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# The Canadian Entomologist.

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## SYNONYMICAL NOTES ON SOME HETEROCERA IN THE BRITISH MUSEUM.

BY JOHN B. SMITH, NEW BRUNSWICK, N. J.

During the latter part of September, and early in October, 1891, I spent two weeks in London, and most of the time in the entomological rooms of the British Museum. My aim was, primarily, to identify the noctuids described by Walker, and in this I succeeded, the MSS. incorporating the notes there made being now in the hands of the printer. So large is the material in this magnificent collection, that I found opportunity for only a very hasty glance at other families of the Heterocera, and on a few species only I made brief notes. So far as they are synonymic they are here given.

### *Alypia crescens*, Wlk.

1856—Wlk., Cat. Lep. Brit. Mus., Het. vii., 1774.

This is the same as *Alypia grotei*, Bdv., Lep. Cal., 1868, 70. Walker's name has priority. I have not the reference to Herrich-Schæffer's *Agarista bimaculata*, which Mr. Grote, Bull. Buff. Soc. Nat. Sci. i, 31, doubtfully refers here. Mr. Stretch in 1876, Wheeler's Rept. v., 802, gives *bimaculata*, H.-Sch., as the species, and cites *grotei* as a synonym of it. *Alypiodes flavilinguis*, Grt., Trans. Kans. Ac. Sci. viii., is another synonym, *vide* Mr. Henry Edwards in Papilio iv., 13. The genus *Alypiodes* is probably a good one, and it is also probable that Herrich-Schæffer's name will be found to ante-date Walker's, so that the species will probably remain as given by me in the recent List.

### *Eudryas Stæ Johannis*, Wlk.

1856—Wlk., Cat. Lep. Brit. Mus., Het. ix., 144.

The type is marked "Taken on the church door at Horsley Downs." There is nothing in the specimen or record to authorize the reference of this species as North American, and yet this is probably correct. The insect is like *grata*, with slightly suffused primaries and deeper yellow immaculate secondaries. It is probable that in some way the pupa of

the insect was transported to England and through the vicissitudes encountered an aberration was produced. I have no hesitation in referring the species as a suffused aberrant *grata*.

*Comacla simplex*, Wlk.

*Comacla murina*, Wlk.

1865—Wlk., Cat. Lep. Brit. Mus., Het. xxxi., 276.

Both the above species are the same as *Vanessodes clarus*, G. & R., Trans. Am. Ent. Soc., iii., 176, and Walker's names, generic and specific, have priority. The reference above given refers to *C. murina*, Wlk. The reference to *C. simplex*, Wlk., I have mislaid in some way, and have not at present access to the books to replace it. The name is earlier than *murina*, however, if my recollection serves, and must stand for the species. This unites numbers 994, 995 and 991 of my list. East Florida is given by Walker as the locality for the species; but the specimens are probably from Texas. Quite a number of species credited to "East Florida" in the British Museum are almost certainly from Texas.

*Cothocida nigrifera*, Wlk.

1865—Wlk., Cat. Lep. Brit. Mus., Het. xxxii., 499.

This was described among the Limacodidæ by Walker, and is No. 1213 in my list. The type specimen is a species of *Crocota* with very dark primaries and almost black secondaries. I cannot recollect having before seen any species quite so dark in colour. The locality is given as "North America."

*Arctia rhoda*, Butler.

1882—Butler, Ent. Mo. Mag. xviii., 135.

*Arctia ochreata*, Butler.

1881.—Butler, Ent. Mo. Mag. xviii., 135.

The types of the above species are usual forms of *nais*, Dru., easily matched in any good series of specimens. The term *ochreata* applies to the common yellow form. These references are made in my list from the descriptions, and are now justified by the comparison of the types.

*Arctia radians*, Wlk.

1856—Wlk., Cat. Lep. Brit. Mus., Het. iii., 632, *Apantesis*.

The type is that form of *decorata*, Saunders, in which the primaries are almost immaculate, the pale colour reduced to a forked line on the median vein. If this form is distinct from *nais* Walker's name has priority, Mr. Saunders's species having been described in 1863.

*Arctia dodgei*, Butler.

1881—Butler, Ent. Mo. Mag. xviii., 135.

This is a poor specimen of *phyllira*, unworthy of even varietal rank. Mr. Butler suggested that this might be the Mexican representative of *phyllira*, though the specimen bore no locality label; but it is Drury's species itself, and not a representative of it.

*Antarctia walsinghami*, Butler.

1881—Butler, Ann. and Mag. N. H. ser. 5, viii., 311.

This is a strongly marked, deeply tinted *rubra*, perhaps worthy a varietal rank. The Museum specimen of *rubra* is almost as far from the normal type in one direction as the type of *walsinghami* is in another.

*Acherdoa*, Wlk.

1865—Walk., Cat. Lep. Brit. Mus., Het. xxxii., 451.

*A. ferraria*, Wlk.

1865—Wlk., Cat. Lep. Brit. Mus., Het. xxxii., 452.

This is the *Varina ornata* of Mr. Neumoegen, Papilio iv., 94.

Among the Abbot drawings in the Museum is an excellent figure of this species, noted as "Taken 27th March flying at night in a swamp near Savannah River. The only one I have met with." It is probable, from the close correspondence of the figure with the Walker type, that the latter is the original of the drawing. According to Mr. Kirby some of the Abbot specimens are in the British Museum, and doubtless this is one of them.

*Bellura gortynoides*, Wlk.

Described as an ally of *Datana*, but is a noctuid, and is an earlier name for *Arzama densa*, the generic term also being earlier than *Arzama*.

*Hatuna semirufescens*, Wlk.

1865—Wlk., Cat. Lep. Brit. Mus., Het. xxxii., 450.

This is *Schizura unicornis*, A. & S. In the Trans. Am. Ent. Soc., ii., 86, Messrs. Grote and Robinson cite *Edema semirufescens*, Wlk., xxxii., 424, to *unicornis*, and this species with the same specific, but other generic designation is referable to the same form.

*Psaphidia resumens*, Wlk., placed near *Edema*, is a noctuid, and is *Dicopis viridescens*, Wlk., = *D. muralis*, Grt.

*Edema ? transversata*, Wlk.

1865—Wlk., Cat. Lep. Brit. Mus., Het. xxxii., 427.

This is the same as *Ellida gelida*, Grt. In the Trans. Am. Ent.

Soc. ii., 86, Messrs. Grote and Robinson make this Walker species a synonym of *Janassa lignicolor*; but this is an error. The species is a very well marked one and not easily mistakeable for any other. It must be known in future as *Ellida transversata* and the specific name is not entirely inappropriate if the maculation be used as guide.

*Heterocampa semiplaga*, Wlk.

1861—Wlk., Can. Nat. and Geol. vi., 37.

This is *Heterocampa pulverea*, G. & R., Trans. Am. Ent. Soc. i., 185, pl. iv., f. 32.

The type of this species is in the collection of the Entomological Society of Ontario, part of the D'Urban material determined by Walker. In the 9th volume of the CANADIAN ENTOMOLOGIST Mr. Grote gives some notes on a number of the species named by Mr. Walker, but he seems not to have had all of Walker's papers, as he omits all reference to the species described in the one above cited. To the courtesy of Mr. J. Alston Moffat I owe an opportunity of examining these omitted species, and the above is one of them; the others are noctuids, to be elsewhere commented on.

*Cossus basalis*, Wlk.

Mr. Henry Edwards has published the synonymy of this species, and I desire here to merely call attention to the fact that the specimen described by Walker is figured by Abbot, who took it "19 August in oak woods." The synonymy is given under No. 1434, in my List of Lepidoptera.

*Zeuzera pyrina*, Linn.

Walker gives North America as a locality for this insect. This would be interesting if true, and would prove that the insect is not a comparatively recent importation as has been supposed. I have not been able to find anything either in the British Museum collection or in the records to warrant Walker's citation, and I am not willing to accept it as evidence without some decided support.

The above comprise all the notes made by me on the earlier series of Heterocera. The time at my disposal was limited, and it would require three or four days work at least to look over the material carefully. It is more than likely that some of the species which I did not see have been removed to other series where I did not keep a lookout for them. A few at least of the names are disposed of here.

CANADIAN GALLS AND THEIR OCCUPANTS—EUROSTA  
SOLIDAGINIS, FITCH.

BY WM. BRODIE, TORONTO.

"Attacking the Solidago or Golden Rod." "Quite common in eastern New York." "Slender, straight, smooth stalks of the Golden Rod quite often have one and sometimes two large, round galls or ball-like swellings upon them, an inch in diameter, when the stalk above and below is less than a quarter of an inch." "In the winter season most of them are found to be empty, with a round hole perforated in them, the worm having completed its growth, and the winged fly having come out through this perforation the preceding autumn. But occasionally one of these balls is found at this season without any hole in it. In these the worm is still remaining to complete its changes and continue its species the coming summer." Fitch, 1st N. Y. Report, 1855.

Galls spherical, from 15-30mm. in diameter. Average of 50 specimens 23 mm.; on stems and panicle branchlets of *Solidago*, sp. ?; outside of gall hard and smooth; colour pale straw; interior uniform white, spongy, dense; larva occupying a small, irregular, nearly central space; from 1-10 galls on a plant, usually 2-3.

"This fly measures from 0.35 to 0.40 inch to the tip of the wings. Its body is of a pale brownish-yellow or a tawny whitish colour with two darker brown stripes above upon the thorax. The antennæ, mouth and legs are dull yellow, the face white, and the top of the head yellowish-brown, with a blackish spot at base where the three ocelli or simple eyes are situated. The wings are tawny brownish-yellow, with blackish clouds, and with several dots and veins of a lighter yellow. On the outer margin beyond the middle are two small triangular hyaline spots, and a third longer one inside of these. A large transverse hyaline spot on the apex and two large triangular ones upon the inner margin, the inner one being larger and prolonged upon the margin of the base. Upon the margin of the wing, in these large hyaline spots are some tawny yellowish dots or small spots, namely, three in the apical spot, one in the small triangular one, one or two in the larger triangular one, and three where this last spot is prolonged in the axilla." Fitch, 1st N. Y. Report, 1855.

"Brownish-ferrugineous with the head and legs more yellow; front very broad; scutellum very convex, with two bristles. Wings reticulated with fuscous having one limpid space at the costa and two at the posterior

border scarcely dotted with fuscous. Long. corp. 0.26. Long. al. 0.26 inch." Loew. Mon. Dip. N.-A. Vol. I. p. 82.

I received a collection of these galls made at Carberry, Manitoba, by W. G. A. Brodie in Nov. '82, from the upper part of the stems and branches of a species of *Solidago* very common on the open prairie. These galls were unusually large, measuring 27-30 mm. in diameter. The producers, *Eurosta solidaginis*, Fitch, began to come out at Toronto May 2, '83, and parasites, *Eurytoma gigantea*, Walsh, a few days later, and also a parasite beetle bred from an *Eurosta* pupa case and identified by Dr. Hamilton, of Allegheny, Pa., as *Mordellistena nigricans*, Melsh. A collection of these galls made at Crowfoot Crossing, N. W. T., by W. A. Ducker, D. L. S., Nov. '83, reached Toronto Dec. 25, '83, gave producers and parasites May 22, '84. A collection made 50 miles north of Crowfoot Crossing, N. W. T., by W. A. Ducker, D. L. S., Dec. '83, producers, *E. solidaginis*, Fitch., came out at Toronto May 25, '84-May 29, '84; parasites, *E. gigantea*, Walsh, May 27, '84-May 31, '84; also three specimens parasitic beetle. A collection made 50 miles south of Crowfoot Crossing, N. W. T., by W. A. Ducker, D. L. S., Dec. '83, gave at Toronto the usual proportion of producers and parasites, *E. gigantea*, Walsh, but the parasitic beetles were numerous. A collection of 87 galls made at Oak River, Manitoba, by Mr. Harry Leigh, in the fall of '84, gave 50 specimens *E. gigantea*, Walsh, at Toronto, June 1, '85-June 6, '85. No producers nor beetles. A collection made at several points between Clearwater, N. W. T., and Portage la Prairie, Manitoba, by W. A. Ducker, D. L. S., in August, '87, arrived at Toronto during Industrial Exhibition, '87, gave producers June 4, '88-June 10, '88, and parasites a few days later. The lot consisted of 183 galls and gave 83 producers, 38 specimens of *E. gigantea* and 7 beetles.

I have had over 500 specimens of this gall from Manitoba and the Northwest provinces, and I think it very certain that none of the occupants come out in the fall season. I never found more than one occupant in a gall, producer or parasite. The larva makes no preparation for leaving the gall, the exit is made invariably by the imago after leaving the pupa case. The boring is done with the front, and it is very interesting to see the soft, flabby looking mass assume the shape of tools, square and triangular brotches, gouges, chisels and lancet-like points, and surprising to see how rapidly the hard shell of the gall is cut away. This gall seems to have a wide range over the Northwest provinces. In addition to the

localities already given I have evidence of its occurrence at Turtle Mountain, Pelly, Edmonton, Regina, Prince Albert, and Calgary.

This gall is not found in the vicinity of Toronto nor in the adjacent counties; but I am informed by Mr. Jas. Fletcher, Dominion Entomologist, that it is more or less common in the Ottawa region.

In May '84, I liberated ten pairs of *E. solidaginis*, in an untilled field, densely grown up with Solidagos, north of the city, but found no galls afterwards. In June '88 I liberated six pairs in a field east of the city, but no galls have been found.

Dr. Fitch gives the habitat "New York," and Osten-Saken, "Washington" (D. C.) There can be little doubt of the parasitic habit of the *M. nigricans* larvæ. None of the galls gave both beetle and fly; the cells in the galls which gave beetles were similar to those which gave flies, and in all the galls examined—out of which came beetles—there were found fragments of *Eurosta* larvæ or pupæ.

The *M. nigricans* larvæ are most probably external feeders.

It is very desirable that some observer should take up this investigation, and from a careful examination of the immature galls determine the relation between the beetle and the fly.

### A NEW DASYLOPHIA FROM FLORIDA.

BY ANNIE TRUMBULL SLOSSON, NEW YORK CITY.

#### *Dasylophia puntagorda*, n. sp.

♂.—Head and thorax appearing palest gray from admixture of pure white with cinereous. Abdomen, secondaries and ground colour of primaries sordid white. Primaries streaked longitudinally with blackish, which contrasts violently with ground colour. A diffuse, heavy, blackish shade runs obliquely from apex inward. A curved blackish line, reaching neither costa nor internal margin at outer three-fourths of wing. Submarginal row of distinct, blackish spots, two of which are much larger than the rest and margined with white. Costa interrupted near apex by white spots. Fringe sordid white, interrupted by blackish. Somewhat smaller than *D. anguina*, S. & A., and differing markedly from that species in its sharp contrasts of colour, which make it appear like a purely black and white insect. It has no ochreous shade. The antennæ resemble those of *D. anguina*, the pectinations not as long as in those of *D. interna*, Packard. Described from two males taken at light. Punta Gorda, Florida.



## EARLY STAGES OF INDIAN BUTTERFLIES.

A new contribution to our knowledge of the *early stages of butterflies* has come from *Bombay*, where Messrs. Davidson and Aitken have published (Journ. Bomb. Nat. His. Soc., Vol. 5,) half a dozen coloured plates, excellently drawn by Mrs. Blathwayt, representing the transformations of sixteen species. Their published notes, however, cover no less than 94 species and run through all the families, and among them will be found many interesting things,—a chrysalis of *Elymnias* “suspended by the tail only, but in a rigidly horizontal position,” a species of *Abisara*, one of the *Lemoniinae*, whose larva has the head free, a gregarious *Delias* where the eggs are laid “in parallel rows with equal intervals,” a *Papilio* laying, like our species of *Polygonia*, ten eggs in a column, *Hesperidæ* with fluffy secretions, and some where the transformations are open, and which in some cases have and in some have not a median girth. When we find this as the result of two seasons’ work, and most of it of one, we can but wish long life to the authors. Seventy species of butterflies were reared the first year.

The course of insect life in India is so different from that with which we are familiar, and yet has so many points of contact, that it is worth while to transfer the following passage to our columns:—“In the case of a great many, perhaps the majority, of species, larvæ are found plentifully in June or July, that is, a short time after the monsoon bursts and vegetation starts into growth. These become pupæ, and for a time not a larva is to be seen; then the butterflies of that brood emerge and lay their eggs and larvæ begin to appear again, but this time they continue for two or three months, in some cases until the end of the year. Then they cease and the butterflies also disappear, but a number of pupæ, and perhaps eggs, remain, to start into life when conditions are again favourable, which will be in March if the food-plant sprouts then, otherwise in June. Of these dormant pupæ a few come out at odd times, but the butterflies thus sent into the world out of season doubtless perish without offspring. This seems to be something like the order of events with many of the common species of *Papilio*, the *Danainæ*, the *Junonias*, and others; but there are many species which do not follow this rule, and some seem to have only one short season in the year.”

## DESCRIPTION OF FOUR INSECT MONSTROSITIES.

BY H. F. WICKHAM, IOWA CITY, IOWA.

The following cases of insect monstrosities have come under my notice, and I have thought it best to make them known in order that those interested in this work might have access to the descriptions. While but little seems to have been written on the subject in this country beyond the describing of a number of interesting forms by Jayne (Trans. Am. Ent. Soc., VIII.) and Henshaw, Scudder and Hagen (Psyche), it has attracted considerable attention in Europe, many writers having published accounts, with figures, of more or less interesting cases. With this prelude I offer the following descriptions and figures. All the specimens are in my own cabinet, deposited in the Museum of the State University of Iowa:—

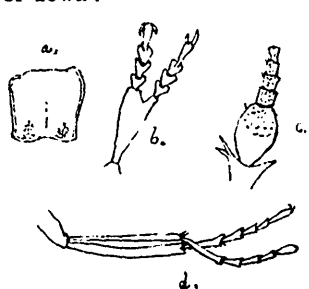


Fig. *a* represents the thorax of a specimen of *Pterostichus validus*, Dej., in which the left side is much shorter than the right. There is nothing in its appearance that would indicate this malformation to be the result of an injury to the pupa, so it has been considered worth while to let this case go on record.

In fig. *b* is shown a rather curious though not particularly uncommon structure. It is the right anterior leg of a specimen of *Trichodes nuttalli*, taken at Iowa City in July, 1885. Here the tibia is somewhat stouter than normal, and from near the tip on the outer surface springs a branch, as shown in the cut, having a tarsus which, except for being a little slender, is almost identical with the other. The claws on this supplementary tarsus are, however, not well formed. Aside from this leg the specimen shows no departure from the average individuals of the species.

A curious monstrosity is seen in a specimen of *Polyphylla hammondi*, Lec., which I have tried to reproduce in fig. *c*. Here the right middle tibia (which is just perceptibly more slender than the normal left one) bears a five-jointed tarsus of the remarkable form shown. The first joint is sub-pyriform in shape, the smaller end articulating with the tibia; the remaining joints are smaller, and decrease regularly in width, also slightly in length excepting the last; there are no claws. The large basal joint has on the under surface a transverse impressed line running about half

way across it a little before the middle ; the base is smooth for half the length, the remainder with rather large, tolerably close punctures ; near the tip is a small spine, not more than one-third of the usual size. The upper surface is covered with dense, recumbent, somewhat golden pubescence which obscures the sculpture. The remaining joints are all more or less scabrous, the second covered above with pubescence like that of the first, but the third, fourth and fifth only bear a few scattering hairs. The specimen is a male and is one of a number taken by me at Albuquerque, New Mex., in 1888.

The remaining example (fig. *d*) is that presented by a *Macrobasis tenella*, Lec., from Tucson, Arizona. The left middle leg is here affected, the femur having two tibiæ, each having its tarsus. What we may consider as the normal one departs but little, if at all, from the usual type, though it is possibly a little more bent ; the other is more slender, its tarsus weaker, the last tarsal joint being more like that of an antenna than of a leg. The accessory member is less perfectly chitinized than the other. Both tibiæ have the usual spurs at the apex, though they are partially hidden in the figure.

### NEW SPECIES OF PHORA.

BY J. M. ALDRICH, BROOKINGS, SOUTH DAKOTA.

The following table includes only the species of *Phora* described by Loew, and four new ones—ten in all. *Phora atra* of European entomologists, together with *P. cornuta*, Bigot, *fuscipes*, Macq., and *rufipes*, Meigen, are said to occur in North America—the second in Cuba, the last two in the Hudson Bay region—but I have not seen the descriptions :

- |                                                                                                                                 |   |
|---------------------------------------------------------------------------------------------------------------------------------|---|
| 1. Middle tibiæ armed with bristles on the outer side below the knee ;<br>frontal bristles all pointing upward, - - - - -       | 2 |
| Middle tibiæ unarmed on the outer side below the knee ; bristles of<br>the lower edge of the front pointing downward, - - - - - | 6 |
| 2. Halteres black or blackish, - - - - -                                                                                        | 3 |
| Halteres white or whitish, - - - - -                                                                                            | 5 |
| 3. Second heavy vein very thick and stout, - <i>pachyneura</i> , Lw.                                                            |   |
| Second heavy vein not unusually stout, - - - - -                                                                                | 4 |
| 4. Second heavy vein simple, the apex dilated, - - <i>clavata</i> , Lw.                                                         |   |
| Second heavy vein forked, - - - - - <i>cimbicis</i> , n. sp.                                                                    |   |

5. Hind tibiae armed with two bristles below the knee, - *luggeri*, n. sp.  
 Hind tibiae armed with one small bristle below the knee,  
 - - - - - *microcephala*, Lw.  
 Hind tibiae with a row of small bristles down the outer side,  
 - - - - - *incisuralis*, Lw.
6. Head yellowish, - - - - - *scalaris*, Lw.  
 Head black or blackish, - - - - - 7
7. Legs pale yellowish, - - - - - *nigriceps*, Lw.  
 Legs brownish or blackish, - - - - - 8
8. The four lower frontal bristles strongly convergent, - *minuta*, n. sp.  
 The four lower frontal bristles parallel, - - - *setacea*, n. sp.

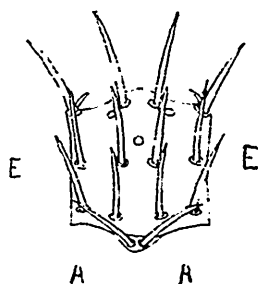


FIG. 1.  
*Phora cimbicis*, female.  
 A.A. antennae. E.E. eyes.

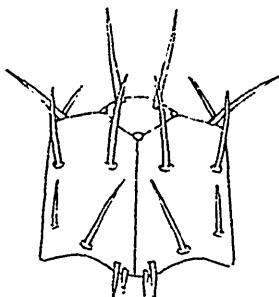


FIG. 2.  
 Front of *Phora setacea*, female.

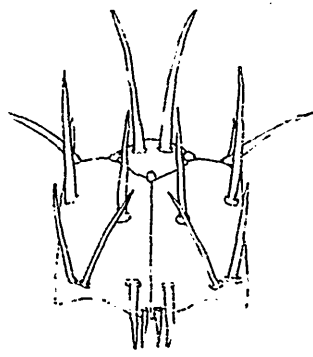


FIG. 3.  
 Front of *Phora setacea*, male.

*Phora cimbicis*, n. sp.

Head black, front broad, nearly square, comprising about half of the width of the head, below with an obtuse prolongation in the middle; no ocellar prominence; at the extreme lower edge of the front in the middle, are two bristles, directed upward and strongly outward. A few minute hairs, arising from coarse punctures, lean toward the middle line of the front. Antennae brownish black. Palpi longer than antennae, of the same colour, oblong, at the tip with about six stiff, short bristles. Proboscis short, stout, yellow. Dorsum of thorax black, the humeri distinctly separated; beginning at their posterior corners, a row of small bristles borders the dorsum. In all my specimens the region of the scutellum is injured by the pin; there is a longer bristle, however, on the dorsum, at the corner of the scutellum, and the latter is bristled behind. Pleure

black, a little shining; a group of two or three bristles just below the prothoracic spiracle, and a pair at the base of the forecoxae. Abdomen wholly satiny black like thoracic dorsum, except the first segment, which is whitish above in the middle; the last joint longer than the preceding. Halteres black, the pedicel a little yellowish at base. Fore and hind tibiae with one, middle tibiae with two, bristles on the outer side a little below the knee; the hind tibiae have also a scattering row of three smaller ones, running down to the tip; the tips of middle and hind tibiae armed with long spurs. The legs are wholly satiny brownish-black, except that the front ones are from the coxae gradually lighter, ending in brownish-yellow tarsi, and that the middle tarsi, and sometimes the tibiae, are also brownish yellow. Wings subhyaline; the second heavy vein is forked; the first light vein is nearly straight, and ends a little before the apex.

Length of body, 3 mm.; of wing, 2 mm.

Brookings, South Dakota.

Three female specimens, reared from *Cimbex americana*, Leach. Dates of emerging, May 24, 26, 27.

*Phora setacea*, n. sp.

♀. Head black, front very wide, at the middle of the lower border with two pairs of small bristles pointing downward, the smaller pair difficult to make out. Ocellar tubercle bounded by a suture which extends as a delicate line down the front. Antennae fuscous. Palpi yellow, with black bristles. Proboscis yellow. Thorax black, with a few scattered bristles along the dorsal margin. Abdomen black, tapering, the last segment cylindrical, more or less retracted, the extremity yellow. Halteres very light yellow. Front and middle legs yellow, the hind ones more brownish. One spur at the apex of the tibia, except in the front legs, where there are none. Wings hyaline, the second heavy vein forked, the first light vein nearly straight, rather long bristles on costal border to end of second heavy vein.

♂. General colour same as ♀, but the bristles everywhere noticeably longer. On the lower edge of the front both pairs are quite prominent, leaning down but little. The coxae have a few bristles on the outer and apical portions; the posterior coxae have a conical protuberance on the hind side. The genitalia are exerted, lying close up under the back part of the abdomen. They consist of some shriveled clasping organs, the structure being unrecognizable. They arise apparently from the next to the last segment, leaving the last one projecting downward and backward

from their base. The bristles upon the costal margin of the wing are unusually long.

Length of body, 1.2 mm.; of wing, 1 mm.

Brookings, South Dakota.

Four ♀ and one ♂ specimen, reared from *Cimbex americana*, Leach. Dates of emerging, June 1, 2 and 8.

*Phora luggeri*, n. sp.

Head brownish black, front very broad, at the lower border with two small, widely divergent bristles arising a little below the edge of the front. Antennæ and palpi brownish-yellow, the former with a yellow bristle, the latter with stiff black ones. Thorax brownish-black, with few and small bristles. Abdomen more or less yellowish at base above, the remainder brownish-black, the seventh segment long and tapering. Wings hyaline, the heavy veins yellow, the second hairy on the upper side to the point of division, which is near the end, the two branches so little divergent as hardly to be made out with a simple lens. First light vein strongly bowed at base, straight for the remaining two-thirds of its course, ending at the apex. Halteres wholly yellow. Legs wholly yellow; the front tibiæ with a bristle on the outer side below the knee, the middle and hind tibiæ with two each in the same situation. Middle and hind tibiæ with spurs at apex.

Length of body, 2.2 to 2.6 mm.; of wing, 2.5 to 3 mm.

Two female specimens from St. Paul, Minn. (Lugger).

In the other three new species the second heavy vein is bare, except a single fine bristle near its base.

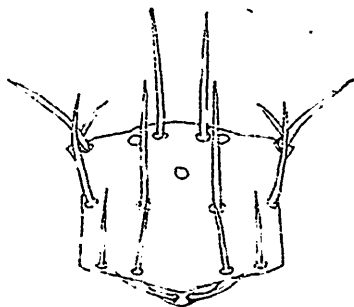


FIG. 4.  
Front of *Phora luggeri*, female.

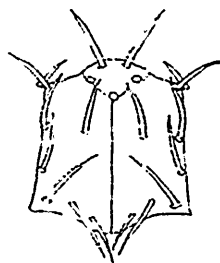


FIG. 5.  
Front of *Phora minuta*, female.

*Phora minuta*, n. sp.

Head black the front broad, convex, with a few minute hairs slanting towards the middle line; the usual bristles rather small, arranged as shown in figure. Ocellar prominence defined by a very fine impressed line, which continues down the front. Antennæ brownish-black. Palpi brownish, with a few black bristles at tip. Proboscis small, yellow. Thorax uniformly black, with but few bristles. Abdomen black, tapering, the last segment slender and cylindrical. Halteres light yellow. Wings a little infuscated, except toward the posterior border. Second heavy vein forked near the end. Light veins four in number, the first nearly straight; costal margin with fine bristles to the end of the second heavy vein. Front legs yellow at the coxæ, gradually browner toward the tarsi, without any conspicuous bristles. Middle legs brown, one long spur at the apex of each tibia. Hind legs black, apex of each tibia with one long spur; about seven short bristles form a row down the back side of the apical half of the tibiæ.

Length of body, 1.2 mm; of wing, 1.3 mm. Brookings, South Dakota.

One ♀ specimen, reared from *Cimbex americana*, Leach. Date of emergence, June 1.

In preparing these descriptions I have been unable to make much use of the characters of the dorsum of the thorax, because this region is injured by the pin in most of my specimens. The smaller points of structure were determined with a compound microscope, mostly at 60 diameters, but occasionally with a higher power in the smaller species.

The accompanying sketches, though somewhat rough, will serve to show the number and arrangement of the frontal bristles. Frontal sutures, where present, are also shown. No attempt was made to draw to a uniform scale; and, as the point of view was necessarily not quite the same in all cases, the outlines given are not to be relied upon for the comparative shape of the fronts.

I shall be glad to receive specimens of Phoridae from any North American locality, and will try to return any favours of this kind. As the species are all very small, the best method of mounting is as follows:—Cut a piece of cork (or pith)  $\frac{1}{8}$  inch square and  $\frac{1}{4}$  inch long; near one end of this run through a No. 00 Klaeger pin till it projects nearly  $\frac{1}{4}$  inch; cut off the head end close to the cork (with scissors, most conveniently); lay the little fly on its back on a smooth surface, and using a lens if necessary, introduce the point of the pin into its body between the middle legs until it has just reached the dorsal surface; then stick a stouter pin through the other end of the cork in the opposite direction from the first one, far enough so that about half will project below.

THE MOLE CRICKET—*GRYLLOTALPA BOREALIS*.

BY E. W. DORAN, COLLEGE PARK, MD.

In the January *CANADIAN ENTOMOLOGIST* Mr. James Fletcher had an interesting article on his "pet" mole cricket. At his suggestion I send a few notes upon the larval form of the same species.

On January 4 last, Mr. A. I. Hayward, connected with our State Experiment Station, brought me five larvæ of the mole cricket, which were found in rather a peculiar situation. He had a number of men putting up ice. The ice had been removed from a considerable space, when, wading around in the water with tall rubber boots on, he found the young mole crickets swimming around upon the water. It seems there was no connection between the open space and the land; besides, as the weather was very cold, they could not live upon or near the surface of the ground.

The only reasonable theory in regard to the matter is that they were buried in the mud at the bottom of the pond, which is a temporary one, having been flooded with water only a month or two. The wading through the mud dislodged them, when they at once came to the surface. However, there are some difficulties in the way of accepting this hypothesis. For example: Could the crickets exist beneath the water in the soft mud so near the surface for so long a time? Westwood says in regard to the European mole cricket, *G. vulgaris*, that the villose coating of the body and wings appears to protect them from the water. Our species has a similar coating of fine hairs; but in the larvæ especially it seems scarcely sufficient to protect it from the effects of the water in a prolonged submersion. Besides, could it live so long entirely surrounded by water, cut off from the air? They must have been in the thin mud very near the water to have been thus stirred out.

They seemed very little affected by the cold or their bath; in fact, they were as "lively as a cricket," and were apparently very much at home upon the water.

The life history of our American species, *G. borealis*, seems not to have been studied extensively. At any rate I have been unable to find figures or descriptions of the preparatory stages. It is stated that *G. vulgaris* requires three years to come to maturity, and *borealis* seems of very slow growth. When these specimens were taken they were but little more than half an inch in length. They are at this time (March 15) about .7 inch long. In two and a-half months they have increased in length but little over one-tenth of an inch, though they have been kept in



a warm room and supplied with plenty of food, consisting chiefly of the roots of growing wheat, earthworms, etc. As the female deposits her eggs in early spring, they are probably nine or ten months old now. The mature insect is an inch and a-half long, while these are but little more than a third as long. Westwood says that *vulgaris* is inactive in winter. These have been active at all times; that is, not in any sense torpid, nor were they when taken.

When I first secured them I put them in a jar of earth, and gave them no further attention for several days. In the meantime one disappeared, and probably served to satiate the appetite of the rest, as they are known to devour their own kind sometimes when they can obtain no other food.

Since then, in exhibiting another before my class, it was accidentally injured and died. I shall try to rear the remaining three to maturity, and figure the various stages. I cannot say what stages they have already passed through. The larvæ of *vulgaris* are white before the first moult. These were dark velvety, and had moulted once or twice, I suppose. They have not moulted since.

I have written these notes in the hope of calling out other observations upon the early stages of the insect. And I should be glad to know of any one who has studied or figured the preparatory stages.

#### FOURTH ANNUAL MEETING OF THE ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.

In accordance with an action of the Association, taken at the Washington meeting, the Fourth Annual Meeting will be held at Rochester, New York, two days prior to the meeting of the American Association for the Advancement of Science.

All members intending to present papers are requested to forward titles to the undersigned before August 1st., in order that the programme may be prepared in proper season.

The proceedings of our meetings are attracting the attention of working entomologists of other countries, and it is to be hoped that members will spare no efforts to make the coming meeting even better than those which have preceded it. Owing to the continued ill-health of President Lintner, and in order to relieve him of as much labour as possible, all correspondence, unless of a nature necessitating his attention, may be addressed to the Secretary.

F. M. WEBSTER,

Secretary, Association of

Columbus, Ohio, May 10, 1892.

Economic Entomologists.

## NEW NORTH AMERICAN SPECIES OF GORYTES.

BY WM. J. FOX, PHILADELPHIA.

The monograph of this genus, published by Handlirsch,\* necessitated the working-up of the unidentified species in the collection of the American Entomological Society. This author has merged several genera into *Gorytes*, viz., *Euspongius*, *Hoplisus*, etc. I have followed him, as several of the species described herein belong to what was once the genus *Hoplisus*. There are several other new species contained in the Society's collection, represented by single specimens only. The following table will separate the species described herein:—

First abdominal segment not petioliform, nor coarctate.

Inner eye-margins almost parallel; antennæ entirely yellowish.

*tricolor*, Cr. ♀

Inner eye-margins distinctly converging towards the clypeus.

Flagellum long and slender, not or scarcely thickened towards the apex; markings yellow.

Posterior face of metathorax not rugulose.

*nevadensis* ♀ ♂

Posterior face of metathorax strongly rugulose.

*atrifrons* ♀ ♂

Flagellum distinctly thickened towards the apex; markings whitish.

*albosignatus* ♀ ♂

First abdominal segment petioliform; joint 10 of the antennæ incised beneath.

*mirandus* ♂

First abdominal segment coarctate; black, with the second abdominal segment red.

*rufocinctus* ♀

## GORYTES TRICOLOR, Cr.

*G. tricolor*, Cr., Trans. Am. Ent. Soc., I., p. 380, ♂, (non ♀).

♀.—Head not as broad as the thorax; ocellar region rather distinctly raised, the ocelli forming a curve; frontal furrow well marked; clypeus with large, sparse punctures, convex, transversly-ovate, the fore margin a little incurved; eyes almost parallel within; front, vertex and occiput with strong, separated, punctures; the cheeks smooth; flagellum but little thickened towards the apex; scape much longer than the clypeus is wide medially; third antennal joint but little longer than the fourth, joints 4-6 about equal, the fourth if anything a little longer than the

\* S. B. Akad, Wien, XCVII., Heft. 6 & 7, pp. 316-562, pls. 1-3, 1888.

fifth. Thorax with very strong separated punctures, those on the scutellum very sparse; basal triangular space of metathorax well marked, divided medially by a furrow, almost smooth (some specimens show traces of longitudinal and others transverse striæ); four posterior tibiæ and tarsi strongly spinose; the anterior tibiæ strongly ciliated; spur of anterior tibiæ obliquely truncate; wings hyaline, a fuscous cloud covers the marginal, upper portion of third submarginal, the second submarginal and parts of the first, second and third discoidal cells; stigma and costal nervure yellowish; transverse medial and the cubital nervures of the hindwing interstitial. Abdomen with strong, separated punctures beneath the middle of the second and the basal half of the third and fourth segments, impunctate; pygidium short and broad, the lateral carinæ or margins not extending to the base of the segment. Black; a broad elongate mark on the cheeks, prothorax, dorsulum and mesopleuræ in part, the metathorax, except enclosed space at base and a somewhat similarly shaped mark on the posterior face, the legs, variegated with yellow, the first abdominal segment above, except apical margin, and the last two segments, all rufous; face, clypeus, basal half of mandibles, antennæ, prothorax above, a large blotch on the mesopleura anteriorly, scutellum and a broad band on apical margin of segments 1-4 above, and on segments two and three beneath, all yellow; the antennæ slightly inclining to brownish. Length, 10-11 mm.

Var.—One specimen from Colorado, instead of being black, is entirely rufous, but with the same yellow ornamentation.

Montana and Col.

#### GORYTES NEVADENSIS.

♀.—Head as broad as the thorax; ocellar region rather distinctly raised; ocelli forming a low triangle; frontal furrow distinct, but not strong; eyes distinctly converging towards the clypeus; clypeus convex, with large, scattered punctures, the anterior margin a little incurved; scape of antennæ not as long as the width of the clypeus medially, the flagellum long, not thickened; third antennal joint about one-third longer than the fourth; front strongly punctured, the occiput finely and sparsely so. Dorsulum with sparse, large punctures, with four impressed, parallel lines basally, which do not extend beyond the middle; mesopleuræ with exceedingly fine punctures; suture between dorsulum and scutellum foveolate; enclosed space of metathorax strongly sulcate medially, with 9-10 strong radiating striæ on each side of the sulcus, the striations

extending slightly over the margin of the enclosure; the posterior face is divided by a very strong sulcus, which begins at the apex of the basal enclosure; with the exception of a few coarse rugæ at the apex the posterior face is smooth, or with exceedingly fine punctures; the meta-thoracic stigmas are covered by a strong, somewhat flat-like production; wings sub-hyaline, with a yellowish tinge, the marginal, a part of the three submarginal cells fuscous, the veins enclosing the marginal, second and third submarginal and the outer vein of the third discoidal cells are black, the rest yellowish; transverse medial vein received by the externo medial nervure before the apex of the submedian cell of the hindwings; legs stout, the four hind tibiæ sparsely spinose; anterior tarsi distinctly ciliated, the bristles sparse and short, about half as long as the first joint. Abdomen glabrous, beneath with a few scattered punctures. Black; scape beneath, manibles medially, prothorax above, tubercles, two spots on mesopleuræ, broad line on scutellum, post-scutellum, two large ovate spots on the metathorax, femora beneath, except base, the base of tibiæ, the posterior coxæ beneath and the apical margins of abdominal segments 1-5 above, those on segments one and two emarginate in the middle, the base of the last segment laterally, beneath the apical half of the second, the third fourth and fifth entirely, all yellowish; tegulæ, tibiæ beneath and the tarsi more or less brownish. Length, 12 mm.

♂.—Differs from the ♀ as follows: Frontal furrow indistinct; the four anterior tibiæ and tarsi entirely yellowish; all the coxæ spotted with yellow beneath and ventral segments of the abdomen 3-5 not entirely yellowish; the third antennal joint about one-fifth longer than the following one.

Nevada. Two specimens.

#### GORYTES ATRIFRONS.

♀.—Resembles *nevadensis* very much, but differs as follows: Front finely and closely punctured; third antennal joint about one-fourth longer than the fourth; labrum ciliated with silvery hairs; metathorax posteriorly strongly rugulose; the first joint of the anterior tarsi is about equal in length to the three following ones united, whereas in *nevadensis* it is longer than the three following joints; the bristles with which the joints are ciliated are more than half as long as the first joint; the yellow bands of the abdomen are narrower, and the pygidium is larger; the scape and joints 3-8, beneath, brownish; the legs are yellow in a greater extent than

in *nevadensis*; the head has, in addition to some sparse pale hairs, which are prominent on the clypeus, a brownish-sericeous pile. Length, 10-12 mm.

♂.—Flagellum longer and more graceful than in the ♀, not brownish, the third joint a little longer than the fourth; clypeus, labrum, face, inner orbits broadly, scape and following joint beneath, yellow. Length, 10 mm.

Nevada. Four females and one male. Two of the females have the metathorax destitute of the yellow spots.

#### GORYTES ALBOSIGNATUS.

♀.—Similar to *atrifrons*, but is at once distinguished by the markings being whitish; the flagellum is gradually thickened; the ninth to eleventh antennal joints are not much longer than broad, the third joint about one-third longer than the fourth; the posterior face of metathorax strongly rugulose, having the appearance of being rugged; wings subhyaline, with scarcely a yellowish tinge; abdomen with the two basal segments shining, the remainder with a slight pile and a few indistinct punctures; pygidium short, a little longer than it is broad at the base, with large, scattered punctures; basal portion of clypeus, face, inner orbits—broadest beneath—scape, and following joint beneath, and a spot on the second and third ventral segments laterally, whitish; the apex of the femora tibiae and tarsi, except the outer side of the two anterior pair, brownish. Length, 10-12 mm.

♂.—Flagellum long, not thickened, the third joint very little longer than the fourth; four anterior tibiae and tarsi entirely whitish; the clypeus is not strongly punctured, as in the ♀. Length, 8 mm.

Montana. Four females, two males. This and the two preceding are closely allied.

#### GORYTES MIRANDUS.

♂.—Head a little broader than the thorax; front depressed medially, with strong, separated punctures, the impressed line distinct; eyes scarcely converging towards the clypeus; clypeus convex, rather strongly and sparsely punctured, the anterior margin incurved; flagellum long, thickened medially, but again narrowed to the apex, the third joint much longer than the fourth, the tenth joint excised beneath. Dorsulum and pleurae with large, scattered punctures; the sutures of the pleurae with short, strong striae, or marked by foveae, being strongest between the meso- and metapleura; scutellum punctured like the dorsulum; basal triangular space of metathorax well marked, strongly furrowed medially, obliquely

striated, at the apex of this space there is a strong pit or excavation; the posterior face irregularly striated; on the sides punctured, with an oblique, foveolate furrow; hind tibiæ and tarsi distinctly spinose; the anterior femora much broadened, flattened or depressed on its inner side on the basal portion; wings subhyaline, iridescent; the marginal cell and the apex of the wing, fuscous. Abdomen shining, petiolate—that is, the first segment is much narrower than the second, broader at the apex than at the base, segments 3-5 above and 2-7 beneath with large, scattered punctures, those on the first segment dorsally and ventrally, and on the second segment above, not so distinct; last ventral segment bifid. Black; clypeus, labrum, mandibles, except apex, face, inner orbits broadly, scape and third antennal joint beneath, the second joint entirely, posterior orbits, anterior margin of collar, prothorax above, tubercles, anterior portion of mesopleuræ, spot beneath tegulæ, an oblique line on the dorsulum by the tegulæ, scutellum, post-scutellum, a large spot on each side of the posterior face of the metathorax, legs, except the upper surface of the coxæ, trochanters and femora, a broad band on apical margins of all the abdominal segments above, the one on second segment broadest, and on the ventral segments, with exception of the base, all yellow; the greater part of the antennæ and the posterior tibiæ and tarsi, in part, brownish. Length, 9 mm.

Nevada. Four specimens. Related to *notabilis*, Handl., from Mexico, but differs in having the tenth antennal joint excised beneath, etc.

#### GORYTES RUFOCINCTUS.

♀.—Ocelli placed in a triangle, the posterior pair connected by a curved furrow; clypeus with large punctures, its anterior margin incurved; eyes diverging towards the clypeus; front having the appearance of being exceedingly finely granulated, the furrow distinct; antennæ long and slender, the third joint much longer than the fourth. Thorax shining, the dorsulum with exceedingly fine and close punctures; the mesopleuræ with large, shallow, scattered punctures; sutures between the dorsulum and scutellum, and the scutellum and post-scutellum, distinctly foveolate; enclosed space on metanotum large, channelled medially and covered with beautiful, radiating striæ; apical portion of posterior face roughened, the basal portion smooth, shining; wings subhyaline, nervures and stigma black; a fuscous cloud fills the marginal, second submarginal and part of the third discoidal cells; transverse medial nervure of hindwing confluent with the cubital nervure; medial and posterior tibiæ and tarsi distinctly

spinose ; anterior tarsi ciliated with long, white bristles. Abdomen with strong, sparse punctures ; the first segment strongly coarctate, before the apex above, with a deep wide, transverse furrow, which extends from side to side ; ventrally, the punctures are more distinct, especially on the last segment ; last segment above strongly and sparsely punctured ; deep black ; shining ; the flagellum beneath and the tarsi slightly brownish ; inner side of anterior tibiæ yellowish ; apical margin of the first segment and the second segment, except apical margin, rufous. Length, 10 mm.

On specimen. Washington (State). A very distinct species.

### DESCRIPTION OF A NEW ANTHOCHARIS.

BY W. G. WRIGHT, SAN BERNARDINO, CAL.

*A. Flora*, n. sp.

♂, expanse 1.40-1.75. White. Forewings blackish at base ; many black scales along costa ; bar broad, at costa reaching inwards, and at the middle with an angle outwards into the orange, with a broadening, vaguely-edged stripe connecting it to the margin near inner angle ; orange patch very large, deep reddish coloured, the colour extending to costa and also to outer margin near the angle ; apical margin black with obtuse serrations inside, the lower end becoming maculate or merely of roundish spots in the edge of the orange patch ; fringe white and black.

Secondaries white, seldom faintly tinged with yellow ; base blackish ; eight or nine relatively large black spots at end of nervules ; fringe white with a few black filaments at the venules.

Under side : bar separated by a deep sinus on the outer side into two ovoid spots ; the orange paler, followed by faint pink, then by pale blue ground, with blackish spots along nervures. Secondaries : veins yellow ; a dense marbling of black relieved by scattered yellow scales ; the pattern of marginal marbling is of even-sized spots along the venules, with narrow interspaces white.

♀, expanse 1.40-1.70. Yellow ; orange patch much smaller and a little paler than in the ♂ ; a yellow sexual stripe, sometimes maculate, next to the orange and scarcely separated from it by indefinite cloudy spots ; the apical margin becoming but a series of connected blackish points projecting sharply into the yellow. Hindwings yellow, with marginal spots as in the ♂.

Under side : similar to the ♂, but more deeply yellow.

Habitat, Western Washington.

Described from 55 ♂, 21 ♀.

This is the most northern of the orange tipped group of *Anthocharis*. It is found from the Willamette Valley in Oregon to Vancouver in British Columbia, and from the Pacific Ocean to the Eastern slopes and spurs of the Cascade Range of mountains in Central Washington, but in Eastern Washington and Idaho it is replaced by *A. stella*. Its metropolis is in the densely fir-forested country west of the Cascades, and about Puget Sound, where it is fairly abundant. The ♂ is a little larger than *A. reakertii*, and with broader wings and more pronounced black markings; and the marginal marbling in even blocks along the venules is distinct. The ♀ is deep lemon yellow, the colour being even and uniform rather than discal. This species is also rather peculiar in that the ♀ is of smaller average expanse than the ♂.

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#### CORRESPONDENCE.

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CATOCALA AMICA, HUBN.

*Dear Sir*: I notice that Mr. Hulst refers *lineella* as a synonym of this species. It is not a synonym, but a well marked variety, constantly recurring with the typical form. I remember that my earlier opinion that it might be a distinct species was shared by W. H. Edwards, as well as other lepidopterists. On the other hand Mr. Hy. Edwards's *herissa*, referred by me as a variety, Check List, p. 40, is a suffused Southern form of *Amica*, no two specimens being exactly alike (as is the case with *lineella*), and giving one the impression as if the species had run out in Texas. I do not know if it is found in Mexico. *Lineella* must be restored as a perfectly recognizable variety of *Amica*. I embrace this occasion to repeat my opinion that *Alabama* is a valid species, as also to protest against the identification of *fratercula*, G. & R., with *micronympha*, Guen. I believe also that when *residua* and *Meskei* come to be bred, their specific validity will abundantly appear. I have had to rescue *praeclara*, *dulciana*, *crataegi*, and other species from Mr. Hulst's errors in cabinet opinion. It is not necessary for me to lose one word over Mr. Hulst's rejection of *Euparthenos* and *Audrewsia* as valid genera.

Very respectfully,

A. R. GROTE.



## A CORRECTION.

*Dear Sir* : In my paper on "New North American Homoptera," in the May number of the CANADIAN ENTOMOLOGIST, on page 115 occurs a typographical error that calls for a prompt correction. The name *Athysanus obtusus* there applied to a species described as new should have read OBIUUS. The name *obtusus* was long ago preoccupied for a well-known European species in this large genus. The similarity of these names is only in their form, and need not be confusing.

Buffalo, N. Y., April 29th, 1892.

EDWARD P. VAN DUZEE.

## BOOK NOTICE.

SPECIAL REPORT OF THE STATE BOARD OF AGRICULTURE on the work of Extermination of the *Ocneria Dispar*, or Gypsy Moth. Boston: Wright & Potter Printing Co., 1892.

This official pamphlet gives an interesting account of the very remarkable and unique efforts that are being made in the State of Massachusetts to exterminate the Gypsy Moth. This insect, imported from Europe, was accidentally permitted to establish itself about twenty years ago, and has now multiplied to such an extent as to be a very serious pest throughout a considerable area of the State. In March, 1890, the Legislature passed an Act appointing three commissioners to "provide and carry into execution all possible and reasonable measures to prevent the spreading and secure the extermination of the *Ocneria dispar* or Gypsy Moth in the commonwealth". The sum of \$25,000 was also appropriated for the work. Last year the commission was merged into the State Board of Agriculture, and a further grant of \$50,000 was made to it. The report before us gives the details of the work carried out and the modes adopted for waging war against the insect. They were very largely under the direction of Prof. Fernald, as Entomological Adviser, and Mr. Forbush as Superintendent of field work. The number of men employed varied with the season, and at one time, in June last, was as many as 242. The work began with the destruction of the eggs; when these proceeded to hatch out, spraying the caterpillars with insecticides was adopted, and towards the close of the season the eggs were again made the objects of attack. An enormous number of the insects were thus destroyed and a perceptible diminution in the amount of injury was observed in some places. We shall look forward with great interest to the results of the present year's operations, and hope in time to be able to record a great victory in this field of practical entomology.

Mailed May 30th.