALLEGHENY, PA.

[In our last number, pages 272-5, the lists of Coleoptera were unfortunately disarranged in making up the forms. We accordingly reprint them in their proper order.—ED. C. E.]

- | | |
|------------------------------------|---------------------------------------|
| Cicindela repanda, <i>Dej.</i> | Platynus melanarius, <i>Dej.</i> |
| var. 12-guttata, <i>Dej.</i> | corvus, <i>Lec.</i> |
| Cychrus Lecontei, <i>Dej.</i> | placidus, <i>Say.</i> |
| Carabus sylvosus, <i>Say.</i> | Bogemanni, <i>Gyll.</i> |
| Calosoma scrutator, <i>Fab.</i> | ruficornis, <i>Lec.</i> |
| Wilcoxi, <i>Lec.</i> | Galerita janus, <i>Fab.</i> |
| calidum, <i>Fab.</i> | Lebia viridis, <i>Say.</i> |
| Elaphrus ruscarius, <i>Say.</i> | Metabletus americanus, <i>Dej.</i> |
| Loricera caerulea, <i>Linn.</i> | Cymindis pilosa, <i>Say.</i> |
| Nebria pallipes, <i>Say.</i> | Brachynus cyanipennis, <i>Say.</i> |
| Scarites subterraneus, <i>Fab.</i> | Chlaenius sericeus, <i>Forst.</i> |
| Dyschirius nigripes, <i>Lec.</i> | pennsylvanicus, <i>Say.</i> |
| Bembidium patrule, <i>Dej.</i> | Anomoglossus emarginatus, <i>Say.</i> |
| versicolor, <i>Lec.</i> | Brachylobus lithophilus, <i>Say.</i> |
| Sp. undetermined. | Agonoderus pallipes, <i>Fab.</i> |
| Tachys nanus, <i>Gyll.</i> | Harpalus erraticus, <i>Say.</i> |
| flavicauda, <i>Say.</i> | viridiæneus, <i>Beauv.</i> |
| Patrobus longicornis, <i>Say.</i> | Sp. undetermined. |
| Pterostichus honestus, <i>Say.</i> | pennsylvanicus, <i>De G.</i> |
| coracinus, <i>Newm.</i> | fallax, <i>Lec.</i> |
| stygicus, <i>Say.</i> | pleuriticus, <i>Kirby.</i> |
| lucublandus, <i>Say.</i> | viduus, <i>Lec.</i> |
| caudicalis, <i>Say.</i> | Stenolophus plebeius, <i>Dej.</i> |
| luctuosus, <i>Dej.</i> | conjunctus, <i>Say.</i> |
| corvinus, <i>Dej.</i> | Anisodactylus Harrisii, <i>Lec.</i> |
| erythropus, <i>Dej.</i> | interstitialis, <i>Say.</i> |
| Amara exarata, <i>Dej.</i> | Ilybius biguttatus, <i>Germ.</i> |
| pallipes, <i>Kirby.</i> | Hydaticus stagnalis, <i>Fab.</i> |
| rubrica, <i>Hald.</i> | Dytiscus fasciventris, <i>Say.</i> |
| Calathus gregarius, <i>Say.</i> | Gyrinus canadensis, <i>Reg. ?</i> |
| Platynus sinuatus, <i>Dej.</i> | analis, <i>Say.</i> |
| extensicollis, <i>Say.</i> | Berosus striatus, <i>Say.</i> |
| atratus, <i>Lec.</i> | Philydrus perplexus, <i>Lec.</i> |

- Hydrobius fuscipes*, Linn.
Creniphilus sub-cupreus, Say.
Cercyon pygmæum, Ill.
Necrophorus vespilloides, Hbst.
Silpha Americana, Linn.
Liodes discolor, Mels.
Homalota trimaculata, Er.
Bolitochara picta, Fauv.
Aleochara bimaculata, Grav.
 graciliformis, Fauv.
Gyrophæna vinula, Er.
Quedius fulgidus, Fab.
 lævigatus, Gyll.
Listrotrophus cingulatus, Grav.
Creophilus maxillosus, Linn.
Staphylinus violaceus, Grav.
Philonthus pclitus, Linn.
 longicornis, Steph.
 micans, Grav.
 cyanipennis, Fab.
 sordidus, Grav.
 Sp. undetermined.
Xantholinus obsidianus, Mels.
 emmesus, Grav.
 obscurus, Er.
 N. S. (found here).
Baptolinus longiceps, Fauv.
Stenus—3 sp.
Lathrobium punctulatum, Lec.
 bicolor, Lec.
Stilicus, sp.
Pæderus littorarius, Grav.
Sunius longiusculus, Mann.
Tachinus repandus, Horn.
 fimbriatus, Grav.
Erchomus ventriculus, Say.
Conosoma pubescens, Payk.
Boletobius cincticollis, Say.
- Olisthærus substriatus*, Gyll.
Oxyporus femoralis, Grav.
 rufipennis, Lec.
Oxytelus sculptus, Grav.
 pennsylvanicus, Er.
 insignitus, Grav.
Trogophlæus 4-punctatus, Say.
Scaphisoma convexum, Say.
Hippodamia 13-punctata, Linn.
Coccinella trifasciata, Linn.
Chilocorus bivulnerus, Muls.
Psyllobora 20-maculata, Say.
Hyperaspis signata, Oliv.
Scymnus lacustris, Lec.
Endomychus biguttatus, Say.
Tritoma thoracica, Say.
Silvanus bidentatus, Fab.
Læmophlæus fasciatus, Mels.
Hister depurator, Say.
 sedecimstriatus, Say.
 carolinus, Payk.
 Lecontei, Mars.
Epurea Erichsonii, Reit.
 Sp.
Ips fasciatus, Oliv.
Stephostethus liratus, Lec.
Corticaria pusilla, Mann.
 pumila, Lec.
Tenebrioides corticalis, Mels.
Cyphon obscurus, Guer.
Deltometopus amœnicornis, Say.
Dromaeolus Harringtoni, Horn.
Alaus myops, Fab.
Agriotes fucosus, Lec.
 Sp.
Melanotus castanipes, Payk.
 fissilis, Say.
Corymbites medianus, Germ.

- Cormybites propola, *Lec.*
 Dicerca tuberculata, *Chev.*
 Sp. undetermined.
 Buprestis rusticorum, *Kirby.*
 fasciata, *Fab.*
 Agrilus ruficollis, *Fab.*
 Calopteron terminale, *Say.*
 Calochromus perfaceta, *Say.*
 Ellychnia corusca, *Linn.*
 Telephorus lineola, *Fab.*
 scitulus, *Say.*
 Collops tricolor, *Say.*
 Trichodes Nuttalli, *Kirby.*
 Hydnocera pallipennis, *Say.*
 longicollis, *Zieg.*
 Cis fuscipes, *Mellie.*
 Canthon lævis, *Drury.*
 Onthophagus Hecate, *Panz.*
 Dialytes striatulus, *Say.*
 Ulkei, *Horn.*
 Aphodius fossor, *Linn.*
 fimetarius, *Linn.*
 ruricola, *Mels.*
 leopardus, *Horn.*
 lentus, *Horn.*
 Geotrupes splendidus, *Fab.*
 Anomala lucicola, *Fab.*
 Ligyris relictus, *Say.*
 Euphoria fulgida, *Fab.*
 Osmoderma scabra, *Beauv.*
 Trichius affinis, *Gory.*
 Valgus canaliculatus, *Fab.*
 Hylotrupes bajulus, *Linn.*
 ligneus, *Fab.*
 Calloides nobilis, *Say.*
 Arhopalus fulminans, *Fab.*
 Xylotrechus sagittatus, *Germ.*
 Clytanthus ruricola, *Oliv.*
 Euderces picipes, *Fab.*
 Desmocerus palliatus, *Forst.*
 Centrodera decolorata, *Harr.*
 Gaurotes cyanipennis, *Say.*
 Typocerus sparsus, *Lec.*
 velutinus, *Oliv.*
 Leptura nitens, *Forst.*
 canadensis, *Oliv.*
 vagans (var. brevis, *Kirby*)
 Monohammus confusor, *Kirby.*
 Urographis fasciatus, *De G.*
 Saperda vestita, *Say.*
 3-dentata, *Oliv.*
 Amphionycha flammata, *Newm.*
 Donacia palmata, *Oliv.*
 piscatrix, *Lac.*
 proxima, *Kirby.*
 2 sp. not determined.
 Pachybrachys femoratus, *Oliv.*
 hepaticus, *Mels.*
 Monachus saponatus, *Fab.*
 Diachus auratus, *Fab.*
 Adoxus obscurus (var. vitis, *Fab.*)
 Xanthonia 10-notata, *Say.*
 Typophorus canellus (var. aterri-
 mus.)
 Chrysochus auratus, *Fab.*
 Rhabdopterus picipes, *Oliv.*
 Doryphora 10-lineata, *Say.*
 Chrysomela bigsbyana, *Kirby.*
 Galerucella nymphææ, *Linn.*
 Diabrotica 12-punctata, *Fab.*
 " vittata, *Fab.*
 Phyllobrotica decorata, *Say.*
 Cerotoma 3-furcata, *Forst.*
 Dysonycha pennsylvanica, *Illig.*
 Haltica ignita, *Illig.*
 Crepidodera helxines, *Linn.*

· Epitrix cucumeris, <i>Harris.</i>	Anaspis rufa, <i>Say.</i>
Systema hudsonias, <i>Forst.</i>	Mordella melæna, <i>Germ.</i>
<i>marginalis, Illig.</i>	<i>marginata, Mels.</i>
Nyctobates pennsylvanica, <i>De G.</i>	Xylophilus tuberculifer, (<i>infra.</i>)
Xylopinus saperdioides, <i>Oliv.</i>	Epicauta pennsylvanica, <i>De G.</i>
Tenebrio molitor, <i>Linn.</i>	Attelabus bipustulatus, <i>Fab.</i>
Blapstinus interruptus, <i>Say.</i>	Ithycerus noveboracensis, <i>Forst.</i>
Uloma impressa, <i>Mels.</i>	Lissorhoptrus simplex, <i>Say.</i>
Diaperis hydni, <i>Fab.</i>	Magdalis armicollis, <i>Say.</i>
Boletotherus bifurcus, <i>Fab.</i>	Orchestes niger, <i>Horn.</i>
Cistela sericea, <i>Say.</i>	Gymnetron tetrum, <i>Fab.</i>
Penthe pimelia, <i>Fab.</i>	Balaninus uniformis, <i>Lec.</i>
Eustrophus confinis, <i>Lec.</i>	Eupsalis minuta, <i>Drury.</i>
Canifa pallipes, <i>Mels.</i>	Dryocetes, n. sp.
Stenotrachelus arctatus, <i>Say.</i>	

CORRESPONDENCE.

NOTES ON HEPIALUS.

In CAN. ENT., Vol. XXV., p. 124, Mr. Neumoegen and myself referred *Hepialus quadriguttatus* as a synonym of *H. argenteomaculatus*, and described the salmon-colored form as a new variety. To this Mr. Grote objected (CAN. ENT., XXV., 186) and also Dr. Strecker, Proc. Acad. Sci. Phila., p. 282). In view of these opinions, it seems probable that we were wrong, and I correct the synonymy below. In the same paper, Dr. Strecker describes as new *Hepialus los*. I cannot see in his description anything but a form of *argenteomaculatus*, wanting one of the basal silver spots and possessing some additional spots subapically, such as we often see in *quadriguttatus*. I have had in my collection for some years a specimen more extreme than this seems to be, for it has none of the silver spots, being otherwise normally marked. I would propose for it the name *perdita*.

Our species of *Hepialus* of large size, with the apices of primaries rectangular, may be arranged as follows, and the generic term *Stenopsis*, Pack, may be retained for them:—

- S. ARGENTEOMACULATUS, Harris.
argentatus, Packard.
alni, Kellcott.
var. purpurascens, Packard.

var. los, Strecker.

var. perdita, Dyar.

var. quadriguttatus, Grote.

semiauratus, Neumoegen and Dyar.

S. THULE, Strecker.

S. AURATUS, Grote.

Dr. Strecker objects to the reference of *quadriguttatus* as a variety of *argenteomaculatus*, and would consider it a distinct species; but I am unable to find a good specific character. I should hesitate to rely on the colour alone in this genus, and have preferred to follow Prof. Smith's "List."

HARRISON G. DYAR.

ALEXICLES ASPERSA, Grote.

As pointed out by Prof. Smith, the original description of *Alexicles* is entirely inadequate. In fact, no characters are given which will determine its family position, the author going as far as to partially retract his own opinion as to its location. I have before me the type, very kindly forwarded to me for examination by Mr. W. A. Snow. It is a true Arctian apparently most nearly allied to *Leptarctia*. Head moderately prominent, tongue imperceptible; median spurs of hind tibiae wanting; anterior tibiae armed at tip with a stout, slightly curved spine or claw. ♂ frenulum a long spine, hooked into a loop on subcostal vein of primaries. Venation arctiiform; one internal vein on primaries, two on secondaries; median veins four-branched, normal; cells closed; vein 8 of secondaries from the subcostal more than one-third the length of cell from base. On primaries no accessory cell; veins 7-10 stalked; 8 and 9 forming a short furcation near apex of wing; 7 nearer the furcation and 10 rather near the cell, leaving a long stalk between their origins; vein 11 from the subcostal near end of cell; vein 12 from the base half way between the subcostal vein and costa.

Fore-wings narrow, costa straight, apex rounded; hind-wings oval.

It is scarcely necessary to add anything to Mr. Grote's description of the species. Though short, it is excellent, as are nearly all of Mr. Grote's specific descriptions. Mr. Grote gives the expanse as 32 mm.; but in the type, mounted as usual, the wings reach 36 mm.

HARRISON G. DYAR.

DR. HAGEN.

We deeply regret the loss of our old friend, Dr. Hermann August Hagen, Professor of Entomology in Harvard University, who died, after a long illness, at Cambridge, Mass., on the 9th of November, in the seventy-seventh year of his age.

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ERRATA.

- Page 6, 3d line, for *P. toll* read *T.*
tolteca.
- Page 161, 20th line, for "Archilithabius"
 read "Archilithobius..."

