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complete

JANUARY, 1914.

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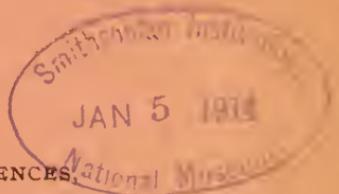
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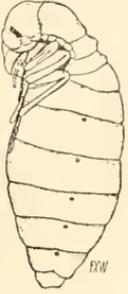
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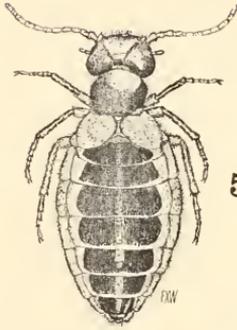
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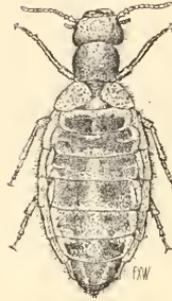
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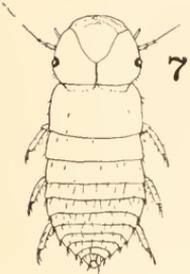
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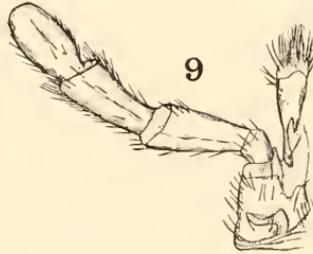
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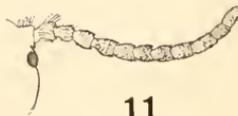
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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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JANUARY, 1914.

NO. 1.

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Notes on Coleoptera from Western Kansas.

By F. X. WILLIAMS, Bussey Institution, Harvard University,
and H. B. HUNGERFORD, Kansas University.

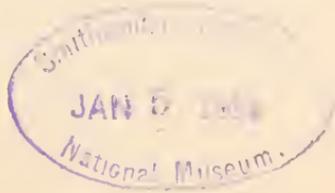
(Plates I and II.)

FAM. MELOIDAE.

Hornia gigantea Wellman, Ent. News—Vol. XXII, page 15, 1911.

The above named and recently described species of Meloid beetle* was taken in the egg, triungulin, pupal and adult stages from the cells of the cliff-bee, *Anthophora occidentalis*, the habits of which are discussed in a previous paper (Ent. News, XXIII, June 1912). This beetle was first taken from a colony of bees in Gove County. The colony was located in the sides and roof of a water-made cave. It had once been a large one, but this parasite had nearly depleted it.

*Contrary to Dr. Wellman's statement, this beetle has the claws armed with a distinct basal spine (Fig. 10, Pl. II). Whether this character would throw it out of the genus *Hornia*, is not a matter for us to decide.



At the date they were taken (June 20, 1910,) the beetles were just coming to maturity. Some were in the pupa stage but most were adults, still in the *Anthophora* cells.

On the scopa of some of these bees taken in Gove County, were found triungulins, possibly of this species, eight being taken on the leg of one bee. (See Pl. I, Fig. 7). They were found associated with this bee also in Greeley, Sheridan, Rush and Logan Counties.

In Rush County, June 25, 1912, Mr. Isely, one of the Entomological Survey party, in digging out *Anthophora* nests, discovered a number of eggs, recently hatched triungulins and an adult female, in the cells of one colony. (See Pl. I, Figs. 1 and 2).

Some of these triungulins succeed in attaching themselves to bees and are thus often transported to new cells, where the life history may be completed by feeding upon the stores of this bee. The life-history is, no doubt, much the same as that of the related *Sitaris humeralis* of Europe, which has been studied by Fabre.

CICINDELIDAE.

Amblychila cylindriformis Say.

According to the summer's observations of 1910, *A. cylindriformis* adults were rare in western Kansas. They were found in three counties: Gove, Wallace and Greeley. In the succeeding summer's survey to southwestern Kansas, they occurred in Grant, Morton, Meade and Stanton Counties.

On June 17, one adult was taken at 5 P. M. under a strip of canvas that lay on the ground by a tree. The beetle attempted to escape into a hole beneath the roots of the tree. No more adults were seen (though search was often made for them), until Wallace County was reached. Here, after a day of fruitless search in holes of all kinds in the clay banks of the Smoky Hill river, where *Amblychila* larvae were said to be found, a small clay break near the top of a hill 300 yards from the river yielded the object of the hunt. This locality was visited at 5 P. M. and two *Amblychila* found crawling about over the ground. One was taken near a hole one-half inch in diameter, and the other near an old badger hole. Both tried to escape

and moved quite rapidly. The sky was darkened by threatening weather, and this may account for their early appearance. At subsequent times they were taken between the hours of 6.30 and 7.30 P. M., save one which was dug from a badger hole in the day time by one of the party.

Other adults taken and not mentioned above were found along a cliff-like bank of the White Woman Creek, in Greeley County.

While the adults were taken along the clay banks and breaks, the elytra were commonly found on the plains some distance from any banks.

The adult begins to search for food at sunset. One was taken Aug. 17, 1910, and lived in captivity until Aug., 1911. Careful notes were made on this insect's habits. It was kept in an iron bucket in the Entomological Department Rooms. It was first placed in an earthen crock, in which had been poured a few inches of sand, but it was three weeks before it excavated a burrow. This was on Oct. 1st. It closed its burrow to come out a week later, probably owing to the dry condition of the soil. The latter being watered, the beetle drank eagerly, its open jaws being pressed against the earth. It then buried itself again. If the ground was allowed to remain dry for any length of time, *Amblychila* would eventually be found at the surface. On such occasions it drank and ate normally and even eagerly, but at times went without taking food for a long while.

Upon being placed outside the window on a cold day in winter, the beetle became torpid but soon became active when brought into the warm room.

Concerning its feeding habits; it seems apparent that owing to its poor sight and lack of agility, it sometimes endures prolonged fasts. It seems to rely more for guidance upon its antennae than upon its eyes. When fed from a pair of forceps it would usually take the insect in a gingerly, hesitating manner, at other times made a frantic effort to locate and secure an insect which had escaped its powerful jaws. Several wasps of the genera *Polistes* and *Pelopoëus* were offered it. It did not appreciate such morsels, however, and usually avoided them. When hard pressed by an undesirable insect (held with a pair

of forceps) it would turn on its back and fight furiously. A pentatomid bug which it once seized in its jaws caused the beetle considerable inconvenience, inasmuch as for a long time thereafter it attempted to rid itself of the evil odor of the bug, and remained with its mandibles deeply inserted in the soil.

A stone being placed on its domain it made a hole beneath it and came to sally forth with some confidence when aroused.

LOCATION OF LARVAL BURROWS OF *A. CYLINDRIFORMIS* Say.

The larvae of this species greatly resemble in structure and general habits other larval forms of the family Cicindelidae. Their burrows were found widely distributed in western Kansas, and were rather numerous in Wallace, Wichita and Morton Counties.

They usually occurred in colonies of from two to eleven, the individual burrows being close together, often not more than one and one-half inches apart. Usually a colony can be circumscribed by a ten inch radius.

We found in general two sizes of burrows, one small and containing larvae not over one-half inch long, and the other containing larvae about two inches long. One small burrow which we excavated was about four inches deep and had a diameter of one-sixteenth of an inch. The larger ones were a little less than one-half inch in diameter and about thirty inches deep. The rim was slightly elevated above the surface or surrounding level, and the entrance perfectly circular. The burrows have quite a characteristic way of going nearly straight down for about eighteen inches and then, turning to an angle of forty-five degrees downward, proceed about eighteen inches farther. This lower portion has a tendency to be feebly spiral. (See Pl. II, Fig. 16). The burrow for the last eight or ten inches is quite noticeably enlarged, especially laterally, and the extreme end is invariably tightly packed with the remains of former repasts. (See Pl. II, Fig. 14).

The holes are generally located on the brow of a cliff, but one colony, figured in Pl. II, Fig. 12, was found in muddy silt at the foot of a cliff-like bank, well below the recent flood level of the stream. Still others occurred on the high plain some

half a mile back from the bluffs. Two or three were found that had their openings in the face of the cliff. These sloped back and did not conform to the normal burrow. It was often noted that these larval colonies were situated near some larger hole, as that of the field mouse or badger.

FEEDING HABITS OF AMBLYCHILA LARVAE.

Careful observations were made in Wallace County in early Aug. of the habits of a colony of six larvae, and upon two, singly located, but conveniently near. The colony of six is figured in Pl. II, Fig. 13. One of the other solitary ones is shown in Pl. II, Fig. 14. The larval holes were on a level spot on the top of a twenty-foot cliff of sandy clay and a few feet from its brink. The said cliff defined the river bed and was at that time 300 feet from the flowing stream and extended for some distance along its side.

Observations were begun August 9th, shortly before sun-down. The colony was roughly sketched and each hole numbered. When we arrived no larvae were at the surface, but at about dusk, cautiously, one by one, the brown "traps" were set, only to drop out of sight at the first disturbance.

One came near the top and, by taking a half turn, the mandibles scraped dust down upon the "trap" which made it more deceptive than ever.

A lantern was lighted and placed within a foot of the colony, but seemed not to disturb it. A beetle of the genus *Trox* was placed over the hole of No. 4. It was seized and dragged partly out of sight but as promptly brought up, lifted from the ground, and by a flip of the head, cast clear of the hole and the trap again set. A mantid (*Litaneutria*) was offered and seized by this same larva. This was at 7.41 P. M..

Number 2 took a moth offered from the forceps. Number 5 accepted a fly. Number 3, the largest of all the colony, was located in a hole, the mouth of which was one-half inch above the surrounding ground and close against the roots of a grass-clump. This larva greedily took a beetle of the genus *Lachnosterne*. The last one in the colony fairly jumped at an antlion adult offered it and drew it into its burrow with lightning

speed. None of the larvae returned to the surface after being fed.

Earlier the following evening the colony was again visited. The bank was searched for adults without success. The first larva appeared at or near its entrance at 6.35 P. M. The sky was one-half cloudy, wind from the south. This larva was one of the solitary ones and numbered 7. Number 6 was up at 6.39. Numbers 1 and 2 were up at 7.00 P. M. All "traps" were set by 7.03. A moment later a shout sent 1, 3 and 6 down. Number 7 seemed wild and more easily disturbed than the others; perhaps it, being alone, got more to eat and was less greedy. At 7.20 a *Pasimachus* (coleopter) was given to number 1. A struggle ensued. Twice the beetle managed to back to the surface only to be dragged from view again. Number 2 was offered a *Chalybion* (wasp) which it took. Buzzing was heard within for some moments later. Number 6 took a Mutillid. Number 4 a *Pelopoecus* wasp head first. Number 3 took the head from a *Cicindela* which was too tightly held in the forceps. Number 5 took a *Cicindela* as it ran over the hole. Number 8 took a pentatomid. This closed the observations for the two evenings.

We noted that the larvae of *Amblychila cylindrifformis* were rather general feeders, the *Trox* alone being rejected.

The following morning the colony was visited. The body of the *Pelopoecus* (legs and wings gone) was found three inches from number 2 and the body of *Chalybion* two inches from number 2. Number 8 was carefully excavated, a small guide-straw being used. The plan of the burrow is shown in Pl. II, Fig. 14. The dimensions are there given.

The colony was also very carefully excavated. Guide-straws were used and the digging done from one side. (See Pl. II, Fig. 13), Each larva was placed in a vial bearing the number of the hole and the contents of each hole were placed in a vial similarly numbered.

In all but two holes, number 8, to which was fed the Pentatomid, and number 5, to which was given the *Cicindela*, we found the remains or parts of the food given the night before. In number 1 was found the *Pasimachus* one and a half inches

below the entrance, head downward and uninjured save that the claws were gone from the fore-tarsi. The larva was in the rear of the burrow and apparently unhurt. In number 2 the wings of the *Chalybion* were found just in front of the larva. In number 3 was found the frons of *Cicindela*. In number 4 the wings and legs of *Pelopoëus*. In number 5 the larva was not in the rear of the burrow but was found discolored and blackened for the first two-thirds of its length and in a stupor, apparently nearly dead. In referring to the notes of the night before, it was found that this one had taken the *Cicindela*, and it was evident that there had been a battle in which the rapid little tiger-beetle had got beyond the plated armor of the larva in that portion of the burrow where it widens out, and had won the struggle. In number 6 the abdomen of the Mutillid was found.

A table at the end of this paper gives these notes in a concise form.

As stated above, the extreme end of the burrow for a distance of two and a half inches was packed with refuse of former repasts. In several cases, as the sides of the burrows were carefully shaved away, there was an opportunity to see the larva naturally situated in its home. It was noted that as the larva grabbed at an object, the head would fly up and backward, the wave thus started would hump the back where the sharp prongs of the dorsal side could grasp the walls of the burrow.

Four of the larvae of this colony were placed in holes made for them in cans containing clay and accepted food normally. Three were carried thus through the remaining camping trips and brought safely to the laboratory and placed in vertical holes in sandy soil. About a week later two of the larvae blocked up the mouth of their tunnels so that the location of the latter could not be well determined. The third did not conceal its whereabouts but kept its burrow open. The larvae were all dead by Feb., 1911. The stopping up of the holes may perhaps be explained by the hibernating instinct of the larvae.

SUMMARY OF FEEDING HABITS OF *AMBLYCHILA CYLINDRIFORMIS*.

No.	Date	Time at Surface	Food Offered	Result	Remains of Food at Surface	Remains of Food in Burrow	Other food remains	Condition of Larva
1	Aug. 10	P.M. 7	Pasimachus	Attacked		Alive 1½ in. below surface, 5 tarsi gone		Normal
2	" 9 " 10	" 7	Moth Chalybion	Taken below	Chalybion body	Chalybion wings		"
3	" 9 " 10	" 7.03	Lachnosterna Cicindela	Taken below Head taken off		Frons of Cicindela		"
4	" 9 " 10 " 9	" 7.04 " 7.41	Trox Pelopoeus Litaneutria	Taken then expelled Taken below " "	Body of Pelopoeus	Wings and legs of Pelopoeus		"
5	" 9 " 10	" dusk " 7.04	Fly Cicindela	" "				Badly chewed and discolored
6	" 9 " 10	" 7.04 " 6.39	ant-lion, adult Mutillid	" "		Abdomen of Mutillid		Normal
7	" 10	" 6.35						Normal
8	" 10	" 7.04	Pentatomid	" "				Normal

They came to surface to feed at dusk.

They are general insect feeders but they reject distasteful insects.

They may sometimes be overcome by the prey they have captured and sometimes fail to retain prey once caught.

In summer of 1911 the larval forms were found widely distributed in southwestern Kansas but the adults were scarce as ever.

FAM. HETEROCERIDAE.

Heterocerus sp.

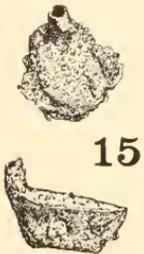
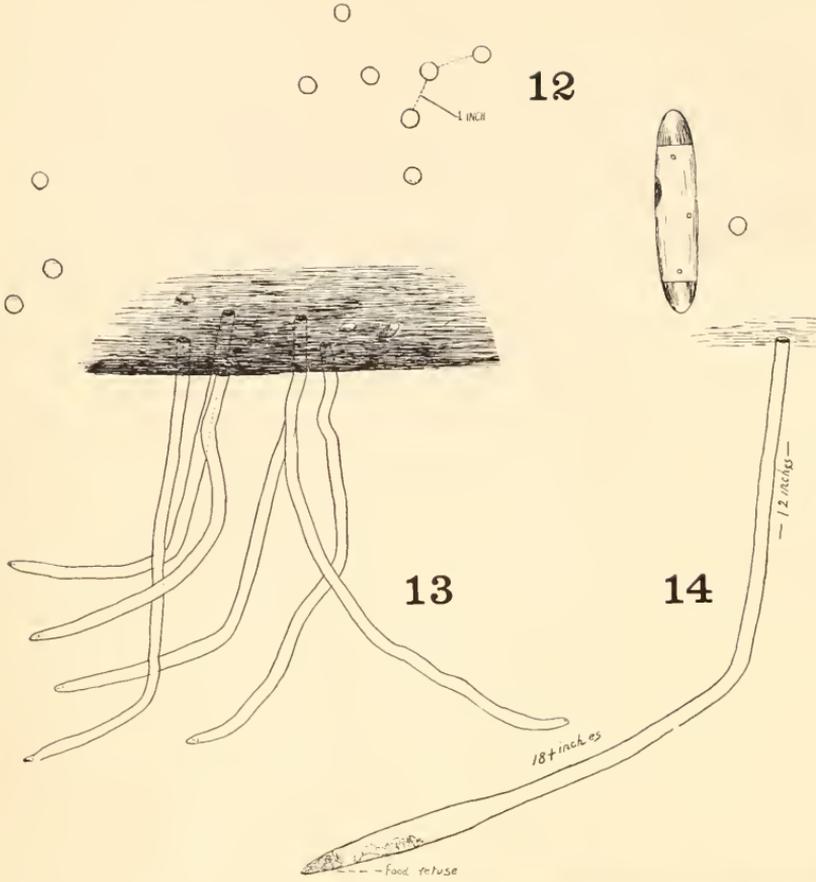
Along the shores of the Sappa Creek, in Rawlins Co., we took some beetles of this genus which live in peculiar little urn-shaped mud cases. These cases were set in the mud with the necks just showing above the level. A side and top view are shown in Pl. II, Fig. 15.

EXPLANATION OF PLATES I AND II.

Plate I. All figures enlarged.

Fig. 1. Egg of *Hornia gigantea* showing the enclosed embryo.

Fig. 2. Young triungulin of *Hornia gigantea* found in the nest of the bee, *Anthophora occidentalis*.



- Fig. 3. Piece of cast larval skin of *Hornia gigantea*.
Fig. 4. Pupa of *Hornia gigantea*.
Fig. 5. ♂ type of *Hornia gigantea*.
Fig. 6. ♀ type of *Hornia gigantea*.
Fig. 7. Triungulin found on leg of the bee, *Anthophora occidentalis*.
Fig. 8. Head of ♂ cotyope of *Hornia gigantea*.
Fig. 9. Maxillary palpus of ♂ type of *Hornia gigantea*.
Fig. 10. Fore tarsal claw of ♂ type of *Hornia gigantea*.
Fig. 11. Antenna of ♂ *Hornia gigantea*.

Plate II. All figures except Fig. 15 reduced.

- Fig. 12. Bird's eye view of a colony of the larvae of *Amblychila cylindriformis*, on the sloping bank of White Woman Creek, Greeley County, Kansas, August, 1910. The pen-knife placed in the figure for comparison, is $3\frac{5}{8}$ inches long. The shaded holes are closed.
Fig. 13. Vertical view of a colony of the larvae of *Amblychila cylindriformis*, Wallace County, Kansas, August, 1910.
Fig. 14. Vertical section through a tunnel of the larva of *Amblychila cylindriformis*, Wallace County, Kansas, August, 1910.
Fig. 15. Dorsal and lateral view of a mud nest of *Heterocerus* sp.
Fig. 16. Vertical section through a tunnel of the larva of *Amblychila cylindriformis*, Morton County, Kansas, August, 1911. Photo by Lovejoy.

The Species-status and the Species-concept.

By CHARLES H. T. TOWNSEND, Lima, Peru.

The question as to what constitutes a species is as old as the science of biology. Nevertheless it is not yet satisfactorily answered. In the case of certain groups of plants and animals the answer is simple. These groups belong to old stocks that have long since passed through their period of evolutionary activity, are no longer undergoing extensive variation and specialization, and have lost at least in great part the transitional forms that arose during the process of their evolution. But when we attempt to define a species in younger groups which are still undergoing extensive evolution, or have but recently reached the climax of multiform development, the answer is not simple. Examples of such groups are furnished by the Muscoidea among insects and by the Compositae among

plants. The difficulty to be overcome in these groups arises from the presence of a large number of the transitional forms and individuals that are always produced during the evolution of stocks. What is to be done in such case? It is clear that what suffices to meet the requirements of the one case will not meet the quite distinct requirements of the other. The species-concept must therefore be modified to such extent as is necessary for adapting it to the requirements of each case.

It has long been held that a species comprises all individuals whose interbreeding will produce fertile offspring. This can not now be accepted. Plants, insects, and even mammals, which the majority of biologists will agree are entitled to specific recognition, possess this power. We have only to recall the plants which have been successfully hybridized within recent years and insect species which have mated and produce fertile progeny. It is quite possible to secure fertile offspring from the union of certain distinct but closely allied species of flies, butterflies and beetles whose external sexual organs admit of mating. Instances of hybrid insect races are on record. It is not within the limits of this article to cite cases, but the records show it to be practically beyond question that in certain instances the spermatozoa of one species have the power to fertilize the ova of another and produce therefrom fertile individuals. Other definitions of species so far given, aside from the above, also fail to apply in young stocks.

The keynote of all biological investigative work is to verify and record faithfully the results of one's investigations. Such results form a sure basis for further investigations. It is certain that all systematists do not yet fully realize the significance of some of the unchallenged results so far obtained. As a profitable though *outré* illustration, true nevertheless to living conditions, we may imagine an immense extent of fertile land surface covered with a varied and teeming flora and fauna still more or less in process of evolution and subjected to all the varied combinations of conditions that will support life. We may further imagine for the moment that we are not only intimately acquainted with each of the practically innumerable

forms and individuals that compose this flora and fauna, but also that we are able to follow out in sequence all the lines of their issue through a period of a few millions of years. What would be the result of our observations in such case? It is certain that we would see many forms drop out, we would see many new ones arise, we would see great variations in some and less variation in others, we would see some persist in nearly their original form; but most important of all from a taxonomic and phylogenetic point of view we would witness the production of hordes and multitudes of transitional individuals and forms that would quite effectually clog any known system of classification, were they assembled with the typical forms in their entirety. At any given time in the production of these transitionals, the living residue would show plainer lines of separation, but specific and other limitations among them would not be amenable to current methods. These conditions are actually exemplified today in certain young stocks inhabiting favored regions. There are stocks of Muscoidea and Compositae in the Andean montanya whose progenitors have almost certainly been in that region or an equally favored contiguous area for the past two or three millions of years, and their living forms in many instances exemplify the conditions just mentioned. While this region is probably the most highly favored in this respect in the world, it is certain that many other regions exist both in and out of the tropics where similar conditions are exemplified by these and other young stocks. Many muscoid groups exhibit today in various parts of the world so many transitional forms and individuals that we have long been unable conveniently to classify them. Yet we know that these groups have already lost many of the transitional forms, together with immense hosts of transitional individuals, that arose during their evolution up to the present time. What conclusion can we draw from these facts? Simply that there exist in nature, among groups of young stocks undergoing active evolution, no well defined or fixed species limits; but that there certainly exist aggregations of individuals observing some general specific bounds which suffice to meet the

requirements put upon them by varying natural conditions, or failing to meet them perish.

This phase of biologic inquiry can, in a measure, be likened to infinity. In theory infinity is incomprehensible, but we comprehend parts of it in practice. Theoretically there is almost no limit to the morphologic variety that life may assume, but practically it is limited to such morphology as we know or can base on that which is known. When we come to consider the limits of species we find that in practice as well as theory they have among themselves no natural sequential or genetic limits, and often no residue limits at any given point in their development, but nevertheless they certainly exist under both conditions, however obscured may be their limits. Were we able to restore and gather together all the individuals that have arisen during the evolution of species on this globe up to the present day, we would find few or no places where we could draw natural lines of division between categories of individuals. In practice, however, among the living residue of today, the limits of natural species are such as they make for themselves. It remains for us to find these limits out. The illustrations which I have used may be judged as forced and far-fetched, but they are true to nature and therefore their forcefulness is the more serviceable.

Variation even among existing forms has almost no limits. The number of possible combinations of the characters of organisms, past, present and future, is almost infinity itself. The best that we can do in the present with the great plastic mass of living young forms is to divide it as conveniently as we may, conforming to phylogenetic lines as closely as it is possible to interpret them. It is certain that in highly specialized and comparatively recent groups we gain simplicity and conciseness as we descend in the taxonomic scale and diminish the scope of our units of treatment. This applies not only to groups but to genera, subgenera, species, subspecies and races. It arises from the contraction of taxonomic values obtaining in such stocks. We need to apply a restricted species-concept in dealing with these forms, as well as employ restricted groups and categories in general.

It appears possible to define a species as an aggregation of individuals which in the majority of cases breed together under normal conditions and produce fertile offspring. This seems true, but it is incapable of application with immediate final results in the case of young stocks. The chief difficulty lies in determining what are the limits of the normal fertile variants of species in such stocks. Long series of observations must be carried out to establish the normal self-observed limits of such species in nature. This labor must here often follow instead of preceding a working species-concept, because we need names under which to record our results during the carrying out of the necessary investigations. By the normal self-observed limits of species in nature is meant their limits in the long run, divested of exceptions and vacillations. It is useless to attempt to solve such problems merely by the study of dead material. The living phases, functions and environment of the material must be studied as well, and that diligently.

Thus it is safe to say that each species will have to be worked out eventually on its own merits and standing. As this cannot be done at once, our working concept must be a tentative one that will apply now for such cases. It must be plastic, but of such nature that it will cause no future confusion or perversion of recorded facts that belong with it. How shall we gain the practicable end of a working species-concept for dealing with the forms exhibited by young stocks? It seems that the best way to do this, because the simplest and most thoroughly guarded against error, is to bestow a name upon every form at all abundant in individuals that can be distinguished as different from other forms—every form that we can sense and characterize as a different form, regardless of the presence or absence of transitional individuals, of interbreeding limits, or of other than an approximate constancy of characters—and to consider that form as a tentative restricted species. Such plan will not interfere with the subsequent proper tabulation of forms as subspecies and races, when our knowledge is sufficiently complete to warrant it.

Individual-occurrences should not be confused with form-

occurrences. Transitional individuals or means of variation occur linking together extremes of variation that seem to have been derived from the same specific stock. The extremes need names if they are abundant enough in individuals to constitute form-occurrences; so do the means if they are similarly abundant and capable of characterization. But isolated transitionals and those of slight differentiation may be recorded by noting their degree of divergence from one or other of the named forms. In this manner exact and concise records are preserved of each individual form and its variations. Such records are indispensable in both present and future work. These forms are in many cases potential if not actual species, and all of them need to be recorded now.

The lumping of recognizable forms under one name is a most serious taxonomic offense, unless in each case the precise limits of divergence from the typical form are shown. An immense number of muscoid names has been thrown into the synonymy within recent years, not only in America but also especially in Europe. No doubt some of these belong there, but it is very probable that many might be profitably employed for the recognition of localized and various transitional forms among these highly versatile flies.

The foregoing remarks at least throw some light on what may be termed the species-status in nature, and it is believed that they demonstrate the need of a modified species-concept for application in young stocks. It will be useful to summarize the main points.

SUMMARY.

1. In old stocks, species have normal values and well defined limits, because evolution has become inactive in those stocks and maturity has been attained by the forms.

2. In young stocks, the contraction of taxonomic values due to youth restricts the scope of species, and the presence of many transitionals due to active evolution obscures their limits.

3. Therefore the species-status is not uniform in old and young stocks, and the species-concept must be modified to agree with it.

4. Though transitionals obscure limiting lines in dead material, species exist in young stocks and the actual limits of each are such as it makes for itself by the general interbreeding of its constituents under normal conditions.

5. The normal self-observed limits of species in nature among young stocks must be worked out on the merits of each case by the study of living material through all its stages with relation to its environment.

6. As a basis for this work all recognizable forms in young stocks must be described, named and regarded as tentative species until their status is finally determined.

7. All recognizable forms in young stocks demand a name and final place in the taxonomic system down to race rank, and none should be lost sight of by lumping of names.

8. Isolated or aberrant transitionals need no distinctive name, but as a matter of record they should be descriptively differentiated from that form which they most closely approach.

9. It follows that the describing and naming of forms in young stocks should be based on as large series as possible.

Notes on the Thoracic Sclerites of Winged Insects.*

By G. C. CRAMPTON, Ph.D.

(Plate III.)

As used by most anatomists, the term *dorsum* is applied to the entire upper or dorsal surface of an insect's body; the entire side, or lateral portion of the body is termed the *latus*; and the entire lower or ventral surface is termed the *venter*. To avoid confusion, these terms should be used in this sense alone.

The entire dorsal region of each segment (i. e. the more membranous, as well as the more strongly chitinized portions of the body wall) is termed the *tergum*, or *notum*; the entire lateral region of each segment is termed the *pleuron* (both flanks being termed the *pleura*); and the entire ventral region

*Contribution from the Entomological Laboratory of the Massachusetts Agricultural College, Amherst, Mass.

of each segment is termed the *sternum*. The sclerites (either distinct plates, or subdivisions of the more strongly chitinized regions marked off by sutures) of the tergum are called *tergites*; those of the pleural region are called *pleurites*; and those of the sternal region are termed *sternites*. Unless confusion is to continue to reign in the terminology applied to the thoracic sclerites we must hold rigidly to the simple and logical usage given above.

From the study of the larval forms of insects, and the more primitive representatives of the order, it would appear that the thoracic sclerites were originally formed as numerous plates formed by depositions of pigment and chitin, due (in all probability) to the stimulus of muscular tension, and to other mechanical stimuli, such as friction. As specialization progresses, there is a marked tendency for these originally distinct plates to unite, or fuse together; and by the breaking up into parts (*derivatives*) of the original plates, by the re-combination of these parts fusing with other sclerites, and by the formation of secondary sutures (i. e. those not originally present), the modifications of the original typical or "ground-plan" met with in the different orders of insects, are brought about.

The hypothetical "ground-plan" of thorax shown in Plate III, Fig. 2, is more of a composite, or combination of the possible conditions met with in different winged insects, than an attempted reconstruction of the original condition found in the ancestors of these insects. It nevertheless approaches the original condition, in many respects. The plates which were originally separate and distinct are, for the most part, so represented in the figure. The greater part of the sutures originally present, or those early formed, are designated by heavy lines; while those added as later modifications (i. e. secondary sutures), are indicated by dotted lines. Although the types of thoracic sclerites represented in the following series do not cover all of the conditions met with in winged insects, it is a comparatively simple matter to reduce any of them to some one of the types here represented. The principal sclerites of the tergal, pleural and sternal regions may be briefly described as follows:

TERGITES—There are two principal plates found in the tergal region of winged insects. These are the *scutoscutellum*, or large anterior plate *Scsl* (Fig. 2), and the *postscutellum*, or smaller posterior plate *PsL*. The scutoscutellum bears the wing, or the wing articulates with its lateral margin. The postscutellum is not connected with the wing in any insects thus far observed. In some insects the scutoscutellum is connected with the pleural region by a pre-alar bridge, or connecting sclerite *Pal* (Figs. 2 and 5), extending in front of the wing; while the postscutellum is usually connected with the pleural region by a post-alar bridge *Plph* (Fig. 2), extending behind the wing.

There frequently occur "*implexes*" (i. e., any in-folding, or in-pocketing of the integument) which serve the double purpose of affording better attachment for the muscles, and of strengthening, or rendering more rigid, the sclerites in which they occur. The outward manifestation of such an "implex," or internal fold, is an external groove or suture, formed by the meeting of the external lips of the fold. Naturally, these folds, or plaits, are composed of two plates. These may be so closely applied to each other as to appear as a single plate. Both plates may be equally strongly chitinized, or one may be strongly chitinized and the other membranous.

The transverse "*implexes*" of the tergal region are termed *phragmas*, and these occur at the dividing line between two consecutive segments, so that the anterior plate of the phragma may be considered to belong to the segment in front, and the posterior one to the segment behind. If the anterior plate of the two which make the phragma is strongly chitinized while the other is membranous, the phragma appears to belong entirely to the segment in front. If the posterior one is strongly chitinized, while the other is membranous, the phragma appears to belong to the segment behind. The anterior plate of the tergal region (i. e., the scutoscutellum, mentioned above) may bear a phragma at its anterior margin, or the posterior tergal plate (i. e., the postscutellum) may bear a phragma along its posterior margin.

The anterior tergal plate *Scsl* (Fig. 2) may be further di-

vided by sutures (with, or without corresponding internal folds) into a number of subregions, or subdivisions. The foremost of these is a narrow, transverse region, the *pre-tergite*, *Am* (Figs. 2, 4, 5 and 6), lateral to which is the *pre-alar*, *Pal* (Figs. 2, 4 and 5). Behind the region *Am* is the *prescutum*, *Psc* (Figs. 2, 4, 5 and 6). Following the prescutum is the *scutum*, *Sc* (Figs. 2, 4, 5 and 6). Situated somewhat anteriorly and laterally to the scutum is a narrow sclerite, the *supraalar*, *At* (Figs. 2, 4, 5 and 6), with which the wing veins articulate by means of a small movable, or articulatory plate, the *notopterales*, *Npt* (Figs. 2, 4, 5 and 6). (These articulatory plates by means of which the wing veins articulate with the tergal plate, have been recently termed the *pteralia*). Situated in the incision between the sclerites *Pal* and *At*, is the *tegula*, or *parapteron*, *Tg* (Figs. 2, 4, 5 and 6). The scutum, *Sc*, may be divided into subregions by the formation of sutures, or even a transverse fissure. The principal subdivision is the *juxtascutellum*, *Jsl* (Fig. 2) situated on either side of the *scutellum*, *Sl* (Figs. 2, 4, 5 and 6). The sclerite *Jsl* is not marked off in the insects figured in the series here given, but occurs in the Diptera and Hymenoptera. An articulatory extension of the scutum, termed the *anal pterale*, *Scpt* (Fig. 2), becomes detached in the higher insects, and forms one of the *pteralia* mentioned above. A narrow, posterior, marginal sclerite, the *postergite*, *Pm* (Figs. 2, 4, 5 and 6) is the hindmost of the subdivisions of the tergal plate *Scsl*. It sometimes occurs as a posteriorly-projecting, fold-like region of this plate. A median dorsal suture (with its corresponding internal fold, or "implex") called the mid-dorsal suture may partially divide the tergal plate into symmetrical halves.

The posterior tergal plate, or postscutellum *Pscl* (Figs. 2, 4 and 5), is not connected with the wing, but is usually connected with the pleural region in the higher insects, as was mentioned above. The postscutellum consists of an external region (the "phragmite") and an internal portion, the phragma. The external region of the postscutellum, in some insects is divided into a median region, the "*mediophragmite*," *Mph*

(Fig. 2), and a lateral portion (one on either side), the *pleurophragmite*, *Plph* (Fig. 2). These are best seen in the Diptera and Odonata. The postscutellar plates *Psl* (Fig. 6) of the cockroach, doubtless are the representatives of the postscutellum in other insects.

The various subdivisions of the tergal plates described above, are not met with in all insects, those usually present being the prescutum (*Psc*), the scutum (*Sc*), the scutellum (*Sl*), and the postscutellum (*Psl*).

The small tergal plates, or *intertergites*, *It* (Fig. 4) occurring in front of the anterior tergal plate in such insects as *Corydalis*, are doubtless homologous with the dorsal cervical sclerites *It* (Fig. 3) occurring in front of the pronotum of the cockroach and other insects. These will be discussed under the consideration of the intersegmental sclerites.

PLEURITES—Situated immediately below the wing is a subalar plate, the *subalare*, *Asa* (Figs. 2, 4, 5 and 6). There are sometimes two of these, an anterior and posterior subalare, *Asa* and *Psa* (Fig. 5), but only the anterior one is large enough to be of any importance. The principal plate of the pleural region is the *eupleurite*, composed of the regions *Em*, *Es* and *Lpl* (Figs. 1 and 2). This was in all probability a single plate originally, but later became divided into a number of sub-regions by the formation of sutures. A more or less oblique infolding of the integument whose external manifestation in the pleural suture *g* (of all figures) extends from the top of this plate to the bottom of it. Internally, an "implex" or ridge called the *pleural ridge*, or *apodeme*, likewise extends from top to bottom on the inner surface of the plate. The region immediately posterior to the pleural suture *g*, is the *epimeron*, *Em* (in all figures). The epimeron may be subdivided into an upper and a lower region *Ppl* and *Hem* (Figs. 2 and 4) in such insects as *Mantispa*, *Chrysopa*, etc., but this is of somewhat rare occurrence.

The region immediately anterior to the pleural suture *g* is the *episternum*, *Es* (in all figures). In the mesothorax of the earwig, the formation of a second suture *e* (Fig. 1) marks off the *lateropleurite*, *Lpl*, from the remainder of the pleural plate.

A lateral plate of the sternal region, the *laterosternite*, *Lst* (Fig. 1) may become detached from the sternal region and unite with the sclerite *Lpl* (Fig. 1) to form a pre-coxal bridge *Lat* (Fig. 3) extending in front of the coxa, and connecting the pleural with the sternal region. This pre-coxal bridge may then be divided by a suture *b* (Fig. 3) into an anterior region, the *precoxale*, *Pcx* (Fig. 1) and a narrow posterior region, the *antecoxale*, or "antecoxal piece" of recent writers, *Acx* (Figs. 3 and 6). The precoxal bridge, however, is usually indistinguishably united with the episternum above, and with the sternum below, in the higher insects.

A secondary suture *d* (Figs. 2, 4, 5 and 6) marks off an upper region, or *anepisternum*, *Aes*, in the dorsal region of the pleural plate, and this small region is usually mistaken for the episternum in such cases, although the episternum *always extends from the top to the bottom of the pleural plate*. Two small "derivatives" of the region *Aes*, at the base of the wing, may be more or less completely detached from this region to form the anterior and posterior *basalare*, or basalar plates, *Aba* and *Pba* (Figs. 2, 4, 5 and 6).

The triangular plate termed the *trochantin*, *Tn* (Figs. 1, 2 and 6) may possibly be a detached sclerite of the pleural plate, although it is regarded by some writers as a detached portion of the coxa. The trochantin may be divided by an oblique suture into an anterior and posterior region as in Fig. 6 (*Tn*); it may be divided into two distinct plates as in Fig. 1 (*Tn*) by splitting up obliquely; or it may split up transversely into two distinct plates as in Fig. 3. The smaller of the two plates is the *trochantinelle*, *Tnl* (Fig. 3). The dorsal portion of the trochantin may unite with the pleural plate, and by a continuation of the suture *b* (Fig. 2) a composite region, the *pleuro-trochantin*, *Ptn* (Fig. 4) is formed. This is not to be considered as the trochantin alone, as is done by most writers.

There occurs in some insects, a post-coxal sclerite, the *post-coxale*, *Poc* (Fig. 2) which may unite with the lower portion of the epimeron and with the sternite *Fs* to form a post-coxal bridge *Poc* (Fig. 4) connecting the pleural with the sternal region. There may thus be a pre-coxal and a post-coxal bridge connecting the pleural and sternal regions.

In front of the pleural plate, there occur, in some insects, a small group of plates, the *interpleurites*, *Ip* (Figs. 2, 3 and 4) which will be discussed with the remainder of the intersegmental plates under the heading intersegmentalia. In addition to these may be mentioned the *peritreme*, *Pt* (Figs. 1, 2, 4, 5 and 6), which surrounds the spiracle or breathing pore. The spiracle is regarded by many investigators as belonging to the segment behind it.

STERNITES—In such primitive insects as the stoneflies *Capnia* and *Leuctra*, there are five distinct sclerites in the sternal region, and traces of certain of these sternites are preserved in some insects, although the most of them disappear in the higher forms, either through fusion with each other, or through a fading out of the pigment and the softening of the chitinous deposits which formed them.

The sternite which is tentatively designated as the foremost of the principal sternal sclerites, is the *prebasisternite*, *Pbs* (Figs. 2, 3 and 5), which is probably a derivative (or detached portion) of the large sternite behind it, called the *basisternite*, *Bs* (Figs. 1, 2, 3, 4, 5 and 6). The basisternite, as the name implies, forms the lower portion of the sternum in many insects; its lateral wings *Lst*, previously described, forming the sternal portion of the flanks. These lateral extensions may become detached to form separate plates, the *laterosternites*, *Lst* (Fig. 1) as in the earwig, or they may remain connected with the sternum, and unite with the pleural plate to form a pre-coxal bridge extending between the pleural and sternal regions. The basisternite may be split up by diagonal fissures, into four sclerites, as in the prothorax of the roach *Ectobia* (Fig. 3, *Bs*). The basisternite is retained in practically all insects, and forms the principal sclerite of the sternal region.

Behind the basisternite is the *furcasternite*, *Fs* (Figs. 1, 2, 3, 4, 5 and 6). As the name implies, it bears the *furca*, or fork-like *apophyses* (internal sternal processes). The apophyses may be separated from each other, one on either side of the median ventral line (i. e., *diapophyses*), or they may approach each other in the median line, and their bases unite,

while their distal extremities remain separated to form the arms of the fork.

Following the furcasternite is the *postfurcasternite*, *Pfs* (Figs. 2 and 5), and behind this is the *spinasternite*, *Ss* (Figs. 1, 2, 3, 4, 5 and 6), so called because it bears the *spina*, or unpaired median apophysis (*monapophysis*). It has not yet been determined whether or not the spinasternite is the foremost or the hindmost of the sternites, but it is here treated as though it were the hindmost.

The internal projections of the sternal region are termed *apophyses*. In order to distinguish the paired from the unpaired apophyses, the terms *diapophyses* and *monapophysis* may be used to designate the two types.

A median ventral fold, the mid-ventral "implex," with its corresponding external suture, frequently partly divides the sternal sclerites into symmetrical halves. It, however, is absent in many insects.

All of the sternites mentioned above are not preserved in the higher insects, the two usually represented being the basisternite and the furcasternite (called the antecoxal piece by the older writers). The prebasisternite is retained in the prothorax of certain lower forms, and two derivatives, or detached portions, of this region occur as narrow transverse plates, the *intersternites*, *Is* (Figs. 2 and 3), in the prosternum of the earwig and roach.

INTERSEGMENTALIA—The term *intersegmental plates*, or *intersegmentalia* is applied to the small sclerites situated between the segments. These plates, in all probability, belong partly to the segment in front of them, partly to the segment behind them, and are therefore not to be considered as vestiges of reduced segments in the process of becoming lost.

The dorsal intersegmentals are the *intertergites*, *It* (Figs. 2, 3 and 4). They occur in front of the mesonotum of *Corydalis* (Fig. 4, *It*) and in front of the pronotum of the roach (Fig. 3, *It*). Those in front of the pronotum are called the dorsal cervicals (*cervicalia*). The dorsal intersegmentals are probably detached plates belonging to the segment in front of them.

The lateral intersegmentals are the *interpleurites*, *Ip* (Figs. 2, 3, 4 and 5), and the postcoxale, *Poc* (Fig. 4) might possibly be likewise included under the designation lateral intersegmentals. There are two well developed interpleurites in front of the pleuron of the mesothorax in *Corydalis*. The posterior one is much the larger, and probably belongs to the segment behind it, while the anterior one may belong to the segment in front. The anterior interpleurite in this insect bears an internal process for muscle attachment. The interpleurites *Ip* (Fig. 3) in front of the pleuron of the prothorax in the roach, are called the *lateral cervicals*.

The ventral intersegmentals are the prebasisternite *Pbs* (Figs. 2, 3 and 5), the intersternites, *Is* (Figs. 2 and 3), and possibly the spinasternite, *Ss* (Figs. 2, 3 and 5). The prebasisternum and intersternites, *Pbs* and *Is* (Fig. 3) in front of the prosternum of the roach, earwig, etc., are termed the *ventral cervicals*. All of these sternites appear to be parts of the segment behind them.

It is thus apparent that the cervical sclerites (cervicalia) are in all probability homologous with the intersegmental sclerites (intersegmentalia) in front of the other thoracic sclerites, and these doubtless belong partly to the segment behind them, partly to the segment in front. It is thus as incorrect to regard the cervical sclerites as representing the entire labial segment, as it would be to regard the intersegmental sclerites in front of the metathorax as representing the entire mesothoracic segment; for these intersegmental (and cervical) sclerites belong partly to the segment behind them, partly to the segment in front, as we have seen.

The region containing the cervical sclerites is the *veracervix*, or "*cervicum*." It would be simpler to designate this region as the cervix, since it is the true neck region, but the term cervix is always applied to the constricted occipital region of the head; on this account the "manufactured" term "*cervicum*," or the compound term *veracervix* is preferable. The function of the neck region is to enable the head to turn more readily.

EXPLANATION OF PLATE III.

Fig. 1. Mesothorax of the earwig *Forficula*.

Fig. 2. "Ground plan" of typical thoracic segment.

Fig. 3. Prothorax of roach. Pleural region as in *Periplaneta*; sternal region as in *Ectobia*.

Fig. 4. Mesothorax of *Corydalis*.

Fig. 5. Mesothorax of stonefly. Pleural region as in *Perla*; sternal region as in *Capnia* and *Leuctra*.

Fig. 6. Metathorax of roach. Pleural region as in *Ischnoptera* (male); sternal region as in mesothorax of *Periplaneta*.

All figures are so oriented that the dorsal region is directed toward the top of the page, and the anterior portion toward the left hand margin, the plate being held sidewise to read the abbreviations. All show lateral views. The coxae are partly cut off in all figures. Black areas denote cavities, or the location of internal processes.

<i>a</i> , Suture between basisternite (Bs) and laterosternite (Lst).	<i>h</i> , Suture below subalar sclerite (Asa).
<i>Aba</i> , Anterior basalare.	<i>Hem</i> , Hypoepimeron.
<i>Acx</i> , Antecoxale.	<i>Hpt</i> , Hypopteron.
<i>Aes</i> , Anepisternum.	<i>i</i> , Suture dividing epimeron (Em) into upper and lower regions.
<i>Am</i> , Pretergite.	<i>Ip</i> , Interpleurites.
<i>Asa</i> , Anterior subalare.	<i>Is</i> , Intersternites.
<i>At</i> , Supraalare.	<i>It</i> , Intertergites.
<i>b</i> , Suture between antecoxale (Acx) and precoxale (Pcx).	<i>Jc</i> , Juxtacoxale.
<i>Bs</i> , Basisternite.	<i>Jsl</i> , Juxtascutellum.
<i>c</i> , Suture between laterosternite (Lst) and lateropleurite (Lpl).	<i>k</i> , Suture between epimeron (Em) and meron (Me).
<i>cm</i> , Coxamarginale.	<i>l</i> , Meral suture (between meron and anterior portion of coxa).
<i>d</i> , Suture marking off anepisternum (Aes).	<i>Lat</i> , Laterale.
<i>e</i> , Suture between episternum (Es) and lateropleurite (Lpl).	<i>Lpl</i> , Lateropleurite.
<i>Em</i> , Epimeron.	<i>Lst</i> , Laterosternite.
<i>Es</i> , Episternum.	<i>m</i> , Suture between episternum (Es) and trochantin (Tn).
<i>Fs</i> , Furcasternite.	<i>Mc</i> , Meron.*
<i>g</i> , Pleural suture (between episternum and epimeron).	<i>Mph</i> , Mediophragmite.
	<i>Npt</i> , Notopterale.
	<i>Pal</i> , Prealare.
	<i>Pba</i> , Posterior basalare.

* In the Diptera, the term *meropleurite* is applied to the meron united with the lower portion of the epimeron.

<i>Pbs</i> , Prebasisternite.	<i>Ptn</i> , Pleurotrochantin.
<i>Pcx</i> , Precoxale.	<i>Sc</i> , Scutum.
<i>Pfs</i> , Postfurcasternite.	<i>Scpt</i> , Analpterales.
<i>Plph</i> , Pleurophragmite.	<i>Scsl</i> , Scutoscutellum.
<i>Pm</i> , Posttergite.	<i>Sl</i> , Scutellum.
<i>Poc</i> , Postcoxale.	<i>Ss</i> , Spinasternite.
<i>Ppl</i> , Pteropleurite.	<i>Tg</i> , Tegula, or parapteron.
<i>Psa</i> , Posterior subalare.	<i>Tn</i> , Trochantin.
<i>Psc</i> , Prescutum.	<i>Tnl</i> , Trochantinelle.
<i>Psl</i> , Postscutellum.	<i>Vcx</i> , Veracoxa.
<i>Pt</i> , Peritrema.	

The subscripts 1, 2 and 3, denote that the sclerite in question belongs to the prothorax, mesothorax and metathorax respectively.

A new Megastigmid from Queensland, Australia (Hym., Chalcidoidea).

By A. A. GIRAULT, Nelson (Cairns), N. Q., Australia.

The following species belongs to a genus heretofore known from Java only but seems to differ from the type of it in bearing a petiolate abdomen.

Spilomegastigmus flavus new species.

Female.—Length, 2 mm., excluding ovipositor which is slightly longer than the abdomen, their valves black. Wings hyaline excepting the stigma; abdomen with a distinct petiole which, however, is not very much longer than wide. Honey yellow the abdomen with transverse short stripes of black; legs and scape pale yellow, the flagellum dusky. Mesoscutum and scutellum transversely wrinkled, the latter without a cross furrow. Mandibles bidentate. Antennae slender, 11-jointed, the club solid, one ring joint; all funicle joints longer than wide, the first three subequal, longest, much longer than the pedicel. Head smooth.

(From one specimen, 2-3-inch objective, 1-inch optic, Bausch and Lomb.)

Male.—Not known.

Described from one female captured by sweeping in a forest, April 1, 1913 (A. P. Dodd).

Habitat: Australia—Nelson (Cairns), Queensland.

Type: In the Queensland Museum, Brisbane, the above specimen on a tag and the head in xylol-balsam on a slide.

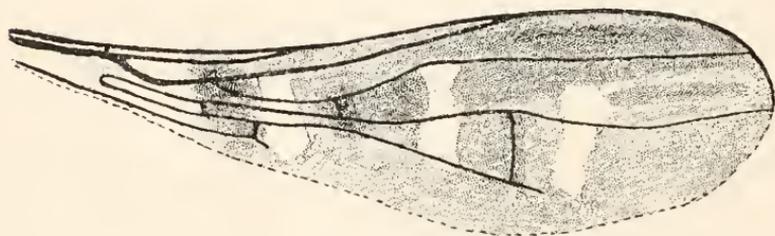
*ENT. NEWS, XXIII, 392-94, 1912.

The Male of *Syringogaster brunnea* Cresson, from Peru (Dipt.).

By E. T. CRESSON, JR., Academy of Natural Sciences, Philadelphia, Pa.

Among some material from Callanga, Peru, in the collection of the Hungarian National Museum, Dr. K. Kertesz found a specimen of the genus *Syringogaster* which he determined as my *brunnea*, although not agreeing with the description in many respects. He sent it to me for verification, and it proved to be the unknown male of that species, or at least I consider it as such, with the following differences:

Frontal median triangle polished, as is also the female to some extent. Posterior half of thorax black with the area about humeri rufous (this black discoloration may be caused by the chemical action on the pin.) Abdomen subopaque, not polished as in female, brown with two



yellow bands on the narrow first and second segments; genital segment yellow, longer than broad, extending to apex of fourth beneath. Anterior tibiae brown; posterior femora discolored on the inside. Wing venation and maculation as figured, the third vein being bent beyond small cross vein, while that of the female is straight.

The species having been described from Costa Rica, this discovery also gives an interesting extension to its distribution. It may be explained here, in case there be some misunderstanding, that what is considered the fused first and second abdominal segments, may be all one segment, but as understood in the typical description,* the first segment is the narrow portion while the second is the dilated portion. The two are sometimes readily distinguished by a faint impressed transverse line between them.

The Identity of Two Insects, each Described by Ashmead as *Megastigmus flavipes* (Hym.).

By C. R. CROSBY, Ithaca, N. Y.

In 1886 Ashmead described *Megastigmus flavipes* (Transactions of the American Entomological Society; v. 13: p. 128). In the United States National Museum there remains the pin on which the type was originally mounted, glued to a pasteboard triangle. Only the hind legs and one front wing remain. The stigmal club is large, very dark colored, and appears to be surrounded by a narrow clearly defined cloud. These characters prove it to be a true *Megastigmus*.

In 1888 Dr. Ashmead described another insect under the same name, *Megastigmus flavipes*. (In Bulletin 3, Kansas Agricultural Experiment Station: p. III). Through the kindness of Professors T. J. Headlee and G. A. Dean, I have been able to examine the type of this species. It is a male *Torymus*. In transferring it to that genus, we find the name *Torymus flavipes* preoccupied by *Callimome flavipes* Walker (Entomological Magazine; v. 1: p. 124. 1833) also a true *Torymus*. It, therefore, becomes necessary to change the name of Ashmead's species, and as the original description was very inadequate, I have drawn up the following:

***Torymus abortus* new name.**

1888 *Megastigmus flavipes* Ashmead. Kansas Agricultural Experiment Station Bulletin 3: p. III.

Not *Megastigmus flavipes* Ashmead. Transactions of the American Entomological Society; v. 13: p. 128. 1886.

Not *Callimome* [= *Torymus*] *flavipes* Walker. Entomological Magazine; v. 1: p. 124. 1833.

Male.—Length, 1.5 mm. Head and thorax metallic greenish blue. Front and face finely reticulate-punctate, vertex becoming delicately transversely rugulose. Antennae dusky. Posteriorly on the thorax and on the pleurae a brownish ground-color shows through the green. Dorsum of thorax finely and densely pustulate; no transverse stria on scutellum. Propodeum not in a position for study. Pleurae and coxae brownish with greenish metallic reflections. Abdomen dark brown with aeneous reflections.

Front and middle legs pale yellow; hind femora and tibiae broadly infusate. Wings hyaline.

A new *Lycaena* from Arizona (Lep.)

By VICTOR L. CLÉMENCE, Pasadena, Cal.

Lycaena florencía, new species.

Expanse, 15 to 24 mm.

♂—Upperside: Light violet blue (blue violet No. 487*), lighter towards the costa and veins; fimbriate black border on all wings, fringes white.

Underside: Ground color greyish-white, spots similar to *hanno*, only very much less intense; secondaries, spots also like *hanno* excepting for the metallic marks which are distributed in the new species as follows: The black eye-spot has a metallic half-circle on the outer side; a round, black spot covered with metallic scales above and two such spots, but smaller, below.

♀—Upperside: Mouse color, dusted with sky-blue scales from the base outwardly; secondaries are dusted in the same way, the anal spot of secondaries showing through indistinctly in both males and females.

Underside: Same as male.

Habitat: Southern Arizona (Huachuca Mountains, May and June, Clémence); Brawley, Imperial Valley, California, May; Yuma, Arizona, June, W. G. Wright.

Types: 2 males, 2 females, from a series of 14 specimens in the collection of V. L. Clémence.

Comparing *Lycaena florencía* with *hanno*, its nearest relative, the following comparative table will enable students to readily separate these two species:

<i>florencia.</i>	<i>hanno.</i>
Size: 15 to 24 mm.	Size: 18 to 27 mm.
♂ Upper side: Light violet blue No. 487. A black fimbriate border. Slight reflection of anal spot from under side.	♂ Upper side: Bright purplish blue (Holland). Very wide black border. A distinct black anal spot.
♀ Upper side: Mouse color dusted with sky-blue scales.	♀ Upper side: Dark purplish blue (Holland).
Under side ♂ ♀: Even light gray, spots very light brown.	Under side ♂ ♀: Brownish gray with broad dark border. Spots dark brown and black.
Four metallic spots.	Two metallic spots.

*Klincksieck et Valette, Code des couleurs, 1908.

There are, in my series, three *florencia* with only three metallic spots, but these specimens are worn and these delicate marks may have become erased.

This interesting *Lycaena* was taken by me in 1910 while collecting in the Huachuca Mountains, Southern Arizona; it was taken in company with *isola*, but whereas *isola* occurred in great numbers, *florencia* was rarely met with, and I considered myself fortunate to take from one to three specimens in a day's collecting while without any difficulty hundreds of *isola* could be secured. Of course the striking difference of the heavy marginal row of spots on the underside of the primaries in *isola* made the two species easily distinguishable, and also the fact that *florencia* is two-thirds of the size of *isola*. It is very distinct, in fact it is not like any other *Lycaena* in appearance, the pale blue of the upper side and its small size being the distinguishable characteristics of this species. This little insect, like most of the *Lycaenae*, is very fond of settling on damp sand bordering the canyon streams.

One evening in last May while doing some entomological work with my friend, Mr. Fordyce Grinnell, Jr., our attention was attracted to some *Lycaenae* from Florida which were not yet classified, and this caused a comparison between these and a series from Arizona which I had labeled *hanno* according to Wright's description in *The Butterflies of the West Coast*. We immediately saw the great difference existing between the Florida specimens and the Arizona ones; at once we started a search through the literature and discovered that the locality of *hanno* is the Gulf States, therefore, the Arizona species were not as Mr. Wright figures them but a new species which I take pleasure in introducing to Lepidopterists.

I have named this new species after my wife, Florence M. Clémence, who is also greatly interested in the collecting of Lepidoptera and has done some good work in Colorado and other places and so added materially to my collection.

Change of Address.

Mr. Henry W. Wenzel has removed from 1523 South 13th Street to 5614 Stewart Street, Philadelphia, Pa., and requests his friends and correspondents to take note of the change.

A new Chalcidid Genus and Species of Hymenoptera from Australia.

By A. A. GIRAULT, Nelson (Cairns) North Queensland, Australia.

This new genus was captured by sweeping foliage and grass along the banks of the Cape River at Capeville, Queensland, January 8, 1913. It is the second endemic genus of its tribe from Australia.

Family CHALCIDIDAE, Tribe CHALCITELLINI.

Chalcitelloides new genus.

Female:—Agreeing with the description of *Chalcitella* Westwood but the antennae only 10-jointed, without a ring-joint, the club solid. The fore wings without post-marginal or stigmal veins, the marginal long, slender and truncate at apex. Posterior femur beneath with eight teeth, the distal two small and equal; scutellum ending in a minute tooth. Venter of propodeum with a pair of stout teeth pointing ventrad. Petiole of abdomen as long as the hind coxae. Posterior tibiae with a small acute tooth outwardly near base (proximal third); wings hyaline. Propodeum with a median carina.

Male:—Not known.

Type:—The following species.

Chalcitelloides nigriscutum new species.

Female.—Length, 3.00 mm.

Blood red, the wings hyaline, the mesoscutum and axillae black; also the venter of thorax, the lateral pieces of the scutellum and an oval spot in center of posterior coxa outwardly; venation pale brown. Head black, the antennae red except distal two-thirds of the club. Umbilicately punctate and with sparse white pubescence. Abdominal petiole with longitudinal carinae far apart. Fore wings practically naked, without marginal cilia. First funicle joint longest, the others more or less subquadrate, the club long, conical.

(From one specimen, 2-3-inch objective, 1-inch optic, Bausch and Lomb.)

Male.—Not known.

Described from one female captured as above.

Habitat: Australia—Capeville (Pentland), Queensland.

Type: In the Queensland Museum, Brisbane, the above specimen on a tag plus a slide bearing the head and posterior femur.

A new Borborid (Diptera) from Panama.

By J. R. MALLOCH, Urbana, Illinois.

Sphaerocera pallipes, new species.

Female.—Black, slightly shining. Antennæ yellow, basal joint darkest; proboscis yellow. Thorax black, pleuræ shining. Abdomen black on dorsum, yellow beneath. Legs entirely pale yellow. Wings clear, veins yellow. Halteres yellow.

Frons opaque, slightly granulose on surface, rather more than one-half as wide as head, no bristles present, the surface hairs pale and very short; antennæ small, inserted in cavities on either side of the upper part of the face, which is flattened, triangular in shape and projects distinctly beyond the anterior margin of frons; the antennæ thus lie at right angles to the long axis of the body; arista hair-like, bare, and about twice as long as width of frons; mouth opening large; labrum flattened, distinctly protruding; cheek as high as the rather small eye; in profile the head is flattened in front and almost upright; the eye occupies slightly more than one-half the distance from vertex to anterior margin of head. Thorax in poor condition, but mesonotum with evident traces of four longitudinal rows of short, pale hairs on disk; scutellum rounded in outline, the posterior margin with faint traces of tubercles, one at either side, widely separated, being most distinct. Abdomen elongate oval; segments bare above. Legs long, and strong; their surfaces with very short, pale hairs, but no bristles present; hind tibia without an apical spur; hind metatarsus swollen, the upper surface slightly rounded; ventral surface flattened, the usual brush of hairs of the other species in the genus is represented only by a few hairs which are most distinct at apex; length of metatarsus about one and one-fourth that of the second joint which is not swollen; claws long, black at apices. Wings with veins 3 and 4 distinctly convergent at apices.

Length, 1.5 mm.

Type: Cat. No. 15974, U. S. N. M.

Locality: Buena Ventura, Panama, May 19, 1911, (A. Busck).

Distinguished from *S. subsultans* Fabricius by the absence of the spur on hind tibia, from *S. bimaculata* Williston by the unicolorous abdomen, from *S. pusilla* Fallon by the course of the third and fourth veins, and from *S. annulicornis* Malloch by the entirely pale legs.

The Twentieth Australian Species of *Elasmus* (Hym., Chalcidoidea).

By A. A. GIRAULT, Nelson (Cairns), N. Q., Australia.

The following species was captured in North Queensland with the sweeping net.

Elasmus doddi new species.

Female.—Length, 2 mm.

In my table of species of the genus (Memoirs Queensland Museum, Brisbane, I, 1912, pp. 188-189), running to *formosus* Girault but differing in having the scutellum wholly black (except narrowly at middle of the side), the vertex wholly yellow, the tip of postscutellum black. Head and scutum with thimble punctures, the scutellum scaly. Legs pallid yellow, the posterior coxae narrowly black at upper edge, the antennae dusky yellow, with two ring joints. Pronotum very narrowly black along cephalic margin, the dorsal half of occiput black.

(From one specimen, 2-3-inch objective, 1-inch optic, Bausch & Lomb.)

Male.—Not known.

From one female captured at Nelson (Cairns), North Queensland, April 1, 1913, by Mr. Alan P. Dodd for whom the species is named as a recognition of his early promise.

Habitat: Australia—Nelson, Queensland.

Type: In the Queensland Museum, Brisbane, the above specimen on a tag.

A new Wasp from Colorado (Hym.).

By T. D. A. COCKERELL, University of Colorado.

On June 26, 1913, when collecting bees at Longs Peak Inn, Colorado, in the Canadian Zone, I captured a wasp which I could not at first determine generically. On close investigation, it proves to belong to *Dryudella* Spinola, based on a species of Southern Europe. According to Kohl, *Dryudella* is a subgenus of *Astata*, but the venation is so peculiar that I think it may well rank as a genus. My species is new, and I take pleasure in naming it after Mr. Enos Mills, the well known writer on the natural history of Colorado, resident at Longs Peak Inn.

Dryudella millsii n. sp.

♀—Length, about 7 mm.; head, thorax, legs and antennæ black, the anterior tibiæ dark reddish brown on inner side except apically; pubescence very scanty, pale, black in region of mouth; abdomen with the first two segments (except base of first), and sides of third basally to some extent, bright ferruginous; the rest of abdomen black; head

shining, broader than thorax; lower margin of middle lobe of clypeus broadly rounded, rather prominent, but not specially modified; front and vertex very sparsely punctured; third antennal joint longer than fourth, fifth about as long as fourth; mesothorax and scutellum highly polished, with a few scattered punctures; area of metathorax dull and granular, with a slight oblique striation; sides of metathorax striate; tegulae black; anterior wings dusky hyaline, not very dark, nervures and stigma piceous; venation of anterior wings much as in *Dryudella tricolor* (*Astata tricolor* v. d. Linden), but differing as follows: Marginal cell longer (but not nearly equal to stigma on costa), first recurrent nervure joining second submarginal cell a very short distance from the base, basal nervure not falling so far short of transversomedial; middle and hind tibiae with numerous black spines; abdomen smooth and shining; basal part of pygidial area microscopically reticulate.

In Fox's table (Proc. Acad. Nat. Sci. Phila., 1893, p. 540) of *Astata* this runs to 8, and runs out on account of the black tegulae and structure of clypeus. *Dryudella caerulea* (*Astata caerulea* Cresson) is another species of this genus. I have taken it upon the campus of the University of Colorado at Boulder, September 9. I was at one time inclined to regard it as a new genus or subgenus, but Mr. S. A. Rohwer expressed the opinion that it was a *Dryudella*, and upon further study I must agree with him. It is atypical however in the shape of the third submarginal cell, and in having the first recurrent nervure joining the second submarginal cell far from the base. The metallic blue color is also remarkable.

An Aberration of *Pyrameis huntera* (Lep.).

On Sept. 12th, 1913, I captured a curious aberration of *Pyrameis huntera* near the Canadian Pacific Railway works here. The specimen is a large one and a female. The black markings have run together and become blurred and the white spots on the upper side are exaggerated. Also there is a purplish suffusion at the apex of each upper wing. The ground color of the upper side of the lower wings is darker than in the type apparently due to the fact that the dark basal cloud of the type has spread all over the wing.

On the underside the same tendency towards the blurring of the black markings is apparent, but on the pink area of the upper wings the black is replaced by indistinct orange marks. The lower wings are very dark underneath and much of the white penciling of the basal portion in the type is suppressed in this specimen.

I should be grateful if some one interested in this capture would let me know if there is any particular name for this aberration.—H. M. SIMMS, 192 Ontario East, Montreal, Canada.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—ED.

PHILADELPHIA, PA., JANUARY, 1914.

Alfred Russel Wallace.

The opening sentence of the NEWS for July, 1913: "In the death of Lord Avebury, on May 28, there passed away the youngest, but not the last, of that group of famous English naturalists intimately associated with Darwin and the promulgation of his theories," is no longer true. Alfred Russel Wallace, "the last," died on November 7, 1913, aged 90 years and ten months less one day. The length of his life is remarkable, considering the attacks of disease from which he suffered both in England and on his expeditions to the Amazon and the Malay Archipelago.

His autobiography, published in two volumes in 1905, under the title, *My Life A Record of Events and Opinions, with facsimile letters, illustrations and portraits*, renders unnecessary any account of his life in this place. It is not superfluous, however, to recall his entomological labors and the influence which he considered that the study of insects had upon his own career and that of his co-discoverer of the theory of natural selection.

At the meeting held by the Linnean Society of London on July 1st, 1908, to celebrate the Fiftieth Anniversary of the joint communication made by Charles Darwin and Alfred Russel

Wallace to the Society, "On the Tendency of Species to form Varieties; and on the Perpetuation of Varieties and Species by Natural Means of Selection," the first Darwin-Wallace medal was presented to Wallace, who said in reply, among other things:

this brings me to the very interesting question: Why did so many of the greatest intellects fail, while Darwin and myself hit upon the solution of this problem—a solution which this Celebration proves to have been (and still to be) a satisfying one to a large number of those best able to form a judgment on its merits? As I have found what seems to me a good and precise answer to this question, and one which is of some psychological interest, I will, with your permission, briefly state what it is.

On a careful consideration, we find a curious series of correspondences, both in mind and in environment, which led Darwin and myself, alone among our contemporaries, to reach identically the same theory.

First (and most important, as I believe), in early life both Darwin and myself became ardent beetle hunters. Now there is certainly no group of organisms that so impresses the collector by the almost infinite number of its specific forms, the endless modifications of structure, shape, color and surface-markings that distinguish them from each other, and their innumerable adaptations to diverse environments. * * *

Again, both Darwin and myself had what he terms "the mere passion of collecting"—not that of studying the minutiae of structure, either internal or external. I should describe it rather as an intense interest in the mere *variety* of living things—the variety that catches the eye of the observer even among those which are very much alike, but which are soon found to differ in several distinct characters. * * *

It is the constant search for and detection of these often unexpected differences between very similar creatures that gives such an intellectual charm and fascination to the mere collection of these insects; and when, as in the case of Darwin and myself, the collectors were of a speculative turn of mind, they were constantly led to think upon the "why" and the "how" of all this wonderful variety in nature—this overwhelming, and, at first sight, purposeless wealth of specific forms among the very humblest forms of life.

Then, a little later (and with both of us almost accidentally) we became travelers, collectors and observers, in some of the richest and most interesting portions of the earth; and we thus had forced upon our attention all the strange phenomena of local and geographical distribution, with the numerous problems to which they give rise. Thenceforward our interest in the great mystery of *how* species came into ex-

istence was intensified, and—again to use Darwin's expression—"haunted" us.

Finally, both Darwin and myself, at the critical period when our minds were freshly stored with a considerable body of personal observation and reflection bearing upon the problem to be solved, had our attention directed to the system of *positive checks* as expounded by Malthus in his "Principles of Population." The effect of this was analogous to that of friction upon the specially-prepared match, producing that flash of insight which led us immediately to the simple but universal law of the "survival of the fittest," as the long sought *effective* cause of the continuous modification and adaptation of living things.

Wallace's interest in beetles, as he tells in *My Life* (i, pp. 236-237), was due to his meeting Henry Walter Bates, in 1844 or 1845, as a result of which he not only began to collect these insects but also to enter into a correspondence with Bates that eventually led to their joint visit to the Amazon. Their choice of this region of the world was the result of reading W. H. Edwards' *A Voyage up the Amazon*, published in 1847. Edwards, being in London soon after, gave the young Englishmen letters of introduction to friends at Para. Forty years later, in April, 1887, Wallace renewed his personal acquaintance with the great American lepidopterist by a visit to the latter's home at Coalburgh, West Virginia.

The richest parts of Wallace's South American collections, 1848-1852, were lost by the burning of the vessel on which he was returning to England. He mentions, in his *Narrative of Travels on the Amazon and Rio Negro*, having gathered 900 species of diurnal Lepidoptera.

He was more successful in his journey to the East, 1854-1862, and, in the preface to *The Malay Archipelago*, tells us that when he returned to England in the spring of 1862 he found that the collections which he had retained for his private use included "at least twenty thousand beetles and butterflies, of about seven thousand species," while the total numbers of specimens which he secured were 13100 specimens of Lepidoptera, 83200 Coleoptera and 13400 other insects. His papers, *The Malayan Papilionidae, as illustrating the Theory of Natural Selection* (Trans. Linn. Soc. Lond. xxv),

on the Pieridae of the Indian and Australian regions and on the Cetoniidae of the Malay Archipelago (these two in *Trans. Ent. Soc. Lond.* 1867) were based in large part on his own collections, are summarized in *My Life* (i, pp. 400-403) and constitute his systematic entomological work.

Many of his essays on general subjects such as Mimicry, and many chapters in his larger works, *The Geographical Distribution of Animals*, *Darwinism*, *Tropical Nature*, etc., are founded on his own observations on insects. As President of the Entomological Society of London, his address in January, 1871, dealt with the peculiarities of insular insects, while that of 1872 "endeavoured to expound Herbert Spencer's theory of the origin of insects, on the view that they are fundamentally *compound animals*, each segment representing one of the original independent organisms."

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

The Alligator Pear Weevil (Col.)—A Correction.

On page 416, ENTOMOLOGICAL NEWS, vol. XXIV, No. 9, November, 1913, under "Notice of Public Hearing on the Alligator Pear Weevil," the insular possessions Hawaii and Porto Rico are incorrectly cited as localities in which the avocado weevil (*Heilipus lauri* Boh.) is known to occur. The only other records of this weevil known to us other than Mexican are Central American. Naturally, no quarantine action will be taken or is intended against the islands referred to, or other avocado-producing countries free from this weevil. The error in the notice is sincerely regretted, and was due to the absence from Washington of the writer at the time.—C. L. MARLATT, Chairman, Federal Horticultural Board, Washington, D. C.

Acknowledgment of Photographs Received.

The album of the Entomological Section of the Academy of Natural Sciences of Philadelphia has been increased by the addition of the photographs of the following persons, and the thanks of the Section are tendered to the donors for their gifts:

Messrs. R. Godfrey,* Harry L. Johnson, A. L. Melander, D. E. Merrill, F. W. Nunenmacher, J. H. Reading, R. J. Smith and O. S. Westcott.

* Deceased since receipt of the photograph.

"Daddy-long-legs"?

It is evident that the newspapers of other countries are no more seekers after truth than those of our own, especially regarding scientific facts. In the Entomological Record for October 15, 1913, under the heading "Newspaper Entomology" one reads of a notice of an article relative to daddy-long-legs published in a London newspaper. It is utterly useless to question the truth or the validity of the facts as given in such newspaper articles, unless written by a competent scientist, as doing so only holds one up to ridicule by the ignoramuses; for it is seldom that a newspaper acknowledges its mistakes or misinformation, or offers any but childish excuses for publishing such articles.

Regarding the article in question, it may be noted that to an American, or, at least, to some of us in the eastern part of the United States, "Daddy-long-legs" refers to "harvest spiders" or "harvestmen," members of the Arachnid order Phalangida. At first glance one might think the author of the article referred to these animals, but in England the name "Daddy-long-legs" is given to some of the members of the dipterous family Tipulidae which of course have "six pairs of legs (evidently meaning six legs), long body and wings." The assertion that "at one time he was classed as an insect, but Lamarck separated him from them, and now he is catalogued along with scorpions and mites" is obviously rubbish, manufactured out of the whole cloth of ignorance.

Incidentally it may be noted that species of Tipulidae are known to be very injurious to pasture lands in the western United States.—E. T. C., Jr.

Schinia gloriosa Strecker (Lepidop.).

During the past summer I obtained a fine specimen of the beautiful *Schinia gloriosa* in Boulder, Colorado. The species was described from Texas, and appears to be new to Colorado. The species is larger than *S. sanguinea*, with much paler hind wings; the figure purporting to represent it in Holland's Moth Book, pl. XXVII, f. 27, is evidently *sanguinea*. Hampson (Cat. Lep. Phal., IV, p. 89) did not know *gloriosa*, and his table is not satisfactory for its separation. It might be amended as follows:

Fore wings with terminal area without longitudinal white or whitish streaks; hind wings pale *regia* Strecker.

Fore wings with terminal area conspicuously longitudinally streaked with white or whitish.

Larger; hind wings creamy white, darkened at apex

gloriosa Strecker.

Smaller; hind wings fuscous *sanguinea* (Geyer).

—T. D. A. COCKERELL.

Parasites of the San Jose Scale (Hym.).

In connection with the editorial in the NEWS for November, 1913, it may be of interest to state that the parasite reported as doing such effective work against the San Jose Scale in Pennsylvania was discovered at Amherst, Mass., in the fall of 1912 in great abundance. It was carefully studied, and as it could not be identified, specimens were sent to Dr. L. O. Howard, who declared it to be a new species of *Prospaltella*.

A description of the insect was published under the name of *Prospaltella perniciosi* in the Annals of the Entomological Society of America, Vol. VI, No. 1, by Mr. D. G. Tower, and studies were continued upon it in the summer of 1913. During the present fall, colonies of this insect have been sent to Washington and Georgia, in the hope of establishing it there, and shipments to other places will be made as opportunity offers. From 75 to 85 per cent. of the scales appear to be parasitized in nature, and as large a per cent. occurs on the small twigs as on the larger ones.

A shipment of the Pennsylvania parasite just received from Professor Surface has made direct comparison of the two possible, and there can be no doubt that they are the same species. In the Pennsylvania consignment *Aphelinus fuscipennis* and *Prospaltella perniciosi* were found, the latter including perhaps three-fourths of the specimens. A letter just received by Mr. Tower from Dr. Howard states: "Professor Surface came to Washington a month or more ago with a series of slides of material reared from San-Jose-scale-infested twigs, and among these parasites I found *Aphelinus fuscipennis* How., a Mymarid, * * * *Anagrus spiritus* Girault, *Signophora nigrita* Ashm. and your *Prospaltella perniciosi*." From the evidence we have it would seem probable that the *Prospaltella* is the one which is doing most of the work.

If claims of priority are in order, it would seem that the date of publication of Mr. Tower's description (March, 1913) should be considered, while the files of the Bureau of Entomology at Washington will provide evidence that the insect was discovered and studied several months before that time.

Careful examination of twigs from Pennsylvania and also from Massachusetts indicates that despite a large amount of parasitism we need hardly expect the scale to soon become an unimportant pest as long as any such number as 10 per cent. are left "for seed."—H. T. FERNALD, Massachusetts Agricultural College, Amherst, Mass.

The species figured in all the newspapers and the one Professors Surface and Grim had the controversy over is a Mymarid, described under the name of *Anagrus spiritus* Girault, in ENT. NEWS, XXII, p. 209, 1911. Prof. Grim sent us the slide that Prof. Surface had and it was sent to Mr. Malloch to compare with the type at Urbana, Illinois. Mr. Malloch reports them identical.—H. S.

Human Case of Verruga directly traceable to *Phlebotomus verrucarum* (Dipt.).

Mr. George E. Nicholson, who has been my assistant in the verruga work since the last of July, and who has rendered particularly efficient service in the investigation at all times, notwithstanding numerous difficulties to be continually overcome, has most unfortunately developed unmistakable symptoms of the disease. A brief outline of the case is as follows:

On the 17th of September, accompanied by both Mr. Nicholson and Mr. Rust, I went to Verrugas Canyon to secure material of the *Phlebotomus* for inoculation of laboratory animals. Both Mr. Nicholson and myself have passed numerous nights there on the same work, and Mr. Rust has been there twice. As usual we applied the ointment recommended by Newstead and were not molested by the *Phlebotomus* up to the time of retiring at about midnight. We all used tight nets for sleeping, through which the *Phlebotomus* could not pass. During the night, however, while asleep, Mr. Nicholson evidently put his hands above his head so that they came in contact with the net, for in the morning we counted fifty-five unmistakable *Phlebotomus* bites on the backs of his hands and wrists. These bites are small, irregular in outline, red, and not raised, as Mr. Rust and I know from a half dozen that we received on July 9th while awake and before we had begun to use the ointment. We also know that during all our night collecting at Verrugas Canyon from July to September, no other biting insect except the *Phlebotomus* appeared, not even a single culicid, and on one occasion I sat up the entire night.

Daily examination of Mr. Nicholson's blood revealed nothing abnormal until October 1, when I found what I considered to be the verruga x-bodies in the red cells, but Dr. A. L. Barton, the best known authority on verruga, pronounced them not so. This was due to the smear having been somewhat overstained as compared with Dr. Barton's customary practice in staining. These x-bodies continued in very small number without clinical symptoms of note, other than a headache or slight feverishness at times, until October 25th, when a decided rise of temperature occurred and the x-bodies were found to be much increased in number. Dr. Barton now recognizes these to be the verruga x-bodies, and Mr. Nicholson has entered the Guadalupe Hospital in Callao under Dr. Barton's immediate care. During the past week his temperature has been lower than at first, and the case promises to be of the benign type rather than the malignant. No eruption has appeared as yet. Salvarsan was administered intravenously to-day, for the purpose of determining whether it will prove a specific against the disease.—CHARLES H. T. TOWNSEND.

Chosica, Peru, November 10th, 1913.

Notice to Authors.

Authors publishing entomological articles in non-entomological journals, who desire to have such articles noted in our current literature list, will do well to send copies of them to ENTOMOLOGICAL NEWS, 1900 Race St., Philadelphia, Pa. After note has been made of the same, they will be deposited in the library of the American Entomological Society.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. 5—Psyche. 7—U. S. Department of Agriculture, Bureau of Entomology, Washington. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 12—Comptes Rendus, L'Academie des Sciences, Paris. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 24—Berliner Entomologische Zeitschrift. 36—Transactions, Entomological Society of London. 46—Tijdschrift voor Entomologie. 50—Proceedings of the U. S. National Museum. 65—La Feuille des Jeunes Naturalistes, Paris. 68—Science, New York. 73—Archives, Zoologie Experimentale et Generale, Paris. 79—La Nature, Paris. 97—Zeitschrift für wissenschaftliche Zoologie, Leipzig. 102—Proceedings of the Entomological Society of Washington. 119—Archiv für Naturgeschichte, Berlin. 136—Stettiner Entomologische Zeitung. 166—Internationale Entomologische Zeitschrift, Guben. 179—Journal of Economic Entomology. 180—Annals, Entomological Society of America. 189—Journal of Entomology and Zoology, Claremont, Calif. 190—Deutsche Entomologische Zeitschrift "Iris," Dresden. 194—Genera Insectorum. Diriges par P. Wytzman, Bruxelles. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 204—New York State Museum, Albany. 216—Entomologische Zeitschrift, Frankfurt a. M. 275—Philippine Journal of Science, Manila.

276—Bulletin, Societe Lepidopterologique de Geneve. 299—Mitteilungen der Naturhistorischen Gesellschaft zu Hanover. 313—Bulletin of Entomological Research, London. 344—U. S. Department of Agriculture, Washington, D. C. 368—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, Cal. 369—Entomologische Mitteilungen, Berlin-Dahlem. 407—Journal of Genetics, Cambridge, England. 420—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington, D. C. 447—Journal of Agricultural Research, Washington. 451—Nature Study Review, Ithaca, N. Y. 452—Lepidopterorum Catalogus, editus a H. Wagner. 453—Texas Agricultural Experiment Station. 454—North Carolina Department of Agriculture, Raleigh. 458—Montana Agricultural College Experiment Station, Bozeman.

GENERAL SUBJECT. Butler, A. L.—Economic value of birds, 8 pp. (Reprint from The Agricultural Gazette, Tasmania, Sept., 1912.) Casey, T. L.—The law of priority, 68, 1913, 442-43. Enslin, E.—Ein ideales klebemittel fur insektenpreparation, 166, vii, 195-96. Felt, E. P.—Report (28th) of the state entomologist of New York for 1912, 204, Bul. 165, 264 pp. Folsom, T. W.—Entomology with special reference to its biological and economic aspects. 2d revised ed. Philadelphia: P. Blakiston's Sons & Co., 1913, 402 pp. Hopkins, A. D.—Discontinuous geographical distribution, 102, xv, 118-122. Jennings & King.—An intensive study of insects as a possible etiologic factor in pellagra. (Am. Jour. Med. Sci., cxlvi, 411-441.) Kaye, W. J.—A few observations in mimicry, 36, 1913, 1-11. Knab, F.—The contentions regarding "Forest malaria," 102, xv, 110-118. Lutz, A.—The insect host of forest malaria, 102, xv, 108-9. McClashan, X.—The collector's by-product, 189, v, 158-160. Martell, P.—Insektenfeinde der bucher, 216, xxvii, 142-43 (cont.). Parker, W. B.—A sealed paper carton to protect cereals from insect attack, 344, Bul. 15. Quade, F.—Insektenstiche, 216, xxvii, 154-55 (cont.). Reuter, O. M.—Obituary notices, 8, 1913, 230-31; 9, 1913, 296. Riley, W. A.—Some recent manuals of parasitology, 179, vi, 416-18. Townsend, C. H. T.—Progress in the study of veruga transmission by blood suckers, 313, iv, 125-128. Tragardh, I.—On the chemotropism of insects and its significance for economic entomology, 313, iv, 113-117. Weiss, H. B.—Notes on the negative geotropism of *Corythuca ciliata*, *Adalia bipunctata*, *Coccinella 9-notata* and *Megilla fuscilabris*, 179, vi, 407-9. Wilcox, E. V., et al.—Annual report of the Hawaii Agricultural Experiment Station for 1912, 91 pp. Williams, C. B.—The berlese funnel, 9, 1913, 273-74.

Cockerell, T. D. A.—Remarks on fossil insects (Abstract), 102, xv, 123-126.

ARACHNIDA, ETC. Mueller, A.—Die afterspinnen, 216, xxvii, 153-154.

Ewing, H. E.—Some new and curious Acarina from Oregon, 189, v, 123-136. Hodgkiss, H. E.—New species of maple mites, 179, vi, 420-24. Simon, E.—Biospeologica, XXX.—Araneae et Opiliones, 73, lii, 359-386.

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Banks, N.—New exotic neuropteroid insects, 102, xv, 137-142. Karny, H.—On the genera Liothrips and Hoodia, 36, 1912, 470-475. Kennedy, C. H.—Notes on the Odonata, or dragonflies, of Bumping Lake, Washington, 50, xlvi, 111-126. Kruger, L.—Beitrag zu einer monographie der neuropteren familie der Osmylidae, 136, lxxiv, 1-123. Paine, J. H.—A new genus of Mallophaga, 5, xx, 158-161.

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Giglio-Tos, E.—Mantidae, subf. Perlamantinae, 194, 144, 13 pp. Shelford, R.—Studies of the Blattidae, 36, 1912, 643-661.

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moth (*Phthorimaea operculella*), 344, Farm. Bul. 557. **Frohawk, F. W.**—"Yellow imagines" of *Pieris brassicae*, 9, 1913, 282-83. **Frohawk & Rothschild.**—Completion of the life-history of "*Melanargia japygia* subsp. *suwarovius*," 9, 1913, 275-78. **Harte, C. R.**—Observations regarding flight of the cotton moth in 1911, 179, vi, 426-7. **Headlee, T. J.**—A broad study of the codling moth, 179, vi, 389-395. **Jacobson, E.**—Biological notes on the Heterocera: *Eublemma rubra*, *E. versicolora* and *Catoblenama sumbavensis*, 46, lvi, 165-173. **Jones, E. D.**—Descriptions of n. sp. of L.—Heterocera from South-East Brazil, 36, 1912, 419-444. **Loquay, R.**—Ein besuch beim raupenpreparator, 166, vii, 169-170. **McClashan, X.**—A worm that cares, 5, 1913, 345-6. **Manders, N.**—Birds eating butterflies, 9, 1913, 292. The study of mimicry (Batesian and Mullerian) by temperature experiments on two tropical butterflies, 36, 1912, 445-469. **Merle, R.**—Les sesies, 79, xli, 371-374. **Meyrick, E.**—Tortricidae, 194, fasc. 149, 81 pp. **Parker, J. R.**—The imported cabbage worm (*Pontia rapae*) and the cabbage aphid (*Aphis brassicae*), 458, Circ. 28. **Pictet, A.**—Recherches experimentales sur l'hibernation de "*Lasiocampa quercus*." Recherches experimentales sur la resistance au froid et la longevite des L. a l'etat adulte, 276, ii, 179-206, 206-212. **Rau, P.**—Notes on the duration of the pupal stage in certain L., 5, xx, 161-62. **Rehfous, M.**—Observations biologiques de "*Lycaena cyllarus*," 276, ii, 238-250. **Vasler, E. J.**—The red-humped caterpillar (*Schizura concinna*), 368, ii, 654-657. **Weldon, G. P.**—The fruit-tree leaf-roller (*Archips argyrospila*), 368, ii, 638-647.

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—La lutte contre un parasite des orangers, **79**, xli, 364. **Sharp & Muir**.—The comparative anatomy of the male genital tube in *C.*, **36**, 1912, 477-642. **Snyder, T. E.**—The ovipositor of "*Parandra brunnea*," **102**, xv, 131-33. **Webster, F. M.**—The southern corn root worm, or bud worm (*Diabrotica duodecimpunctata*). The western corn root worm (*D. longicornis*), **344**, Bul. 5 & 8.

Barber, H. S.—A new species of *Phengodes* from California, **5**, 1913, 343-4. **Breit, J.**—Zur systematik der Bathysciinae, **369**, ii, 301-316. **Champion, G. C.**—Coleoptera from British Honduras, **8**, 1913, 256-7. Notes on various Central American *C.*, with descriptions of new gen. and sp., **36**, 1913, 58-169. **Cockerell, T. D. A.**—Some *C.* from Central America, **9**, 1913, 299-300. **Dupuis, P.**—Carabidae, Pentagonicinae, Peleciinae, Hexagoniinae, **194**, fasc. 145-147. **Prell, H.**—Beitrage zur kenntnis der Dynastinen, **136**, lxxiii, 53-57. **Schmidt, A.**—Scarabaeidae: Aegialiinae, Chironinae, Dynamopinae, Hyposorinae, Idiostominae, Ochodaeninae, Orphniinae, **194**, fasc. 150, 87 pp. **Spaeth, F.**—Kritische studien ueber den umfang und die begrenzung mehrerer Cassiden gattung nebst beschreibung neuer amerikan. arten, **119**, 1913, Ab. A., H. 6, 126-164. Neue Cassiden aus Columbien, Peru, Bolivien und Ecuador, **136**, lxxiii, 1-16. **Wickham, H. F.**—The Princeton collection of fossil beetles from Florissant, **180**, vi, 359-370.

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Beutenmuller, W.—A n. sp. of *Amphibolips*. A new *Andricus* from N. J. Description of a new gall fly (*Andricus decidua*), **420**, i, 122-23, 124-25, 131-32. **Bischoff, H.**—Chrysididae, **194**, fasc. 151, 86 pp. **Cockerell, T. D. A.**—*Pseudomasaris* bred in California, **102**, xv, 107. A leaf cutting bee from Arizona, **179**, vi, 425. **Enderlein, G.**—Beitrage zur kenntnis aussereuropaischer Ichneumoniden, **136**, lxxiii, 105-144. Ein hervorragender zwitter von "*Xylocopa mendozana*" aus Argentinien. Mit einen verzeichniss aller bisher H., **136**, lxxiv, 124-140. **Girault, A. A.**—More new genera and species of Chalcidoid H. from Paraguay, **119**, 1913, Ab. A., H. 6, 51-69.

- McColloch, J. W.**—A parasite of the chinch-bug egg, **5**, 1913, 342-3.
Peets, W.—Die Panzer'schen H. ausgenommen die Apiden, **299**, D, 65-77. **Schmiedeknecht, O.**—Opuscula Ichneumonologica, Fasc. 35. Tryphoninae (cont.). **Weld, L. H.**—A new oak gall from Mexico, **420**, i, 132-34.

ÉTUDES LÉPIDOPTÉROLOGIE COMPARÉE. By CHARLES OBERTHÜR. Volume IX, Part 1.

This part contains an exceedingly important contribution to American Lepidopterology, as herein Mr. Oberthür gives 74 figures in color, of the species of Californian butterflies, described by Dr. Boisduval in the Annals of the Entomological Society of France in 1852 and in the Annals of the Entomological Society of Belgium in 1869. Dr. Boisduval's descriptions were often brief and he compared the Californian species with those of Europe in a very few words. It has been quite difficult, on account of the variation in the species of Californian Lycaenidae and Hesperidae, to be certain about some of Dr. Boisduval's species in reference to those described by Dr. Herman Behr, William H. Edwards, Henry Edwards and others. By means of these beautiful and accurate figures given by Mr. Oberthür it will be possible to put the study of the Californian diurnal Lepidoptera on a firm foundation. American students of these insects owe a great debt of gratitude to Mr. Oberthür for so generously supplying figures of these types and recognizing the necessities of the case.

It may prove useful at this time to make some comments on the species in relation to their validity or synonymy.

Thecla borus Bd. is a synonym of *californica* Edw.

Thecla auretteorum Bd. *Thecla spadix* H. Edw. is a synonym of this.

Thecla sylvinus Bd. This species I do not know, unless it is a race or variety of *californica* Edw.

T. iroides Bd. is a synonym of *augustus* Kirby.

Thecla eryphon Bd. is a western race of *niphon* Hübn.

Thecla dumetorum is a synonym of *rubi* Linn.

Chrysophanus arota Bd. The species described as *virginiensis* by Edwards is close but apparently sufficiently distinct for specific rank.

Chrysophanus xanthoides Bd. *Dione* Scud. is close to this.

Chrysophanus nivalis Bd. This has erroneously been put into the synonymy in our lists under *mariposa*.

Chrysophanus zeroe Bd. is a synonym of *mariposa* Reak.

Lycaena suasa Bd. is a synonym of *fuliginosa* Edw.

Lycaena antiacis Bd. This must be a rare form. *Polyphemus* Bd. is the common species in California.

L. rhaea Bd. is a synonym of *sagitigera* Feld.

L. nestos Bd. is a synonym of *podarce* Felder

- L. nivium* Bd. is a synonym of *shasta* Edw.
L. antaegon Bd. is a synonym of *acmon* Dbl.-Hew.
L. philemon Bd. is a synonym of *anna* Edw.
L. regia Bd. is a synonym of *sonorensis* Feld.
Pamphila comma Bd. This is close to the variety *juba* Scud.
Pamphila agricola. *Siris* Edw. is a synonym.
Pamphila pratincola. This is not typical of the species and probably represents an aberration or variety.
P. campestris Bd. The eastern *huron* Edw. is the same species.
Pamphila sylvanoides Bd. *Napa* Edw. is a synonym.
Pamphila nemorum Bd. *Verus* Edw. is a synonym.
P. vestris Bd. *Metacomet* Harris is a synonym.
Thanaos tristis Bd. *Funeralis* Scud.-Burg. is probably not a synonym.

These figures will enable us to make further studies of interest. The available time at present has been too short to study them all carefully and they will be taken up as the species in the various genera are studied more minutely.—HENRY SKINNER.

OBITUARY.

JULES DESBROCHERS DES LOGES, French Coleopterist, editor of *Le Frelon* (Chateauroux), died on August 10, 1913, at Tours in his 78th year.

The numbers of *The Entomologist's Monthly Magazine* and *The Entomologist* for October, 1913, contain obituary notices (the former accompanied by a portrait) of ODO MORANNAL REUTER, the distinguished Finnish entomologist, and, since 1906, one of the twelve honorary fellows of the Entomological Society of London. He died at Abo, on September 2, aged 63. Like our own Uhler, he was totally blind in his later years. No less than 500 papers on Hemiptera (chiefly), Collembola, Thysanoptera and Neuroptera have issued from his pen. His work on the Miridae (Capsidae) and a new classification of the Heteroptera are especially important. He was a member of the zoological faculty of the University of Helsingfors. He had also published both poetry and fiction.

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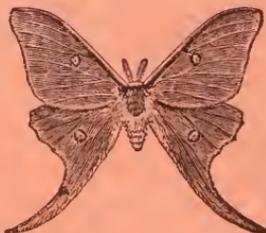
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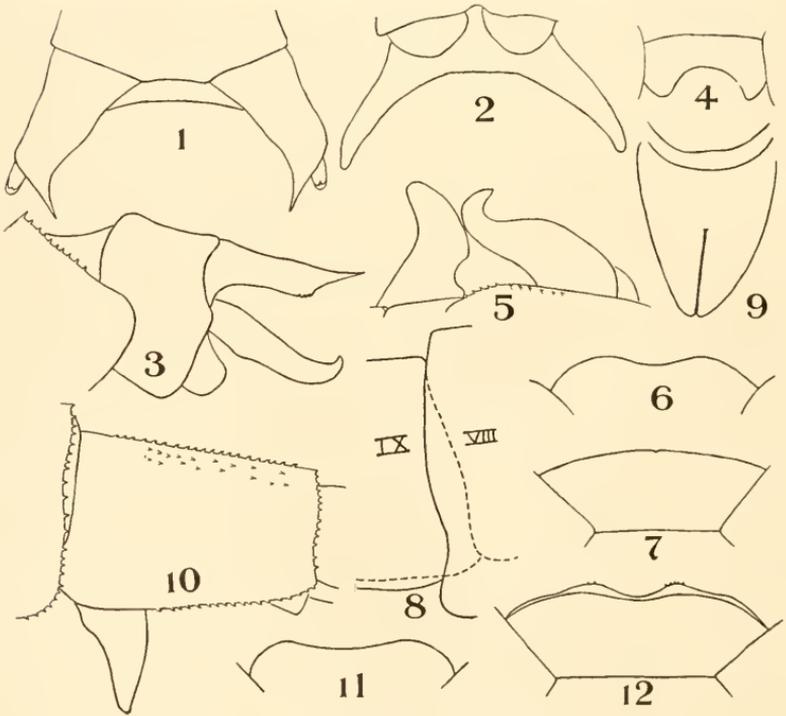
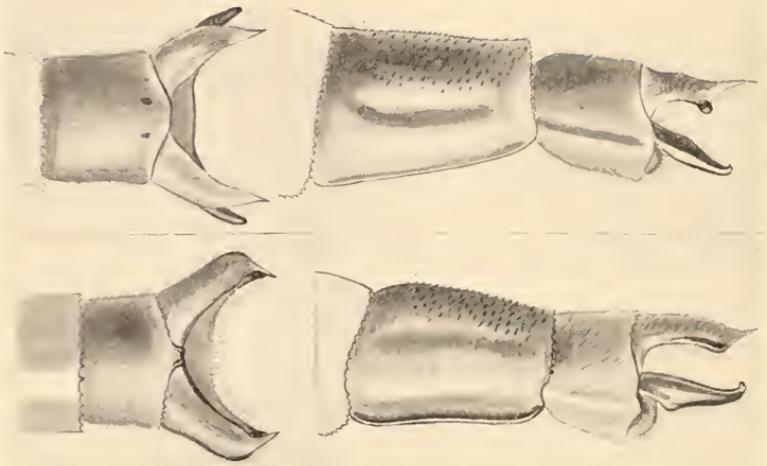
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GOMPHUS PALLIDUS, ETC.—WILLIAMSON.

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AND

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ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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Gomphus pallidus and Two New Related Species (Odonata).

By E. B. WILLIAMSON, Bluffton, Indiana.

(Plates IV and V.)

Recently in identifying some dragon flies from Florida collected by my father, L. A. Williamson, I had occasion to study a pair of *Gomphus* taken in copulation by him at Salt Lake, St. Petersburg, Florida, March 31, 1913. These were evidently *G. pallidus* Rambur, but they certainly differed from specimens from Texas and Oklahoma which I had at an earlier date also determined as *pallidus*. When the Florida material was first studied I had referred all my material from Texas and Oklahoma to one species, and, with this idea in mind, I sent rough sketches of the two species to several students in the hopes of learning more of their distribution. Later, when the southwestern material was studied, two species were found to be included in it, to only one of which, *submedianus* n. sp., my

sketches applied. This correspondence, which will be referred to again, clearly indicates that in recent literature two or more species of dragon flies have been confused under the name of *pallidus*.

I have no doubt of the existence in the genus *Gomphus*, as generally used, of several subgroups, along the lines indicated by de Selys and Professor Needham. As soon as possible it will be convenient to use these subgroups as genera. But before this can be done an exhaustive study of the approximately seventy species involved will be necessary. At present no one can use these group names intelligently. These groups have been defined by Professor Needham, so far as imagoes go, in terms not used or emphasized by de Selys, whose groups were based largely on thoracic pattern, though the resultant groupings, in the two cases, have much in common. For example de Selys' Group 5 includes *pallidus* (and *villosipes*), *lividus*, *spicatus*, *mimitus* and *exilis*. *Arigomphus*, as used by Needham, includes *pallidus*, *villosipes*, *spicatus* and other species not known to de Selys in 1858, the date of the *Monographie*. *Lividus* and *exilis* are placed in another group by Needham, who has not discussed *minutus*.

As stated above the groups require accurate definition. So far as de Selys goes, *spicatus* and *exilis*, at least, should not be associated with *pallidus*; and in Needham's arrangement it is certainly a mistake to separate *exilis* and *spicatus*, for example. *Arigomphus* is defined (*Aquatic Insects Adirondacks*, p. 447-8) as having two cells between the base of veins A1 and A2 at their origin. Five males and one female of *villosipes*, selected at random, all have a single cell. Three males of *cornutus*, which is an *Arigomphus*, have two wings with one cell, and four wings with two. This character is tabulated below for the material discussed in this paper. To the shape of the apex of abdominal segment 8 some importance may attach, but the character is difficult of accurate definition (see Fig. 8, and explanation). As to the hind femora in the two sexes, I have examined thirty species of which I have both sexes, and the femora are different in the sexes in all of them. In the males

the last femur has short or very short subequal numerous spines or teeth, and no hair, sparse non-concealing hair, or long dense hair. In the females the spines on the apical half or two-thirds of the femur are longer and sparser than on the basal portion. But hairiness in the male is not a characteristic of *Arigomphus*. In fact, it is not evident why Professor Needham included *spicatus* in *Arigomphus*; and in *furcifer*, which I agree with him belongs in *Arigomphus*, the femur has very sparse hair, and the term hairy could better be applied to *viridifrons*, *brevis* and *abbreviatus*, for example. The position of the posterior hamule of the male seems a valuable character, though applicable only to the one sex.

Not wishing at this time to discuss these subgroups of *Gomphus*, it is nevertheless necessary, in order to give some idea of the relationships of the two new species described in this paper, to point out some characters which they possess in common with others of the genus. Briefly some of these characters are as follows: Thorax green, varying in shade with age, sex and species, and with distinct markings if present confined to the region of the mid-dorsal carina and the humeral suture. Face without dark markings. Legs robust, hind femora extending beyond the auricles; in the male with short subequal spines and more or less hair; in the female without hair, or with very sparse hair, and with unequal spines, many of which exceed the spines of the male and which are longest at about two-thirds the length of the femur. Posterior hamule of male directed posteriorly; posterior edge of seminal vesicle, seen in profile, distinctly concave or excavated. Vulvar lamina one-fourth to one-half length of segment 9, triangular, apex divided for a short distance with the branches pressed together or parallel. North America, east of the Rocky Mountains.

The species may be grouped as follows:

Legs dark, last femora black; *furcifer*, *villosipes*, *cornutus*, *lentulus*,¹ *australis*.¹

¹ *Australis* and *lentulus* are known to me only from descriptions. So far as I know, only the types are known, unless a male, referred by Muttkowski to *lentulus*, should prove to be that species (New Records

Legs paler, last femora largely pale; *pallidus*, *submedianus*, *subapicalis*.

MATERIAL EXAMINED AND LITERATURE.

Gomphus pallidus Rambur.

Through the great kindness of Mons. Guillaume Severin and Mr. Samuel Henshaw, I have been able to study the classical material of de Selys and Hagen. De Selys' material consists of one male and three females, including the two female types of Rambur. In addition Mons. Severin sent me the single specimen of *G. villosipes* in the de Selys collection. For convenience I have designated these specimens numerically.

De Selys 1,—*G. villosipes* male, a slightly teneral, badly faded specimen, labelled in de Selys' hand, "*G. villosipes* ♂, Philadelphia, Calvert."* This is lightly smaller and less robust than Pennsylvania, Ohio, Indiana and Illinois specimens in my collection. However, I believe all represent a single species.

De Selys 2,—labelled, "*Gomphus pilipes*. Hag. ♂ (♂ de *pallidus*.)" "N. America." "*Gomphus pallidus* R. ♂."

De Selys 3,—labelled "*Gomphus pallidus* R. ♀."

of Wis. Drf. Vol. IX, April 1911, Bull. Wis. Nat. Hist. Soc., pp. 36, 37, plate IV. "A single male in the Brooklyn Museum, locality unknown.") The type of *lentulus* is stated to be in the collection of Mr. C. A. Hart, but this is a mistake as the following quotation from a letter of April 21, 1913, from Mr. Hart shows: "As to *lentulus* a university student captured it, and I attempted to name it. It was badly broken and I attempted to mend it; in so doing I disturbed the genitalia, but as I had already studied these carefully and they seemed unlike anything I had ever seen, I managed to keep them about as they were. The question of the location of the type has come up before. I can only say that it is not in the State Laboratory Collections, so far as I know, and that I have no dragonfly collection." This loss is the more unfortunate from the fact that *lentulus*, like *australis*, was not figured, nor were characters for separating them from their closest allies pointed out. It seems to me that *australis* is probably not closely related to species included under *Arigomphus* in this paper. The larva of *australis* (supposition) is known, but it is possibly *pallidus*, since the Illinois specimens, described by Needham and Hart as *pallidus*, are not that species.

*[As I never obtained *villosipes* in Philadelphia, it is likely that this specimen is from one of the Pennsylvania localities cited on p. 245, Trans. Amer. Ent. Soc. vol. xx, with my original locality label displaced.—P. P. CALVERT.]

De Selys 4,—one of Rambur's types, labelled, "Collect Latreille," then below this is a red ink margined label, one end of which has been torn off, on which is written in red ink "Amer. Sept.," following which is some character which may be a continuation of the abbreviation of 'septentrionale,' but which resembles the figure 6 with a long comma or figure 7 below it as much as anything. It is hardly possible, however, that this is a date, September 6. Below this label is a small rectangle of gilt paper.

De Selys 5,—the other of Rambur's types, a small label "♀," below this a label similar to the red-inked label of the other type, but in this case the ink is faded to brown, and one end of the label is cut off obliquely, instead of being torn, on which is written a word the first four letters of which are plainly "Pari," but the last letter or character of which I cannot be sure; this is the label "Paris" of Rambur; below this label is a bit of gilt paper, as in the other type, and below this a long narrow label "*G. pallidus*." The entire abdomen of this specimen is lost.

Hagen's material consists of 3 males and 1 female: Hagen 1,—a tenereal male bears Hagen's printed label "Hagen" and "Florida, Thaxter."

Hagen 2,—a male in good condition, labelled "Ft. Reed, Fla., Apr. 26, '76," and "*Gomphus pallidus* Rbr."

Hagen 3,—a male, with abd. appendages broken off, labelled "New Orleans." "*G. pallidus* Rbr." "*Gomphus pilipes* Hagen, ♂ a vous" (on this label is glued the thoracic sclerite from between the front wings), "*G. pilipes* Sel." This is the type of *pilipes*.

Hagen 4,—a female in good condition, with the printed label "Hagen" and "*G. pallidus* Rbr., Georgia" and a word I cannot decipher followed by 7 (de Selys records *pallidus* from Georgia in May).

In my collection, a pair, in copulation, Salt Lake, St. Petersburg, Florida, March 31, 1913, L. A. Williamson.

The references to the literature of *pallidus* cited by Kirby, Catalogue p. 64, all relate to papers by de Selys and Hagen, and all I believe refer to true *pallidus*. In two places in the *Monographie* de Selys refers, apparently inadvertently, to *pallidus* as *pallens*, p. 148 (408), and 415 (675).

In the Dragonflies of Indiana, 1899, p. 291, and in Additions to the Ind. List, Proc. Ind. Acad. Sci., 1900, p. 176, two females from Elkhart Co., Indiana, collected by R. J. Weith are recorded as *G. pallidus*. One of these specimens is in the Phila. Acad. Nat. Sci. Collection and Dr. Calvert writes that the occiput is very close to my sketch of *submedianus*. It is probable that both Weith's specimens are *submedianus*.

Needham, Can. Ent. 1897, p. 166, and Needham and Hart, Bull. Ill. St. Lab. Sept. 1901, pp. 14, 16, 67, 77, 79-81 and 87, refer to Illinois specimens as *pallidus*. Letters were written to both Professor Needham and Mr. Hart. Professor Needham writes: "Clearly there are

two things we have been calling *G. pallidus*. I have male specimens from the type locality and both sexes from Florida that correspond exactly with your sketches of *pallidus*. I have many others from Galesburg, Ill. (determined long since, when I first began collecting, for me by Kellicott) that agree with your sketches of *submedianus*. And I have no intermediates." Mr. Hart kindly sent me drawings of the postocellary vertical ridge of the male and of the occipita of the 2 females in the State Laboratory Collection. Evidently the specimens are *submedianus*.

Calvert, Occas. Papers Bost. Soc. Nat. Hist. VII, 1905, p. 20, reports *pallidus* from Waltham, Mass. (Hagen). This record probably refers to true *pallidus*.

Dr. Calvert in addition to notes on the Weith specimen from Indiana, mentioned above, sent me notes on the other specimens in the Phila. Acad. Two males from Texas are *submedianus* or *subapicalis* (these two species were not distinguished in my correspondence with Dr. Calvert); a Florida male is intermediate, so far as my sketches of the postocellary vertical ridge go, between *pallidus* and *submedianus*, this specimen is doubtless *pallidus*. A female from Thomasville, Georgia, is *pallidus*.

Wilson, Drf. Cumberland Valley in Ky. and Tenn., Proc. U. S. Nat. Mus., September, 1912, pp. 192 and 199 states "that the river is entirely patrolled by *pallidus*." It is impossible to state what species is here referred to.

I wrote to Mr. Currie for data on *pallidus* in the U. S. Nat. Mus. A male, labelled Texas, is *submedianus* or *subapicalis*; a female from Missouri and a female from Henderson Co., Illinois, are *submedianus*. These are the only specimens under the label *pallidus* in the Nat. Mus. Three other references in literature to *G. pallidus* do not record anything of interest in this connection.

Gomphus submedianus n. sp.

Bay City, Texas, May 24, 1907, ♂ (type) and teneral ♀; Williams Lake, Matagorda, Texas, May 26, 1907, ♂; Wister, Oklahoma, June 3, ♀, and June 4, 1907, 3 ♂, 1 ♀. Association of the sexes supposition only. For literature see under *pallidus*. For description of localities see under *subapicalis*.

Gomphus subapicalis n. sp.

Bay City, Texas, May 24, ♂ (type), and May 27, 1907, ♀; Williams Lake, Matagorda County, Texas, May 26, 1907, ♂. Association of the sexes supposition only. For literature see under *pallidus*. On May 24 I collected near Bay City,

Texas, by pools along the railroad to Brownsville. Both *submedianus* and *subapicalis* were taken, but were not distinguished at the time. The two species were associated again at Williams Lake on May 26. On June 3 and 4 *submedianus* was taken at an artificial lake along the Frisco R. R. about 1½ miles north of Wister, Oklahoma.

CHARACTERS OF *PALLIDUS*, *SUBMEDIANUS* AND *SUBAPICALIS*.

Size.—Abdomen: *pallidus*, male 39-42, female 40-43; *submedianus*, male 38-41, female 39-42; *subapicalis*, male 39-40, female 40.

Hind wing: *pallidus*, male 31-33, female 34-36; *submedianus*, male 30-33, female 35-39; *subapicalis*, male 31-34, female 36.

Head.—Face unmarked, apparently yellowish green in *submedianus* and *subapicalis*, and paler green, without yellowish, in *pallidus*. In Rambur's types, de Selys 4 and 5, much discoloration is evident; in 4 entire face and frons above are brown; and in 5 the frons, both in front and above, is sharply brown. The color pattern of the frons at its base above is distinct in the three species; in *pallidus* there is a brown basal stripe of practically uniform width, if anything widest at the middle; in *submedianus* the stripe is distinctly notched or narrowed in front of the median ocellus; and in *subapicalis* it is reduced to two spots, one on each side of and in front of the median ocellus, these spots joined medianally in the single female. The entire vertex is dark brown, almost black, in *pallidus*; in *submedianus* it is paler, and the postocellary vertical ridge is still paler and greenish, only slightly darker, especially along the anterior border, than the frons and the occiput; *subapicalis* is fairly intermediate between the two others in this character. Fig. 28 is of the postocellary ridge in a Florida male of *pallidus*; Hagen's 1 and 2 have the ridge much like figure 31; *pallidus* and *submedianus* males which might be confused by the form of the appendages, are certainly clearly separated by the form and color of this ridge.

Thorax.—Green, apparently inclining to brownish in *pallidus* and yellowish green in the other two. So far as I can detect in the *pallidus* before me there is no dorsal stripe on either side of the carina, and the carina itself is pale excepting at the median angle. In *submedianus* and *subapicalis* the carina is dark above the median angle, and there is a very narrow dorsal stripe on either side, or this reduced to a vestige or, in one male of *subapicalis*, entirely wanting. (This variation, I believe, is not entirely due to post-mortem changes.) (In the single female referred to *subapicalis* the thoracic markings are the most developed of any specimen before me; in this case the dorsal stripes are wide and long, and closely approach the middorsal carina). Antehumeral brown stripe present (wanting in

some *pallidus* due to post-mortem changes or loss of thoracic contents), widest and most definite in *submedianus* and *subapicalis*. The humeral stripe, like the antehumeral, in *pallidus* is narrow, obscure, and scarcely evident; in *submedianus* it is reduced to a line, in striking contrast to the well developed antehumeral; in *subapicalis* it is nearly as wide as the antehumeral.

Venation between A₁ and A₂.

I. Two cells of about equal size in first series¹, A₁ angled²: *submedianus*, 2 male wings, 20%; *subapicalis*, 3 male wings, 75%.

II. Two cells in first series, the proximal one of these two long and narrow, A₁ not angled: *pallidus*, 9 male wings, 90%, 4 female wings, 40%; *submedianus*, 1 female wing, 16.7%.

III. One cell in first series, A₁ angled: *pallidus*, 1 male wing, 10%; *submedianus*, 8 male wings, 80%, 3 female wings, 50%; *subapicalis*, 1 male wing, 25%, 1 female wing, 50%.

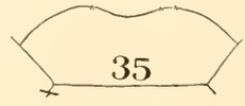
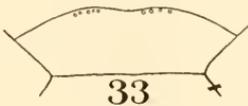
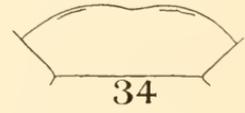
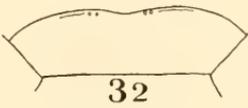
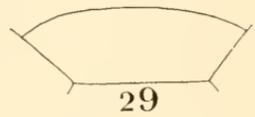
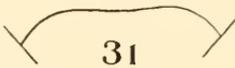
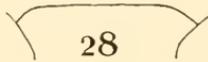
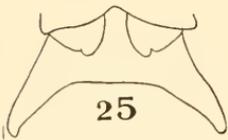
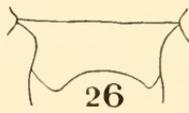
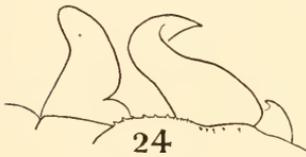
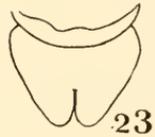
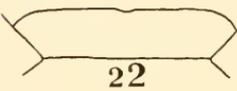
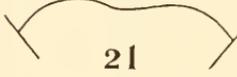
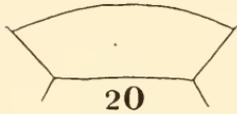
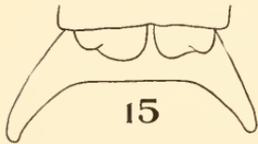
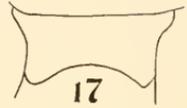
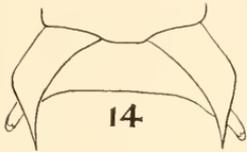
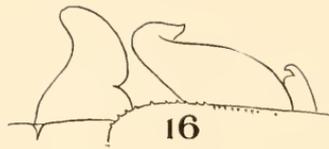
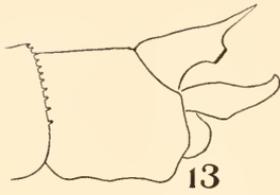
IV. One cell in first series. A₁ not angled: *pallidus*. 6 female wings, 60%; *submedianus*, 2 female wings, 33.3%; *subapicalis*, 1 female wing, 50%.

Legs.—Light brown in *pallidus*, femora darker apically and dorsally, tibiae gray dorsally, tarsus black, second joint of last tarsus gray, and first joint of same tarsus gray in the middle; last femora with some hair in the female, and in the male almost covered with brown pile. In the other two species the femora are not nearly so hairy, and there is a distinct color pattern of dark on a ground color paler than the light brown of *pallidus*. In *submedianus* the legs are green or yellowish green, the femora apically and dorsally black; the tibiae black ventrally and, in sharp contrast, yellow dorsally, tarsus patterned as in *pallidus*, but the middle joint of the middle legs shows more or less pale also; from the apical black of the last femur three fine lines run basally on the dorsal surface of the femur, two of these are anterior (external) and the other is posterior (internal), the apical black occupies 1 to 2 mm., and the black lines, except sometimes the most anterior one and the posterior one in the male, do not reach the base of the femur. *Subapicalis* is similar to *submedianus*, but on the last femora the apical black is more extensive and the lines are less developed, the posterior scarcely evident, and the two anterior lines shorter than in *submedianus*.

Abdomen.—The abdominal markings are generally obscure, ill-defined and difficult of description. Probably this is true of the majority of these insects in life, and more generally true of dried material. In the absence of any notes on living colors and with

¹In all wings examined there are 2 cells in the second series.

²A₁ varies from distinctly angled to straight in the entire series of wings examined, so the description as angled or straight is, in some cases, arbitrary.



GOMPHUS PALLIDUS, ETC.—WILLIAMSON.

the material before me, it seems that any detailed descriptions might be more misleading than otherwise. The absence of any extensive, well defined area of black is at once a conspicuous character. In *pallidus* a dorsal interrupted green or yellowish green stripe, continued from the pale area between the wings, extends from 1-7, this stripe bordered by brown which shades out indefinitely ventrally, excepting on 1 and 2, where, as generally in the genus, the color pattern is better defined, the sides below of these two segments being similar to the pale thoracic colors; 8-10 are brown or yellowish brown, 10 the lightest color and possibly in the male sometimes yellow. In the females of the other two species the color pattern is essentially similar, but in the males of these two, segments 3-6 are largely pale, the color of the middorsal stripe, with apical dark brown spots on either side of the dorsum. In *submedianus* male segments 7-10 are similarly colored, orange or golden brown, with 10 paler. In *subapicalis*, on the other hand, segment 7 more closely resembles 6 (rather than 8) as in *pallidus*.

Abdominal appendages, male.—Yellow or yellowish brown in color, extreme apex and tubercle of the superiors and the apex of each branch of the inferior black or dark brown. In *pallidus* and *submedianus* the ventral tubercle is placed near the middle of the superior appendage; in *subapicalis* it is placed beyond the middle and in size is reduced to a minimum, the maximum being reached in *pallidus*. The appendages of *pallidus* and *submedianus* are very similar. When the appendages are in the position shown in Figs. 18 and 27, in *pallidus* the dorsal and inner edge of the right superior appendage is straight or a flat uniform curve; in *submedianus* this edge has a distinct angle at the base of the needle-like apex, as though the edge were wrinkled or folded.

Vulvar lamina, female.—In de Selys' 3 and 4 and Hagen's 4 the vulvar lamina lies close to the abdomen, but little erected; in my material in every case the lamina is more erect, and the maximum in this direction is shown in fig. 10. I believe that the position of the lamina in this respect is largely a matter of chance, since there is apparently nothing in the form of the lamina of fig. 10 to prevent it being closely appressed to the abdomen.

EXPLANATION OF PLATES IV AND V.

Four half tone figures from drawings from Mons. Guillaume Severin. Upper two, *Gomphus pallidus*, de Selys No. 2; lower two, *Gomphus villosipes*, de Selys No. 1.

All the numbered figures are of the same magnification.

Figs. 1-12, *Gomphus subapicalis*; figs. 1-8, male; figs. 9-12, female. 1, 2, 3, dorsal, ventral and lateral views of abdominal appendages; 4, anterior lamina; 5, accessory genitalia; 6, postocellary vertical ridge,

dorsal view; 7, occiput; 8, right profile of apex of abdominal segment 8 and base of 9 of two specimens, superimposed and with dorsa coinciding; solid line, Bay City, Texas, May 24, 1907, (the specimen from which figs. 1-7 are drawn), dotted line, Williams Lake, Matagorda County, Texas, May 26, 1907. This figure shows the difficulty or impossibility of using the shape of the apex of 8 as a definite character. Fig. 9, vulvar lamina; 10, left profile of abdominal segment 9, showing position of vulvar lamina; 11, postocellary vertical ridge, dorsal view; 12, occiput. All female figures from a specimen from Bay City, Texas, May 27, 1907.

Figs. 13-23, *Gomphus submedianus*; figs. 13-20, male, Bay City, Texas, May 24, 1907; figs. 21-23, female, Wister, Oklahoma, June 4, 1907. 13, 14, 15, lateral, dorsal and ventral views of abdominal appendages; 16, accessory genitalia; 17, anterior lamina; 18, left superior abdominal appendage, externo-dorsal view; 19, postocellary vertical ridge, dorsal view; 20, occiput; 21, postocellary vertical ridge, dorsal view; 22, occiput; 23, vulvar lamina.

Figs. 24-35, *Gomphus pallidus*; figs. 24-29, male, Salt Lake, St. Petersburg, Florida, March 31, 1913, L. A. Williamson; figs. 30-35, female. 24, accessory genitalia; 25, ventral view of inferior abdominal appendage; 26, anterior lamina; 27, left superior abdominal appendage, externo-dorsal view; 28, postocellary vertical ridge, dorsal view; 29, occiput; 30, vulvar lamina, de Selys No. 4; 31, postocellary vertical ridge, dorsal view, Salt Lake, St. Petersburg, Florida, March 31, 1913, L. A. Williamson (this specimen in copulation with male of figs. 24-29); 32, occiput, de Selys No. 3; 33, occiput, de Selys No. 5; 34, occiput, de Selys No. 4; 35, occiput, same data as for fig. 31.

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Preliminary List of Heterocera Captured in and around St. Louis, Missouri.

Sphingidae to Sesiidae Arranged According to Dyar's List of North
American Lepidoptera.

Compiled by PAUL A. SCHROERS, St. Louis, Mo.

(Continued from Vol. XXIV, page 463.)

2810.	<i>Catocala lacrymosa Guén.</i>				
	a. <i>ulalume Str.</i>				b. <i>uxor Guen.</i>
	b. <i>paulina Edwards.</i>	2866			c. <i>osculata Hulst.</i>
	c. <i>emilia Edw.</i>				<i>innubens Guen.</i>
	d. <i>evelina French.</i>				a. <i>flavidalis Gr.</i>
	e. <i>zelica F.</i>	2867			b. <i>hinda Fr.</i>
2811	<i>viduata Guen.</i>	2868			c. <i>scintillans Gr.</i>
2813	<i>vidua Sm. & Ab.</i>	2869			<i>nebulosa Edw.</i>
2814	<i>dejecta Str.</i>	2870			<i>piatrix Gr.</i>
2815	<i>retecta Gr.</i>				<i>dyonisa H. Edw.</i>
	a. <i>luctuosa Hulst.</i>				<i>neogama Sm. & Ab.</i>
2816	<i>flebilis Gr.</i>				a. <i>communis Gr.</i>
2817	<i>robinsonii Gr.</i>	2871			b. <i>snowiana Gr.</i>
	a. <i>curvata Fr.</i>	2872			<i>subnata Gr.</i>
2819	<i>obscura Str.</i>	2873			<i>cerogama Guen.</i>
	a. <i>simulatilis Gr.</i>				<i>paleogama Guen.</i>
2820	<i>residua Gr.</i>				a. <i>annida Fager.</i>
2821	<i>insolabilis Guen.</i>	2874			b. <i>phalanga Gr.</i>
2822	<i>angusi Gr.</i>	2881			<i>consors Sm. & Ab.</i>
	a. <i>lucetta Edw.</i>	2882			<i>illecta Walk.</i>
2823	<i>judith Str.</i>	2887			<i>serena Edw.</i>
2827	<i>cara Guen.</i>				<i>habilis Gr.</i>
	a. <i>sylvia Edw.</i>	2888			a. <i>basalis Gr.</i>
	b. <i>carissima Hulst.</i>	2891			<i>clintonii Gr.</i>
2828	<i>amatrix Hüb.</i>	2892			<i>nuptialis Walk.</i>
	a. <i>nurus Walk.</i>				<i>polygama Guen.</i>
2829	<i>marmorata Edw.</i>				a. <i>crataegi Saunders.</i>
2841	<i>junctura Walk.</i>				b. <i>mira Gr.</i>
2848	<i>unijuga Walk.</i>	2894			<i>amasia Sm. & Ab.</i>
2857	<i>parta Guen.</i>				a. <i>virens French.</i>
2858	<i>coccinata Gr.</i>	2898			<i>fratercula</i>
2864	<i>ultronia Hüb.</i>				d. <i>timandra H. Edw.</i>
	a. <i>celia Edw.</i>				e. <i>hero H. Edw.</i>
	b. <i>mopsa Edw.</i>				f. <i>gisela Meycr.</i>
	c. <i>adriana Edw.</i>				<i>praeclara Gr. & Rob.</i>
2865	<i>Catocala ilia Cr.</i>	2900			
	a. <i>zoe Behr.</i>				

- 2901 *dulciola Gr.*
 2902 *grynea Cr.*
 2903 *alabamæ Gr.*
 2904 *titania Dodge.*
 2906 *minuta Edw.*
 a. parvula Edw.
 2907 *amica Hüb.*
 a. lineella Gr.
 b. nerissa H. Edw.
 2911 *Euparthenos nubilis Hüb.*
 a. apache Po-
 ling.
 2915 *Phoberia atomaris Hüb.*
 2920 *Panopoda rufimargo Hüb.*
 a. carneicosta
 Guen.
 b. roseicosta.
 2921 *Parallelia bistriaris Hüb.*
 2922 *Agnomonía anilis Dr.*
 2923 *Remigia repanda Fab.*
 2940 *Phurys vinculum Guen.*
 2946 *Celiptera frustulum Guen.*
 2953 *Strenoloma lunilinea Gr.*
 2962 *Trama detrahens Walk.*
 2971 *Yrias clientis Gr.*
 repentis Gr.
 2977 *Zale horrida Hüb.*
 2979 *Pheocyma lunifera Hüb.*
 2983 *Ypsia undularis Dr.*
 2986 *Homoptera lunata Dr.*
 a. edusa Dr.
 3006 *Erebus odora L.*
 3007 *Thysania zenobia Cr., one*
 specimen, by Mr. L.
 Schnell.
 3012 *Epizeuxis lubricalis Geyer.*
 denticulalis Har.
 3013 *Zanclognatha laevigata Gr.*
 ochreipennis
 Gr.
 3039 *Chytolita morbidalis Guen.*
 3058 *Palthis angulalis Hüb.*
 3059 *asopialis Guen.*
 3062 *Salia interpuncta Gr.*
 3066 *Bomolacha bijugalis Wlk.*
 3067 *scutellaris Gr.*
 3068 *albalinealis Wlk.*
 3069 *madefactalis*
 Guen.
 3073 *deceptalis Wlk.*
 3079 *Platypena scabra Fab.*
 3080 *Hypena humuli Har.*
 NOTODONTIDÆ.
 3091 *Apatelodes angelica Gr.*
 3092 *Melalophia apicalis Walk.*
 3098 *Datana ministra Dr.*
 3100 *angusi Gr. & Rob.*
 3108 *integerrima Gr. &*
 Rob.
 3111 *Hypereschra stragula Gr.*
 3112 *georgica Her.-*
 Sch.
 3113 *tortuosa Tep-*
 per.
 3118 *Pheosia dimidiata Her.-Sch.*
 3121 *Lophondonta angulosa*
 Pack.
 3123 *Nadata gibbosa Sm. & Ab.*
 3125 *Symmerista albifrons Sm.*
 & Ab.
 3133 *Heterocampa obliqua Pack.*
 3137 *manteo*
 Doubleday.
 3142 *bilineata*
 Pack.
 3143 *Misogada unicolor Pack.*
 3145 *Ianassa lignicolor Walk.*
 3148 *Schizura ipomoeae Double-*
 day.
 3149 *concinna Sm. &*
 Ab.
 3153 *badia Gr.*
 3162 *Harpyia cinerea Walk.*
 3165 *Fentonia marthesia Cr.*
 3170 *Ellida caniplaga Wlk.*
 THYATIRIDÆ.
 3180 *Euthyatira pudens Guen.*
 LIPARIDÆ.
 3189 *Heterocampa vetusta Boisd.*

- 3190 *leucostigma* *Sm.*
& *Ab.*
- 3192 *definita* *Pack.*
- 3196 *Porthetria dispar* *L.*, one specimen.
- 3198 *Doa ampla* *Gr.*
- 3222 *Heteropacha rileyana* *Har.*
- PLATYPTERYGIDAE.
- 3226 *Oreta rosea* *Walk.*
- 3229 *Drepana arcuata* *Walk.*
- GEOMETRIDAE.
- 3232 *Dyspteris abortivaria* *Her.-Sch.*
- 3234 *Nyctobia limitata* *Wlk.*
- 3248 *Eudule mendica* *Wlk.*
- 3260 *Nannia refusata* *Wlk.*
- 3262 *Heterophleps triguttaria*
Her.-Sch.
- 3294 *Tephroclystis absinthiata*
Clerk.
- 3323 *Eucymatoge intestinata*
Guen.
- 3332 *Euchoeca albivittata* *Guen.*
- 3340 *Hydria undulata* *L.*
- 3348 *Eustroma diversilineata*
Hüb.
- 3354 *atrocolorata* *Gr.*
- 3359 *Rheumaptera hastata* *L.*
- 3370 *Percnoptilotia fluviala* *Hüb.*
- 3374 *Mesoleuca lacustrata* *Guen.*
- 3416 *Triphosa dubitata* *L.*
- 3436 *Marmopteryx marmorata*
Pack.
- 3468 *Haematopsis grattaria* *Fab.*
- 3469 *Erastria amaturaria* *Wlk.*
- 3480 *Cosymbia lumenaria* *Hüb.*
- 3486 *Synelis alabastaria* *Hüb.*
- 3530 *Eois ossularia* *Hüb.*
- 3546 *inductata* *Guen.*
- 3550 *sideraria* *Guen.*
- 3561 *Chloroclamys chloroleucaria*
Gr.
- 3581 *Synchlora liquoraria* *Guen.*
- 3604 *Eufidonia notataria* *Wlk.*
- 3614 *Mellila inextricata* var.
a. xanthometata
Wlk.
- 3651 *Sciagrapha heliothidota*
Pack.
- 3664 *mellistrigata*
Gr.
- 3667 *Philobia enotata* *Guen.*
- 3722 *Cymatophora tenebrosata*
Hulst.
- 3747 *Sympherta tripunctaria*
Pack.
- 3803 *Paraphia subatomaria*
Wood.
a. unipuncta *Haw.*
- 3814 *Tornos scolopacinarius*
Guen.
- 3838 *Selidosoma humarium* *Guen.*
- 3850 *Cleora pampinaria* *Guen.*
- 3858 *Melanolophia canadaria*
Guen.
- 3862 *Ectropis crepuscularia*
Denis.
- 3864 *Epimecis virginaria* *Cr.*
- 3865 *Lycia ursaria* *Wlk.*
- 3867 *cognataria* *Guen.*
- 3908 *Therina endropiaria* *Gr. &*
Rob.
- 3911 *fervidaria* *Hüb.*
- 3916 *Eugonobapta nivosaria*
Guen.
- 3922 *Ennomos subsignarius* *Hüb.*
- 3923 *magnarius* *Guen.*
- 3925 *Xanthotype crocataria* *Fab.*
- 3932 *Plagodis emargataria* *Guen.*
- 3934 *Hyperitis amicaria* *Her.-Sch.*
- 3939 *Ania limbata* *Haw.*
- 3944 *Gonodontis duaria* *Guen.*
- 3956 *Euchlaena obtusaria* *Hüb.*
- 3961 *amoenaria* *Guen.*
- 3957 *effectaria* *Wlk.*

- | | | | |
|--------------|--|----------------|---------------------------------|
| 3965 | pectinaria Denis. | 4094 | Cochlidon biguttata Pack. |
| 4007 | Caberodes confusaria Hüb. | 4096 | Y-inversa Pack. |
| 4011 | Tetracis crocallata Guen. | | |
| 4013 | Sabulodes sulphurata Pack. | MEGALOPYGIDAE. | |
| 4026 | transversata Dr. | 4108 | Carama cretata Gr. |
| 4028 | Abbottana clemataria Sm.
& Ab. | 4110 | Lagoa crispata Pack. |
| | | | |
| LACOSOMIDAE. | | THYRIDAE. | |
| 4059 | Cicinnus melsheimeri Har. | 4131 | Thyris maculata Har. |
| 4060 | Lacosoma chiridota Gr. | 4147 | Prionoxystus robiniae
Peck. |
| | | 4160 | Hypopta anna Dyar. |
| PSYCHIDAE. | | | |
| 4065 | Thyridopterix ephemerae-
formis Hw. | SESIDAE. | |
| | | 4162 | Melittia satyriniformis
Hüb. |
| COCHLIDIDAE. | | 4188 | Aegeria apiformis Clerk. |
| 4080 | Euclia chloris Her.-Sch. | 4221 | Sesia acerni Clemens. |
| 4092 | Prolimacodes scapha Har. | | |

A Recently Described Psyllid from East Africa (Hemip.).

By D. L. CRAWFORD, Department of Entomology, Cornell
University, Ithaca, New York.

Specimens of an interesting Psyllid affecting fig trees in East Africa, submitted to the writer by Dr. L. O. Howard for determination, prove to be identical with a species recently described by Robert Newstead, from Nyasaland. A new genus, *Pseuderio-psylla*, was erected by Newstead for the species, which he called *nyasae* n. sp. There is a very close resemblance between this African species and a species described earlier, from the Island of Formosa, by Kuwayama. The relationship is so close, moreover, that the two species cannot be considered as generically distinct. The description of *Macrohomotoma* Kuwayama was apparently overlooked by Newstead, for otherwise a new genus would not have been erected. *Pseuderio-psylla* Newstead may, therefore, be considered a synonym of *Macrohomotoma* Kuwayama.

MACROHOMOTOMA Kuwayama.

Kuwayama, S. Trans. Sapporo Nat. Hist. Soc. II:179, 1907.
Pseuderio-psylla Newstead, R. Bul. of Ent. Research, II:105, 1911.

Body large, robust; head as broad as thorax, deflexed; vertex broad, more or less cleft in front; genal cones entirely wanting; frons not covered by genae, but visible as a narrow sclerite from front ocellus to clypeus; front ocellus above; antennae short, about as long as width of head. Thorax large; pronotum very short. Forewings large, hyaline, transparent, acute at apex; pterostigma unusually large, elliptical; marginal cells very large; branching of veins similar in type to *Carsidara*.

Type of genus: *Macrohomotoma gladiatum* Kuwayama (loc. cit., p. 180).

The genus shows a distinct relationship to *Carsidarinae*, although the head is not so deeply cleft in front and there is no basal spur on the hind tibiae, as there is in many of the other genera placed in this subfamily (Crawford—Pomona Journ. Ent., III, p. 381, 1911).

Synopsis of the Species.

A. Cubital vein before its furcation as long as stem of media and cubitus; pterostigma black apically; female genital segment very short.*M. gladiatum* Kuway.

AA. Cubitus exceedingly short before furcation, many times shorter than stem of media and cubitus; pterostigma not black apically; female genital segment long and slender.*M. nyasae* (Newst.)

Macrohomotoma nyasae (Newstead).

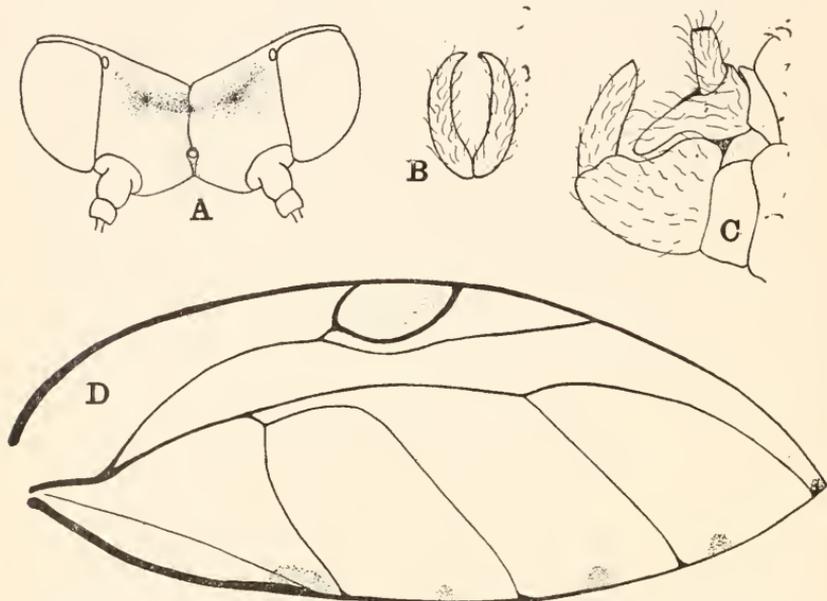
Syn.—*Pseudcriopsylla nyasae* Newstead—loc. cit. p. 105, 1911.

Length of body (male) 2.9 mm.; (female) 3.3 mm.; length of forewing 5.2 to 5.6 mm. General color reddish brown to chocolate brown; dorsal portion of scutellum and posterior part of dorsulum, vertex, male genitalia, and legs, lighter brown to ochraceous; venter of abdomen whitish.

Head very broad, as broad as thorax, greatly deflexed; vertex nearly twice as broad as long, coarsely punctate, with a deep fovea on each side of median line posteriorly and a deep sulcus connecting them; front margin somewhat cleft, but not as much as in *Carsidara*; front ocellus easily visible from above. Genal cones entirely wanting; frons narrowly visible between genae. Antennae slender, about as long as width of head, black at tip.

Thorax very large, broad and strongly arched; pronotum very short, sometimes mostly concealed behind posterior margin of head; dorsulum longer than broad; metanotum produced at posterior end

into three erect contiguous, tuberculous processes. Legs short, thick; hind tibiae with four black spines at apex. Forewings very large, two and a half times as long as broad, acutely pointed at apex, costal margin more strongly arched; marginal cells unusually large, subequal; Cu very short; pterostigma more opaque than rest of wing



Macrohomotoma nyasae (Newstead).—A, head, dorsal view; B, forceps of male, posterior view; C, male genitalia, lateral view; D, forewing.

surface; primary furcation very near to base of wing. (I find no traces of the supernumerary vein between Rs and the pterostigma, as shown by Newstead. Either he examined an anomolous wing or else examined the wing *on* the insect and mistook the costa of the hind wing beneath for this vein.) Hind wings small, transparent.

Abdomen large; *male* anal valve about as long as forceps, cylindrical and truncate at apex, with the anus occupying most of truncate surface;—with a long, lateral, sinuate prolongation extending caudad to base of forceps (cf. fig. C). Forceps long, stout, acutely pointed at apex, carinate at base on outside; pubescence conspicuous. *Female* genital segment long and very slender, longer than rest of abdomen, dorsal valve longer than ventral, both acute at tip.

Described from one male and one female, collected at Lourenço Marquez, Portuguese East Africa (C. W. Howard), on leaves and fruit of *Ficus* sp., July 13, 1908. A thick, white,

floccose substance is excreted by the nymphs and adults and renders their presence very conspicuous. These floccose filaments are unusually long and are sticky to the touch.

Newstead described this species as affecting a native fig ("Kachire"), on the northwest shore of Lake Nyasa, Nyasaland, Africa. Although I have not seen Newstead's specimens, there can be little doubt but that the specimens before me are identical with those from Nyasa.

Nymph: Rather circular in outline, flattened, strikingly colored; brownish, with a median dorsal white stripe from anterior end to base of abdomen and a transverse white band on meso- and meta-thorax, connecting with a white stripe around the inner margin of wing pads. Abdomen basally with four narrow, transverse black bands, and caudad with a bilateral pair of brown rings with a brown spot in the center of each. Margin of body with slender hairs; surface sparsely hairy.

Length 1 to 2.5 mm.

The nymphs excrete and cover themselves with a dense, white, flocculent, sticky substance, as noted above.

Eggs:—"Pale yellow, when empty pearly white. They are laid upon the surface of the leaves and are protected by a layer of white and rather densely felted wax, the latter extending beyond eggs for some considerable distance." (Newstead).

The Latest Work of Prof. O. M. Reuter.

In *Science* for January 9, 1914, Prof. W. M. Wheeler has a two-page notice of Prof. Reuter's *Lebensgewohnheiten und Instinkte der Insekten bis zum Erwachen der sozialen Instinkte*. This is a German translation from the Swedish manuscript and was revised by the author shortly before his death, to which regrettable event attention was called in the *News* for January.

Memorials of Alfred Russel Wallace.

Science states that it is proposed to place a memorial to Alfred Russel Wallace in Westminster Abbey, a statue or bust in the British Museum of Natural History, and a portrait in the Royal Society's gallery. Contributions for these purposes may be sent to the Union of London and Smith Bank, Holborn Circus, London, E. C.

Notice to Authors.

Authors publishing entomological articles in non-entomological journals, who desire to have such articles noted in our current literature list, will do well to send copies of them to ENTOMOLOGICAL NEWS, 1909 Race St., Philadelphia, Pa. After note has been made of the same, they will be deposited in the library of the American Entomological Society.

Standards of the number of eggs laid by Spiders (Aran.)—III.*

Being Averages Obtained by Actual Count of the Combined Eggs
of Twenty (20) Depositions or Masses.

By A. A. GIRAULT, Nelson (Cairns), North Queensland,
Australia.

3. ULOBOROUS GENICULATUS Oliv.

No.	Date counted—1912	No. counted per mass	Successive Totals	Av. per Egg Mass	Max.	Min.	Range
1	May 1	140.	140.	140.	140.		
2		101.	241.	120.			
3		108.	349.	113.			
4		70.	419.	105.			
5		68.	488.	98.			
6		78.	566.	94.			
7		107.	673.	96.			
8		127.	800.	100.			
9		97.	897.	100.			
10		73.	970.	97.			
11	May 5	134.	1104.	100.			
12		111.	1215.	101.			
13		94.	1309.	101.			
14		108.	1417.	101.			
15		89.	1506.	100.			
16		71.	1577.	99.			
17		60.	1637.	96.	60.	80	
18		May 6	87.	1724.	96.		
19			82.	1806.	95.		
20			119.	1925.	96.		
20				1925.	96.	140.	60.	80

The above eggs were obtained from a number of nests in a private residence used as a field laboratory on the edge of the little hamlet of Nelson (Cairns District), North Queensland, Australia, the first week in May, 1912. The species was kindly identified for me by Mr. W. J. Rainbow, of the Australian Museum, Sydney. Three egg bags to the nest seem to be the average per female, but the following observations show that as many as six may be deposited. A female kept under observation from April 30, 1912 (subpended in an isolated web across part of the frame of a rude ladder on the back veranda) made a fresh cast a day or two previously and another on May 10, so that she became mature not until the night of

* For the first two of this series, see ENT. NEWS, XXII, pp. 461; XXIV, p. 213.

May. 9. Mating was not observed. On May 29 (early A. M.), or about twenty days after reaching maturity, the first cocoon of eggs was found suspended in the nest; and the second very early in the morning of June 10. Early in the morning of June 21 the third mass was deposited and the fourth about the same time July 4. The four cocoons were then suspended in the nest above the center in one corner, the first above and the other three in a nearly straight line below it, all taken together forming a triangle of which the second made the middle of the base directly below the first, the triangle's apex. The fifth mass was deposited during the night of July 30-31, and the sixth August 26-27. The female disappeared on September 6, 1912. All of these eggs were fertile.

Nos. 4 and 5, 6 and 7, 8 and 9, 15 and 16, and 18 and 19 (in the table) were from the same nest, each couple being the second and third bags from the respective females, the first having hatched; No. 11 was the fourth mass from a nest, the three others having hatched; the other numbers were first or second masses.

The number of eggs which may be laid by some spiders is illustrated by the contents of a medium-sized, hemispherical egg mass, covered with a silk cap found placed flat against a board at Paris, Texas, in March, 1904. It contained two thousand one hundred and three compact, round, yellow eggs. Unfortunately the species was unknown.

Origin of Oligotropy of Bees (Hym.).*

By CHARLES ROBERTSON, Carlinville, Illinois.

In this journal, volume 24: 104, Mr. Lovell replies to some criticisms made in the number for December, 1912, Vol. 23: 457.

The statement about *Epeolus*, quoted from the *Botanical Gazette* 28: 35, July, 1899, was corrected two months afterward on page 215 of the same journal, where it is also re-

[*This article was received in July, 1913, but has not been published at an earlier date, owing to the large number of manuscripts sent in before it.—Editor.]

corded that *Triepeolus donatus* is an inquiline of *Entechnia taurea*. Lovell states that this bee visits the Compositae exclusively. Of ten local species of *Triepeolus*, including *T. donatus* and excluding one of only one visit, none are exclusive visitors of Compositae.

Lovell is correct in saying that in my view a bee is oligotropic everywhere or nowhere. The whole matter is an inference from the fact that a bee has been observed collecting pollen on a certain flower and has not been found doing so on any other. The force of the latter statement depends upon the presumption that the observer would know whether a bee collects pollen from another flower or not. In 1899 I suggested fifty-three bees as oligotropic. I had observed 3670 visits of 194 nest-making bees to about 400 different kinds of flowers, so there was some basis for the presumption that if the bee were not oligotropic I would know it. Nevertheless, from my own observations I have found it necessary to modify six cases and reject four. Lovell quotes my statement: "When the flowers upon which a bee depends becomes extinct or rare, the bee may disappear or be forced to resort to flowers which originally it did not visit." This may be true as a general statement, but I have never used it to support untenable cases.

The statement of Müller quoted from the *Fertilisation of Flowers* (not "Plants"), p. 570, has already been commented on in the *Bot. Gaz.* 32: 367, 1901. It only shows that Müller did not understand the flower-visiting habits of bees.

I do not accept the opinion: "Therefore the entomophilous flora of a region, as a whole, is not better pollinated because a part of the bees are oligotropic than it would be if they were all polytropic."

Lovell says: "The fact that so many bees are oligotropic to the Compositae would seem alone to refute the theory that this habit is an effort on their part to avoid competition by visiting different plant families." Observing that Lovell can not cite a passage where anyone has propounded such a theory, let us consider the Compositae oligotropes. In the *Can. Ent.* 42: 327, I have stated that of twenty exclusive both in their pollen and nectar visits the majority are oligotropes of Com-

positae and say: "It is not so surprising that some of these are exclusive when we consider that at their maximum the Compositae form 34 per cent. of the indigenous flowers."

At Carlinville the phenological positions of the indigenous Compositae and their oligotropes are:

	Apr.-May	Jn.-July	Aug.-Sept.	Oct.
Compositae	10.8	57.6	86.9	42.3
Oligotropes	7.5	47.5	90	50

It may be that some of these originated under the maximum of the Compositae. But it is a little too much to assume that they originally had a short flight, turned to the Compositae and happened to fall into a nice phenological correlation. My view is that they have a short flight and form their maximum under that of the Compositae because they are oligotropes. They are the most abundant at the time when competition would be the least. Whenever competition becomes the most severe at this point, it will be an advantage to change food habits, or fly earlier or later.

That the pressure of competition has already reached a severe stage is indicated by *Melissodes* and at least some genera of Panurgidae. In my opinion *Melissodes* is typically a genus of Compositae oligotropes and the polytropic species, as well as those which are oligotropes of other flowers, were originally developed from oligotropes of Compositae. The same may be true of the Panurgidae, but I am doubtful about it except in some of the genera.

But it is misleading to speak as if Compositae oligotropes were all competitors. Some do not occur at the same time as others; probably the flight of no two exactly coincides. Moreover they are not all oligotropes of the same flowers. They fall into the following fourteen more or less non-competitive sets. Where two tribes are mentioned most of the visits are to the first:

Krigia: *Pterandrena krigiana*; *Boltonia*: *Perditella boltoniae*; *Vernonia*: *Melissodes vernoniana*, *vernoniae*; *Cnicus*: *M. cnici*; *Coreopsis palmata*: *M. coreopsis*; *Helianthus*: *Halicoides marginatus*; *Asteroideae*: *Colletes armatus*, *Andrena nubecula*, *Pterandrena asteris*, *solidaginis*, *Pseudopanurgus*

compositarum, *M. asteris*; *Helianthoideae*: *Sayapis pollicaris*, *pugnata*, *Pterandrena aliciae*, *pulchella*, *rudbeckiae*, *Pseudopanurgus albitarsis*, *rudbeckiae*, *labrosus*, *labrosiformis*, *rugosus*, *M. illinoensis*; *Asteroideae and Helenioideae*: *M. sinillima*; *Asteroideae and Helianthoideae*: *Colletes americanus*, *Pseudopanurgus asteris*, *solidaginis*, *Perdita 8-maculata*, *M. autumnalis*; *Helianthoideae and Asteroideae*: *Ashmeadiella buconis*, *Megachile 6-dentata*, *Pterandrena helianthi*, *Calliopsis coloradensis*, *M. agilis*; *Helianthoideae and Cynarioideae*: *Sayapis pugnata*, *M. coloradensis*; *Three tribes*: *Colletes compactus*, *Guathosmia georgica*, *M. trinodis*, *Sayapis sayi*; *Four tribes*: *M. boltoniae*.

Lovell says: "How has the oligotropic habit originated? Mr. Robertson believes that it is the result of an effort on the part of the different species to avoid competition. I hold that it has arisen because of the advantage gained coupled with a short term of flight." He also says: "Accessory factors are small size, time of flight, weak flight, vicinity of nests, and the number of bees."

In the *Bot. Gaz.* 28: 29, 30, 1899, I have recognized a short flight as an important condition of oligotropy and have practically excluded bees of long flight from the discussion. The use of the words "an effort" in every reference to my views is not justified. I have never used that expression or any words implying that idea. My view is that the bee fauna is all that the flora will support, that there is constant competition between the bees, and that natural selection favors those which are the most diversified, *i. e.*, the least competitive in their food habits.

Compared with bees which fly all season the oligotropes have a short flight, but that they, as compared with their relatives, originally had a short flight there is no evidence. And the general statement that they have a short flight is misleading. Compare:

	Less than 51 days	51-100 days	Over 100 days
Oligotropes	30	36	7
Polytropes	18	39	9
The average flight is shorter and there are more of them			

with a short flight. In these cases there is no evidence that the oligotropy is the result of the short flight. On the other hand there are enough certain cases to establish the presumption that the short flight is a result of the oligotropy.

Oligotropic bees are no smaller than their polytropic relatives, and the percentage of small bees is no greater than among the polytropes. In my neighborhood 38% of the oligotropes and 37% of the polytropes are large.

The long-tongued oligotropes and their relatives are among the swiftest of bees, far surpassing *Bombus* in this respect. Lovell seems to regard small size as an indication of a weak flight. At any rate, he speaks of *Andrena illinoensis* as "a small bee, not likely to fly far," and of *Halictoides novae-angliae*: "They are small bees with a weak flight." This requires proof. When the proportions are the same there is a probability that a small bee has a stronger flight than a large one.

I have shown that *Emphor bombiformis* nests in the neighborhood of the *Hibiscus* on which it depends. The proximity of the nests and food plants is a result rather than a determining condition of the oligotropy.

At Carlinville the maximum of Compositae is in August and September. Of the nectar flowers observed by me in these two months seventy-two, 32%, are Compositae. There are fifteen species of inquiline bees flying late and forming a maximum under that of the Compositae. They make from three to thirty visits and an average of fifteen. On the average they make visits of 6% to a flora composed of 32% of Compositae. They seem to fill the conditions required by Lovell's theory: a short flight of 60 days average determined by the fact that they are inquilines of bees most of which are evidently oligotropes of Compositae. a rather weak flight, and probably come from nests conveniently located with reference to the Compositae. They might easily confine 30 visits, or an average of 15, to the 72 Compositae. Only three species, with an average of 5 visits, confine themselves to the Compositae, while twelve species, with an average of 17 visits, do not. The exclusive ones are *Epeolus autumnalis* 7, *Holonomada vincta*

4, *H. placida* 4. The best of these shows eight less than the average and may be regarded as fragmentary.

If a bee limits itself to a given flower, it gains the immediate advantage of being able to anticipate other bees in their visits to the chosen plant. It may increase this advantage by locating its nests near the flowers. To humanize, it may concentrate its attentions upon the flowers so as to get to them first, learn how to manipulate the pollen better than other bees, and finally develop special structures which will increase the advantage.

I have pointed out that some oligotropes which collect large pollen have loosely plumose scopae which are better adapted to collect and hold the large grains, while some others which collect the fine pollen of Compositae have densely plumose scopae.

Anthedon compta, an oligotrope of *Oenothera*, whose pollen grains are hard to collect on account of being connected by threads, has scopae of long simple bristles quite different from its nearest relatives. After doing the best it can on the flower, it goes to the stem and turns head downwards so as to work the cobwebby pollen into its scopae. Other bees collect the pollen, but *Anthedon* surpasses them all in the facility with which it does so.

The anthers of *Verbena* are included in a slender tube and above them is a circle of hairs as if intended to prevent the pollen from being extracted. Ordinary bees can only collect the pollen which adheres to their proboscides. *Verbenapis verbenae* has its front tarsi provided with curled bristles. When collecting pollen the bee thrusts both front legs into the tube of the corolla and drags out the pollen with its front tarsi.

There are 223 indigenous nest-making bees. One species, flying throughout the season and fitted about like *Apis*, except for flowers of unusual construction, might collect nearly as much pollen and support nearly as many individuals as all of the 223 together. It would be to the advantage of this bee to become as polytropic as possible, and, as the number of individuals increased, to extend its visits to the most difficult

and inconvenient flowers. It would be distinctly disadvantageous for it to limit itself to some particular flowers and exceedingly unlikely that it would do so. The ecological specialization exhibited by *Anthedon*, *Verbenapis* and other oligotropes is a fairly certain indication of the pressure of competition.

I think that the long-tongued pygidial bees were developed as competitors of the bumblebees, the first on the ground and the most polytropic of bees. I think this explains why they have a comparatively short and rapid flight and so frequently oligotropic habits. In a similar way the Andrenidae, Panurgidae and related groups which are so often oligotropic were probably preceded by the Halictidae, the most polytropic of short-tongued bees. There are forty species of Halictidae flying throughout the season. In the spring there are the females which have passed through the winter, but later both sexes of the regular brood are flying so that the maximum is late. There are ninety-four other short-tongued bees occupying the same region. It would be a hard matter for all of these bees to fly throughout the season and compete with the Halictidae. Instead they have short times of flight and are distributed so that not more than fifty-two are flying in any month and these only in the spring when the Halictidae are least abundant. And these bees are the least abundant when the Halictidae are the most abundant and most active. The early maximum, the short flight, the non-competitive phenological distribution, and the frequently oligotropic habits indicate that these bees have managed to hold their own only by dividing up the remaining field and occupying the most favorable corners left by their perennial polytropic competitors.

To the list of local oligotropes add: *Petalostemon violaceus*: *Colletes albescens*, *robertsonii*; *Strophostyles angulosa*: *Megachile strophostylis*; *Papilionaceae*: *Meg.* *generosa*, *Gnathodon georgicus*, *Anthidium psoraleae*, *Synalonia atriventris*, *fuscipes*; *Salix*: *Andrena salicacea*, *macoupinensis*; *Nymphaeaceae*: *Chloralictus nymphaearum*; *Cassia chamaecrista*: *Melissodes atripes*; *Ipomoea pandurata*: *Cemolobus ipomoeae*.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., FEBRUARY, 1914.

The Influence of Insects on Civilization.

The discoveries of recent years of the parts played by insects in the transmission of diseases have demonstrated, as never before, how civilization may be retarded by creatures formerly so commonly despised as unworthy of serious attention. The Panama Canal, the health of Italy, of India, of Havana, of Rio de Janeiro, of New Orleans, are now familiar examples of the influence of the hexapods on human prosperity. Sir Ronald Ross has gone so far as to suggest that the downfall of Greece was largely due to malaria, and malaria means the *Anopheles* mosquito, a conqueror greater than Alexander. No less striking is the effect produced by insects which in large numbers, through a series of years, devastate a staple agricultural product.

Dr. W. E. Hinds, of the Alabama Agricultural Experiment Station, in a paper on "County Organization in the Boll Weevil Campaign," read at the recent Atlanta meeting of the American Association of Economic Entomologists, considered that the spread of the boll weevil eastward through the Southern States has been more of an advantage than a loss to the human population, inasmuch as it has operated to diminish the deleterious practice of planting cotton year after year on the same ground, to encourage the habit of rotation of crops and to bring about the necessity for greater co-operation between the planters and other members of the community, a co-operation which has not stopped with measures to combat the weevil but has subsequently extended to those for bettering the community in other ways.

We find no entomological entries in the indexes to Buckle, but the future historian of civilization cannot neglect the influence of insects on the processes he attempts to describe.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

3—The American Naturalist. 4—The Canadian Entomologist. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 13—Comptes Rendus, Societe de Biologie, Paris. 14—Proceedings of the Zoological Society of London. 18—Ottawa Naturalist. 19—Horae Societatis Entomologiae Rossicae. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 28—Archives d'Anatomie Microscopique, Paris. 38—Wiener Entomologische Zeitung. 40—Societas Entomologica, Zurich. 44—Verhandlungen. K. k. zoologisch-botanischen Gesellschaft in Wien. 50—Proceedings of the U. S. National Museum. 59—Sitzungsberichte, Gesellschaft der naturforschenden Freunde, Berlin. 64—Annalen, K. k. Naturhistorischen Hofmuseums, Wien. 68—Science, New York. 69—Bolletino, Societa Italiana Entomologica. 79—La Nature, Paris. 81—Biologisches Centralblatt, Erlangen. 84—Entomologische Rundschau. 87—Bulletin, Societe Entomologique de France, Paris. 89—Zoologische Jahrbucher, Jena. 92—Zeitschrift fur wissenschaftliche Insektenbiologie. 97—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 123—Bulletin, Wisconsin Natural History Society, Milwaukee. 160—Internationale Revue der Gesamten Hydrobiologie und Hydrographie, Leipzig. 161—Proceedings, Biological Society of Washington. 164—Bulletin, University of Kansas, Lawrence. 166—Internationale Entomologische Zeitschrift, Guben. 179—Journal of Economic Entomology. 182—Revue Russe d'Entomologie, St. Petersburg. 184—Journal of Experimental Zoology, Philadelphia. 186—Journal of Economic Biology, London. 191—Natur, Halbmonatschrift fur alle Naturfreunde. 193—Entomologische Blatter, Cassel. 195—Bulletin, Museum of Comparative Zoology,

Cambridge, Mass. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 200—Bulletin Scientifique de la France et de la Belgique, Paris. 216—Entomologische Zeitschrift, Frankfurt a. Main. 239—Annales, Biologie Lacustre, Brussels. 251—Annales, Sciences Naturelles, Zoologie, Paris. 264—Boletin del Ministerio de Agricultura, Buenos Aires. 278—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. 322—Journal of Morphology, Philadelphia. 324—Journal of Animal Behavior, Cambridge, Mass. 327—Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India (New Ser.), Calcutta. 365—Collections Zoologiques du Baron Edm. de Selys Longchamps, Bruxelles. 367—2nd International Entomological Congress. 368—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, Cal. 369—Entomologische Mitteilungen, Berlin-Dahlem. 397—Pfluger's Archiv fur die Gesamte Physiologie des Menschen und der Tiere, Bonn. 420—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington, D. C. 447—Journal of Agricultural Research, Washington. 455—Nachrichten von der Kongl. Gesell. der Wissenschaften zu Gottingen, Math.-Phys. Klas. 456—Kosmos, Handweiser fur Naturfreunde, Stuttgart. 457—Memoirs of the Coleoptera by Thos. L. Casey, Washington, D. C. 459—Proceedings of the Thoreau Museum of Natural History, Concord, Mass. 450—Ohio State University Bulletin, Columbus.

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FABRE, POET OF SCIENCE, by DR. C. V. LEGROS, with a preface by J. H. FABRE. Translated by Bernard Miall. The Century Company, New York. 352 pp.

A number of books and articles on the life and works of this student and historian of the social insects have lately appeared. While well-known and appreciated for over half a century by his fellow-laborers in the vineyard, it is only comparatively recently that he has been discovered by the laity. What has happened is illustrated by his own words: "Moreover, it was not unimportant to warn the public against the errors,

exaggerations and legends which have collected about my person, and thus to set all things in their true light."

A common fault in biographies is that they are generally too laudatory, and in this book the author has not neglected his opportunities in this respect. However, if it be a fault, it is one that can be readily forgiven. The most interesting part of the book is the account of the life of a very modest man, who never took advantage of any untoward means of personal advancement, an enemy to all advertisement, depending solely on honesty of purpose and an effort to investigate the wonders of nature for the joy of the work and with the hope that mankind would benefit from his endeavors. The pleasure was in the work and the hope of material reward unseen and unlooked for.

The title of the work illustrates another feature in such books. Authors are prone to look so far into the poetic and aesthetic side that they develop a pronounced myopia in relation to the necessary technical and scientific part of all natural history investigation. On the other hand the true scientist and systematist sees the poetic and aesthetic aspect but also recognizes the absolute necessity of a scientific terminology. In fact, it is the aesthetic that starts him on the road. Our author makes Fabre appear restless as a user of the technical names of insects; yet use them he must. He also places him as an opponent of evolution, at least in part.

The lay reader of the book would suppose that all things related in the work were the discoveries of the "Poet of Science," yet all careful students of science know that most of the important facts and discoveries in nature and science have been cumulative and built up like concretions, or like the rolled snowball, that has had a push from many hands, before it reaches its final resting place. The book, however, is a most interesting one and was constructed by loving hands, in honor of a modest man who has done a noble work as a naturalist, entomologist and as a literary chronicler of our minute, but none the less mighty, little friends and enemies.—HENRY SKINNER. (*Advertisement.*)

TWO BOOKS ON ANIMAL ECOLOGY.

ANIMAL COMMUNITIES IN TEMPERATE AMERICA, AS ILLUSTRATED IN THE CHICAGO REGION. A Study in Animal Ecology. by VICTOR E. SHELFORD, PH.D., of the Department of Zoology, The University of Chicago. Published for the Geographic Society of Chicago by the University of Chicago Press, Chicago, Illinois, October, 1913, 8vo., pp. xiii, 362. More than 300 figures, maps and diagrams. Price \$3.00 net, postpaid \$3.22.

GUIDE TO THE STUDY OF ANIMAL ECOLOGY, by CHARLES C. ADAMS, PH.D., Associate in Animal Ecology, Department of Zoology, University of Illinois, New York, The Macmillan Co., 1913, 12 mo., pp. xii, 183. 7 figures. Price \$1.25.

The organization of the data for his book, Dr. Shelford tells us, "is the result of many attempts and failures which at times made the task seem hopeless," but as "here presented has in the main grown out of three lines of thought: (a) The physiology of organisms as opposed to the physiology of organs; (b) the phenomena of behavior, as illustrated by the studies of Loeb, much of the data of which can be related to natural environments; and (c) the organized comparable data of plant ecology, as set forth by Cowles and Warming" (pp. v, vi). "The definition of ecology, like that of any growing science, is a thing to be modified as the science itself is modified, crystallized and limited. At present, ecology is that branch of general physiology which deals with the organism as a whole, with its general life processes as distinguished from the more special physiology of organs, and which also considers the organism with particular reference to its usual environment" (p. 1). The point of view of the ecologist is illustrated by a concrete example on page 314.

The topics discussed, as shown in the chapter headings, are: Man and Animals, the Animal Organism and its Environmental Relations, The Animal environment, Its General Nature and Its Character in the Area of Study, Conditions of Existence of Aquatic Animals, Animal Communities of Large Lakes (Lake Michigan), of Streams, of Small Lakes, of Ponds, Conditions of Existence of Land Animals, Animal Communities of the Tension Lines Between Land and Water, of Swamp and Flood-Plain Forests, of Dry and Mesophytic Forests, of Thickets and Forest Margins, of Prairies; and a General Discussion. An Appendix suggests Methods of Study, in which emphasis is laid on the prime importance of experiments in the field, and some description of the apparatus used by the author in this new line of work is given (p. 322). A bibliography of 214 titles, almost exclusively in English (*cf.* p. v), and two indexes of authors and collaborators and of subjects, complete the book.

The treatment of the chapter topics, while not identical throughout, is sufficiently similar to be illustrated by a single chapter, for example, that on Animal Communities of Ponds. A brief introduction recalls the causes of the general interest in pond animals and the differences in pond bottoms. The origin and physical characteristics of the ponds in the area of special study are summarized. The communities of ponds are classified and discussed as the Pelagic and Pioneer (or Terrigenous Bottom) Formations and the Submerged Vegetation and Emerging Vegetation Associations.

The order of these four is that of the changes which ponds in general undergo, that of transformation from open water areas to swamps and eventually to dry land. The animals comprising each one of these ecological groups are, to a great extent, different and hence give each one a particular facies. The "characters" and "tendencies" of each

group are usually stated. Thus the characters of the Submerged Vegetation Association are "in being distinctly aquatic and also essentially independent of the bare bottom and of the surface," but "strictly dependent upon the vegetation for nesting places, shelter, etc. The mud minnow has been studied experimentally and shows avoidance of light." The tendencies of this same association are toward change: "This association, like all the others, is destined not to last; changes are taking place all the time. The chara is filling the pond at the rate of one inch a year and is making a fine soil for roots of other plants. As soon as the dense chara stage has existed for a time we find other plants, such as *Myriophyllum*, *Potamogeton*, and water lilies. As soon as these have become established we have the commencement of the next association." Finally, the succession of animal life in the same pond and the fate of the pond itself is considered and illustrated with tables showing the occurrences of species in ponds of different ages.

The terms "formation," "association" have here a technical ecological significance and, just as there is a well-known series of taxonomic groups of increasing magnitude (species, genus, family, order, class, phylum), so there is employed in this book a series of ecological groups, also of increasing magnitude (mos or mores, consocieties, stratum, association, formation, extensive formation) which, with the exception of the first, bear not "the slightest relation" to the taxonomic groups. They are defined on pages 37 and 38 but, we suspect, with no greater exactness than has attended attempts at definition of the taxonomic groups.

As may be seen from the resumé of the Pond chapter, change in nature is emphasized throughout, the phenomena are dynamic, not static. Ecological succession is often met in different parts of the book, especially on pages 110-124.

An interesting discussion is that of the efforts of ecologists, geographers and climatologists to find a method of measuring the environment of organisms which shall include a number of the most important environmental factors. Dr. Shelford concludes that "the evaporating power of the air is probably the best index of environmental conditions of land animals" (p. 164).

The author is best known to entomologists by his excellent work on tiger beetles, but these are by no means the only insects employed in characterizing ecological groups. The Index of Subjects is so arranged that one can quickly ascertain what members of a given group are mentioned in the book. Thus under "Flies or diptera" are references to fifty-one names of families and genera, alphabetically arranged. Almost all of the orders of insects, some of the Arachnids and some Myriopods are represented, so that the book contains much of interest to the entomologist.

Owing to the numerous species cited and figured, the book is one

which would be willingly carried on field trips and excursions, if it were not so heavy. It has 362 plus xiii pages, $9\frac{1}{2} \times 6\frac{1}{2}$ inches, and weighs 42 ounces. It is too heavy to read without a support, and too large and too heavy to go into any ordinary pocket. Much of its weight is due to the sized paper used throughout the volume for the sake of the half tones. When will all concerned in the manufacture of books see the absurdity and foolishness of this practice and, instead, give us a light weight paper for the text and limit the use of the heavy sort to interspersed plates to which the half tones shall be confined?

The entomologist will not find many data relating to his subject matter in Dr. Adams' book, but he will find many suggestions as to the kinds of work that is worth doing and as to the ways in which it may be done. Dr. Shelford's book is a contribution to the data of ecology and their organization. Dr. Adams is concerned with showing and developing the ecological "point of view, the importance of an understanding of explanatory processes and of the methods of scientific investigation. * * * At present ecology is a science with its facts out of all proportion to their organization or integration. There is thus an immediate need of integration and this above all requires a clear conception of the scientific method as a tool and independent thinking as well."

How different Dr. Adams' book is from Dr. Shelford's may be seen from the following list of chapter headings: I. Aim, Content and Point of View. II. The Value and Method of Ecological Surveys. III. Field Study. IV. The Collection, Preservation and Determination of Specimens. V. References to Scientific Technique. VI. References to Important Sources of Information on the Life Histories and Habits of Insects and Allied Invertebrates. VII. The Laws of Environmental Change or the "Orderly Sequence of External Nature." (The dynamic or process relations of the environment). VIII. The Laws of Orderly Sequence of Metabolism, Growth, Development, Physiological Conditions and Behavior, or "The Living Organism and the Changes which Take Place in It." (The dynamic or process relations of the animal). IX. The Continuous Process of Adjustment between the Environment and the Animal, with Special Reference to other Organisms. (The dynamic or process relations of animal associations and aggregations).

Special features of the book are the quotations from eminent biological writers, placed at the heads of chapters or of sections, indicating the value, importance or method of ecological inquiries, and the bibliographies. Indeed from page 84 (that is six pages from the beginning of chapter VII) to page 149 the book is almost entirely bibliography. It is thus, as the author hopes in the preface, "a useful source book." "Particular attention is called to the fact that it is not to be assumed

that the various authors [cited in the bibliographies] strive to make the points to which attention is here called; they may or may not do so. My aim is to call attention to the *utility* of the publications from the *standpoint* advocated throughout the book" (p. 84). The entomologist will note, from the preceding list of chapter headings, the utility to him of the references in chapter VI, but he should not fail to look through the other chapters as well.

Dr. Adams considers that there are three branches of ecology, individual, aggregate, and associational. The first deals with the ecology of a given individual or kind of animal, the second with the ecology of "hereditary or taxonomic units, as in a family community, or in genera, families, orders," etc. The third is devoted to "animals which are grouped or associated in the same habitats and environments. In this case the associates in a given association and habitat are considered as a unit, whose activities and interrelations and responses are investigated in the same manner as if it were a single animal" (pp. 3-5). It is associational ecology which Dr. Adams is anxious to advance and with which Dr. Shelford's book is concerned. "Applied or economic zoology and entomology are fundamentally more closely related to associational ecology than to any other phase of zoology, and * * * it would be to the great advantage of the students of such problems if they clearly understood this relation" (Adams, p. 29).

We heartily commend the same author when, in chapter II he says of non-ecological surveys, "The environment is considered as static, and not as a changing medium; it has no past or future, it has merely horizontal extension. The problem as to its *dynamic status*, whether in a condition of stress, in the process of adjustment, or in relative equilibrium, is not raised, or if it should be, it could not be handled. The student eager for new and little known species is not the one to study such relations, at least, as a rule, this has not been his practice. So long as the success of a day's work is measured by the length of the list of novelties secured, rather than by the quality and quantity of ecological relations discovered, such students and surveys will not contribute greatly to our knowledge of the economy of nature in the regions surveyed" (p. 31). And again, in the chapter on Field Study: "Early in field work one should learn that the collection of specimens is not the primary aim of excursions, that specimens are only *one* kind of facts, but that field study should be devoted to the accumulation of specimens, and to observations on the habits, activities, interrelations, and responses of animals, as well as to all facts, inferences, and suggestions, which are likely to be of use in the interpretation of the problems studied" (p. 41).

The book concludes with two very full indexes of subjects and of authors' names. (*Advertisement.*)

SECOND INTERNATIONAL CONGRESS OF ENTOMOLOGY.

VOLUME II. TRANSACTIONS, of this Congress, held at Oxford in August, 1912, has appeared. It is edited by K. Jordan and H. Eltringham and is dated Oxford, October 14th, 1913. Printed by Hazell, Watson & Viney, Ltd., London and Aylesbury. It is large octavo and consists of 489 pages and Plates III to XXXIV, all in black and white. There are thirty-eight papers by as many authors, titles of which were given in the NEWS for October, 1912. As it corresponds in size and contents to Vol. II, Memoires, of the First Congress, it seems a pity that the same name was not used for the present issue instead of "Transactions."

C. PICADO. LES BROMELIACÉES ÉPIPHYTES CONSIDÉRÉES COMME MILIEU BIOLOGIQUE. Bulletin Scientifique de la France et de la Belgique, 7e Serie T. XLVII, fasc. 3, pp. 215-360, pls. VI-XXIV. 54 text figs. Paris, 21 Oct., 1913.

Previous writings on the biology and the fauna of the epiphytic Bromeliaceae can be divided into three categories, says Senor Picado: A. Those which have for their object the bromeliculous* animals independently of the conditions of the medium; B. Those which bear on the biology of the Bromeliaceae; C. Those on the relations between the Bromeliaceae and their fauna. It is in this third class that his own interesting and excellent memoir belongs.

After a historical sketch (chapter I) of previous researches on the general subject, the biology of the epiphytic Bromeliaceae (chapter II) is considered with special reference to his observations on those of his native country, Costa Rica, whose government granted a subvention for this work. The climatic conditions favorable to the growth of these plants, some features of their structure, macroscopic and microscopic, with a resumé of the work of Schimper and of Tietze (1906) on their physiology, lead up to fuller statements of the author's researches on the phenomena of nutrition in these plants than have heretofore appeared in the *Comptes Rendus* (1912) of the Paris Academy. His results may be briefly summarized that a gum secreted by the plant digests starches and albuminoids and the products of the digestion are absorbed by the leaves, whereby putrefaction in the water held between the leaf bases is avoided. In chapter III a bromeliad is regarded as composed of a central water-containing *aquarium*, divided into as many compartments as there are living leaves, and a peripheral more or less continuous *terrarium*, enclosed by the outer older dead or dying leaves, wherein is found no water but a cellulose mud due to the gradual breaking down of leaf fragments. These two zones of unlike character, the perman-

*In the NEWS and elsewhere we have used the adjective *bromeliadicolous*, while Senor Picado has employed the shorter form as above.

ence† of water in the *aquarium*, its darkness, etc., lead to a number of highly interesting differences in the animals which inhabit even the same plant. The origin and dissemination of the bromelicolous fauna is discussed and comparisons made with the biology and fauna of other "Reservoir Plants." Chapter IV is more technical and is composed of descriptions of larval and adult stages of a few Diptera, Hemiptera, Coleoptera and an earth worm from Costa Rican Bromeliaceae. The brief chapter V is a summary of twenty "Conclusions." There is a bibliography of three pages, while an Appendix (pp. 333-360) lists all the bromelicolous animals from Rotifers to Batrachians known to the author. Previous to his own researches about one hundred such species were known; he has brought the total up to about 250, of which forty-nine were new. The work is highly valuable and well worth reading, even by those who have not the opportunity to work with these plants, on account of its suggestiveness.

(The name *Odontomachus* on page 273 should be replaced by *Aptero stigma*; cf. p. 348, where also the source of its fungous nourishment is more fully stated).—P. P. C.

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of September 17th, 1913, at 1523 South Thirteenth Street, Philadelphia. Ten members were present. J. C. Bradley, of Ithaca, N. Y., visitor. President Haimbach in the chair.

Dr. Castle said he had gotten a few good things in Maryland and near Harrisburg, Pa., but on the whole collecting was very poor.

Mr. Daecke exhibited a rare mosquito, *Culiseta inornatus* Will., from Rockville, Pennsylvania, III-30-13. Also *Brachyopa notata* O. S. (Dip.), Harrisburg, Pa., IV^v-24-13, which had been recorded from Washington, Oregon, Quebec, Alaska and mountains of New Hampshire, the latter being the most southern locality. He said that *Oncodes dispar* Macq., a little yellow fly, breeds on spiders; Champlin had found a mud wasp nest in a stump at Harrisburg, VIII-20-13, and upon breaking it open found six specimens of this fly inside. The wasp had most

†Senor Picado speaks (pp. 236, 255) of the epiphytic bromeliads constantly retaining water, but in some situations, as on isolated trees or on the trees of the *cerclos*, or hedges, near Cartago, Costa Rica, we have seen them dry.

likely carried the spider to its nest after the fly had laid its eggs upon it and when they hatched the flies had eaten the contents of the nest and Mr. Champlin had broken it open at the psychological moment, as they were all in good condition.

Mr. Harbeck reported catching *Cicindela rugifrons* Dej. on a sandy path near railroad track at Manahawkin, New Jersey, IX-1. Said his nephew had taken him to a park on an island near Trenton and he had caught *C. marginipennis* Dej. along the shore about August 10th. Exhibited a specimen of *Chloromyia* from Woernersville, Pennsylvania, VIII-4-13, with abnormal center legs—these are twice as long as the others. A species of this genus is figured in Williston's Manual.

Mr. George M. Greene recorded seeing a male *Pelecinus polyturator* Dru. (Hym.) and capturing a *Scaphinotus elevatus* Fabr. (Col.) at Great Falls, Virginia, VIII-6-13. Also *Cicindela rufiventris* Dej. as common on Barren Hill at East Falls Church, Virginia, VIII-4-13.

Mr. Kaeber exhibited a small specimen of *Goes tigrina* De G. (Col.) from Philadelphia Neck, VI-21 on oak and *Trichodes nuttalli* Kirby, Red Bank, New Jersey. In discussing the former Mr. Wenzel said he had been collecting it for years in southern Philadelphia and nearby Delaware County, and had always found it on isolated trees which also contained other species of Coleoptera. He showed a very bright yellow form of *Chelymorpha argus* Licht. from Delaware County, VII-12 (both sexes). When first caught he placed them in cyanide and they quickly discolored, becoming almost black. Then he caught more specimens which he killed in wood alcohol and afterward placed in ammonia; these specimens retained their color.

Mr. Wenzel, Jr., said collecting was very good this year up to July.

Mr. Haimbach recorded the capture this year of many Noto-dontids, including *Apatelodes torrefacta* S. & A., *A. angelica* Grt., a very light form of *torrefacta* (undescribed) and ten species of *Datana*.

Adjourned to the annex.

Meeting of October 15th, 1913, at 1523 South Thirteenth Street, Philadelphia. Fifteen members present, President Haimbach in the chair.

Mr. Wenzel exhibited three boxes of Cerambycidae (*Monilema* Goes, etc.) from which only four known species were missing.

Mr. George M. Greene recorded a species of Diptera which is not in the New Jersey list: *Syrphus fisheri* Walton, from Riverton VII-9-10, collected by C. T. Greene. He also stated that he had acquired the Godfrey collection of North American Coleoptera (approximating ten thousand specimens) by gift.

Mr. Daecke said that on July 19th, 1912, Mr. H. L. Adams had pulled off a piece of hemlock bark ("about the size of your hand") at West Lenox, Pennsylvania, beneath which he found a specimen of *Scaphinotus viduus* Dej., two of *Leptura canadensis* Fabr. and two *Iphthimus opacus* LeC. (Col.).

Mr. Laurent exhibited specimens of *Chrysophanus thoe* Bd.-LeC. (Lep.) male and female, that he captured July 29, 1913, on the meadows in Philadelphia Neck, and stated that to the best of his knowledge, this butterfly had never been captured before in the vicinity of Philadelphia.

Mr. Wenzel said that they have been filling up the low ground, where Mr. Laurent had caught this species, with soil from along the river and other places and that no doubt many seeds had been transplanted in this manner, and he knew of many plants growing there now which were unknown a few years ago. He reported *Lema trilineata* Oliv. (Col.) as common in that locality both this year and last on the "jimson weed."

Mr. Hoyer exhibited a box of Coleoptera collected by boys on a camping trip on Valcour Island, New York, this year. Stated that this island is about a mile from shore in Lake Champlain, opposite the town of Valcour, Clinton County. This contained many interesting and rare species.

Mr. Harbeck recorded a species of *Ophyra* (Dip.) collected

by Mr. Hornig in Philadelphia Neck, IX-24-13, about the pig-geries. He believes this to be a species new to this locality.

Adjourned to the annex.

Meeting of November 19th, 1913, at the home of H. A. Wenzel, 4247 Ogden Street, Philadelphia. Eleven members were present, President Haimbach in the chair.

Mr. George M. Greene exhibited an odd pair of pinning forceps invented by Mr. Godfrey, which could not be patented owing to an infringement. These forceps did not seem to be much in favor with the members.

Mr. Laurent exhibited a female *Pamphila campestris* Bdv. (Lep.) that he had captured July 31st on the high meadows in Philadelphia Neck. The speaker stated that, to the best of his knowledge, this was the second record for this butterfly in the vicinity of Philadelphia; the first record was a specimen, or specimens, captured at Cobb's Creek, Pennsylvania, some twenty odd years ago by Eugene M. Aaron. Mr. Haimbach said he had taken this species here.

Mr. Daecke exhibited two specimens of the moth *Haploa lecontei* var. *dyari* Merrick, from Rockville, Pennsylvania, VI-29. Also five specimens of *Tabanus*, which at a casual glance might be taken for one species, but when relaxed the maculations of the eyes are so distinct as to show them to be all different.

Mr. Kaeber said that since recording *Trichodes nuttalli* Kirby (Col.) from Red Bank, New Jersey, at the September meeting he had found another specimen with his unmounted material from the same locality VII-4-08.

Mr. Harbeck said some papers containing tables and descriptions for separating species are very unsatisfactory, but, to prove this is not the case with all, cited the recent paper on *Neurigona* by Van Duzee. After working out the species he had, to his own satisfaction, sent them (upon request) to Mr. Van Duzee, who verified all the identifications as correct.

Adjourned to the annex.

GEORGE M. GREENE, *Secretary*.

THE CONVOCATION WEEK MEETINGS.

Entomological papers were presented to the American Association of Economic Entomologists, the Entomological Society of America, Section K (Physiology and Experimental Medicine) of the American Association for the Advancement of Science, and the American Phytopathological Society, meeting in affiliation at Atlanta, Georgia, December 29, 1913, to January 3, 1914, and to the American Society of Zoologists meeting at Philadelphia December 29 to January 1. The following list gives their titles and authors, although in a number of cases they were read by title only. Those unmarked are from the program of the Economic Entomologists, those starred (*) from the Entomological Society of America, others are followed by an abbreviation of the respective society's name.

At Atlanta the entomological hosts were the State Entomologist, Mr. E. L. Worsham, and members of his staff, Messrs. Chase, Lewis and Spooner, who tendered the visitors a smoker on the evening of January 1 and in many ways added to the enjoyment of the sojourn in the southern city. The meetings were certainly a success in attendance and in the interest evoked by the papers read.

GENERAL SUBJECTS.—J. CHESTER BRADLEY, Cornell University.—Collecting insects in the Okefenoke swamp.* PHILIP P. CALVERT, University of Pennsylvania.—The desirability of a bibliographical dictionary of entomologists.* The fauna of epiphytic bromeliads in Costa Rica.* E. P. FELT, State Entomologist of New York.—Gall Insects, The Annual Public Address.* H. T. FERNALD, Massachusetts Agricultural College.—Notes on some old European collections.* L. O. HOWARD, Washington, D. C.—The Education of the Entomologists in the Service of the United States Department of Agriculture. W. C. O'KANE, Durham, N. H.—Further Experience with an Insectary. (Some difficulties experienced, changes made, cost.)

GENERAL MORPHOLOGY AND CYTOLOGY.—A. D. MacGILLIVRAY, University of Illinois.—The structure of the thorax in generalized insects.* J. A. NELSON, Bureau of Entomology.—A pair of Tracheal Invaginations on the Second Maxillary Segment of the Embryo of the Honey Bee. (Amer. Soc. Zool.) W. A. RILEY, Cornell University.—Some sources of error in the interpretation of insect

tissue.* F. PAYNE, Indiana University.—Chromosomal Variations in the European Earwig, *Forficula auricularia*. (Amer. Soc. Zool.)

GENERAL PHYSIOLOGY.—W. M. BARROWS, Ohio State University. The reactions of the Orb-weaving Spider, *Aranea cavatica*, to Rhythmic Vibrations of the Web. (Amer. Soc. Zool.) NORMAN EUGENE McINDOO, Bureau of Entomology, The Olfactory Sense of the Honey Bee. (Amer. Soc. Zool.) E. F. PHILLIPS and GEORGE S. DEMUTH, Bureau of Entomology, The reaction of the Honey Bee to Changes of External Temperature. Instruments (Thermo-Electric Outfit) (Special Scale), used in work on Behavior of the Honey Bee. (Amer. Soc. Zool.) L. M. PEAIRS, Morgantown, W. Va. The Relation of Temperature to Insect Development. V. E. SHELFORD, University of Chicago, The Experimental Modifications of Tiger Beetle Color Patterns by Variation of Temperature and Moisture During Ontogeny. (Amer. Soc. Zool.)

GENETICS.—JOHN H. GEROULD, Hanover College, A Male Gynandromorph of *Colias (Eurymus) eurytheme* Showing Dimorphism in the Female Color Pattern. (Amer. Soc. Zool.) ROBERT K. NABOURS, Kansas State Agricultural College, Inheritance in Orthoptera. (Amer. Soc. Zool.) F. H. MOSHER, Melrose Highlands, Mass. Relation of the Number of Larval Stages to the Development of Male and Female Gipsy Moths.

INSECTS INJURIOUS TO PLANTS.—P. J. PARROTT, Geneva, N. Y., The Growth and Organization of Applied Entomology in the United States. Annual address of the President. F. L. WASHBURN, St. Anthony Park, Minn. Today's Work in Applied Entomology, (A review of recent work in economic entomology). W. E. HINDS, Auburn, Ala., County Organization in the Boll Weevil Campaign, (Information concerning organization of county agricultural advisory committees, co-ordinating and promoting all movements for rural betterment and bringing merchants and farmers, et al., into helpful cooperation). LEONARD HASEMAN, Columbia, Mo., Entomological Work in Missouri, (A brief discussion of the work which the Department of Entomology is now doing and our plans for extending the work in the future). GEORGE A. DEAN, Manhattan, Kans., Grasshopper Control Work in Western Kansas, (A brief review of the Grasshopper situation during the last three years. The serious outbreak of the summer of 1913. The organization for a systematic fight. The distribution of 1875 tons of poisoned bran mash. The result of the campaign). Z. P. METCALF, Raleigh, N. C., Report of Field Work on the South Corn Bill Bug, *Sphenophorus callosus*. A. F. BURGESS, Melrose Highlands, Mass., The Present Organization and Methods used by the Bureau of Entomology on the Gipsy Moth Work. WILMON

NEWELL, College Station, Texas, A Simple and Economical Method of Filing Entomological Correspondence, (Ordinary pasteboard letter files are used for filing and the correspondence handled by subjects in such a manner as to eliminate the use of filing cabinets, index cards, folders, and transfer cases. The file is self-indexing and has been found practical and efficient in handling correspondence for the past four years). M. A. YOTHERS, Pullman, Wash., Some New Insects of Economic Importance in the State of Washington. (A brief discussion of the occurrence of new species of "Weevils" found in destructive numbers on fruit trees in the arid regions of the State). A. E. STENE, Kingston, R. I., Some Notes on the Box Leaf Miner, (Notes on the appearance of this insect in Rhode Island. Its present distribution and observations on its life history and methods of control). R. A. COOLEY, Bozeman, Mont., Notes on two new Pests of the Currant and Gooseberry, (Notes on the life history, economic importance and means of controlling a weevil, injuring fruit of the currant and a species of thrips injuring the foliage of the currant and gooseberry). A. L. MELANDER, Pullman, Washington, Can Insects become Immune to Spraying? E. P. FELT, Albany, N. Y., The Reaction of Sugar Maples to Miscible Oils, Notes on Forest Insects. W. H. GOODWIN, Wooster, Ohio, Some Factors Affecting Results in the Use of High Temperature for the Control of Insects Injuring Cereal Products. H. T. FERNALD, Amherst, Mass., Control of the Onion Thrips and Onion Maggot. C. R. CROSBY, Ithaca, N. Y., Experiments Against the Tarnished Plant Bug as an Enemy of Peach Nursery Stock. GLENN W. HERRICK, Ithaca, N. Y., Further Data on the Control of the Fruit Tree Leaf Roller, Oviposition of two Apple Pests. W. E. HINDS, Auburn, Ala., Reducing Insect Injuries on Stored Corn, (Outlining factors predisposing to injury, extent of injury, methods of preventing and reducing it). GEO. G. AINSLIE, Nashville, Tenn., The Western Corn Root Worm in the South. C. GORDON HEWITT, Ottawa, Canada, Thrips Attacking Oats. L. O. HOWARD, United States Entomologist, Note on the present status of the Gipsy Moth parasites in New England.* J. A. HYSLOP, Washington, D. C., Soil Fumigation for Subterranean Insects. R. A. STUDHALTER, Insects as Carriers of the Chestnut Blight Fungus, (Amer. Phytop. Soc.) E. R. SASSCER, Washington, D. C., Notes on Entomological Inspection in the District of Columbia. D. M. ROGERS, Boston, Mass., The Gipsy Moth and Brown-Tail Moth Quarantine in New England. W. D. HUNTER, Washington, D. C., The Control of the Boll Weevil by Quarantine.

INSECTS INJURIOUS TO MAN.—CHARLES T. BRUES, Forest Hills, Boston, Mass., Observations on Insect Borne Diseases in Ecuador and Peru. T. J. HEADLEE, New Brunswick, N. J., Anti-Mosquito Work in New Jersey. W. E. BRITTON, New Haven, Conn., A Remark-

able Outbreak of *Culex pipiens* Linn. (Species appearing in West River, New Haven, Conn., where fish had been killed.) C. GORDON HEWITT, Ottawa, Canada, Further Observations on the Breeding Habits of the House Fly and its control. A. W. MORRILL, Phoenix, Ariz. Experiments with House Fly Baits and Poisons. (Tests of the various fly trap baits and poisons used for house flies to determine their relative attractiveness and effectiveness.) A. H. JENNINGS, Bureau of Entomology, Washington, D. C., The Entomological Aspects of the Pellagra Investigation of the Thompson, McFadden Commission. (Section K, A. A. A. S.) H. F. PERKINS, University of Vermont, The Fly, *Oestrus Ovis*, Parasitic in Man. (Amer. Soc. Zool.)

BENEFICIAL INSECTS.—LEONARD HASEMAN, Columbia, Mo., Beekeeping and Apiary Inspection in Missouri, (A brief report of the work of the State Apiary Inspector and the work which the Department of Entomology has undertaken.) The reading of papers was followed by a discussion of Apiary Inspection in the United States. Subject: The Relation of the Inspection of Apiaries to other Factors for the Education of the Beekeeper. J. W. MCCOLLOCH, Manhattan, Kans., Notes on the Life History, Distribution and Efficiency of the Egg Parasite of the Chinch Bug. (This paper dealt with the length of the life cycle, number of broods, habits, distribution in Kansas, and percentage of parasitism at various times during the summer.) H. E. HODGKISS and P. J. PARROTT, Geneva, N. Y., The Parasites of the San Jose Scale in New York, Species and Distribution. OTTO H. SWEZEY, Honolulu, Hawaii, Notes on Parasites in the Hawaiian Islands. WILLIAM MOORE, University of Minnesota. —A comparison of the enemies of *Toxoptera graminum* in South Africa and the United States.*

ORTHOPTERA.—P. J. PARROTT, New York Agricultural Experiment Station. Studies on the Snowy Tree-cricket, *Oecanthus niveus*, with references to apple bark diseases.* E. L. WORSHAM, State Entomologist of Georgia. Some notes regarding the natural history of the mole cricket.*

PLATYPTERA, NEUROPTERA, ODONATA.—J. S. HOUSER, Ohio Agricultural Experiment Station, *Comventzia hageni* Banks, life-history notes and variations in wing venation.* J. T. LLOYD, Cornell University, The structure of the hind intestine of *Corydalis*.* See also Coleoptera.

HEMIPTERA, THYSANOPTERA.—HERBERT OSBORN, Ohio State University, Studies on the geographical distribution of leaf-hoppers, especially of Maine.* The box elder bug in Ohio. R. W. LEIBY, Cornell University, Notes on the external anatomy of some Pentatomidae.* R. D. WHITMARSH, Wooster, Ohio, The Life History of the Green Soldier Bug, *Nezara hilaris*. ALVAH PETERSON, University of Illinois, Notes on the head structures of Thysanoptera.*

COLEOPTERA.—A. F. CONRADI, Clemson College, A little known wire-worm, *Horistonotus uhleri*.* ROBERT MATHESON, Cornell University, Life-history notes on *Psephenus lecontei* and *Hydroporus septentrionalis*.* C. L. METCALF, Raleigh, N. C., The Egg Laying Habits of the Pecan Twig Girdler, *Oncideres cingulatus* Say. V. E. SHELFORD, University of Chicago.—The elytral tracheation of the sub-families and genera of Cicindelidae.* The sequence of color changes during ontogeny in *Cicindela*.* E. L. WORSHAM and J. CHESTER BRADLEY, Office State Entomologist of Georgia, Exhibit of Collections of Coleoptera and Odonata from Georgia belonging to Georgia State Board of Entomology.*

LEPIDOPTERA.—L. S. BARBER, Cornell University, The biology of *Gelechia gallaesolidaginis* with some reference to some of its parasites.* STANLEY B. FRACKER, University of Illinois, New characters in the classification of microlepidopterous larvae.* ARTHUR GIBSON, Ottawa, Canada, A New Destructive Cutworm of the Genus *Porosagrotis* Occurring in Western Canada. (Preliminary note on the occurrence and destructive nature of a new enemy of Cereals.) H. A. GOSSARD, Wooster, O., The Lesser Peach Borer, *Sesia pictipes*, (Life history studies in the Lake Erie fruit belt.) CORNELIA F. KEPHART, Cornell University, The poison glands of *Euproctis chrysorroea* Linn.* EDNA MOSHER, University of Illinois, Some interesting structures in the pupae of the Lepidoptera.* F. B. PADDOCK, College Station, Texas, Life History of the Bee Moth or Wax Worm, (A brief review of the life history of this insect as established by experimental work at College Station, Texas. There are in this latitude three generations. Carbon bisulfide has been found to be effective in the control of this pest.) N. L. PATRIDGE, University of Illinois, The tracheation of the anal area of the wings of the Lepidoptera and the homology of the veins.*

DIPTERA.—LEONARD HASEMAN, University of Missouri, The life-history of a species of Psychodidae.* C. GORDON HEWITT, Ottawa, Canada, The Occurrence of the Warble Fly, *Hypoderma bovis*, in Canada. PAUL S. WELCH, Kansas Agricultural College, Observations on the habits and life history of *Hydromyza confluens* Loew.* JAMES ZETEK, Panama Canal Commission, The dispersal of *Musca domestica*.*

OBITUARY.

DR. GEORGE WILLIAM PECKHAM, known for his work on spiders and on wasps, died January 11, 1914, at Milwaukee, Wisconsin. We hope to present a notice of his life in a later issue.

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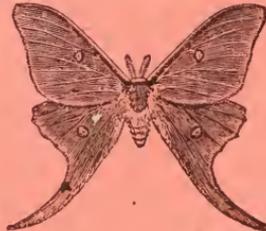
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New American Bees of the Genus *Halictus* (Hym.).

By MRS. MARION DURBIN ELLIS, Boulder, Colorado.

The following new species of bees belonging to the subgenus *Chloralictus* Robertson were described in the zoological laboratory of the University of Colorado. The material and types are in the collection of Prof. T. D. A. Cockerell, except where otherwise stated. I wish to thank Prof. Cockerell for his direction in this work and for comparing some bees with types in the National Museum.

Halictus zophops sp. nov.

♀ Length 6.7 mm. Head and thorax dark green; abdomen black with metallic green reflections.

Facial quadrangle a little longer than broad, clypeus produced for about two-thirds its length beyond the eyes. Face very closely and rather coarsely punctured above the antennae, less so on the lateral areas and supraclypeal area; clypeus mostly black, somewhat shiny, and very little punctured. Antennae entirely black.

Pleurae opaque and punctured but without coarse sculpture. Metapleura with very weak cross plicae throughout its length. Mesonotum finely lineolate, the fine sharp punctures scattered in the middle but very close and crowded on either side and in front of the distinct parapsidal groove and along the posterior margins. Scutellum with a sharp, closely punctured median groove. Truncation of the metathorax with a salient rim, the surface with numerous weak striae radiating upward and outward from the center of the base; basal area without a rim, the edge lineolate, rounded and elevated in the middle, central plica a little stronger than those immediately on either side of it and appearing as a stem from which the others branch off at right angles, plicae at the sides strong and continued over the sides of the segment. Tegulae shiny, reddish brown, paler in front.

Wings a little brownish; stigma and nervures light brown, costal nervure darker.

Legs entirely black, with rich golden brown pubescence.

Abdomen broad; finely punctured throughout; apical margin of the segments broad, finely lineolate, not paler than the rest of the segments, discs of the third to fifth segments and sides of the first and second segments with scant yellowish pubescence.

Pubescence rather scant throughout, ochraceous above, paler beneath.

Habitat.—Boulder, Colorado. 1 (type) at flowers of *Pulsatilla hirsutissima* (Pursh) Britton, April 13, 1913 (M. D. Ellis.)

This species is closely related to *H. versatus* Robertson and *H. euryceps*, as is shown by the type of the metathorax and the crowding of the punctures of the mesonotum about the parapsidal grooves. It is distinguished from both of these species by the produced clypeus and the longer face, by the metallic reflections on the abdomen and by the wholly black legs.

Halictus euryceps sp. nov.

♀ Length 7 mm. Head and thorax dark blue green or greenish blue, abdomen dark brown to nearly black.

Head broad, face round, a little broader than long, with strong close punctures and sharp lineolation; clypeus not produced. Antennae entirely blackish brown.

Mesonotum opaque, with fine scattered punctures, becoming crowded in the area just to either side of the parapsidal grooves and along the posterior margin, finely and sharply lineolate. Disc of the metathorax with a low, sharp rim on either side below; basal area entirely without a rim, with relatively few, simple plicae usually reaching the margin

on the sides, surface very finely lineolate. Tegulae dark brown, impunctate.

Wings brownish hyaline, stigma and nervures dark transparent brown.

Legs black at the base, shading to dark reddish brown on the tarsi.

Abdomen broad and rather blunt, almost black, the margins of the segments never lighter than the rest of the dorsal surface; the third, fourth and fifth and a triangle at the sides of the second segment covered with pale grayish white hair which is faintly tinged with buff only around the anal rima.

Pubescence elsewhere rather scant, white on the pleurae and somewhat reddish buff on the legs.

Habitat.—Beulah, New Mexico, altitude 8000 feet, 1 (type) and nine others, the end of August; 1, July 16; 1, at flowers of *Heracleum lanatum*, July 24; 2, nesting, July 27; 2, on foliage of *Veratrum*, Aug. 3, 1902; 1, Aug. 16; 1, Aug. 18 (T. D. A. Cockerell); 6, at flowers of *Polemonium* aff. *coeruleum*, Aug. 18; 6, August 18, 1, August 16; 2, August 24; 4, August 25, 1899; 3, August 28, 1899; and 10, (W. Porter); Santa Fé, New Mexico, 1, at flowers of *Solidago canadensis*, September 20 (Cockerell); Dailey Canon, New Mexico, 1, August 10 (W. P. & T. D. A. Cockerell); Green Mountain Falls, Colorado, 1, August 11 (J. W. Frey); Copeland Park, 1, September 6, 1907 (S. A. Rohwer); White Mountains, New Mexico, north fork of Rio Ruidoso, altitude 8200 feet, 1, at flowers of *Solidago trinervata*, August 17 (Townsend); 1, Beulah, New Mexico, at flowers of *Frasera*, July 7 (W. P. Cockerell). All the specimens enumerated, except the type, are to be considered cotypes.

This species is very closely related to *H. versatus* Robertson from which it differs in the dark, not testaceous tegulae, the brownish wings, the lack of paler margins on the abdominal segments, the grayish white, not yellowish, abdominal pubescence, and the dark tarsi. *H. versatus* is a widely distributed and very variable species; it is therefore not safe to say that the few plicae on the basal area of the metathorax of *H. euryceps* separates it from *H. versatus*, although these plicae are usually much more numerous in the case of *H. ver-*

satus. The same is also true of the larger size which is almost constant for *H. euryceps*. *H. zophops* is also closely related to *H. euryceps* and *H. versatus*, but differs from both in the produced clypeus and the faintly metallic tinge of the abdomen.

***Halictus jamaicae* sp. nov.**

♀ Length 4 to 4.5 mm. Head, pleurae and metathorax dark metallic green, mesonotum more brassy, sometimes with a coppery reflection; abdomen shiny piceous.

Facial quadrangle square, clypeus produced less than one half its length below the eyes; face somewhat shiny, although finely lineolate throughout and with numerous fine punctures, especially close above the antennae; lateral areas of the face with whitish pubescence: distal half of the clypeus very dark brown.

Mesonotum sharply and finely lineolate; the punctures fine and scattered, except in the areas just outside of the parapsidal grooves and along the posterior margin, where they are closely crowded; median groove distinct. Entire basal area of the metathorax very distinctly lineolate; the margin elevated for only a short distance on either side of the middle; rugae weak, turning laterally on either side of the short middle ridge and continued over the side of the segment. Tegulae testaceous, impunctate.

Legs dark brown to black, knees and tarsi all testaceous.

Wings faintly dusky; stigma and nervures dark brown.

Abdomen rather slender, the first, second and third segments a little inflated on either side, just above the broad apical margins; black with brown or sometimes faint metallic reflections, very shiny in spite of the very fine, shallow and close punctures; apical margin of each segment dark testaceous, impunctate.

Pubescence scant; slightly buffy on the legs, the fifth abdominal segment, the mesonotum and the free margin of the clypeus, white on the lateral areas of the face, the cheeks and the pleurae.

♂ 4.5 to 5 mm. long. Quite like the female; the abdomen more slender, the apical margin of each segment narrow and distinctly constricted; face triangular, clypeus more produced, entirely green and evenly punctured like the lateral areas of the face, mesonotum less lineolate. Tegulae dark brown, a very little elongate and slightly pointed behind, a few weak punctures along the posterior margin, otherwise impunctate. Second submarginal cell little more than one-half as long as the third. Face and cheeks more pubescent.

Habitat.—Liguanea Plain, Jamaica, females 1 (type) and 6 cotypes, males 5 cotypes (C. T. Brues); 3 cotypes of the male (Mrs. C. T. Brues); November and December, 1911.

This species is related to *H. coactus* Cresson by the similar-

ity of the tegulae of the male; the metathorax is rather similar in the two species and the constriction of the abdomen so pronounced in Cresson's species is present in the male and indicated in the female of the present species. *H. jamaicae* differs from the older species in the finer and more scattered punctures of the mesonotum and in the dark brown, not honey colored, stigma and nervures.

In the present connection the relationship of *H. coactus* to the species of the *tegularis* group might be discussed. This relationship was suggested by the form and sculpture of the tegulae of *H. coactus* and *H. tegularis* Robertson; in both species the tegulae are longer than the average for the genus and distinctly pointed behind, the point turning mesially. In *H. tegularis* the entire surface of the tegulae is coarsely and closely punctured, while in *H. coactus* a large central space is bare and shiny; behind the punctures are like those of *H. tegularis*, but in front they are a little finer. The second and sometimes the third abdominal segment in *H. tegularis*, *H. pseudotegularis* Cockerell, and *H. tegulariformis* Crawford, show the inflation on either side just above the apical margins as in *H. jamaicae*, but to a less degree. The mesonotum in all five species mentioned is sharply lineolate; and the knees and tarsi in all five are somewhat paler than the rest of the legs. In the light of the relation of *H. coactus* to *H. jamaicae* the *tegularis* group is brought nearer to the rest of the genus.

Halictus deceptor sp. nov.

♀ Length 5 mm. Head and thorax blue-green, not brassy, abdomen black.

Face closely punctured, a little longer than broad, clypeus produced two-thirds of its length beyond the eyes.

Mesonotum shiny, with very fine punctures, well scattered in the middle, but quite crowded on either side of the parapsidal groove. Truncation of the metathorax rather broad, unsculptured and with shiny rounded edges; the basal area with no indication of a rim, and with but few, very short, weak and simple plicae reaching one-third of the distance to the margin; its surface shiny, although somewhat lineolate. Tegulae dark brown, shiny.

Wings dusky brown, the stigma and nervures very dark brown.

Legs blackish, shading into dark brown on the tarsi.

Abdomen shiny black, the disc of the first segment impunctate, the rest with very fine scattered punctures.

Pubescence very scant, a few fine whitish hairs on the sides of the third to fifth abdominal segments, on the lateral areas of the face, the cheeks and the pleurae, hair of tarsi yellowish.

Habitat.—Quirigua, Guatemala. 1 (type) and 1 co-type, February and March, 1912 (W. P. Cockerell, at flowers of 21).

This species was at first confused with *H. exiguus* Smith, which it closely resembles in size and character of the metathorax; and from which the produced clypeus, dark tegulae and legs and a closely punctured area on either side of the parapsidal grooves separates it. If it is considered as closely related to *H. exiguus*, it must go into the group with *H. zephyrus*, but all the members of this group have the clypeus short and the punctures of the mesonotum scattered. It is probable that this species really belongs in the group with *H. hortensis* Lovell and *H. jamaicae*, both of which have a very similar pattern of punctures on the mesonotum; while *H. sparsus* Robertson, and *H. tenuis* Ellis, of the same group, have a produced clypeus; the loss of a few plicae would make the metathorax of *H. hortensis* resemble that of *H. deceptor*.

Halictus perparvus sp. nov.

♀ Length 3 mm. Head and thorax dark blue green, mesonotum olive green, with brassy tints.

Head round; clypeus produced; face finely and closely punctured, and sharply lineolate, except on the clypeus and supraclipeal area; front a little inflated just above and to either side of the short median carina.

Mesonotum finely lineolate, finely and quite closely punctured, the punctures a little coarser and somewhat crowded along the posterior half of the deep median groove and on either side of the parapsidal grooves. Scutellum finely and closely punctured. Basal area of the metathorax lineolate, the surface of the numerous, weak, indistinct plicae finely granular, the middle plica stronger and reaching the truncation; the narrow rounded margin slightly elevated on either side of the middle but not forming a rim; plicae continued on to the sides of the segments laterally. Tegulae dark brown, shiny, but with very fine rather close punctures.

Wings somewhat dusky, stigma and nervures grayish testaceous; second submarginal cell much smaller than the third.

Legs dark brown.

Abdomen dark aeneous-brown, all the segments except the fifth distinctly inflated on either side just above the broad apical margin; margin of the segments lineolate but not punctured or different in color from the rest of the segments. Discs of all except the first segment with very fine punctures. Last three segments very scantily pubescent along the apical margin.

Pubescence very scant, distinctly buffy on the legs.

Habitat.—Phoenix, Arizona (Kunzé), 1 (type), a second specimen, similarly labeled but badly broken.

This species is probably related to *H. tegularis* Robertson and the other small species with more closely punctured tegulae, from which the finer more scattered punctures of the tegulae, the dusky wings, and the smaller size distinguish it. The inflation on the sides of the abdomen relates it to *H. coactus* Cresson, and *H. jamaicae* Ellis. *H. perparvus* is the species recorded from Arizona as *H. pseudotegularis* by Cockerell in Canadian Entomologist, 1898, p. 237.

***Halictus crassiceps* sp. nov.**

♀ Length 6 to 7.5 mm. Head and thorax dark greenish-blue, abdomen very dark brown to black.

Head variable in actual size, usually as broad as the thorax, sometimes broader in large specimens; facial quadrangle almost square, a little shiny, finely and closely punctured above the antennae, the punctures more scattered over the lateral areas of the face, median carina very short, supraclypeal area narrow and well elevated; clypeus very short, not at all produced. Cheeks full, shiny, finely punctured, and openly lineolate.

Thorax finely roughened on the sides; metapleurae with fine regular plicae over the upper half; mesonotum very smooth and shiny, usually without lineolations, very finely and very sparsely punctured; median and parapsidal grooves distinct but not deep. Truncation of the meta-thorax with distinct lineolations and coarse scattered punctures; a small, impunctate, triangular area at the middle of the upper margin; basal area broad and concave, without a salient rim except near the middle; the surface lineolate, and with relatively few, fine, sharp, simple or branched rugae, well separated from each other and usually reaching the edge, the middle one stronger and simpler. Tegulae testaceous, impunctate and shiny.

Wings hyaline, a little milky, stigma and nervures pale honey color, costal nervure darker.

Legs black, tarsi dark testaceous.

Abdomen shiny, all of the segments margined with testaceous, segments 1 and 2 almost impunctate, segments 3 to 5, and sides of segment 2 covered with thin, closely appressed, grayish white hair.

Pubescence rather scant, whitish on the sides of the thorax and under sides of the abdomen, faintly grayish on the lateral areas of the face, cheeks and legs, darker on the post scutellum.

Habitat.—Mesilla Park, New Mexico, 1 (type) at flowers of *Sophia ochroleuca* Wooton, March 18 (Cockerell No. 5661); Paraje, New Mexico, 1 at flowers of plum, April 11 (Ckll.); Las Cruces, New Mexico, 2 at flowers of plum, March 23 and 25 (Ckll.); Mesilla Park, April 12, 1 at *Sophia* (Ckll. 2686f); Albuquerque, New Mexico, August 16, 1 at flowers of *Aster spinosus* Bentham (Ckll. 4548); Bernalillo, New Mexico, July 1-2, 1 (Ckll. No. 3269).

Three specimens differ from the type lot by having the mesonotum faintly but distinctly lineolate. Habitat, Colorado Springs, Colorado, 2 on willow, April 20 (W. P. Cockerell); Boulder, Colorado, 1 on Virginia creeper, July 17, 1908 (W. P. Cockerell).

This species is probably related to *H. zephyrus* Smith, from which it is distinguished by the wholly nonmetallic abdomen, the blue, not brassy head and thorax, and the longer plicae on the basal area of the metathorax. The punctures of the mesonotum are not crowded around the parapsidal grooves in *H. crassiceps* as in *H. zephyrus*. The perfectly hyaline wings, the pale tegulae and the lineolate cheeks as well as the nonmetallic abdomen separates it from *H. umbripennis* Ellis.

(To be continued.)

Bibliography of Diptera.

I am keeping a card index of the literature of North American Diptera. The number of references has approximately doubled since the publication of my catalogue in 1905, and new matter is now being published in greater volume than ever, especially on the biological phases of the subject. I have a good deal of trouble in finding all the articles, as I am not situated where I have access to an extensive scientific library. It becomes necessary therefore to request and urge that workers in Diptera furnish me with separates of their articles, whether taxonomic or otherwise. In return I will furnish my own separates as far as possible, or will look up bibliography; as far as my time allows will determine species.—J. M. ALDRICH, 238 S. Grant St., La Fayette, Ind.

Notes on Habitats of Grasshoppers at Douglas Lake, Michigan (Orth.)

By ARTHUR G. VESTAL, University of Colorado.

A list of the *Orthoptera* at the summer biological station of the University of Michigan has been published,¹ but no records of dates or habitats have been included. During the summer of 1912 the writer collected *Acridiidae* at Douglas Lake, in Cheboygan County, seventeen miles south of the tip of the southern peninsula. In addition to records and habitat notes obtained, six species were taken which had not been listed from the region. The *Tettiginae* collected were few, and the notes below refer only to members of our other three sub-families.

Douglas Lake is irregular in contour, and about four miles long. The beach is narrow, in many places wanting. More than half the area adjoining the lake is sandy burnt-over pine lands, now occupied by open woodland of large-toothed aspen, with undergrowth of bracken fern and blueberry. Clay morainic lands are partly under cultivation, but mostly occupied by hardwood forest of beach, maple and hemlock, or by hardwood clearing. There are also grassland areas, meadows and sedge growths, cedar bogs, and open peat bogs.

Subfamily TRYXALINAE.

Chloealtis conspersa (Harris). July 25, 1912, in small opening in hardwood forest, on shrubbery; July 25, open hardwood forest, on sandy loam surface; July 30, hardwood clearing; Aug. 11, aspen forest, shaded lichen-covered surface. The species is typical of thickets, open forest situations, clearings and forest borders, depending upon wood, as is well known, for egg-laying sites. It is not found in numbers. Not formerly known in the region.

Stenobothrus curtipennis (Harris). July 30, on willow shrubs in moist swale of sand-bar; Aug. 9, moist weed-patch near tile drain in cultivated field; Aug. 11, beach-grass dunes. (This locality, on the lake shore, is unusual for the species. Occasional specimens were washed ashore and picked up alive on the beach. The single beach-grass specimen may have come from the lake); Aug. 11, grassy border

¹ Woodward, Alvalyn E. The *Orthoptera* collected at Douglas Lake, Michigan, in 1910. Mich. Acad. Sci., vol. 13, pp. 146-167. 1911.

between sedge bog and forest; Aug. 12, abundant in meadow-marsh adjoining brook, in tall sedges and grasses; Aug. 12, wet meadow, abundant in blue-grass, white clover, sedges; August 12, in aspen forest. Typically found in humid grassland, and usually on the plants, not on the ground.

Subfamily OEDIPODINAE.

Arphia pseudonietana (Thomas). July 27, hay field, dry and sandy; Aug. 11, open sandy area near beach; Aug. 11, open parts of aspen forest, mostly on sandy road; Aug. 12, numerous along road through aspens; Aug. 14, very abundant in extensive dry blue-grass growth. A species of many and varied habitats, more abundant in open, dry, sparsely vegetated areas. Not recorded from the northern peninsula. More frequently seen on bare soil surfaces.

Camnula pellucida (Scudder). July 8, dry bluegrass in open aspen forest; July 12, open aspen forest; July 20, sparse grassy growth near beach, numerous; July 25, open hardwoods, on sandy loam, abundant; July 25, deeply shaded hardwoods, very few, in adjoining clearing much more numerous; July 30, moist swale, one specimen; July 30, open sand-bar; Aug. 1, dry pasture, very abundant; Aug. 9, dry pasture, abundant; Aug. 9, stubble-field; Aug. 11, open aspen growth, more abundant in sandy roadways; Aug. 11, beach-grass dunes, numerous; Aug. 12, open parts of aspen woodland; Aug. 14, dry bluegrass, very abundant. Abundant in dry, unforested habitats. The second species of the region in abundance.

Hippiscus tuberculatus (Palisot de Beauvois). June 28, bare and sparsely vegetated sand near beach; July 3, open areas and bare sand in aspen forest, and in sandy roadways; July 8, dry bluegrass in open aspen forest; July 10, clay roadways through hardwood forest and farming district. Not hitherto listed from the region.

Dissosteira carolina (Linnaeus). July 20, roadway in aspens; July 25, open hardwoods; July 27, hayfield, dry and sandy, nymphs; July 30, hardwood clearing; July 30, bare sand-bar; July 30, grassy swale; Aug. 1, dry pasture, numerous; Aug. 9, dry stubble-field; Aug. 10, nearly bare sand near beach; Aug. 11, open aspen growth. In this region, as in others, the species appears to be more abundant in cultivated or waste fields than in native habitats.

Spharagemon bolli Scudder. July 12, sparsely vegetated sand near beach; July 22, sandy roadways through aspens; July 24, open parts of aspen forest; July 25, open hardwoods, sandy loam slope; July 25, deep hardwoods, in shade, one specimen; July 30, hardwood clearing, very numerous; Aug. 11, open aspen growth; Aug. 11, sandy road through aspens; Aug. 12, roadway through aspens. Usually associated with sandy loam in forested regions. Not recorded from the northern peninsula.

Scirtetica marmorata (Harris). July 22, aspen forest, in undergrowth of bracken and blueberry, rather numerous; July 24, rather open area, aspen forest, on lichen surface, several specimens; Aug. 10, open grassy situation, one specimen; Aug. 12, lichen surface in aspen forest, numerous locally. In the region the species appears to be associated with lichen surfaces in rather open situations, somewhat after the manner of *Trimerotropis saxatilis* McNeill. The markings of *Scirtetica* give it much the general appearance of the lichens on which it rests.

Circotettix verruculatus (Kirby). July 7, open aspen growth; July 10, dusty road in hardwood district; July 25, deep hardwoods, in shade, one specimen; July 30, hardwood clearing; Aug. 9, sandy roadway; Aug. 11, open aspens; Aug. 12, dry bluegrass, sandy loam soil; Aug. 12, roadway through aspens, numerous; Aug. 14, roadways through dry bluegrass.

Subfamily ACRIDIINAE.

Podisma glacialis variegata Scudder. No specimens of this wingless grasshopper were taken by the writer. The only record, kindly furnished by Miss Alvalyn E. Woodward, reads, "Two specimens, one male, one female, collected August 20, 1910, Carp Creek, state road, by A. S. Pearse." These specimens were determined by Mr. A. N. Caudell as *Podisma variegata* Scudder. The writer has examined one of them. Carp Creek is in a deep forested ravine.

Melanoplus islandicus Blatchley. July 25, beech-maple-hemlock forest, dense shade, thick leaf-mulch, adults and nymphs; July 26, deep hardwood forest; July 30, deep hardwood forest; August 12, cedar bog, dense shade, moist *Sphagnum* surface. All the specimens come from deep, moist forest. The species is recorded from Ontario; La Salle Island, in Lake Huron; and from the northern peninsula, but not hitherto from the southern peninsula.

Melanoplus fasciatus (Barnston-Walker). July 20, advanced stage of aspen forest, under the taller trees, aspen, birch, maple; July 22, in shady moss-grown parts of aspen forest; July 24, aspens, common in shaded places; August 11, aspen growth; August 11, open bluegrass in sand, adjoining aspen forest; August 11, shaded part of aspen growth; August 12, aspens, shaded lichen surface. These records are all for the short-winged form, *M. f. curtus*. One male of the long-winged form, *M. f. volaticus*, was taken August 12, in sandy loam, adjoining a grove of hardwoods. The species had not been listed from the region.

Melanoplus atlanis (Riley). July 8, 20, 22, 23, 25, 30; August 1, 9, 11, 12, 14. Open parts of aspen forest, particularly in dry bluegrass along roadways; hardwood clearings, very abundant; black-

berry-maple thickets in hardwood cuttings; open hardwood forest; deep hardwood forest, rare; nearly bare sand-bar; dry bluegrass in sandy loam, very numerous; dry pastures, very abundant; stubble-fields; tall meadow-grass near brook; wet bluegrass-white clover meadow. This is the most abundant and most generally distributed species in the region.

Melanoplus femur-rubrum (De Geer). No specimens were taken by the writer. Miss Alvalyn E. Woodward has furnished the following information: "*Melanoplus femur-rubrum* was first collected August 8. From that time on it was found in nearly all collections from dry meadows." The species usually selects moister and less sandy habitats than those in which *M. atlanis* is most abundant.

Melanoplus angustipennis (Dodge). July 1, open aspen growth, near beach; July 6, aspens near bench; July 20, open sandy parts of aspen growth, among plants of bracken and blueberry, numerous; July 22, bracken-blueberry growth in aspens; August 11, open aspen forest; August 11, beach-grass dunes; August 11, bluegrass in aspen forest; August 11, in aspens, bracken-blueberry growth; August 12, aspen forest, open parts; August 14, dry bluegrass growth, few. In more sandy ground than *M. atlanis* selects. Not listed from any of the other localities in Michigan, nor has it been recorded from the region studied. Known from Ontario, however.

Melanoplus minor (Scudder). July 30, in hardwood clearing, one male. The only record for the Douglas Lake region. Not recorded from the northern peninsula.

Melanoplus luridus (Dodge). July 6, aspen forest, open parts near beach; July 22, aspen forest; July 30, hardwood clearing; August 11, aspen forest, open growth. A species of dry grassland and dry open woodland. It is seldom taken in abundance.

Melanoplus differentialis (Thomas). Aug. 1, pasture, nymphs; August 9, dry stubble-field, nymphs; August 11, bluegrass in aspen forest, nymph; August 12, tall meadow-grass near brook, adults; August 12, wet bluegrass-white clover meadow, adults. Not abundant in the region, being near the northern limit of its range. Not recorded from the other Michigan localities.

Melanoplus bivittatus (Say). July 8, 11, 20, 25, 27, 30; August 9, 11, 12. On beach, sparse grasses; beach-grass dunes; dry blue-grass, sandy loam soil; dry stubble-field; aspens, in bluegrass; aspens, open situations; tall meadow-grass near brook; moist swale, few; hardwood clearings, abundant; deep hardwoods in shade, few. All belong to the red-legged form, which is known as *M. femoratus* (Burmeister) and *M. bivittatus femoratus* Scudder. Abundant and generally distributed within the region.

Insect records for the State of Michigan are few. The writer is acquainted with lists of *Orthoptera* from but four other localities in the State. These are the Saginaw Bay region;² the Keweenaw Bay region, Baraga County, northern peninsula,³ the Porcupine Mountains region, Ontonagon County,⁴ and Isle Royale.⁵ The grasshopper faunas of northern and southern extremes of the State are quite different, the Douglas Lake fauna being intermediate in character. In general the habitats recorded for the species in other localities are very similar to those observed at Douglas Lake, often being identical.

Euptoieta claudia at Montreal (Lep.).

On September 23rd, 1913, I captured just outside the Canadian Pacific Railway locomotive shops here, a male specimen of *Euptoieta claudia* and on September 25th close to the same spot, a female specimen of the same species. The latter was, however, malformed, one of the lower wings being undeveloped. I note that in "The Butterfly Book," by W. J. Holland, the range of this species is given only as far north as the Middle New England States and that it is very rare there. It struck me that possibly these two specimens had been accidentally transported from the southern states in either the larval or pupal stages on freight cars, of which there are always a large number in the adjoining works, and that the imagines upon emerging had sought the nearest piece of waste land, which is covered with bushes and young birch and maple trees.

The female was apparently ovipositing when I caught her, though I had no time to search for the ova. Hence it is just possible, if the ova can withstand the Canadian winter, that larvae may be found next year in the same locality.—H. M. SIMMS, 192 Ontario, East, Montreal, Canada.

[*E. claudia* has been reported from Canada, including Winnipeg, Man.—H. S.]

² Shull, A. Franklin. *Thysanoptera* and *Orthoptera*. In Ruthven, A. G., a biological survey of the sand dune region on the south shore of Saginaw Bay, Michigan. Mich. Geol. and Biol. Surv., Publ. 4, Biol. Ser. 2, pp. 217-231. 1911.

³ Rehn, J. A. G. Notes on the Orthoptera of the Keweenaw Bay region of Baraga county, Michigan. (Collections by Morgan Hebard). Ent. News, vol. 15, pp. 229-236, 263-270. 1904.

⁴ Morse, A. P. The ecological relations of the *Orthoptera* in the Porcupine Mountains, Michigan. (Collections by A. G. Ruthven.) In Adams, C. C., An ecological survey in northern Michigan. Rept. State Board of Geol. Surv., pp. 68-72. Lansing, 1906.

⁵ Morse, A. P. Report on the Isle Royale *Orthoptera* of the 1905 expedition. (Collections by H. A. Gleason and C. C. Adams.) In Adams, C. C., An Ecological survey of Isle Royale, Lake Superior. Published by the Geol. Surv., pp. 299-303. Lansing, 1908.

In connection with the above paper see also:

Gleason, H. A. The ecological relations of the invertebrata fauna of Isle Royale, Michigan. In Adams, C. C., loc. cit., pp. 57-78. 1908.

A New Coccid from Arizona (Hemip.).

By T. D. A. COCKERELL, University of Colorado, Boulder, Col.

Recently Mr. O. C. Bartlett sent me some specimens of a large Coccid collected by Dr. A. W. Morrill in the Verde Valley, near Jerome, Arizona. The small piece of the food plant sent is superficially just like *Viborquia spinosa* (Engelm.) Ckll., but certainly different, as the leaflets are strongly inequilateral and do not possess dark gland-dots beneath. The Coccid is a very distinct new species of *Monophlebinae*.

Palaeococcus morrilli n. sp.

Females solitary on small branches; about 7 mm. long, 5 broad, 4.5 high; globose, tapering posteriorly into a tail, so that the whole shape is pyriform; dark plumbeous, coated with white mealy secretion, which does not wholly hide the dark surface; down the middle of the abdomen and at the extreme sides are more or less distinct tufts of secretion. The structure of the antennae, legs, etc., is as usual in the genus; antennae ten-jointed, the joints measuring as follows in microns: (1) a ring, not readily measured, (2) 140, (3) 115, (4) 75, (5) 57, (6) 90, (7) 100, (8) 100, (9) 100, (10) 190.

Larva bright red, with black legs and antennae. Antennae 6-jointed, the joints measuring in microns: (1) 55, (2) 72, (3) 80, (4) 57, (5) 57, (6) 170. On the last joint are long hairs, the longest about 400 microns. At the caudal end of the abdomen are two hairs about 480 microns long, then on each side of these a pair about 1,000 microns long, and anterior to these, along the margin, four curled hairs about 480 microns long.

The species is readily known by its large size and produced tapering abdomen, as well as the 10-jointed antennae. The adult antennae are very much larger than in *P. hempeli* or *P. rosae*. Compared with *P. townsendi*, the antennae are much more slender, with the subapical joints proportionately longer, and the third and fourth joints not nearly so robust. The larva also has more slender antennae than that of *townsendi*.

Dr. Skinner in Cuba.

Dr. Henry Skinner, Editor Emeritus of the NEWS, and Mrs. Skinner have been spending the month of February in Cuba, collecting insects, most of the time as guests of Mr. and Mrs. C. P. Ramsden at Guanatanamo, in the eastern part of the island. This is Dr. Skinner's first experience in the tropics.

Species Limits in the Genus *Lucilia* (Dipt.).

By CHARLES H. T. TOWNSEND, Lima, Peru.

The paper by Mr. John D. Tothill on variation in North American *Lucilia* spp. (Ann. Ent. Soc. Am., vol. 6, pp. 241-256) is excellent so far as it goes. The number of specimens examined is pitifully small. Until work of this general nature, but on a much more extended scale, has been done and verified for any given group of muscoid species, we shall not know what are the species limits within that group. It is quite possible that the ten species of *Lucilia* in question are largely variations of previously described species, but the evidence presented is not conclusive in all the cases. The results deduced from the rearings of *L. sericata* carry a certain slight amount of weight; the others mean almost nothing.

The isolation of any form by means of a name and description becomes at once a challenge to all interested to test the form in question and determine its standing. Such work is perfectly legitimate, but it must be done with care and full attention to details in order to exclude possible sources of error. The capacity for exact results of the plan followed in the above paper is very questionable. An isolated egg-mass, not followed through its entire deposition, carries no positive assurance of all the eggs therein being the product of a single female fly. If left undisturbed, the female of *Lucilia* usually deposits at one sitting the entire matured product of both ovaries, which is to say one egg from each ovariole. But this takes considerable time and the flies may easily be disturbed from a variety of causes, resulting in a partial deposition by one female, which is added to by another. The writer has noted hundreds of thousands of eggs deposited by *Lucilia* females in continuous masses, often plastered over each other tier upon tier, which showed no line of separation between the products of different females. The only safe plan to pursue in this work is to rear adults from puparia, mate like individuals, isolate the gravid females and furnish them proper food materials for oviposition, rear the progeny, mate these again similarly, rear their progeny, etc. Every specimen in the en-

tire series of all the generations must be examined and all of its external characters tabulated. Thousands and not hundreds of specimens need to be dealt with.

There is no doubt that much variation prevails in the chaetotaxy of certain groups, and the limits of this variation need to be determined. It needs to be determined also to what extent macrochaetal variations are inheritable. Clean strains must be used for this work. Gravid females taken in the open will not suffice, still less will egg masses found in the open. The writer has not the time at present to verify the results presented in the above paper, but he notes a few glaring discrepancies which need immediate correction.

1. *Lucilia morrilli* T. is said to be, type and cotypes throughout, *Pseudopyrellia cornicina*. It is manifestly quite impossible that the latter species should have been determined by the writer as *Lucilia*. If page 50, Tax. Musc. Flies, is turned to, it will be seen that *Ps. cornicina* is there recorded as without hypopleural hairs and with fourth vein arcuate at bend. *Lucilia* shows opposed characters. The conclusion is inevitable that the specimens of *Ps. cornicina* in question are not the specimens on which *L. morrilli* was founded.

2. *Lucilia giraulti* T. It can be positively affirmed that the actual type, at time of characterization, possessed two pairs of ocellar bristles, these being of practically equal strength. This is indicated in the table of species, as well as in the description.

3. *Lucilia infuscata* T. It is likewise impossible that a specimen of *Phormia regina* should have been included in the original series as a cotype. *P. regina* is defined on the same page.

The writer has made it an invariable rule, at the cost of much labor, to verify repeatedly his examinations of material in making determinations and descriptions, so that no error may result. It is by reason of this fact that he is able to make the above definite assertions.

As to *Lucilia terraenovae* Desv., it is the type of the genus *Protophormia* T.

The above paper is followed in the same journal by a very

carefully pursued study of chaetotactic variation in *Lucilia* and *Calliphora*, especially the former, carried out by Mr. Phineas W. Whiting (Ann. Ent. Soc. Am., vol. 6, pp. 257-267). The author states that he secured female flies and caused them to oviposit, rearing the progeny for study, but points out that the issue of each female probably represents a mixed issue from the paternal side, since copulation is frequent. Rearing the flies from collected puparia and mating like individuals, or unlike individuals, in each case tabulating both parental sets of characters, will eliminate from the investigation this as well as other conditions that might prove a source of inexactness.

Mr. Whiting's results are not only extremely interesting but highly suggestive. The data which he presents are extensive enough to carry much weight. He is undoubtedly right in attaching much importance to habitus in specific determination, involving general coloration and slight differences in form including frontal width, by which criteria it seems certain that more than four recognizable species of *Lucilia* exist in North America. The series bred by Mr. Whiting from abnormal females is especially instructive. Such work can not fail to yield results of great value in determining species limits. It is to be hoped that Mr. Whiting will pursue this work farther.

Notes on North American Tineina, with descriptions of new species (Lepid.).

By ANNETTE F. BRAUN, Cincinnati, Ohio.

Argyresthia media n. sp.

Palpi, face and front part of the tuft on the head pale golden, tuft white behind; antennae pale golden with brown annulations.

Thorax white, patagia golden. Fore wings silvery white, costal edge suffused with pale golden. The markings which are dark bronzy brown are distributed as follows: A rather broad fascia from the middle of the dorsum reaches almost to the costal edge, widening just below it, and sending a narrow spur obliquely outward where it joins with the eleventh or twelfth of the narrow brown streaks which mark the costal edge of the wing. Apical third of the wing entirely overlaid with dark bronzy brown scales, except for two white costal spots and three smaller dorsal spots. The proximal side of the dark apex

projects inward, forming an acute angle at the middle of the wing. Hind wings pale fuscous with golden tinged cilia. Veins 7 and 8 of the fore wings are separate.

Legs silvery white, outwardly fuscous and with the tips of the tarsal joints dark brown.

Expanse: 9 mm.

One specimen, Cincinnati, Ohio, May 28, 1910, captured in a clump of willow trees, on the trunk of one of which it was resting. I have kept this specimen for a number of years, hoping to discover its food plant, or at least collect additional specimens, but without success.

The species is most closely related to *A. inscriptella* Busck, which has, however, a darker costal edge, and a greater portion of the apical half of the wing dark.

Type in my collection.

Acrolepia incertella Chambers.

Heribeia incertella Chambers, Can. Ent., IV, 44, 1872; Dyar, List N. A. Lep., No. 6471, 1902.

Syn. *dorsimaculella*, Chambers, Can. Ent., V, 13, 174, 1873; Walsingham, Trans. Am. Ent. Soc., X, 172, 1882.

Contrary to the usual habits of the larvae in this genus, which, according to Meyrick (Handbook of British Lepidoptera) mine blotches in leaves, the larvae of *A. incertella* Cham. feed within folded leaves. In May, at the time the new shoots are developing, the young leaves toward the ends of the shoots of *Smilax hispida* Muhl. are folded edge to edge with the upper surface inside and are closely spun together along the margins. The larva feeds within leaving the lower epidermis of the leaf intact. At the time of pupation, the larva deserts the leaf and spins upon a leaf or twiner, an open network cocoon of yellowish or brownish silk, within which the chrysalis is placed upright with anal end attached.

Elachista praematurella Clemens.

Elachista praematurella Clemens, Proc. Acad. Nat. Sci., Phila., 172, 1860; Tin. No. Am., 133, 1872; Chambers, Can. Ent., VI, 76, 1874; Bull. Geol. Surv. Terr., III, 143, 1877; Busck, Proc. Ent. Soc., Wash., V, 203, 1903; Dyar, List N. A. Lep., No. 6088, 1902.

I have bred a specimen of this species from a mine on nodding wild rye, *Elymus canadensis* L. At first the mine is a mere thread-like line, but gradually increases in breadth until it comes to occupy almost the entire breadth of the leaf. The length of the mine is about 10 or 11 cm. The pupa is attached to a leaf beneath a few criss-cross threads of silk, not sufficient to be termed a cocoon.

There are several generations a year and specimens appearing in the middle and the latter part of summer are duller and have the white markings less distinct and less clearly limited, due to the encroachment of the grayish scales upon them.

I have not been able to verify Chambers' surmise that the larva of this species mines the blades of "blue grass," although I have often captured specimens on lawns and in pastures almost exclusively of blue grass; other species of grass, among them the food plant recorded here, are, however, always present.

***Leucanthiza dircella* n. sp.**

Head golden, with dark brown hairs behind. Antennae dark brown with the tips silvery white.

Thorax golden, dark brown in front. Fore wings orange-yellow, with the apical portion dark brown, and a dark brown patch occupying the basal part of the wing *on the costa and at the base, but not reaching the dorsal margin*. This patch is bordered behind by an *almost straight golden fascia extending from costa to dorsum which thus encloses on the dorsal margin, a small patch of the orange-yellow ground color*. Basal angle sometimes with a few golden scales. An oblique somewhat curved golden streak, dark margined on both sides extends from the basal third of the wing near the costa to the middle of the costa. At the beginning of the cilia is a small golden costal streak. *Near the middle of the dorsum, is a short golden streak, margined toward the base by an oblique line of dark brown scales. At the tornus is an inwardly oblique and longer golden streak*. There is a streak of golden scales just within the margin along the termen, not very distinct in some lights. Cilia dark brown. Hind wings and cilia dark brown.

Abdomen dark brown above. Legs golden, tarsi dark brown.

Expanse: 5-6 mm.

Four specimens bred from large white blotch mines on the upper side of leaves of moosewood, *Dirca palustris* L., Cler-

mont County, Ohio. The mine resembles that of *L. amphicarpeifoliella* Clem. very closely and contains from one to eight larvae. It may occupy almost the entire surface of the leaf, with finger-like projections made by the individual larvae. The cocoon, as in the other species of the genus, is spun outside the mine. Mines of the first generation may be collected toward the end of June, those of the second generation in September. Although the mines are common where the food plant occurs, the species is a difficult one to rear, as a large proportion of the larvae are parasitized.

Imagoes, July 8th to 29th.

The differences between this species and *L. amphicarpeifoliella* Clem., though slight, are constant. These differences are italicized in the description.

Type and paratypes in my collection.

Acrocercops strigosa n. sp.

Head brownish with whitish scales intermixed. Palpi fuscous. The labial palpi have the base of the terminal joint and a ring near the base whitish. Antennae fuscous.

Fore wings pale brownish with a sprinkling of fuscous scales, which are occasionally gathered into spots on the margins and near the tip of the wing. A series of seven oblique almost parallel and equally distant narrow white lines cross the wing from costa to dorsum, reaching the dorsum farther from the base. The first of these is placed at the basal fifth on the costa; the third forks below the fold; the fourth and fifth are a little interrupted in the middle; the seventh is concave outwardly. There is a short white streak at the extreme apex, and a similar one beyond it crossing the cilia. Cilia gray. Hind wings and cilia brownish gray.

Legs whitish gray, with broad black annulations. Abdomen gray.

Expanse: 10 mm. (male).

Powell County, Kentucky; one specimen bred on *Quercus prinus* L. The early mine is a narrow white gallery, which suddenly expands into a very large whitish blotch. The larva feeds here and there, finally consuming the entire parenchyma. A dense brownish cocoon, ornamented with several whitish globules, is spun in a fold in a leaf. Mine collected May 23rd; imago, June 25th.

Type in my collection.

Parectopa pennsylvaniella Engel.

Gracilaria pennsylvaniella Engel, Ent. News, XVIII, 278, 1907.

I have bred this species from large inflated mines on leaves of *Aster cordifolius* L., similar to the mines of *P. plantaginella* Cham. on *Erigeron*. At first the parenchyma is not eaten in the loosened area and the mine is indistinct; later most of the parenchyma is consumed and the mine becomes yellow. Cocoon in a fold of the leaf. Mines collected July 17th yielded imagoes July 30th.

Recent Collections of Spiders in Newfoundland and Labrador (Aran.).

By J. H. EMERTON, Boston, Mass.

In the last two seasons several small collections of spiders from Newfoundland and Labrador have come into the writer's hands, which considerably extend the published range of several species. The Newfoundland spiders are nearly all familiar species of northern New England, but they include *Lycosa quinaria*, previously found in the Rocky Mountains and once in a bog in Maine. The spiders from the Natashquan River region in southern Labrador are also familiar New England species. The Labrador spiders from Battle Harbor and northward include two species of very wide distribution, *Epeira patagiata* and *Erigone longipalpis*, but all the others are well known residents of mountain tops in New England and in the Rocky Mountains. Messrs. Leng and Engelhart, two New York entomologists, while at Battle Harbor sifted the scanty leaf mold under the dwarf birch trees and found *Ceratinella brunnea*, a common northern New England species and *Tmeticus montanus*, *Tmeticus bidentatus* and *Bathypantes alpina*, all common under moss and leaves in the upper forests of the White Mountains. In Miss Esterbrook's collection from the northern part of the Labrador coast occurs for the first time *Lycosa pictilis*, a species before only known from the top of Mt. Washington. The accompanying table gives a list of the species found with their localities and range. Besides the species mentioned are two unidentified Linyphiadae from Newfoundland.

The Bethyloid Genus *Mesitius* in South America (Hym.).

By CHARLES T. BRUES, Bussey Institution, Harvard
University.

The members of the remarkable genus *Mesitius* Spinola¹ are some of the largest and perhaps the most strikingly ornamented species of the varied family Bethyloidea. A considerable number of species have been described from the Old World, several of which have been most beautifully figured by Westwood.² So far, however, the genus has not been recorded from the Western Hemisphere, although Ashmead³ referred to it a number of North American insects which have since been shown by Kieffer⁴ to fall into quite a different genus, *Epyris*.

The South American specimen upon which the present note is based was collected at Bartica, British Guiana, by H. S. Parish, and given me by Prof. A. L. Melander. It represents a new species which may be described as follows:

***Mesitius neotropicus* sp. nov.**

♂ Length 9.5 mm. Metallic green, blue and purple, scutellum ferruginous; head thorax and abdomen spotted with yellowish white; wings infuscated at base and apex.

Head two and one-fourth times as wide as thick, rather coarsely irregularly confluent punctate above and on the face, more sparsely so behind, especially on the cheeks; occiput and temples margined; ocelli in a small triangle, thrice as far from the eye margin as from one another; eyes large, oval, much narrowed below, bare; malar space very short, not furrowed. Antennæ 13-jointed; scape as long as the pedicel and first flagellar joint together, the latter twice as long as the pedicel and four times as long as thick; joints from thence onward shortening to less than twice their own width just before the apex. Ocelli large, on a tubercle in a very small triangle; the face below them with a median groove that extends to the base of the antennae. Head above greenish æneous, below æneous; front on each side below with a large triangular whitish spot which nearly meets the apex of the

¹Mem. Acad. Sci. Torino (2), vol. 13, p. 73. (1851).

²Thesaur. Entom. Oxon., plate 31, figs. 8-11. (1874).

³Bull. U. S. Nat. Mus., No. 45, p. 62. (1893).

⁴Ann. Soc. Sci. Bruxelles, vol. 29 (2), p. 109. (1905).

spot from the opposite side; mandibles white, with black tips; palpi black, the maxillary 5-jointed with the joints increasing in length apically; labial 3-jointed.

Pronotum coarsely confluent punctate, with a deeply impressed transverse line which marks off sharply its anterior third; behind this with a deep median groove; æneous in color, with the central portion bright green, with a small median quadrate yellowish spot anteriorly, and on the posterior margin with a narrow band of the same color that widens laterally and extends over the lateral angles. Mesonotum much more sparsely punctate than the pronotum, with four parallel furrows, the lateral ones abbreviated anteriorly; distinctly purple, with the posterior third of the median lobe ferruginous; tegulae bright metallic purple. Scutellum smooth, with a few small scattered punctures, ferruginous; postscutellum ferruginous, with a black, truncate posterior margin and a few large punctures on the disc. Metanotum black, coarsely, irregularly rugose, narrowed behind by converging lateral carinae into a more or less shield-shaped form with subtruncate posterior margin; lateral angles strongly produced, white.

Abdomen minutely punctulate on the first two segments; closely punctate beyond; æneous anteriorly, but with green and bluish reflections beyond the second segment; basal half of first segment and anterior lateral corners, much enlarged below on the sides, of second, yellowish white; venter with second and first segment, except its posterior margin, whitish.

Propleurae whitish except for a large black fovea above, confluent punctate; mesopleura confluent punctate, metallic green, metapleura below the spine with a few coarse, vertical rugae.

Legs æneous, whitish at the incisures of the trochanters, and on the anterior tibiae inwardly at tip.

Anterior wings infuscated at base over most of the submedian and half of the basal cell, and also beyond the beginning of the stigma, this spot growing much weaker toward the wing tip; basal and submedian cells completely enclosed by very strong nervures and radial cell nearly closed, although the radial vein suddenly becomes weak beyond its middle; transverse median nervure not broken; base of cubitus indicated by a hyaline streak; hind wing weakly infuscated on apical half.

One specimen, which is very probably a male, from Bartica, British Guiana, February, collected by Mr. H. S. Parish.

The Latest Honorary Fellow of the London Society.

Dr. A. P. Semenoff Tian-Shanski was elected an honorary fellow of the Entomological Society of London at its meeting of November 5, 1913, in the place of the late Prof. O. M. Reuter.

On the *Blatta aegyptiaca* of Drury (Orthoptera : Blattidae).

By JAMES A. G. REHN and MORGAN HEBARD, Philadelphia, Pa.

In 1773, Drury, in his classic *Illustrations of Exotic Insects* (II, p. 67, pl. XXXVI, fig. 3) figured and described a roach from Jamaica, which he judged to be the same as the *Blatta aegyptiaca* of Linnaeus. The latter species we know to be a member of the genus *Polyphaga*, and, while in a most superficial manner it resembles Drury's species, the two are quite different. Beauvois in 1805 (*Ins. Rec. Afr. et Amer.*, p. 228, pl. Orth. IIc, fig. 4) figured and described from San Domingo the same species as Drury, calling it *Blatta laevigata*. Beauvois's name has had a somewhat checkered career, having been considered the correct one for one species of the genus *Phoetalia* by a number of authors and for a second member of the same genus by another, while more recently Kirby referred it with a query to the genus *Leucophaea*.

In 1839, Serville (*Hist. Ins. Orth.*, p. 86) recognized that Drury's figure was of something quite different from the true *Blatta aegyptiaca*, and, having received specimens from Brazil which appeared to agree with Drury's illustration, he described the Brazilian material as *Blatta druryi* and referred Drury's figure to the same species. There is no difficulty in placing the species described by Serville, which is clearly the same as that called *Blatta limbata* by Thunberg in 1826 and *Nyctibora sericea* by Burmeister in 1838. The names *limbata* and *sericea*, however, apply to a species having much longer tegmina and a smaller and more ovate pronotum than Drury's form, these characters being evident in the figures of both Drury and Beauvois. Almost without exception recent authors have quoted the figure of Drury under *limbata* Thunberg, or rather under the synonymous *sericea* Burmeister.

Recently we have had occasion to determine two specimens, representing both sexes, of a species of the genus *Nyctibora*, both apparently accidental importations into the eastern United States, having been taken in situations where tropical fruits,

such as bananas, have been handled. One of these specimens was taken in a store at Manahawken, N. J., on September 1, 1913, by Mr. H. S. Harbeck, the other having been secured on a wharf in Philadelphia.* These specimens were found on comparison with material of *limbata* from Paraguay and northern Argentina to represent an allied but very distinct species, the characters of which were well shown by Drury and Beauvois. Knowing that the probable source of bananas received at Philadelphia was Jamaica, we examined an unworked collection of Jamaican Orthoptera which had been placed in our hands for study and were pleased to find a specimen of the same species included in it. This specimen is a female and was collected at Palm Beach, Montego Bay, Jamaica, on March 3, 1911. This individual proves the correctness of Drury's locality, which had, however, corroboration in a record by Walker under the name *druryi*. It is necessary to add the West Indies to the range of this genus and subfamily, something which most recent authors have not done, the general tendency being apparently to discredit Drury's locality. Aside from this, however, the senior author some years ago recorded *Nyctibora mexicana* from Jamaica.†

It is quite probable the accidental New England records of *N. sericea* given by Scudder‡ and Henshaw§ refer to this species instead of true *sericea* (= *limbata*), which latter, being South American, is less likely to be imported than a West Indian species.

We are now able to place this peculiarly West Indian species in its proper position as a valid species, the following references and differential characters enabling one to recognize it.

*The latter specimen was recorded by Rehn (Entom. News, XIII, p. 309, Dec., 1902) as *Nyctibora sericea*. Individuals of true *sericea* were not available for comparison at that date.

† Trans. Amer. Entom. Soc., XXIX, p. 130.

‡ Proc. Davenport Acad. Nat. Sci., VIII, p. 9 [Massachusetts]; Psyche, IX, p. 100 [about Boston].

§ Psyche, IX, p. 119 [Springfield, Mass.].

Nyctibora laevigata (Beauvois).

1773. [*Blatta*] *aegyptiaca* Drury (not of Linnaeus), Ill. Nat. Hist. Exot. Ins., II, p. 67, pl. XXXVI, fig. 3 [Jamaica.]

1805. *Blatta laevigata* Beauvois, Ins. Rec. Afr. et Amer., p. 228, Orth. pl. IIc, fig. 4. [San Domingo.]

1868. *Nyctibora druryi* Walker (not *Blatta druryi* Serville), Catal. Spec. Blatt. Brit. Mus., p. 147. [Jamaica.]

1902. *Nyctibora sericea* Rehn (not of Burmeister), Entom. News, XIII, p. 309. [Accidental at Philadelphia.]

Compared with *N. limbata* the present species can be separated immediately by the shorter, more ovate form, much larger and nearly semicircular pronotum, which has the caudal margin nearly straight, by the shorter tegmina and wings, which but slightly or not at all surpass the apex of the abdomen, by the more robust limbs, the much less velutinous surface and the uniformly colored coxae and femora.

Measurements (in millimeters).

	<i>N. limbata</i> (Thunb.)		<i>N. laevigata</i> (Beauv.)		
	Male Misiones, Arg.	Male Puerto Bertoni, Paraguay.	Male Phila., Pa.	Female Mana- hawken, N. J.	Female Palm Beach, Jam.
Length of body	32.	27.	27.2	27.8	26.5
Length of pronotum	8.	7.9	9.	8.6	8.2
Greatest width of pronotum	12.	12.4	13.2	13.	12.2
Length of tegmen	31.2	32.	23.5	21.6	20.3
Greatest width of tegmen	12.5	11.8	10.7	10.	10.

Notes on Inadequate Locality Labels (Dipt.).

By CHARLES W. JOHNSON, Boston, Mass.

The more one collects and becomes familiar with the conditions governing the fauna of a given area and their relation to problems bearing on geographical distribution, the more one realizes the importance and value of having the exact date and the locality where a specimen was found. This is especially true of the rarer species, as many of the localities where one collected years ago are now entirely changed; woods have been cut and the clearings in many cases covered with buildings;

while meadows and swamps have been either drained or flooded and the original fauna thus wholly or partly destroyed.

In 1891 I commenced to specialize on the Diptera in connection with my work, on the collections representing the local fauna for the Museum of the Wagner Free Institute of Science of Philadelphia, of which I was then curator. As the labels used for the species found in Pennsylvania were only those of the counties adjacent to Philadelphia, and as much of the material has been scattered, it seems desirable to state for the benefit of future workers the exact localities where most of the collecting was done. My note book covering the period from May 30, 1891, to June 25, 1895, represents some fifty-four local collecting trips in the vicinity of Philadelphia.

"Phila." stands for all of Philadelphia County. One of the favorite collecting trips was to Fairmount Park, back of George's Hill, along a small brook called "George's Run," thence under the railroad bridge to an old pasture field (now entirely built over), thence to the woods in front of the Episcopal Home, to Belmont Avenue, then across the fields around Belmont Mansion and down the walks leading to the Columbia railroad bridge and from there home, via Strawberry Mansion. Another trip was to Chamonix, opposite the "Falls" and also home via Belmont and Columbia Bridge. This was before the electric line was built through the Park. Some collecting was also done along the Wissahickon.

I can only mention a few of the many interesting species captured in the twenty-seven collecting trips made to Fairmount Park. The types of *Leptogaster atridorsalis* (July 14), *Dolichopus reflectus* (May 30), *D. gracilis* (August 4), and *Chilosia prima* (September 4), were taken near George's Hill, and *Callicera johnsoni* near Strawberry Mansion, May 7. The latter was collected by Mr. C. T. Greene.

The label "Montg. Co." is an abbreviation for Montgomery County. The greater portion of the material marked thus was collected on eight different trips to a piece of woods about one mile east of Edgemoor, near the old ore washer. These open woods were a favorite place for many of the rarer Syrphidae—

Xylota bicolor and *chalybea*, *Criorhina umbratilis* and *analis*, *Sphecomyia vittata*, *Teuchocnemis lituratus* and *Temnostoma pictula*. It is also the type locality of *Symphoromyia hirta* (June 2), *Neaspilota achilleae* (July 4), *Pipunculus atlanticus* (June 2), and *Tetragoneura pimpla* (June 16). One trip was made to Arcola on the Perkiomen River, April 27, 1894. *Pipiza albipilosa* was abundant there. Fairmount Park is the type locality for this species, and also for *Pipiza nigripilosa*.

In Bucks County, Neshaminy Falls and vicinity were the principal collecting grounds, but the amount of material collected was limited.

The label "Delaware Co." stands for several places covered by about eight collecting trips. The woods between Folsom and Morton yielded many new and interesting species. It is the type locality for *Asilus johnsoni* (July 7), *Atomosia sayi* (July 23), *Empis tridentata* (June 12) and *Haematopota rara* (June 12). My only specimens of *Criorhina notata* and of *Teuchocnemis bacuntius* were taken there May 8, while such species as *Odontomyia flavicornis* and *Trichopoda radiata* were taken frequently. Another favorite trip was up the valley from Darby to Collingdale and then through the woods to the home of my friend, Mr. Charles Voelker, at Clifton Heights. In the spring (May 5) an old log near Collingdale was usually frequented by *Chalcomyia aerea*, *Pseudotephritis corticalis* and *Leptis plumbea*. *Brachyopa vacua* was frequently found on the sap of injured trees or stumps. *Solva americana* and *Echthodopa formosa* were found in the woods at Clifton Heights. August 19, 1892, was spent with my friend, Mr. Charles S. Welles, at his home at Elwyn. Among the captures were two new species, *Leskia thccata* and *Plethochaeta versicolor*. At Media (June 21, 1895) I captured a specimen of *Microdon megalogaster*.

In Chester County, collections were made at Frazer, July 25, and Lenover, August 25, 1893. Later some collecting was done at Green Tree.

In this connection I should also like to refer to the locality label "North Mt., Pa." This applies to all species taken at

Lake Ganoga, August 29; Ricketts, August 30 and 31, September 1 and 2, and above Stull, September 3, 1897, also those collected at Ricketts June 7 to 9, 1898. The region is in the Canadian life zone, and yielded many new and interesting species.

There is another matter connected with labels that is often annoying and misleading. It is the abbreviation of the names of places and towns to suit one's fancy. We are not alone, however, in this matter, for I have specimens from foreign correspondents where the locality label defies interpretation. Specimens with lot numbers should never be sent out by the collector until properly labeled.

A New Proctotrypoid Genus from Australia (Hym.).

By ALAN P. DODD, Nelson via Cairns, Queensland.

Family SCELIONIDAE, Subfamily TELENOMINAE.

PLATYTELENOMUS nov. gen.

♀. Body completely flattened. Vertex of head very thin; head viewed from in front semi-circular; eyes large, slightly pubescent. Antennae slender, 11-jointed; the club slender, 5-jointed. Thorax nearly twice as long as wide; pronotum not visible from above, mesonotum as long as wide, without furrows; scutellum short, semi-circular; postscutellum short; metanotum rather long, with a median and two lateral lines of foveae separated by delicate carinae; the median line straight, the lateral ones curved. Venation as in *Telenomus* Haliday. Abdomen sessile, fusiform, no longer or wider than the thorax; second segment longer than wide, equal to two-thirds abdominal length.

This genus comes nearest to *Aradophagus* Ashmead but differs in having 11-jointed antennae.

Type.—*Platytelenomus planus* sp. nov.

Platytelenomus planus sp. nov.

♀. Length, 1.10 mm.

Shining black; legs (including coxae) and antennal scape and pedicel golden yellow.

Head and mesonotum with fine polygonal sculpture; rest of thorax smooth, shining. Abdomen with first and base of second segment striate; rest of abdomen smooth. Antennae 11-jointed; scape slender, equal to next four joints combined; pedicel twice as long as wide; funicle joints all longer than wide; 1-3 subequal, as long as the pedicel; fourth a little shorter; club slender, 5-jointed, the joints longer than wide; third joint slightly the longest and widest. Forewings reaching apex of abdomen; rather narrow, hyaline; longest marginal cilia equal to one-third greatest wing width; discal cilia fine and dense; submarginal vein attaining the costa a little before the middle of the wing; marginal vein short; stigmal vein rather long, oblique; post-marginal vein nearly as long as the submarginal.

(From 1 specimen, 2-3-inch objective, 1-inch optic, Bausch & Lomb.)
♂. Unknown.

Habitat.—North Queensland (Nelson, near Cairns). A common species in forest country.

Type.—South Australian Museum, a ♀ tagmounted plus a slide bearing head, antennae and fore wings.

Two new species of *Psychoda* (Dipt.).

By NATHAN BANKS, East Falls Church, Virginia.

Psychoda autumnalis n. sp.

Gray, with gray, black, and white hair; thorax with dark gray hair, interspersed with a few black ones, abdomen with rather paler gray hair, and not nearly as long as that on the thorax.

Antennae pale gray. Femora yellowish gray, tibiae similar, but with black middle and apical bands, separated by a white spot; tarsi black, first joint white on base, second and third almost wholly white.

Wings gray, with gray hair, each wing with two rows of about five black dots of erect hair across wing, both obliquely curved, first before and the second beyond the middle, the first one has the anterior and posterior spots much larger than the others, in the outer row the two spots behind are rather dislocated from the others; between the two rows and near the costa is another dot of black hair; the costal fringe is twice gray and black before the stigma, where there is a white spot, followed by two more before the tip; apical fringe black; posterior fringe brown, interrupted three times with white, not as long as one-half the width of the wing. The tips of the black veins tend to form spots on the margin; in some specimens there are other minute black dots of erect hair between the two rows. The forks

are equal, and arise before the middle of the wing, the wing is hardly acute at tip, and of moderate breadth.

Expand: 5 mm.

From Washington, D. C., in November.

***Psychoda aterrma* n. sp.**

Deep black throughout, with black hair, but that on thorax mostly brown, and some on costa of wing beyond middle, and also near tip are brown; at extreme tip are a few snow-white hairs, hardly discernible. Wings narrow, and acute at tips, the hairs at base and on basal part of costa are very long, many fully one-half as long as the width of the wing, the fringe on posterior margin also very long, longer than one-half width of wing; the forks of the two forked veins are equally long, and both begin before the middle of the wing; the wing is perhaps less hairy across the middle than elsewhere.

Expand: 4.8 mm.

From Ithaca, New York, July. Differs at once from *P. niger* in deeper black color, longer hair, and narrower wings.

The types of both species are in the author's collection.

Technical Assistant in Malaria Investigations (Male).

The United States Civil Service Commission announces an open competitive examination for technical assistant in malaria investigations, for men only. The duties of this position will be to conduct laboratory studies of malaria, to make surveys of malarial regions, and to advise in respect to the prevention of the disease. Competitors will not be assembled for examination, but will be rated upon the following subjects, which will have the relative weights indicated: 1. General education and medical training 30, 2. Experience in laboratory studies of malaria 30, 3. Experience in making field surveys 20, 4. Publications or thesis 20; Total 100. Under the third subject credit will be given for experience in identifying different species of mosquitoes and their larvae, or conducting surveys of mosquito-breeding places, or applying practical measures for the prevention of malaria in a community. If a thesis is submitted under subject 4 it must present the results of original research work in some phase of malaria or other public health subject. Graduation from a medical school or college of recognized standing, and experience in laboratory technique connected with malaria studies, are prerequisites for consideration for this position.

No application will be accepted unless properly executed, excluding the medical certificate, and filed with the Commission at Washington, with the material required, prior to the hour of closing business on March 9, 1914.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., MARCH, 1914.

On Writing History.

History is very interesting if true, and it becomes equally ridiculous if untrue. History to be respected should be accompanied by references to sources of information.

In the *Bulletin of the Brooklyn Entomological Society*, Volume 8, page 54, is an account of what happened to the Say collection. According to this account it was sent (some time) from New Harmony (Indiana) and was stored unopened in Philadelphia and forgotten. How long it was forgotten is not stated. "Nearly twenty years later it was resurrected and sent to Thaddeus W. Harris, State Entomologist of Massachusetts, and a very notable man."

In the same journal, Volume 8, page 111, is a letter from Charles Christoph Andrew Zimmerman to Dr. W. T. Harris. This letter is dated Columbia, S. C., June 9th, 1841. In it he pays his respects to Philadelphia, and refers to the Say collection, then in the hands of Dr. Harris.

Thomas Say died October 10th, 1834. Making no allowance for the time his collection remained in New Harmony and the time it was forgotten in Philadelphia and the time it took to send it to Massachusetts, "nearly twenty years" from the date of his death only, would make nearly the date 1854.

H. S.

An Ant Story.

Near Lawton, Okla., according to a story said to be fact, the sportsmen of that town have established a shooting range. At the end of the range a great many mound-building ants had established colonies, and naturally some of the spent shot dropped in that vicinity. It was discovered that the ants in gathering the round granite pebbles for their mounds had also carried a great quantity of shot and mingled it with the tiny particles of stone. More than fifty pounds of shot were taken from the mounds investigated.—*Bulletin, New York Zoological Society*, Sept., 1913.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Naphthalene and Fleas (Siphonap.).

In June, 1913, while giving a bath to an orphan kitten which had been adopted several months before, I noticed some fleas upon it and not desiring to have the animal infested nor to have the house stocked with such dangerous insects, I thought over the possibility of killing the latter. Besides kerosene oil and soap, the only other available insecticide was naphthalene in the form of the usual naphthalene or moth balls used for keeping among clothes. It was thought undesirable to use kerosene, while ordinary soaps seemed likely to be inefficient. The only hope then seemed to be in the naphthalene. I took three or four balls of it, therefore, and crushed them into a fine powder by wrapping them in a piece of burlap and using a hammer. Holding the kitten over a large sheet of paper placed over the floor of the veranda, I rubbed the powder into her fur, working from behind toward the head and including the tail and legs. After several minutes, the insects became noticeable about the head, especially around the eyes and at this stage I commenced to remove them by hand, killing each one in succession by crushing it with the hammer. In this manner, after about five minutes, thirty or more of the insects were successfully killed and the kitten seemed to be free of them.

About a week previous to this, another older kitten had been obtained and it seemed to be likely (and was found to be so) that the young kitten had gotten the fleas from this comparative stranger. So she in turn was given the same treatment with the result that over a hundred and fifteen of the vigorous insects were killed; this time a few escaped, though most of them were quite stupid and did not hop when placed upon the paper: in fact many dropped off. In this case also, however, a few of the insects remained upon the cat; a half hour after finishing, I went to the cat again and found six grown fleas, stupidly resting upon the top of the fur whence they were easily caught and killed. It was decided, after such toward results to repeat the treatment after a day's time, so as to allow the animals to pick up, as it were, any of the insects which may have escaped into the house. This was done, with the result that about a half dozen fleas were obtained from the young kitten and about fifteen from the older one. The animals then seemed to be quite free from infestation but the treatment apparently made them ill for about a day or so; the most noticeable symptoms were loss of appetite and an inclination to lie about instead of, as was usual with the younger kitten, continually running about and playing. The

older of the two animals refused nearly all food for two whole days following the treatment. But the latter does not seem dangerous and is certainly a cleanly and desirable agent for the purpose of ridding household animals of dangerous parasites.—A. A. GIRAULT, Nelson, Queensland.

Sequelae of Human Verruga Case Traceable to *Phlebotomus verrucarum* (Dipt.).

A preliminary notice of Mr. Nicholson's case, dated November 10, 1913, appeared in the January, 1914, issue of the NEWS. The following data bring the record up to date:

Nov. 10, 1913—Received 30 cc. neosalvarsan intravenously in left arm.

Nov. 15—Fever subsided for good. The fever had lasted with practically no absolute intermission for three weeks, from October 25 to November 15, but ranging all the way from slightly above normal to close on 40 deg. C. The temperature was very irregular, but usually lower in mornings and highest in evenings. During this period pains were pronounced in back of neck, cervical region and knees, more so in mornings. Also during this period the *Bartonella bacilliformis* Strong et al. was present in numbers in the red cells, as attested by Dr. A. L. Barton and shown in numerous smears.

Nov. 15 to 30—Pains were most prominent in the ankles, knees, wrists and finger joints, especially in mornings. During the first several days of this period the temperature ranged distinctly below normal, and no *Bartonella* was found in the blood.

Dec. 1 to 24—Acute pain internally in region of spleen but not affecting that organ, very sharp at start and very gradually wearing away until completely disappeared about Dec. 24 or 25. At beginning of this period the pains in joints ameliorated and disappeared.

Dec. 24—The first sign of eruption appeared, being a minute red point on back of right hand next wrist. This very gradually increased in size, almost imperceptibly at first but rather more rapidly later on, until on Jan. 26, 1914, it has become a perfectly circular well-raised papule 3.5 mm. in diameter. Its initial stage seemed miliar, but its present state must classify it as nodular.

Dec. 28—Several minute eruptive points like preceding on ankles.

Jan. 8, 1914—Typical nodular papule of considerable size suddenly appeared on outside of right forearm next elbow, about 2 to 3 mm. in diameter.

Jan. 12—Several minute points just back of original papule on right wrist.

Jan. 14—One large nodule, about the size of a pea, on right thigh outside, accompanied by several smaller ones.

Jan. 17—Small ones in great numbers have appeared on feet, ankles, shins, knees and thighs.

Jan. 19—Several larger ones on knees and calves.

Jan. 21—Very many small and minute ones on hands and fingers.

Jan. 25—More large ones on right thigh.

Mr. Nicholson has not been exposed to any verruga infection since he left the hospital on Nov. 22, 1913, not having entered the verruga zone from that date to date of eruption, and not having been within the verruga zone at night since Nov. 6, 1913.

It is quite certain from these facts that both the *Bartonella* bodies

and the eruption have resulted in this case from the *Phlebotomus* bites of Sept. 17, 1913, to which were added a half dozen bites on the night of Nov. 6, 1913. It is practically certain that only one species of microbe was transmitted during the bites of the *Phlebotomus*.

The injection of neosalvarsan produced a slight temporary diminution of the Bartonian bodies, according to Dr. Barton. They shortly increased again. It is indicated that this drug, in larger quantity and frequently repeated, is a specific against the disease.

A complete history of this case will eventually be published by Dr. Barton.—CHARLES H. T. TOWNSEND, Chosica, Peru, January 26, 1914.

Control Work Against Forest Insect Depredations in the Hetch Hetchy Watershed of the Yosemite National Park (Coleop.).

Special investigations by the experts of the Department of Agriculture have shown that as much as 95 per cent. of the timber in some of the canyons and valleys of the Tuolumne River, which is to supply the water for the Hetch Hetchy project, has been killed by bark-boring insects.

The areas in which practically all of the timber has been killed, some of it many years ago, are Jack Main Canyon and Matterhorn Canyon. It was found that the forest growth of the entire watershed was more or less affected, and that the destructive insects were killing a great amount of timber from near Tenaya Lake through the forests surrounding Tuolumne Meadows to and through Virginia Canyon.

This alarming condition, affecting as it did the scenic beauty of the area north of the Yosemite Valley and its consequent effect on the water supply and general economy of the Hetch Hetchy project, presented a problem of great importance.

As soon as the matter was called to the attention of the Secretary of the Interior in the fall of 1912, he appealed to the Secretary of Agriculture for such advice and assistance as his Department could render through the expert who has charge of the forest insect branch of the Bureau of Entomology.

The matter received the required prompt attention and arrangements were soon made for active warfare against the depredating beetle. A plan of procedure was outlined by the expert and recommended by the Secretary of Agriculture to the Secretary of the Interior. According to the plan, the Interior Department was to allot the required funds, the control work to be carried on under the immediate supervision of an entomological assistant of the Bureau of Entomology. This plan was adopted and the work was started just as soon as the weather conditions permitted in June, 1913.

The areas near Tenaya Lake and in the Cathedral Basin around Tuolumne Peak to the Tuolumne Meadows were carefully cruised for

the location and marking of the particular trees, in the bark of which the broods of the destructive beetle had passed the winter. Two areas representing centers of infestation were thus located and designated—one as the Tenaya Project, the other as the Cathedral Project.

Control work was started on the Tenaya Project on July 1, and finished when the beetles began to emerge from the bark on July 24. Work on the Cathedral Project was started on September 8, after the beetles coming from the overwintered broods had entered the bark of the living trees, and was completed on October 7.

The method recommended and followed was to fell the infested trees, lop off the limbs, pile them on the prostrate trunk, and set fire to it; thus the infested bark was scorched or burned to a sufficient extent to kill the broods of the insects. The trees thus treated ranged in diameter from 6 inches to 54 inches with the average of about 22½ inches.

One thousand, six hundred and seventy-one trees were treated in the two projects, at a cost of \$1158, including all expenses except the salaries of two representatives of the Bureau of Entomology who directed and assisted in the work.

It is claimed that this work, with an additional expenditure of about \$500 next season, will be sufficient to bring the beetle under such control that very little attention will be required to protect the remaining living timber from further serious injury. Both this and an infestation in the timber around the rim of the Yosemite Valley will receive the required attention next season. The Interior Department has expressed a determination to prosecute a warfare against the depredations of insects in the Yosemite and Glacier National Parks to the limit of the funds available for the purpose.

The insect which is directly responsible for the death of such a large percentage of the lodgepole pine timber of the northern section of the park is the mountain pine beetle (*Dendroctonus monticolae* Hopkins). It attacks perfectly healthy trees and kills them by mining between the bark and wood in such a manner as to stop the movement of sap and kill the bark which results in the final death of a tree within ten to twelve months after it is attacked. This beetle is the most destructive enemy of the lodgepole pine, western yellow pine, and mountain or silver pine of the entire Pacific Coast and Northern Rocky Mountain region. A vast amount of the best timber of these regions has been killed by this beetle during the past fifty years and has gone to waste through the agencies of decay and forest fires, but, thanks to the discoveries of the experts of the Bureau of Entomology, it can now be controlled and a great waste of forest resources prevented in the future.—*Office of Information, U. S. Dept. of Agriculture, Washington, D. C.*

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

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MACROLEPIDOPTERA by PROF. DR. A. SEITZ.

Critical Remarks by WILHELM LEHR, Baltimore, Md.

The issue of Volume II of "Macrolepidoptera of the World," by Prof. Seitz, concludes the palaearctic part of this great work, in so far as "Moths (Tineidae) and Spinners" (Bombycidae) are concerned. This volume is quite extensive, containing fully 440 pages of text alone, irrespective of the index.

It represents, like Volume I, the "Butterflies," the most complete work of its kind known to-day in this line of literature. Above all, it contains the pictures of almost all the species of the Amur Region, of Turkestan, of the Caucasus, of Persia, of Syria, etc., many of these illustrations appearing for the first time.

The text of this volume was compiled by nine authors, generally known as reliable authorities on Entomology. In this respect it certainly is astonishing that notwithstanding the "many cooks," a pleasing uniformity in the book, in regard to text as well as to the plates, could be obtained, which uniformity does not appear in so marked a degree throughout Volume I.

The following figures are intended to give an idea of the thoroughness of the volume in question:

In the catalogue of Staudinger-Rebel, which appeared thirteen years ago, 238 forms of Zygaenidae were enumerated, while "Seitz" lists 418 Zygaenidae of the palaeartic region; of Saturnidae "Seitz" has 122, against "Staudinger-Rebel's" 31. Furthermore "Seitz" describes 329 Sphingidae against 100 mentioned in the "Stgr.-Reb." catalogue; of Cymatophoridae 86 are given in the "Seitz," while in "Staudinger's" work only 23 are shown; of Limacodidae 46 are found in the "Seitz," whereas 15 are accounted for in the catalogue mentioned above, etc.

All in all, this volume describes about 300 species (or varieties) of Spinners, besides about 300 Sphingidae. The number of colored figures on 55 plates amounts to nearly 2400. If it be taken into consideration that the Moths and Spinners in the Staudinger do not quite number a thousand (to which, of course, some varieties are to be added); one must readily admit that our knowledge of the palaeartic region, with reference to Entomology, approaches completion, by means of this gigantic work.

The reliability of the text, it must be said, can only be judged by scientists versed in this line, or by specialists of the palaeartic Fauna. The names of the authors, who contribute to this work, are so well known in the scientific world that one may readily place confidence in their ability, their statements and their scientific work.

By reading a chapter of the "Seitz," it will doubtless be perceived that the numerous serviceable hints on catching butterflies and caterpillars, on their raising and mode of living, etc., are based upon personal experience; and that furthermore the author himself has personally bred the principal representatives of almost all the species, whether they live in the Amur region, or in Syria, or in Mauretania, etc.; he has, at any rate, viewed them alive. The vast information on feeding-plants, on methods of catching the animals, etc., are of the utmost importance to any collector. For is there any other book, which, for example, mentions at what hour the caterpillars of *Emydia striata* must be collected, in order to obtain the greatest quantity of them; or one, which cautions against delay in taking in the *Ognogyna* caterpillars, and admonishes collecting them, before the grass has grown so high that they are completely hidden from sight?

As in the first volume the plates are the most essential and predominant features of the work, so they are in the second also. If anyone should deem this assertion to be too bold, that it was left to the "Seitz" to teach the world and show what real good pictures are, he certainly ought to make a critical comparison with other works of this kind. The average collectors are, of course, satisfied with the

illustrations in the new "Berge," and everybody admits that the butterflies illustrated therein, in that complex mixed company in which caterpillars, plants and butterflies are placed together upon a tinted background, present an attractive picture. But, alas! how do these "pictures" compare with those of the "Seitz," taken from a scientific viewpoint, which is of the greatest importance to the collector? If, for instance, a *Batis* in the "Seitz" is entered into competition with the corresponding picture of a *Batis* in the "Berge," plate 28, figure 49, *e*, a vast difference manifests itself. This also applies to the illustrations of the Vienna peacock's-eye-butterfly! Looking at plate 29 of "Berge," without comparing real nature, one is well pleased with the *pyri* picture, fig. 1, *b*; but a comparison with the figure in the "Seitz," table 31*b*, discloses the mistakes of the former at once. The borders and the ground of the wings of *pyri* are in the "Berge" yellowish-red, whereas, in reality, they are *grey*, as correctly depicted in the "Seitz." Of course the representation of *pyri* in the "Seitz" does not make a brilliant showing, as only one-half of the insect is illustrated, which is furthermore not as finely touched up, in order to be in accordance with real nature, and because it does not show any head. But by comparing it with a specimen in one's collection, it is at once evident, that, viewed from above, all *pyri* seem to be headless, as also *spini* and *pavonia*. The picture in the "Berge," which shows a big head, is nothing but a phantasm, while the half-picture in the "Seitz" is pure, genuine nature. It is therefore to anybody, who earnestly intends to work in Entomology, far more valuable, than the "trimmed-up" and "pleasingly grouped" illustrations of amateur-works.

This point apparently so accessory has been mentioned quite intentionally, as there is a species closely resembling *pyri*, namely *atlantica*, on which, viewed from above, the fore-head is clearly to be seen. As the plates in the "Seitz" are admittedly scientific in their preciseness, everybody may find in them a productive source of entomological perception, and an inexhaustible spring of pleasure. To convey an idea of the number of plates contained in the different volumes of "Seitz," so far printed, it must be mentioned, that up to last year they already exceeded 500.

As it is, the author has unquestionably earned well-deserved praise with the eminently satisfactory issue of the Second Volume of Macrolepidoptera. In the meantime Volume III has also been finished, and Volume IV is nearly completed. It goes without saying, that these later volumes are just as excellent in every particular as the two former ones.

"Macrolepidoptera of the World" is also published in a separate English edition by the Verlag des Seitz'schen Werkes, Stuttgart, Germany.

Doings of Societies.

ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Meeting of November 20th, 1913, Mr. Philip Laurent, Director, presided. Ten persons were present.

Dr. Calvert exhibited a specimen of *Erythrodiplax berenice* Drury (Odon.), a salt marsh species from Philadelphia, August 1st, 1909, by G. M. Greene. This is the third Philadelphia record.

Dr. Skinner exhibited a picture of the store that was formerly situated at the northwest corner of Second and Market Streets, Philadelphia, occupied as a drug store by Speakman & Say, the first meeting place of the Academy of Natural Sciences of Philadelphia, in 1812. The Say mentioned was the father of Thomas Say, called the father of American Entomology.

Mr. Laurent said he had collected specimens of *Colias philodice* as late as November 7th, showing the mildness of the present fall.

Mr. J. R. Malloch was elected an Associate of the Section.

Meeting of December 8th, 1913, Mr. H. W. Wenzel, Vice-Director, presided. Nine persons were present.

Dr. Calvert exhibited two lantern slides, showing a beetle, *Pachyteles seriatoporus* Chaudoir, taken in a bromeliad, at Juan Vinas, Costa Rica. He called attention to certain structures of the legs, viz.: a spine on the first femur and a groove armed with a row of stiff hairs on the first tibia as quite similar to the apparatus known as the antenna-cleaner of the bees and ants; he supposed that these parts of the beetle may be used for the same purpose. Mr. Wenzel said he had not observed any beetles using such an apparatus for cleaning the antennae. Mr. Liebeck thought the apparatus was used for holding objects of prey.

Mr. Hornig reported finding salt marsh mosquitoes (*Aedes sollicitans*) at Cobb's Creek and Clearview, Pennsylvania.

He mentioned the prevalence of mosquito larvae in the Philadelphia sewers in various places. He found thirty-two and forty-eight eggs respectively in two specimens of the Lubber grasshopper from Louisiana.

Mr. Greene announced the death of Mr. R. Godfrey, an Associate of the Section.

Mr. Ellwood R. Casey was elected an Associate.

The following were elected officers to serve for 1914:

Director—Philip Laurent.

Vice-Director—Henry W. Wenzel.

Treasurer—Ezra T. Cresson.

Conservator—Henry Skinner.

Secretary—James A. G. Rehn.

Recorder—Henry Skinner.

Publication Committee—Ezra T. Cresson, Ezra T. Cresson, Jr.

Meeting of January 22nd, 1914, Mr. Laurent, Director, presided. Ten persons were present, including Mr. W. T. Davis, of Staten Island.

Dr. Calvert exhibited eggs, triungulin larva, pupa and imago of *Hornia gigantea* Wellman (Col.), presented on behalf of Mr. F. X. Williams, who described and figured them in the NEWS for January, 1914.

Mr. Laurent presented *Noctua treatii* and the fall form of *Plusia precatationis*.

Mr. Davis described a box for containing vials of alcoholic specimens devised by Mr. Sleight. He also described a device for mounting small insects on card points.

Dr. Calvert read a letter from Dr. A. D. MacGillivray in relation to the so-called antenna-cleaner of the Coleoptera. Dr. MacGillivray said the structure was common in the Carabidae and was well represented in *Harpalus caliginosus*. Dr. Calvert sketched the apparatus in *Harpalus* and pointed out how it differs from that of *Pachyteles*. He called attention to Packard's mention of this structure (*Text Book of Entomology*, page 97).

Mr. Rehn exhibited specimens of three species of grouse lo-

custs (Acrydiinae), illustrating the retention of a nymphal type of pronotum in adults of several species. The tegmina and wings could be seen on careful examination, but being largely hidden under the pronotum they could be easily overlooked and the specimens mistaken for nymphs. This condition of the pronotum is known to occur in four species of two genera, two of the forms being African, one Australian and the other, which is new, as far as known, is only found in the southeastern United States.

Mr. Laurent called attention to a beautiful variety of *Colias caesonia* described by Jerome McNeill in the *Canadian Entomologist* for 1889 as *Colias caesonia* variety *rosa*. The speaker stated that this variety was found in many of our large collections intermingled with *Colias caesonia*. The specimen in his own collection had been attached to the label *Colias caesonia* for more than twenty-five years, until Mr. Roswell C. Williams called his attention to its being the variety *rosa*. Specimens of *Colias caesonia*, as well as variety *rosa* were exhibited.

HENRY SKINNER, *Recorder.*

OBITUARY.

James John Rivers.

James John Rivers, well known to students of the Lepidoptera and Coleoptera, died at his home in Santa Monica, California, on December 16, 1913, at the age of nearly ninety years. He was born in Winchester, England, January 6, 1824. He studied medicine at the University of London, where he came under the influence of Thomas Henry Huxley: he attended Faraday's lectures and became acquainted with Charles Darwin and Alfred Russel Wallace. He attended the meetings of the Entomological Society of London, where he met Stainton, Douglas, Robert McLachlan, T. Vernon Wollaston and others. He knew Francis Walker and G. R. Crotch.

He lived and collected in Devonshire and other parts of England. He left his native country about 1867 for the United States, settling first in Junction City, Kansas; he was associated with the late Dr. Snow at the University of Kan-

sas; was in Denver for a short time and about the middle of the seventies came to Berkley, and became a Californian naturalist for the remainder of his life. He became acquainted with all the scientists of the State and played leading parts in all the various activities, including the California Academy of Sciences. He was one of a little group of naturalists, including Behr, Behrens, Stretch, Harford, Lockington, Dunn and others, who met informally and were known as the Arthrozoic Club.

Rivers was Curator of Organic Natural History in the University of California until he resigned about 1895, and removed to Ocean Park and Santa Monica, where he resided till his death. Prof. Rivers, as he was generally and affectionately called, ranged over nearly the whole of the natural sciences; he was a representative of the old time naturalists. He studied and published papers on living and fossil shells, Coleoptera, Lepidoptera, spiders, reptiles and collected plants. His published papers are mostly in the *Proceedings of the California Academy of Sciences*, *Bulletin of the Southern California Academy of Sciences*, *Zoe*, *Papilio* and *Entomological News*. Rivers, with the late L. E. Ricksecker, was the first to work out the interesting life history of *Pleocoma*; he studied the habits of a new Californian turret building spider named in his honor by Cambridge; he described a new *Amblychila*, and in the Lepidoptera was especially interested in the genera *Melitaea* and *Clisiocampa*. His last paper was published only a short time before his death, in the *Bulletin of the Southern California Academy* for July, 1913, being a description of a new fossil shell from San Pedro.

J. J. Rivers was a real naturalist, and to have known him was a great privilege. His little workshop and museum behind his house in Santa Monica, filled with books and specimens, will always be remembered by those who were ever in it.

F. GRINNELL, JR.

DR. ARNOLD PAGENSTECHEER, well known for his work on the Lepidoptera, died in Wiesbaden, June 11, 1913. He was born in 1837.

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PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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George Williams Peckham, M.D., LL.D.

1845-1914.

(Portrait, Plate VI.)

Fährt der Blitz aus Wolkenmitte,
Schlägt er wohl die stärkste Eiche;
Tritt der Tod in unsre Mitte,
Schlägt den Stärksten er zur Leiche.

—*Musikantenfahrt.*

On January 10, 1914, Milwaukee's circle of nature students lost one of its most prominent members through death. Latent heart trouble, with an attack of angina pectoris as the immediate factor, ended the life of Dr. George Williams Peckham, patriot, educator, scholar and scientist.

Dr. Peckham was born in Albany, New York, on March 23, 1845. In 1853 he came to Milwaukee, where he attended the public schools and proved himself both mentally and physically



a leader of men. At the outbreak of the Civil War he wished to join the Union ranks, but it was not till 1863 that parental consent was obtained. Within a month after his enlistment he was made a sergeant, and later fought with such personal valor in an artillery regiment, that he was made a first lieutenant at the age of 19 and placed in charge of a battery.

After the war he went to Antioch College, in Ohio, and later to the Law School in Albany, New York, where he was admitted to the bar. In 1870 he enrolled in the medical course, at Ann Arbor, Michigan, being awarded the degree of Doctor of Medicine in 1872.

Fitted for both the professions of law and medicine, Dr. Peckham decided to follow neither of the two, but took up the teaching of Biology in the East Division High School, then the only one in Milwaukee.

In 1880 he married Elizabeth Gifford; and from that period date practically all of Dr. Peckham's researches, most of them collaborations with his devoted wife. Three children, now living, proved the blessing of their union.

About 1888 Dr. Peckham was appointed principal of the high school in which he taught. Four years later, in 1891, he was made Superintendent of Public Instruction, which office he held till 1897, when he accepted the office of Director of the Milwaukee Public Library, where he remained till his retirement, in 1910.

In dealing with the work of Dr. Peckham, we cannot separate therefrom the work of his wife and collaborator. From the time of their marriage these two are inseparably linked in all phases of their work, in their researches, in their travels, in their very thoughts. Scientifically, their researches followed two definite lines—each, in a way, logically the outcome of the other, that of psychology of spiders and wasps, and that of taxonomy of spiders.

In taxonomy the Peckhams dwelt exclusively with the Attidae-group of spiders; the first of their many papers on the subject appeared early in the eighties and was followed by annual or biennial contributions of various length, the chief

of which appeared in the *Proceedings*, the *Occasional Papers* and the *Bulletin of the Wisconsin Natural History Society*, and in the *Transactions of the Wisconsin Academy of Sciences, Arts and Letters*.

The earliest contribution on what may be broadly termed "Animal Psychology" appeared about 1883, in the *Journal of Morphology*—a brief treatise on mental powers of spiders. This was followed by several minor contributions in the publications of the Wisconsin Natural History Society, on both wasps and spiders, a larger treatise on Sexual Selection and Protective Resemblance (1890), and finally, by the epoch-making work, "On the Instincts and Habits of Solitary Wasps." *Bulletin No. 2, Wisconsin Geological Survey*, pp. 4 & 245, 14 pls., 1898.

It is upon this last-named work that the Peckhams' chief claim to fame rests. Based upon years of difficult and laborious observations, it bore at once the impress of scientist, scholar and poet: the scientist analyzed, the scholar synthesized, and the poet idealized. Just as the "Origin of Species" has its fixed place as a classic of Biological Science, so the Peckhams' "Habits of Solitary Wasps" bids fair to become a classic of, at least, the psychological phase of animal study.

Before this, scientific recognition had come to Dr. Peckham in the form of the presidency of the Wisconsin Natural History Society and of the Wisconsin Academy of Sciences, Arts and Letters; in 1896, the University of Wisconsin honored him with the degree of Doctor of Laws.

The trait of "nature student" dominated in Dr. Peckham's life. To this he sacrificed the careers of lawyer and physician: to this he sacrificed his vacations and what leisure hours he could spare from his arduous duties. Dr. Peckham, as the writer knew him, was a small man, somewhat bent with age, rheumatism and the close application necessitated by his myopia. The scholarly stoop, the silvery white hair, and the moderate gait impressed everyone as attributes of a man who has made his mark on the world. On public or semi-public occasions the thoroughness and breadth of Dr. Peckham's infor-

mation was surprising, even as the modesty and moderation with which it was put forth won him innumerable friends. Amiable, moderate, modest, kindly and scholarly,—in these words his personality is best described.

There is one aspect of his work which is probably very little known, or if known, appreciated. This is the literary aspect of his work. "For literary attainment among modern writers I look to Dr. Peckham," a well-known professor of English has said to the writer. "For clearness, elegance and simplicity of style, combined with lucidity and aptness of diction, Dr. Peckham merits a place among the best of modern literary men, and certainly one of the very best among scientific men."

With his retirement, in 1910, Dr. Peckham practically ceased his scientific labors. It was then his intention, as stated repeatedly to the writer, to devote all of his time to his favorite studies, but the revolutions in Mexico interfered with his planned investigations in that country, and his severe rheumatism would not permit much outdoor work at Milwaukee. The year 1910 therefore practically marks the close of Dr. Peckham's career as educator and scientist.

As stated on a former occasion (*Ent. News*, 22, p. 460, 1911) Dr. Peckham's types have been deposited chiefly in the Museum of Comparative Zoology at Cambridge, while the remainder of his spider collections and the greater part of his library on spiders have been donated to the Milwaukee Public Museum.

Although Mrs. Peckham has expressed a contrary intention to the writer, it is hoped that she will continue the work so well begun and carried on with her collaboration. To her, the able wife of an able husband, these meager words are dedicated.

R. A. MUTKOWSKI, Madison, Wis.

Overwintered Cocoon Surviving Forest Fire (Lepid).

Of several cocoons of *Attacus cecropia* obtained at Annapolis, Maryland, during the winter of 1898, one had been exposed to a woods fire, its outer covering burned off and the next cover very much scorched. Still the adult emerged the following May in perfect condition. Several others of the same species, obtained the next several winters, were uninjured.—A. A. GIRAULT.

Neuroptera and Trichoptera from Costa Rica.

By NATHAN BANKS, East Falls Church, Virginia.

Dr. P. P. Calvert sent me for determination a small collection of these insects which he made in Costa Rica, together with two specimens given him by Mr. C. H. Lankester. As few species have ever been recorded from that country, the following records will be useful.

[I have added a few notes which are enclosed in square brackets. Most of the specimens will be placed in the Academy of Natural Sciences of Philadelphia.—PHILIP P. CALVERT.]

NEUROPTERA.

Corydalis crassicornis McLachl.

Cartago, at the street electric lights in May; Alajuela, Sept. 12, 1909. [According to the late Professor P. Biolley's "Elementos de Historia Natural—Zoologia," San Jose, 1899, the Costa Rican name for *Corydalis* is *Maria seca*, dry Mary.]

Myrmeleon crudelis Walk.

Mangrove swamp, Puntarenas, 2 Feb., 1910.

Myrmeleon mexicanum Banks.

Cachi, 21 Sept., 1910 (C. H. Lankester).

Brachynemurus fenestratus Banks, Trans. Amer. Ent. Soc. xxxix, p. 221, 1913.

In a rice field along the railroad between Turrucare and Atenas, Dec. 21, 1909. Road from Hac. Guachipelin to Liberia, Jan. 17, 1910. The first-named locality is that of the types of this species which were collected by Prof. J. F. Tristan at the same time.

Colobopterus trivialis Gerst.

Juan Viñas, 3300-3500 ft., June 29, July 30, 1909. [The specimen of June 29 was on a long freely-hanging vine in the deep shade of the ravine of the little Rio Naranjo, the position assumed being such as to give the insect a most stretched-out appearance, as antennae, body, wings and hind legs were held parallel to the vine, the wings folded over the back roof-wise. On July 30 two of this species were pairing on a branch over the "farther" waterfall.]

Ululodes tuberculatus Banks.

Rio Tizate, Turrucare, 23 Dec., 1909.

Leucochrysa sp.

Cachi, 22 Sept., 1910 (C. H. Lankester), near *L. ceratica*, but the basal part of the antennae pale.

Leucochrysa calverti n. sp.

Pale yellowish, face unmarked, basal joint of antennæ brown, and a dark spot at outer tip, rest of antennæ pale; a dark spot each side on pronotum, and on anterior and lateral lobes of the thorax; a dark spot on the second segment of the abdomen, and another toward tip; legs pale. Wings hyaline, venation pale, costal end of costals, and radial end of radial cross veins dark; gradates dark, and faintly bordered, outer forkings dark, dark on cubital cross veins, and a rather large spot on origin of radial sector; stigma dark; hind wings have pale venation, stigma and outer cross veins faintly dark.

Pronotum plainly longer than broad, narrowed in front.

Wings of moderate size, fore wings rounded at tip, hind wings acute; four to six gradates in each series of fore wings, five in each series in the hind wings; in fore wings the outer gradates are about as near to the inner as to margin, and inner about as near to radial sector as to outer row; in hind wings inner series nearer to radial sector than to outer series; the divisory veinlet reaches nearly to end of third cubital cell.

Expanse, 23 mm.

Holanda Farm, Banana River District, 5 Nov., 1909 (Calvert). Type in the Academy of Natural Sciences of Philadelphia.

Leucochrysa ceratica Navas.

Alajuela, 4 Sept., 1909.

Chrysopa effusa Navas.

Cartago, July 9, Aug. 20, 1909. [The specimen of July 9 was reared from a larva collected June 17. The larval covering, to which the maker had attached fragments of the bodies of the insects on which it fed, had its free edge drawn partly together with silk to form the pupa case.]

TRICHOPTERA.

Leptonema albovirens Walk.

Cartago, 13 July, 1909, in daylight; another specimen found floating in the Rio Grande de Tarcoles, near the Cebadilla electric plant, April 12, 1910.

Heteroplectron maculatum Banks.

Flying over river, close to water's surface, just after sunset, Rio Liberia, Liberia, Guanacaste, 11 Jan., 1910.

New American Bees of the Genus *Halictus* (Hym.).

By MRS. MARION DURBIN ELLIS, Boulder, Colorado.

(Continued from page 104.)

Halictus pallidellus sp. nov.

♀ Length 5.5 mm. Head and thorax rather light metallic blue, the mesonotum with a tinge of brassy green. Abdomen brown, the margins of the segments pale testaceous.

Face round, a little broader than long, closely punctured except on the vertex, which is very shiny, cheeks and face with abundant short white hair. Flagellum testaceous.

Mesonotum very shiny, punctures only moderately fine, and well separated, especially scattered just mesad of the parapsidal grooves, median groove distinct. No rim around the disc of the metathorax. Basal area without a true rim, the margin broadly rounded and very shiny, a narrow crescent-shaped area lying next to the post-scutellum finely roughened and with short indistinct plicae appearing very slightly depressed near the middle. Tegulae pale testaceous, impunctate.

Wings milky white, stigma and nervures very pale yellow, costal and marginal nervures light brown.

Legs dark brown, the tarsi testaceous.

Abdomen shiny brown, all the segments finely and sharply punctured, all except the disc of the first and the middle of the second segment, with abundant short white hair.

Pubescence not long but abundant throughout and everywhere pure white.

Habitat.—Roswell, New Mexico. 1 (type), and 1 cotype, at flowers of plum, April 14 (T. D. A. Cockerell).

The affinities of this bee are uncertain; the shiny metathorax, along with the very shiny mesonotum in which the punctures become more scattered along the parapsidal grooves, and the posterior margins of the segments, together with the short face, seem to place it in the same group with *H. zephyrus* Smith, *H. semibrunneus* Ckll., and *H. crassiceps* Ellis, from all of which the milky wings and the abundant white pubescence readily separate it. It is smaller than either *H. pruinosiformis* Crawford, or *H. albohirtus* Crawford, both species with milky wings and pale pubescence (*H. pruinosiformis* also has the dark costal and marginal nervures), from which the non-rugulose basal area of the metathorax also distinguishes it.

Prof. Cockerell compared *H. pallidellus* with the type of *H.*

albohirtus Crwf. in the U. S. National Museum, and found it considerably smaller and quite differently colored from Crawford's species. The following characters of *H. albohirtus* were noted as distinctive on comparison with *pallidellus*: Head and thorax yellow-green, almost golden green; front dull and coarsely granular, vertex shining in contrast; mesothorax very yellow, shining, with strong, not dense punctures; area of metathorax rugulose, with median impressed line and shining rim (area smaller, apical part hardly sculptured, in *pallidellus*); white hair on apical part of abdomen very long and abundant; anterior wing about 4.75 mm. long (much less in *pallidellus*); hind tarsi, knees and apices of tibiae clear light fulvous. The color of the wings is about the same in both species.

Halictus microlepidoides sp. nov.

♀ Length 5.5 mm. Bright, metallic blue.

Face almost round, only the shiny, black, apical half of the clypeus produced below the eyes; frons and vertex finely and closely punctured, the punctures more scattered on the finely roughened lateral areas of the face; clypeus and supraclypeal area shiny; cheeks very shiny.

Thorax opaque; the mesopleurae with coarse punctures above and coarse fovea above the middle; upper half of the metapleurae with rather strong plicae. Mesonotum with fine scattered punctures and sharp, close and rather coarse lineolations. Basal area of the metathorax a little longer than the scutellum, with a low, rounded, faintly, shiny rim extending well laterally; the surface finely lineolate and with rather numerous, strong, reticulate rugae. Tegulae dark testaceous, impunctate.

Wings hyaline, stigma pale testaceous, the nervures darker, costal nervure piceous; second submarginal cell very little smaller than the third.

Legs black, knees and tarsi dark brown.

Abdomen almost nude, very shiny throughout, discs of all of the segments with very minute punctures; the narrow apical margins of the segments dark testaceous.

Pubescence very scant, pale gray on the legs and under side of the body.

Habitat.—Organ mountains, La Cueva, New Mexico, altitude 5300 feet, 1 (type) 5.5 mm. at flowers of *Datura meteloides* DC., August 31 (Townsend); Mesilla Park, New

Mexico, in the Agricultural College building, 1, cotype, May 8, 1895 (Cockerell No. 2930).

This species looks very like and is closely related to *H. pruiniformis* Crawford, and *H. lazulis* Ellis, from which the very sharp lineolation of the mesonotum clearly separates it.

Halictus eophilus sp. nov.

♀ Length 6 mm. Head and thorax rather light bluish-green, clypeus and supraclypeal area shiny and a little brassy; abdomen clear brown, margins of the segments much paler.

Face round, clypeus somewhat produced, closely punctured, vertex, between the ocelli, shiny; ocelli glassy white and larger than in *H. connexus* Cresson (which is a much larger bee). Antennae dark brown, paler beneath.

Mesothorax broad, disc rather shiny, with only very weak lineolations, but with numerous, close, only moderately fine punctures, which are quite evenly distributed over the entire mesonotum; median groove distinct but not deep, parapsidal grooves rather indistinct. Metathorax not strongly retracted, the truncation without a rim; a distinct shiny rim around the basal area, widest immediately on either side of the middle, and extending well laterally, truncating the strong, crooked rugae. Tegulae clear, pale testaceous.

Wings whitish hyaline, stigma and nervures light testaceous, costal nervure reddish brown.

Legs brown, testaceous on the knees and tarsi.

Abdomen shiny, but finely and scatteringly punctured, margins of the segments testaceous; segments three to five and sides of one and two clothed with a thin white pubescence.

Pubescence of the face, sides and legs white and very scant, a little denser on the cheeks.

Habitat.—La Cueva, Organ Mountains, New Mexico, altitude 5300 feet, 1 (type), at flowers of *Datura meteloides* DC., September 5, before sunrise (Townsend); 1, cotype, at flowers of *Datura meteloides* DC., August 31 (Townsend); 1, cotype, at flowers of *Nuttallia multiflora*, September 2 (Townsend); Las Cruces, New Mexico, 1, cotype, on *Helianthus*, June 10, 1894 (Cockerell No. 917).

This species is clearly a near relative of *H. perpunctatus* Ellis, and *H. pruiniformis* Crawford, with which it shares the rimmed and rugose basal area of the metathorax, and the close even puncturing of the mesonotum. The light clear

brown and totally nonmetallic abdomen, together with the very pale tegulae separate it from every other species of the *H. perpunctatus* group. Like every other species of this group, unless *H. sancti-vincenti* Ashmead be admitted to it, *H. eophilus* is a species of the Rocky Mountain region.

***Halictus diversopunctatus* sp. nov.**

♀ Length 6 mm. Bright olive green throughout, the metathorax bluer.

Head broad, facial quadrangle square, narrowed below, clypeus but little produced. Entire face rather shiny, although closely and finely punctured above; front without a median carina below the antennae, supraclypeal area almost impunctate in the middle, not marked off from the lateral areas by a distinct sulcus, the face evenly convex right across in this region, almost to the orbits; cheeks shiny but finely punctured.

Mesopleurae shiny, coarsely punctured; metapleurae opaque with a very few faint plicae near the upper end. Mesonotum somewhat shiny, with numerous rather fine and close punctures of three distinctly different sizes, the very fine and the coarsest both less abundant than the medium ones. The punctures especially crowded on either side and just in front of the parapsidal grooves; median groove obsolete. Basal area of the metathorax narrow, with a low rounded rim limited to a short space immediately on either side of the middle, the surface distinctly lineolate and with numerous, simple, strong plicae reaching the truncation. Tegulae bright brown, impunctate.

Wings hyaline, very faintly yellow; stigma pale yellow, costal nervure piceous, the other nervures light brown; second and third submarginal cells subequal.

Legs dark brown, inner spur of the hind tibia with five well developed teeth.

Abdomen blunt, discs of the segments with minute punctures, apical margin of the segments narrow and testaceous; segments 3 to 5 covered with short grayish hair.

Pubescence pale grayish and rather abundant on the face, cheeks and thorax; faintly yellowish on the mesonotum and legs, white below.

Habitat.—California, 1 (type), No. 930, collector and exact locality unknown.

This species may be separated from all other species of the genus found in North America, with a green abdomen, by the character of the mesothoracic punctures and the configuration of the supraclypeal area.

***Halictus proangularis* sp. nov.**

♀ Length 6.5 mm. Head, thorax' and abdomen rather dark, uniform greenish blue, abdomen more shiny.

Head longer than wide, clypeus produced for half its length beyond the eyes, the margin black and closely punctured. Face rather finely and closely punctured; the narrow margin of the lateral area of the face, along the supraclypeal area and clypeus shiny and unsculptured. Antennae dark brown, cheeks narrow.

Tubercles pointed and the antero-lateral angles of the pronotum sharply projected, forming two broad angles on each side, somewhat curved forward. Mesonotum finely lineolate and rather finely punctured, the punctures rather close and crowded except along the median groove and at its anterior end. Metathorax very short, the entire surface closely lineolate, basal area narrow and crescent-shaped, slanting sharply downward, with a low narrow rim extending well laterally, and numerous weak, simple plicae that extend over the rim at the sides. Tegulae pale brown, the anterior half with very fine punctures and rather long yellowish hair.

Wings dusky and pale brownish, stigma and nervures dark brown.

Legs light brown, somewhat paler towards the tarsi; covered with rather dense, rich ochraceous hairs.

Abdomen broad and blunt at one end, the first segment almost impunctate and very shiny, the rest of the surface finely punctured, margins of the segments not testaceous. Segments three to five and the sides of segment two with a thin, pale buffy pubescence.

Pubescence scant and ochraceous, a little paler on the face and lower part of the pleurae.

Habitat.—Bayamon, Porto Rico, 1 (type), January, 1899 (August Busck). In U. S. National Museum.

The relationships of this species are not clear. The sharp tubercles and antero-lateral angles of the prothorax separate it from all of the other North American green *Halictus*. The uniform greenish blue color with the dark wings gives it a superficial resemblance to *H. aquilae* Ckll., which, however, is a much larger species, with a short face and a very different metathorax.

Length of the Pupal Stage of *Adalia bipunctata* Linn. (Col.)

Two larvae of this species pupating on June 19, 1900, at Annapolis, Maryland, emerged five and a half days later. Another pupating May 27, 1900, emerged early in the morning of June 3, or after six and two-thirds days. When disturbed, the pupa raises itself very quickly to a perpendicular position.—A. A. GIRAULT.

Adelocephala bisecta (Lepid., Family Ceratocampidae).

By JOHN R. EYER and CHESTER H. MENKE, Greenville, Ohio.

(Plate VII.)

Adelocephala bisecta, together with its near relative *A. bicolor* form the only two representatives of this genus in the United States. These two show a remarkable similarity in their larval habits, and as both feed on the same food plants they have not, until very recently, been distinguished.

The moth of *A. bicolor*, in coloring and marking, resembles very closely the female moth of *Anisota senatoria*. Yet the males of the two may very easily be distinguished, for *bisecta* lacks the transparent spot on the fore wings which is so characteristic of the male *senatoria*.

The fore wings of *bisecta* are ochre-brown, speckled with purplish dots and crossed by a purple border line. The discal dot, although white, is very small and inconspicuous. The under wings vary from orange to carmine, but are most deeply colored near the abdomen. The body is ochre-brown, and very "furry." Male and female are marked exactly alike, but the wings of the male are more acutely cut. The antennae of the male are pectinate at the base, and simple at the tip; those of the female are simple.

In the Ohio valley *bisecta* is double brooded, the moths being found late in May, and then again in July.

The eggs are light, brownish green in color, and very flat. They are laid in mats or clusters, and may be distinguished from those of *bicolor* by their brownish tinge. In nine days the caterpillars can be seen through the egg-shell, and on the eleventh day they hatch.

The little caterpillars are $\frac{1}{4}$ inch in length, yellow green in color, and bear eight dark colored, knobbed horns on the second and third segments, as well as a smaller one on the anal segment. They will feed on either honey locust (*Gleditschia*), or Kentucky coffee-tree (*Gymnocladus*).

In about two weeks they moulted, coming out dark green, with yellow horns and granules. Along each side they bore a stripe composed of yellow granules. After the third moult



ADELOCEPHALA BISECTA—EYER & MENKE.

they developed four silver-colored horns on the seventh and ninth segments. Before, these were only rudiments resembling large granules. In the last moult many of the granules, as well as the last set of horns on the third segment, and the lines on the anal segment, take on this silvery color. The eight horns on the second and third segments vary from orange to light blue. Along each side they bear a compound sublateral line composed of a yellow and blue stripe running parallel to one another.

When full grown the caterpillar is about $1\frac{3}{4}$ inches in length. Its main distinguishing marks from the *bicolor* are its greater number of silver horns and yellow granules, and in the lighter color of the eight horns on the second and third segments. Near pupation, the caterpillar burrows and, in the cell it forms, turns into a very dark brown pupa about $1\frac{1}{4}$ inches in length and heavy in proportion. The pupa resembles *bicolor* very closely although it is not so rough on the wing cases. The caterpillar period of *bisecta* is from 46-50 days. The pupae are very inactive, yet are seldom diseased. The moths emerge in late afternoon or early morning, and may be easily mated in captivity. They are night flyers and, as all the *Ceratocampids*, fly very late.

1913 as a Catocala Year (Lepid.).

By R. R. ROWLEY and L. BERRY, Louisiana, Missouri.

In the middle region of the Mississippi valley this has been the best *Catocala* year since the summers of 1900 and 1901. Like the season of 1900, the past summer was hot and rainless and a poor one for most butterflies. Even in August, when the *Papilios* usually are plentiful along the streams, there was an almost entire absence of them about their usual haunts. In June, it is true, the *Fritillaries* were abundant through the woods and at *Asclepias* bloom, but that was just as the drought set in, and they were the only butterflies that were abundant here in Pike County, Missouri, in 1913. There was a great scarcity of the "Little Wood-Satyr," *Neonympha eurys*,

never scarce here before, and even the Monarch and the Viceroy were among the rarities. Scarcer than "hens' teeth" was the "Goat Weed Butterfly" and the drought actually burned up its food plant, *Croton capitatum*. Hardly a Grapta was to be seen and only an occasional "Red Admiral."

In September, when the rains came, a few Cloudless Sulphurs, Dwarf Yellows and Little Sulphurs, but not a *nicippe*, flitted about the straggling flowers in the creek beds.

It was a great year for the Argynnids, as we said before, and perfect clouds of them hung over the milkweed flowers, magnificent Cybeles and occasional Idalias, those splendid "Silver Underwings." At one sweep of the net one could take a dozen Cybeles. Some of my school boys took a few of the "Red-spotted Purples," but, all in all, it was a gloomy butterfly year. However, the poet has told us that every cloud has a silver lining, and the silver lining to the 1913 cloud was the great abundance of *Catocala*. The season began early with the usual number of *ilia*, yielding some splendid varieties, the "white spots," "the pale front wings" and some with the top side of the forewing almost black, but never a yellow hind wing, such as the Senior Author took two years ago. *Epione* was fairly common and *residua* in great numbers. *Immubens* and its varieties came later than usual and *scintillans* outdid itself in its varieties and beauty. One splendid specimen had intensely black front wings with an almost white outer border and lacking the suffused boundary. *Habilis* was very plentiful, as also *palaeogama*, with its varieties, *annida* and *phalanga*. Better than all else, the very giant of "Underwings," *viduata*, always heretofore scarce in central Missouri, was almost common. The Senior Author and Mr. George Dulany took quite forty between the middle of July and the last of August. Perry Glick took numbers of it in Caldwell County and shared equally with the Pike Countians in catches of the usually rare *nebulosa* and *junctura*. It was distinctly an *ilia-epione-residua-palaeogama-habilis-viduata* year.

From pupae of bred larvae, the first imagoes of *illecta* emerged June the 14th and that was the "beginning of the

fun." In the woods searching for Cato-larvae from June 10th to the middle of the month no imagoes were flushed, but a quest for winged creatures on the 20th bagged several *ilia*. On the following day, accompanied by Mr. George Dulany, the Senior Author took two *polygama*, two *ultronia*, one *illecta*, two *innubens*, four *epione* and twenty-eight fine *ilia*, five or six of the latter being white spotted and one almost black. The day was a close one, with a temperature of ninety degrees, and the moths were at the bottoms of the trees.

June 25th was a sultry day after several showers, and Catos were fairly abundant. Lowell Pinkerton was the companion on this trip.

A "red-letter" day was June 28th, when Mr. Dulany and the Senior Author added to the usual catches one each of *coccinata*, *dejecta* and *parta*.

The first *palaeogama* was seen on July 3rd. We sugared on the night of the 4th, but failed to get many moths. The first *residua* from bred chrysalids appeared on the 5th and specimens of that species and the first *neogama* in the woods on the 6th. This was the trip on which the best of the *scintillans* were taken. The first *retecta* was from a bred chrysalis, July 11th. The first *amica* was taken on the 12th, along with the first *cara* and many *palaeogama* and *innubens*.

George Dulany, Harold Davenport and the Senior Author chased the "millers" on July 13th, taking many *residua*, *neogama*, *cara*, *palaeogama*, *innubens*, *scintillans*, one *retecta*, two *grynea*, a few *polygama* and ragged *ilia* and *epione*.

The first *habilis* was a bred specimen on July 16th. In the woods the first *habilis* was taken on the 19th. At the same time Mr. Dulany took the first *cerogama*, an imperfect *junctura* and the first *phalanga*.

On the 21st day of July, the Senior Author took the first *viduata*, some fine *retecta* and the second *cerogama*. July 23rd was a hot day with a heavy atmosphere and Catochas were abundant, high and low, but nothing new was added to the series taken on the 21st, except a *snoviana*.

With a heavy atmosphere after a shower and at a tempera-

ture of 90 degrees, close and cloudy, we took many moths, including half a dozen fine *cara*, two splendid *viduata*, four brand-new *habilis*, the first *lacrymosa*, besides the species mentioned on the 13th.

Alone in "Catocala Hollow," on the 28th, Mr. Dulany took two *viduata*, one *lacrymosa* and the first each of *nebulosa* and *amatrix*.

With the thermometer at 100 degrees, close and dry, July 29th, Mr. Dulany and the Senior Author found the woods alive with Catocala, along the branch and upon the bench and side of the hill, *innubens*, *cara*, *palacogama*, *neogama* and *retecta*, in the hollow, with *residua*, *palaeogama* and *viduata* along the hill slope. The valuable catches were three *viduata*, one *cerogama*, and the first *vidua*, as well as the first *angusi*.

July 30th yielded Mr. Dulany three *nebulosa*, one *viduata*, one splendid *carissima* and numbers of *cara*, *palacogama*, *retecta*, etc.; two *nebulosa*, one *vidua* and the first *lucetta* on the 31st.

August 2nd gave us three *vidua*, two *viduata*, one *lucetta*, three *lacrymosa* and a ragged *flebilis*, the first of the season. August 4th, one *nebulosa*, three *viduata* and one *vidua*. *Cara*, *innubens*, *palaeogama*, *residua*, *habilis* and *neogama* were especially abundant. The day was close, dry, hot, 92 degrees. On the 5th, took two fine *lacrymosa*, one splendid *paulina*, one *angusi* and many *habilis*. The day was warm, close, cloudy and threatening rain.

The "high-water" mark" of *viduata* was August 7th, when four perfect ones were taken, besides one *vidua*, one *angusi*, one *lacrymosa* and a number of good *cara*. The first *piatrix* of the season was taken on this trip.

Another "red-letter day" was August 11th, when the Senior Author, accompanied by Dr. Roy Marsh, took a dozen *cara*, one *amatrix*, one *nebulosa*, four *vidua*, four *viduata*, two *angusi*, two *lacrymosa*, *neogama*, *palacogama*, *retecta* and *residua*. There were Catocalas on almost every tree, high and low, in a close, hot, moist atmosphere after a slight rain.

In company with Dr. Marsh again on the 13th, the record

of the 11th was almost duplicated, the species taken embracing *nebulosa*, *vidua*, *viduata*, *lacrymosa*, *angusi* and one ragged *flebilis*.

One *nebulosa* and one *piatrix* on the 15th.

On the 16th, in company with Mr. George Dulany, took two *viduata*, one *lucetta*, five *lacrymosa*, three of which were *paulina*, one poor *flebilis*, the first *robinsoni*, a ragged female *nebulosa*, seven *vidua*, etc. Added a *lucetta* on the 19th.

Although the temperature was 94 degrees, warm and clear, on the 20th, moths were few and nearly all high on the trees. One *viduata*, one *robinsoni*, five *vidua* and one ragged *lucetta*. On August 28th, took four *robinsoni* and other *Catos*. Moths abundant and at the bases of the trees. Saw a *vidua*, a *palaeogama*, a *residua* and an *innubens* on the same tree. On the 30th, took two *viduata*, nine *vidua*, two *robinsoni*, one *lacrymosa* and the last of the *nebulosa*, a very ragged male.

September 1st, in company with Mr. Dulany, found moths plentiful. Took twenty-six *robinsoni*, thirteen *vidua*, four *piatrix*, one *amatrix*, one ragged *junctura*. The moths were at the bottoms of the trees and the temperature was 105 degrees at 2.00 P. M.

On September 5th, took three *robinsoni*, besides many other ragged things. The day was like the 1st in every way, but *Catocalas* were far less abundant.

Mr. George H. Hosenfelt, of St. Louis, reports September 7th as one of the best *Cato* days of the year. He took *viduata*, *phalanga*, *evelina*, *paulina*, *zelica* and a splendid *marmorata*. He captured the last named on the bare bark of a great elm.

September 10th saw a few ragged *robinsoni* and *vidua* in the woods and *robinsoni* again on the 18th.

On September 15th Mr. E. A. Dodge, of Santa Cruz, California, reports taking *Catocala hippolita* on shade elms.

With the Junior Author, the *Catocala* season at Vinton, Iowa, hardly began before August and was at its best about the first of September, and the catches included *minuta*, *ultronia*, *polygama*, *clintoni*, *innubens*, *parta*, *cerogama*; *resecta*, *palaeogama*, *neogama*, *piatrix*, *cara*, *amatrix*, *unijuga*, *relicta* and varieties, one *coccinata*, *amica* and *meskei*.

Both of the authors are still somewhat puzzled over the scarcity of *Catocala* one day and it may be, their great abundance the very next. On damp, sultry days, insects fairly swarmed in the valleys, not only *Catocala*, but other winged hexapods, while on close, hot days the moths were usually abundant and low on the trees everywhere. On cool or high-windy days few moths were to be seen, high or low. The puzzle is what becomes of all the *Catos* on such days. After all, isn't it barely possible that one year is quite as prolific of moths as another and the supposed great abundance of some years is merely the result of weather conditions that drive the moths to the forest and low on the trees? At least, this will account for the abundance or scarcity on certain days. Another point, in observation on one species, namely, *lacrymosa*, that this moth fluctuates in numbers from day to day, being fairly common one day and almost totally absent the next, under the same weather conditions. It is true, they may be high in the trees and always fairly common during their season, but this is hardly probable. One can imagine that they migrate from place to place in the woods. The Junior Author found that some species rare in the daytime were rather common at night, as she sugared. The Dodges found that true of *amatrix* here some years ago. Now, *amatrix* is a rare moth by daylight at Louisiana, but not uncommon at bait in the late summer evenings.

It was interesting to find, this summer, that several species of *Catocala* feed at flowers and the observation was the result of the accidental finding of the pollen grains of *Asclepias cornuti* adhering to the legs of *innubens*, *epione* and *residua*.

Of female *Catocala*, imprisoned in paper sacks for eggs, numbers of *retecta*, *residua*, *palaeogama*, *habilis*, *neogama* and *vidua* lived a month, supplied with crushed or bruised grapes for food and with a change of air and food every day. Some of these prisoners, fairly fresh, laid no eggs, while battered specimens sometimes laid hundreds. Some specimens hardly survived a week, dying with no apparent excuse.

In the forest, *Catocala viduata* proved to be easy game.

rarely flying away from the hickory or white oak on which it rested, even if disturbed, while *lacrymosa* took flight at the slightest sound and was hard to trap.

Associated under the roots of trees overhanging the brook were *cara*, *amatrix*, *junctiona* and *nebulosa*, the last named always out of sight, and the wariest of the *Catocalae*. Mr. Dulany seemed to make a specialty of capturing *epione*, *lacrymosa* and *nebulosa*, and certainly became proficient in taking them.

Residua, *angusi* and *judith* are always at rest on hickory and usually the shell-bark variety.

Vidua, *viduata*, *robinsoni*, *resecta* and *habilis* on hickory or white oak, and occasionally on sugar tree; *amica* on white oak.

Both Mr. Ernst Schwarz and George Hosenfelt report the capture of *Catocala titania* about St. Louis in the early part of the season among the crabs and hawthorns.

On the collecting trips of June 21st, 28th, July 4th, 6th, 12th, 13th, 19th, 27th, 29th, 31st, August 2nd, 16th and September 1st, Mr. George W. Dulany accompanied the Senior Author, and it was his unerring eye and perseverance that made possible many of the best catches. As a *Catocala* hunter, he has no superior.

Perhaps we should call attention to the entire absence of *Catocala subnata* and *insolabilis* and the great scarcity of *flebilis*, *amatrix* and *piatrix* in the neighborhood of Louisiana, Mo., in the summer of 1913.

The attempt to feed the young larvae of *Catocala aspasia* on willow was a failure and the caterpillars that hatched on May 5th lived nearly two weeks.

RESUMÉ OF OBSERVATIONS IN 1913.

- June 15 *illecta*, rarely taken in the woods.
 20 first *ilia* with the white spotted variety.
 21 first *ultronia*, *polygama*, *innubens*, *epione*.
 25 first *scintillans*.
 26 *minuta*.
 28 *coccinata*, *dejecta*, *parta*.
 29 *ultronia* abundant.
 29 *aholibah* (bred.)

- July 2 *neogama* (bred.)
 3 *verecunda* (bred), first *palaeogama*.
 5 *grynea* (bred).....*nebulosa*, 1912.
 6 *neogama*, first in the woods.....*insolabilis*, 1912.
 6 *residua*, first in the woods. Afterward very plentiful.
 6 *innubens* and *scintillans*, suddenly become plentiful.
 11 *retecta* (bred.)
 12 first *amica* and *cara*. *Innubens* numerous.
 13 *retecta* in the woods, *grynea*.....*viduata* and *paulina*, 1911.
 16 *habilis* (bred.)
 19 *habilis* in the woods, *cerogama*, ragged *junctiona*.
 19 *phalanga*.
 21 first *viduata*.
 23 *residua*, *palaeogama* and *cara*, abundant.
 23 *cerogama*, *snooviana*.
 27 *lacrymosa*.
 28 *nebulosa*, *amatrix*.
 29 *angusi*.
 30 *carissima*.
 31 first *vidua*, *lucetta*.
 Aug. 2 ragged *flebilis*.
 5 *paulina*.
 7 first *piatrix*.
 16 first *robinsoni*.
 30 *robinsoni* and *vidua* fairly common and good.

Imagoes are worth taking for a month from first appearance. 1913 gave an abundance of *epione*, *residua*, *palaeogama*, *habilis*, *viduata*, *nebulosa*, *robinsoni*.

DESCRIPTIONS OF EARLY STAGES.

Catocala aholibah.

Eggs of *Catocala aholibah*, as well as those of the variety *coloradensis* hatched on the 1st and 2nd of May and at one and a half days of age were light grayish brown with dark brown heads and about one-fourth of an inch in length. Lateral lines and stripes indistinct. The larvae of both these forms indistinguishable throughout their growth.

On the 5th, the larvae of *aholibah* moulted for the first time and were light in color, with large bi-lobed head, distinct tubercle and short black bristles. Longitudinal body lines more distinct. The little caterpillars after the first moult take to the twigs for color protection; i. e., lie lengthwise of the twigs.

The second moult occurred on the morning of the 8th and the lar-

vae were over half an inch long, dark gray with fine longitudinal light lines. A strong hump over the 5th abdominal segment. Head large with facial white lines. Face flat, slightly lobed above. The top of the abdominal hump black.

The third moult occurred on the 12th and 13th and the larvae were about an inch long, dirty gray with a big head, bearing a pair of blunt-like tubercles above with yellow lunules in front. Body tubercles yellow-brown. A sharp dark brown hump with a yellow point over the 3rd pair of prolegs. A pair of strong tubercles over the 7th abdominal segment.

After the fourth moult on the 16th, the caterpillars were from $1\frac{1}{2}$ to $1\frac{3}{4}$ inches long, light gray with a yellowish tinge. Tubercles white with black tips. Head large, flat in front, lobed above with yellowish tips to the lobes and heavy black lines behind the lobes. Head a little lighter in front than the rest of the body. A pale brownish band just behind the hump over the 3rd prolegs. The hump is hardly distinguishable from the body color except it has a white top. The pair of tubercles over the 8th abdominal segment have black tips and are strong. The under side of the body light with round black spots.

By May 21st, the larvae of *aholibah* were full grown and less than three inches long, thick heavy caterpillars, gray with a brownish tinge, black dots in encircling irregular white patches. Tubercles black in a white basal spot. The cross band over the 3rd pair of prolegs light yellow brown. Hump with dark base and yellow tip. The lateral row of setae rather short. The bristles on the top of the tubercle short. Head bi-lobed above with a broad black band behind the lobes. The true legs reddish brown with cross black bands at the segments. Spiracles black with an encircling white patch or line. A cross patch of lighter than body color over the first abdominal segment. The under side of the body pale or white with a midrow of large black spots in red-brown or yellow-brown patches.

All of the *coloradensis* larvae died after the fourth moult and the first of the *aholibah* began spinning on the 23rd. From a number of chrysalids of *aholibah* but one imago emerged, a fine male, on June 29th, with a pupal period of over five weeks. The chrysalids were killed, perhaps, by heat. The larvae of both *aholibah* and *coloradensis* fed on bur oak.

Catocala faustina and var *verecunda*.

Eggs of *Catocala faustina* and variety *verecunda* hatched on the 4th and 5th of May. The larva of *verecunda* at the first moult on the afternoon of the 7th was one-third of an inch long, light color, with almost white dorsum. Head light chestnut. Larva slender.

Just before the second moult on the 10th, the larva of *verecunda*

is light greenish, much darker, almost black, along the abdomen behind the hump to the rear end. Head light chestnut.

After a moult on the 14th, the larva was over half an inch long, pale brown with a cross black band and hump over the 3rd pair of prolegs. Head flattened, body color much like the larva of *Catocala cara*. On the 16th, the larvae were about three-fourths of an inch long, very light brown, almost cream color, striped indistinctly. A dark reddish brown band crosses the body over the 3rd pair of prolegs. The hump slight. Head as in *cara*.

Moulted on the 17th. On the 28th, the larvae of both *faustina* and *verecunda* were about grown. One of the latter was very light with a tinge of brown. Another, a decided brown with pink tubercles. Lateral setae very short. The cross band over the 3rd pair of prolegs very pale, obsolete on top. The dorsal hump small, pale straw color. Head as in *cara*, flattened and lobed above with yellow-brown lobes, behind which is a dash of black to the mouth, the dashes uniting above. Under side of the body white with the central row of black spots. Pinkish around the spots.

All of the *verecunda* larvae except two or three, could not slip their tough skins at the last moult and so died. Either the food was not damp enough, or the larvae lacked strength. The first larva of *verecunda* began spinning on June 2nd and was two inches long, light brown with yellow tinge. Very short lateral setae. Tubercles red-brown but dull. The longitudinal lines indistinct. The hump over the 3rd pair of prolegs small and with a light straw colored top. The cross band behind this tubercle, or hump, is only slightly darker than the general color, and that only on the side. The crest over the 8th abdominal segment slight with a dark line behind it that runs down on the side to the spiracles. Spiracles small with a dark ring about each. Head yellowish, strongly so at the lobes above. A dark encircling line surrounds the face. Under side of the body greenish white, with a midventral row of black spots with a slightly pinkish border. Larvae fed on willow. No distinction between the larvae of *faustina* and *verecunda*. The first larva of *faustina* cocooned on June 5th. On the 3rd of July, one pupa of *verecunda* gave a moth, twenty-seven days after beginning to spin. No other chrysalids of either *faustina* or *verecunda* gave imagoes.

Catocala residua.

Eggs of *Catocala residua* hatched on May 4th, the same day that the *verecunda* eggs hatched. On May 7th, before first moult, the little caterpillars were 1-5 to $\frac{1}{4}$ of an inch long, light reddish brown with small darker head. Slow growth. On the 10th, larvae still small, color dark gray, striped longitudinally with white. Head small, dark.

After moulting on the 17th, the larvae were three-fourths of an inch long. Very dark brown, almost black, striped longitudinally with light and black lines. Head round and colored as body. True and prolegs light or flesh color. A mid-dorsal row of triangular whitish spots. No dorsal hump.

After the moult on the 21st, the larvae were over an inch long, dark brownish gray with large round head, slightly lighter, not dish-ed in front as in *aholibah*, and the *cara* group. A line of small light reddish brown mid-dorsal triangles with the vertical angle toward the head. True legs cream color. No apparent row of lateral setae.

After moulting the last time, the larva was gray-brown with large round head, white and brown mottled. True and prolegs flesh color. Tubercles light reddish brown. Tubercular bristles rather strong. No lateral setae.

The grown larva of *residua* is from $2\frac{1}{2}$ to $2\frac{3}{4}$ inches long, light grayish brown, streaked longitudinally with black and cream color. Whole surface with black dots and broken black lines. No dorsal hump or lateral setae. Tubercles light straw color. True legs faintly pinkish. Prolegs flesh or straw color. Head round, not lobed, and with pale red brown linear mottling. The top of the crest over the 8th abdominal segment straw color. Under side of body white with the usual row of mid-ventral round black spots with hardly a surrounding tinge of red. The tubercular bristles strong.

The colony was fed on pecan. The first larvae began spinning June 6th. The first imagoes appeared July 5th, twenty-nine days from the time the larvae began spinning. A larva of *residua* taken under hickory bark in the woods was over two inches long, very light gray with a mid-dorsal row of light triangles surrounded by dark brown, almost black. A dark brown, almost black spiracular band. Head light gray with pale reddish brown mottling. Stiff tubercular bristles but no lateral setae. Under side of body whitish-green with the mid-ventral row of smoky black spots. No humps. Prolegs faintly greenish. True legs pale. No facial dash but with a black splotch either side of the mouth. This larva was much lighter in color than the brood of larvae bred from the egg but the imago differed little from other *residua*.

Supposed Diseased Eggs of *Thyridopteryx ephemeraeformis* Haworth and Record of Parasites (Hym.)

Among a number of eggs of this species obtained during the winter of 1900-1901 there were some which appeared to be diseased in other-wise healthy masses. These were coffee-colored with irregular black-ish markings, and afterward no evidences of eggparasitism by insects were obtained. From many of the overwintered bags *Catolaccus thyri-dopterygis* Ashmead was obtained and a few *Smicra mariae* Riley. The latter seemed to be the host of the *Catolaccus*.—A. A. GIRAULT.

The Nearctic Species of the Hymenopterous Genus *Symphya* Foerster.*

By S. A. ROHWER.

As far as the writer can learn no record of the host of any species of the Dacnusine genus *Symphya* has ever been published. Mr. C. T. Greene has bred a species, *Symphya agromyzae*, from the pupa of a species of *Agromyza* where it is a primary parasite. The conditions under which the host lives and some remarks on the parasite will be published by Mr. Greene.

While studying these Nearctic species the writer studied the literature dealing with the European species and judging from it none of the species noted here are the same as any of the European species, although *sericea* (Provancher) is evidently closely allied to *ringens* (Haliday).

TABLE TO THE SPECIES.

Mesonotum coarsely sculptured, notauli not sharply defined; (head rather densely and strongly punctured above antennae),	
	<i>belfragei</i> Ashmead
Mesonotum not coarsely sculptured, notauli well defined	1
1. Prescutum without a median furrow; head below the antennae shining and impunctate	<i>lucida</i> Rohwer
Prescutum with a median furrow which is foveolate; head below the antennae punctured	2
2. Head above the antennae impunctate; suture in front of the scutellum without a strong longitudinal carina,	
	<i>portlandica</i> Rohwer
Head above the antennae with separate punctures; suture in front of the scutellum with strong carinae	3
3. Dorsal and posterior aspects of the propodeum separated by a complete oblique carina; (antennae 29-jointed, scape black; hind tarsi dusky)	<i>nigricornis</i> Rohwer
Dorsal and posterior aspects of propodeum not separated by carina	4
4. Hind tarsi dusky; antennae 27 to 29-jointed; median carina of first tergite complete to apex	<i>sericea</i> Provancher
Hind tarsi pale; antennae 32-jointed; median carina of first tergite not extending to apex	<i>agromyzae</i> Rohwer

*A contribution from the Branch of Forest Insects of the Bureau of Entomology, Washington, D. C.

Symphya belfragei (Ashmead).

Oenone belfragei Ashmead, Proc. U. S. Nat. Mus. Vol. 11, 1888, p. 649.

Symphya belfragei Dalla Torre, Cat. Hym. Vol. 4, 1898, p. 30.

"*Male and female*.—Length, 3 to 3.25 mm. Black, opaque, rugosely punctate, covered with a sparse, white, sericeous pubescence; two basal joints of antennae and legs flavo-testaceous. The head is transverse, very short, about twice as wide as long vertically; the eyes are oval and extend to the base of the mandibles; the clypeus projects much below the lower line of the eye, and with the short head and the distended mandibles gives the insect a very peculiar appearance. Antennae 31-jointed in the male, 29-jointed in the female; the thorax is shorter than the abdomen, with distinct parapsidal grooves, the middle lobe has a punctured longitudinal groove down the center; metathorax areolated; abdomen oval, the sculpture having a longitudinal direction, the first segment being more distinctly striated; in the female it is 4-segmented, in the male 5-segmented, the terminal segments being very small. Wings hyaline, iridescent; veins brown; the recurrent nervure joins the 1st submarginal cell between the middle and the apex; the submedian cell is slightly longer than the median.

"*Habitat*.—Texas.

"Described from four specimens, two male and two female, in collection Belfrage." [Original description.]

Type.—Cat. No. 2978, U. S. N. M.

Symphya lucida new species.

Male.—Length, 2.75 mm. Head entirely smooth, shining, impunctate; anterior margin of the clypeus truncate; anterior margin of the labrum obtusely pointed; ocelli not enclosed by a furrow; antennae 29-jointed, third joint about one-third longer than the fourth; mesonotum shining, almost impunctate; prescutum without a median longitudinal line; notauli finely foveolate posteriorly, where they unite, strongly foveolate; suture between the scutum and scutellum with four strong rugae; scutellum shining, almost impunctate; dorsal aspect of the propodeum shining, not separated from the posterior aspect by a carina, strongly reticulate; entire sides shining, almost impunctate; first tergite longitudinally striate and with nine longitudinal rugae, second and third segments longitudinally striate, the striae irregular and not as strong as on the first tergite; the posterior segments shining, impunctate.

Black; scape piceous beneath; legs ferruginous, the hind tarsi slightly dusky; wings hyaline, iridescent; venation pale brown.

Easton, Washington. Described from one male collected by A. Koebele.

Type.—Cat. No. 16471, U. S. N. M.

Symphya portlandica new species.

Male.—Length, 2.5 mm. Anterior margin of the labrum broadly rounded; anterior margin of the clypeus subtruncate; head below the antennae subopaque with fine, poorly defined and rather separated punctures; head above the antennae shining, impunctate; ocelli not surrounded by a furrow; antennae 25-jointed, the third joint subequal with the following. Mesonotum shining, practically impunctate; prescutum with complete longitudinal furrow which is finely foveolate; notauli rather coarsely foveolate and forming a *U* posteriorly where they are reticulate; suture between the scutum and scutellum with two fine longitudinal rugae; scutellum shining, impunctate; dorsal and posterior aspects of the propodeum not separated by a carina, both reticulate; posterior part of the mesepisternum shining, impunctate, anteriorly strongly reticulate; sides of the propodeum sculptured like the posterior face; first tergite sculptured like the following two, finely striato-reticulate with the striae predominating, no predominating carina on three basal tergites; the following tergites shining, impunctate.

Black; palpi piceous; legs below the coxae rufo-ferruginous; the four posterior tarsi being dusky; wings hyaline, iridescent, venation pale brown.

Portland, Oregon. Described from one male collected April 28.

Type.—Cat. No. 16472, U. S. N. M.

Symphya nigricornis new species.

Female.—Length, 3 mm. Head below the antennae opaque, closely, rather finely punctured; above the antennae shining, with well defined punctures; ocelli enclosed by deep furrows; antennae 30-jointed, the third and fourth joints subequal; mesonotum shining, sparsely punctured with well defined punctures; prescutum with a complete longitudinal foveolate furrow; notauli more coarsely foveolate, and posteriorly V-shaped with the apex of the V reticulate so as to be U-shaped; suture between the scutum and scutellum with five strong rugae; scutellum shining, impunctate; dorsal aspect of the propodeum finely reticulate on a granular surface and with two poorly defined longitudinal carinae which extend posteriorly to the oblique carina which separates the dorsal and posterior aspects; posterior aspect of the propodeum reticulate; posterior part of the mesepisternum shining, sparsely punctured with well defined punctures; the an-

terior portion granulato-reticulate; sides of the propodeum coarsely reticulate; first tergite more coarsely longitudinally striate than the following and with a complete, very prominent median carina; second and third tergites with fine, well defined longitudinal carinae which extend to the apex of the third tergite; following tergites shining, impunctate.

Black; palpi ferruginous; mandibles, malar space, and scape piceous; tegulae and legs rufo-ferruginous; wings hyaline, iridescent, venation pale brown.

Described from one female from Colorado without definite locality.

Type.—Cat. No. 16473, U. S. N. M.

Symphya sericea (Provancher).

Oenone sericea Provancher, *Addit. fauna Canad. Hym.*, 1888, p. 394.

Symphya sericea Dalla Torre, *Cat. Hym.* Vol. 4, 1898, p. 30.

Original Description. "♀.—Long. .12 pce. Noire avec les pattes jaune-miel. Les mandibules jaunes avec l'extrémité noire. Antennes soyeuses, noires, le scape jaunatre en dessous; les écailles alaires jaunes. Le mésothorax à 3 sillons bien prononcés, se réunissant avant d'atteindre la fossette de la base de l'écusson, les 2 latéraux crenelés; le métathorax finement rugueux. Ailes hyalines, le stigma et les nervures brun-foncé. Pattes jaune-miel sans aucune tache y compris les hanches. Abdomen sans aucune tache, soyeux, seulement 3 segments; tariere à peine sortante.—Ottawa (Harrington.)"

Additional Characters.—Head below the antennae with fine, rather close punctures, above the antennae with well separated and well defined punctures; ocelli enclosed by a deep furrow; median, longitudinal line of prescutum complete, well defined, foveolate; suture in front of the scutellum with four strong rugae; dorsal aspect of the propodeum irregularly reticulate on a granular surface, with two raised, but poorly defined longitudinal lines; carapace sculptured to apex, the following segments smooth.

Above characters taken from a female from the type locality, collected by Harrington and now in collections of U. S. N. M.

Symphya agromyzae new species.

Female.—Length, 3 mm. Head below the antennae shining, sparsely punctured with fine, well defined punctures; above the antennae shining, punctured with sparse but well defined punctures; ocelli enclosed by a strong furrow; antennae 32-jointed, the third joint about one-fourth longer than the fourth; mesonotum with fine, well defined

punctures; prescutum with a complete, longitudinally foveolate furrow; notauli foveolate, U-shaped posteriorly where they are more strongly foveolate but are not depressed; suture between the scutum and scutellum with three strong longitudinal rugae; scutellum shining, with a few fine punctures; dorsal aspect of the propodeum coarsely reticulate and not separated from the posterior aspect which is also coarsely reticulate; mesepisternum reticulate, more strongly so anteriorly, with a rather small, shining, punctured spot on the posterior part; sides of the propodeum strongly reticulate; first tergite coarsely, longitudinally striato-reticulate, the striae predominating, no complete, well defined median stria; second and third tergites sculptured similarly to the first, but not so strongly so; the apex of the third tergite almost impunctate and shining, as are the following tergites.

Black; palpi pale brown; mandibles, scape, pedicel, tegulae in part, rufo-ferruginous; legs ferruginous; wings hyaline, iridescent, venation pale brown, stigma dark brown.

Chain Bridge, District of Columbia. Described from one female recorded under Bureau of Entomology Number Hopk. U. S. 10219a, collected by Mr. C. T. Greene and reared from species of *Agromyza*. A paratype from Ithaca, New York.

Type.—Cat. No. 16474, U. S. N. M.

New American Diptera.

By J. R. MALLOCH.

The species included in this paper are described from types in the Academy of Natural Sciences, Philadelphia.

Hydrotaea cressoni, new species.

Male.—Glossy black, with a distinct, bluish tinge. Frontal lunule, face and eye margins beneath level of antennae silvery pollinose. Proboscis and palpi black. Mesonotum without any indications of stripes or pollinosity. Abdominal segments 3, 4 and 5 with a very distinct, elongate, anterior marginal spot on each side, forming an interrupted white fascia on each segment. Legs black. Wings clear. Calypterae white, margins and fringe yellowish. Halteres yellow.

Eyes distinctly, but not thickly, pubescent; frontal stripe narrow; third antennal joint not twice as long as second; arista with an elongate swelling at base, microscopically pubescent; cheeks linear, bristles numerous and moderately strong; palpi elongate, with numerous hair-like bristles.

Two pairs of presutural and four pairs of postsutural macrochaetae on mesonotum; acrostichals indistinguishable from the rather long discal hairs.

Fore femur with a short, sharp, forwardly directed tooth at about apical fourth on the postero-ventral surface, on the base of which, on the posterior side, are 2 bristles; antero-ventral surface with an elongate, ridge-like callosity slightly nearer to base of femur; bristles at base on postero-ventral surface very long, decreasing in length to middle; beyond the postero-ventral thorn there are 2-3 short bristles on same surface; fore tibia attenuated at base, hollowed out on ventral surface, the postero-ventral margin with a slightly raised ridge on middle; one long bristle on apical third of postero-ventral surface, one, shorter, on dorsal surface nearer to apex and another short one at apex on almost the posterior surface; fore metatarsus as long as next 3 joints. Mid femur thin, slightly curved, and except at near base almost bare; mid tibia without any bristles. Hind femur elongated, reaching slightly beyond apex of abdomen, curved, and slightly dilated on beyond middle; ventral surface with two short, closely approximated thick thorns, which have the tips dilated; anterior surface with a row of bristles which become longer and stronger, are more widely placed and descend slightly as they approach apex of femur; postero-ventral surface bare; hind tibia curved, apically becoming slightly thicker, and four-fifths as long as femur; ventral surfaces on apical half with numerous closely placed hair-like bristles which are at middle rather more than equal in length to the tibial diameter, and rapidly decrease in length to apex; dorsal bristle very long; antero-dorsal surface with a series of short bristles from base to upper antero-dorsal bristle.

Wings with veins 3 and 4 slightly convergent; last section of fourth vein $2\frac{1}{2}$ times as long as penultimate section. Calyptres with the lower scale distinctly protruding. Length 4.5 mm.

Holotype: Cloudcroft, New Mexico, May 24, 1902, (H. L. Viersck). Type No. 6053.

Allied to *ciliata*, Fabricius, but the absence of the very long mid femoral apical bristles, so conspicuous in that species, readily distinguishes it from *ciliata*.

Pseudostenophora bispinosa n. sp.

Female.—Black, subopaque. Antennae, tibiae and tarsi brownish-yellow. Wings slightly grayish. Halteres yellow, knob black-brown.

Frons twice as broad as long; second row of bristles straight, one pair of bristles only in first row; antennae normal in size; arista nearly twice as long as width of frons, distinctly pubescent; palpi

slightly larger than third joint of antenna, with several end bristles; proboscis thickened and enlarged, almost identical in form with that of *Aphiochaeta rostrata* Brues.

Mesonotum with 1 pair of dorso-centrals; scutellum with 2 bristles.

Abdomen almost bare, anal organs hairy.

Fore tibia with 1 dorsal bristle before the middle; mid tibia with the normal 2 on basal third very weak, and the one at apex not distinguishable; hind tibia without any bristle, or with a weak one on antero-dorsal surface before middle.

Costa to about three-fifths the wing length, first division equal to 2 plus 3, 3 about three-fourths as long as 2; fourth vein leaving third at about midway from fork to apex with a very decided curve (as in *Truphconeura vitrinervis* Malloch) and ending almost at wing tip; seventh vein less distinct than the others, but complete; costal fringe fine and close, its length equal to about twice the diameter of costal vein. Length 1.5 mm.

Holotype ♀, Westville, New Jersey, April 11, 1900. Type No. 6054.

Paratypes: 6 specimens with same data.

I consider that this species belongs to the genus in which I have placed it rather than to *Truphconeura* with which it has certain affinities. The species in the latter forms have the seventh vein interrupted except in the case of the female of *lugubris* Meigen, which has that vein complete, but indistinct. There is a close resemblance between certain species in *Truphconeura* and others in *Pseudostenophora*, but so far as I have seen the following set of characters may be relied upon to distinguish the species of the latter forms from all other Phorid genera: Frons much broader than long; mesonotum with 1 pair of dorso-centrals; scutellum with 2 bristles; male hypopygium large, but without any projecting anal organ and not highly chitinised as in *Truphconeura*; legs with generally the following bristles: 1 on fore tibia, 2 weak ones at basal third of mid tibia, and occasionally a weak one at apex, and the hind tibia never with more than one bristle; third vein of wing forked.

This is the first species of the genus that I have seen from America.

Paraspiniphora pennsylvanica n. sp.

Male and female.—Black, shining. Knee joints yellowish. Halteres yellow. Wings slightly browned.

Frons glossy, distinctly broader than long, the surface with numerous short hairs; first and second rows of (4) bristles almost straight; one pair of post-antennals present; male antennae enlarged, third joint about half as large as eye; female antennae slightly enlarged, third joint about one-third the size of eye; arista bare, its length about equal to $1\frac{1}{2}$ times the width of frons; palpi and proboscis in both sexes normal, the former moderately bristled; one very long, downwardly directed bristle on cheek in both sexes.

Mesonotum with 1 pair of dorso-centrals; basal pair of scutellar bristles much weaker than apical pair in both sexes.

Abdomen almost bare; male hypopygium with numerous hairs.

Fore tibia with 3-4 serial bristles on dorsal surface from base to apex; mid tibia with 3 antero-dorsal bristles, 2 on basal half and one near apex, and 4-5 on almost the dorsal surface from base to apex; hind tibia with generally 10 bristles, 5 on the dorsal and 5 on the antero-dorsal surfaces, arranged in pairs, besides the apical spurs; no ventral bristles present on either of the posterior pairs of tibia.

Costa to middle of wing; first division about 1 1-3 times as long as 2 plus 3, 3 half as long as 2; fourth vein slightly bent at base, leaving just beyond fork of third and ending almost in fore margin of wing owing to its gradual forward inclination; one strong bristle present on base of third vein; costal fringe close and fine, equal in length to about twice the diameter of costal vein. Length 3-4 mm.

Holotype: ♀, Swarthmore, Delaware County, Pennsylvania, March 30, 1905 (E. T. Cresson, Jr.). Type No. 6055.

Paratypes: 1 male and 1 female same data.

Resembles *spinosissima* Strobl, and *spinulosa* Malloch, but differs in chaetotaxy from both.

Aphiochaeta submanicata n. sp.

Male.—Yellow, slightly shining. Frons brown, surface with grayish pollinosity; antennae brownish yellow, arista brown; palpi clear yellow. Mesonotum reddish yellow on disk; pleurae yellow, with a large blackish patch below wing base; postnotum black-brown. Abdomen black-brown on dorsum; basal segment yellowish at base; each segment with but slight indications of a pale posterior margin; anal protuberance and hypopygium yellow. Legs yellow, mid coxa with a black streak on posterior surface; apices of hind femora blackened. Wings clear; veins brownish, very distinct except at apices of thin veins. Halteres clear yellow.

Frons slightly longer than broad; lower post-antennals not half as large as the strong upper pair; central pair of bristles in first row slightly below level of upper post-antennals and nearer to them than to eye margin; outer pair in same row slightly higher placed than upper post-antennals and about as far from the central pair as from eye margin; antennae of moderate size; arista slightly longer than frons, slightly pubescent; palpi large, the size exceeding that of the third antennal joint, almost bare, the bristles very short.

Scutellum with 4 bristles; mesopleura with numerous short bristles.

Abdomen tapering; second segment slightly the longest, the others subequal; last 2 with numerous short discal hairs and a few longer posterior marginal hairs; second segment with several lateral hairs which are not very conspicuous; anal protuberance large, well exposed, the apex with the usual curved hairs.

Basal joint of fore tarsus about three-fifths as long as fore tibia, and slightly longer than joints 2 plus 3, much swollen, as thick as tibia; hind femur with soft hairs to middle on ventral surface; hind tibial setulae very weak and hair-like.

Costa to wing middle; first division slightly longer than second, and shorter than 2 plus 3, third division slightly less than half as long as second; fourth vein leaving at beyond fork of third with a slight bend and ending, recurved, at before wing tip; costal fringe equal in length to interior arm of fork (free end of vein 2). Length 1.5 mm.

Holotype: Frankford, Philadelphia, September, 1913, (J. R. Malloch). Type No. 6056. Taken indoors on window.

This species is allied to *projecta* Becker, but differs materially in wing venation. It shows a nearer approach to *magnipalpis* Aldrich in venation but differs in coloration and other characters from that species.

Leptocera (Limosina) subpiligera, n. sp.

Male.—Black-brown, slightly shining. Face and cheeks, distinctly whitish gray pollinose; pleurae, lateral margins of mesonotum narrowly, and abdomen on sides gray pollinose. Legs black-brown. Wings clear, veins black, vein 4 traceable to margin though not darkened beyond cross-vein, vein 5 not distinguishable beyond cross-vein. Halteres with yellow knob and darkened pedicel.

Frons entirely shining; all bristles strong, the two orbital bristles subequal in size, anterior to the lower one there are several short setulae; divergent ventral rows of setulae distinct, incurved; 5-6 in number, increasing in length from upper to lower extremities; face

buccate between antennae, slightly concave on middle, mouth margin not produced; cheek less than half as high as eye at its lowest part and gradually increasing in height posteriorly; vibrissa strong and long, incurved, behind the vibrissa there is an almost equally strong bristle which is upcurved and reaches almost to middle of eye. Marginal bristles distinct and not particularly numerous; mouth opening large, labrum slightly protruding, proboscis broad, at apex sucker-like, short; palpi small, with a few weak bristles; antennae rather above the average size, standing well clear of the eyes, third joint pilose, broader but barely longer than second, which has on the inner side at apex several distinct setulae; arista tapering, basal joints distinct, but slightly thickened; pubescence sparse, distinct from slightly beyond base, arista in length equal to from its base to vertex; eye bare, distinctly longer than high.

Mesonotum with posthumeral bristle strong, incurved; three pairs of dorso-centrals present; acrostichals distinct from near anterior margin, between them and the anterior dorso-central there are 3-4 rows of short discal setulae; scutellum with eight marginal bristles as in *fontinalis* Fallen, disk bare; postnotum glossy black.

Abdomen shorter than thorax, cylindrical in shape; second segment much elongated, the others short, all segments with numerous hairs, which are particularly noticeable, long and bristle-like laterally on apical segments; hypopygium rounded, large, knob-like, its surface, particularly on venter, covered with numerous rather long hairs.

Legs strong; fore tarsi gradually and distinctly dilated from base to apex; mid-tibia with seven dorsal bristles (2:2:3) and 1-2 on ventral surface; mid-trochanter with a strong bristle; apex of mid-metatarsus with 3-4 end bristles; hind femur with a series of 5-6 bristles on apical half of antero-ventral surface; hind tibia with four rows of hair-like bristles, one on almost the ventral surface from base to apex, which is longest on middle, one rather shorter on anterior surface which is rather longest at base, one on dorsal surface consisting of 6-7 rather widely placed bristles, and a fourth much shorter on the postero-dorsal surface which is regularly and rather widely spaced and becomes longer toward apex; hind tarsus thickened, joints about, 2:3:1½:1:2.

Wings with costa to end of vein 3, second costal division 1 2-3 times as long as third; costa setulose to end of first vein; outer cross-vein distinctly before the vertical line of apex of vein 2, the section of vein 4 between cross-vein equal to basal section of vein 3; outer cross-vein about half as long as section of vein 4 preceding it; last section of vein 3 slightly but gradually and appreciably bent forward.

Length, 2½ mm.

Holotype, male, Hazleton, Pa., August 7, 1909, (Dr. Dietz), Type No. 6057.

Paratype: 1 male with same data.

This species comes close to both *piligera*, Stenh., and *zosteræ* Haliday, but differs in venation from both of those species.

Mantis religiosa Linnaeus, in Rochester, New York, in 1913 (Orthop.)

One day, early in September, while collecting some *Colias philodice*, etc., I was amazed to find a large female mantis. I would not have observed it had it not been for a *Xylocopa virginica* which I was transferring from my net to the killing bottle, and in doing so, knelt on the ground. This must have aroused the mantis from its hiding place. Being unaware of its habits, I picked up the specimen, but dropped it just as quickly, being pierced by the fore legs, which gave me a swollen finger for several days. The females hide under long grasses, etc., and to collect them they must be aroused from their hiding places.

They vary greatly in color. Some individuals are almost gray, while others are green, yellow, pale brown or dark brown.

The males resemble a katydid in their flight, and differ very greatly from the females in regard to habits. They can be found flying from bush to bush, but are by no means common.

The species interested me so much that I wrote to Mr. A. N. Caudell, U. S. Nat. Mus., Washington, D. C., for its identification, etc. It proved to be *Mantis religiosa* L., introduced into this vicinity some years ago. As it is an insect of predaceous habits, eating other insects, etc., it should be therefore protected. A few beneficial insects may be destroyed by it, but, on the whole, it is to be regarded as a friend.

After becoming aware of their habits, I had no trouble in finding them in considerable numbers. In all, I must have taken 200 or more, two-thirds of which are females. The males are very slender, and resemble *Stagmomantis carolina* very closely, being about $1\frac{3}{4}$ to 2 inches in length. The females measure from $2\frac{1}{4}$ to $2\frac{1}{2}$ inches, and are much stouter in form.

I found a small quantity of egg-masses generally attached to the weeds or grasses, within two or three inches from the ground. They measure from $1\frac{1}{4}$ to $1\frac{3}{4}$ inches in length. I shall try to raise these and take all possible notes. Should I be fortunate enough to get the complete metamorphosis, I will publish the results for the sake of some of our collectors.—ROBERT SCHMALTZ, 319 Central Park, Rochester, N. Y.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., APRIL, 1914.

The Ethics of Publication.

Several times during the past three years articles accepted for publication in the NEWS have appeared in other journals, subsequent to the date of acceptance here but before they could be published in this magazine. From the fact that the NEWS has been receiving material months in advance of the possibility of publication, we assume that it is a not unwelcome outlet of communication for entomologists. With such a bounteous supply, justice to our contributors suggests that we must publish accepted articles as nearly as possible in order of reception, after the current month's reviews and records of literature have been provided for. The enforced delay chafes some eager authors and exposes them to the temptation of offering their already accepted productions to other media less crowded at the moment, without advising us of their intentions. It is a marvelous thing, only appreciated in its full force by an editor, how nearly unanimous authors are as to the all-importance of their writings and how serious will be the damage to the world at large if each article be not published within one week of its reception by the aforesaid editor.

Irrespective of the question as to the value of the entomological articles that are published, it is true, at present, that the production exceeds the means of publication. It is, therefore, not economical to publish the same article in two journals. The space occupied by the repeat were better devoted to something else. The NEWS does not intentionally publish that which has already appeared elsewhere, except in the case of brief notes or announcements. An author who publishes in two places an article not coming under these exceptions, is the thief of space, as well as of time, and excludes his fellow from the opportunity which his repeat usurps.

Fragments on North American Insects—VI.

By A. A. GIRAULT, Nelson (Cairns), Queensland, Australia.

(Also on pages 148, 155, 167.)

Proctotrypoids With Wings Folded Upon Emergence (Hym.)

From a note made in August, 1899, it appears that a species of Scelionidae was obtained from some lepidopterous eggs brought in from the field which upon emerging had the wings folded, later spreading as usual.

Callosamia promethea Drury (Lepid.)

A number of cocoons of this species taken at Annapolis, Maryland, February, 1900, and confined indoors at nearly normal temperature (in an attic), commenced to give forth adults on May 8 following. The cocoons were found in forest trees and wild cherry.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

3—The American Naturalist. 4—The Canadian Entomologist. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 35—Annales, Societe Entomologique de Belgique. 36—Transactions, Entomological Society of London. 37—Le Naturaliste Canadien, Quebec. 40—Societas Entomologica, Zurich. 50—Proceedings of the U. S. National Museum. 65—La Feuille des Jeunes Naturalistes, Paris. 74—Naturwissenschaftliche Wochenschrift, Berlin. 84—Entomologische Rundschau. 87—Bulletin, Societe Entomologique de France, Paris. 90—Revue Scientifique, Paris. 92—Zeitschrift fur wissenschaftliche Insektenbiologie. 97—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 143—Ohio Naturalist. 153—Bulletin, American Museum of Natural History, New York. 155—Nova Acta Academiae Cae-

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CECIDOMYIIDAE, by J. J. KIEFFER, *Genera Insectorum*, Fascicle 152, pp. 346, pls. 15, 1913.

This comprehensive work lists some 2500 species and 330 genera from all parts of the world. It is more than a list of the species, since it is a generic synopsis and contains keys for the separation of the various groups. It is well printed, the plates are admirably executed and the copious three-column index, occupying 19 quarto pages, makes the contents most accessible. The work has been prepared by one who has spent years of productive labor upon the group and has probably seen more genera and species of gall midges than any one else. The classification in this generic synopsis and list of species should therefore represent the latest and most advanced taxonomic ideas. The following tabulation gives the author's arrangement in outline and may be advantageously scrutinized:

SYNOPSIS OF KIEFFER'S CATALOGUE OF CECIDOMYIIDAE.

SUBFAMILIES AND TRIBES	NUMBER OF GENERA	NUMBER OF MONOTYPIC GENERA	NUMBER OF SPECIES
CECIDOMYINAE	285	176	2302
Lasiopterariae	16	6	231
Oligotrophiariae	49	34	678
Asphondyliariae	16	9	171
Brachyneuriariae	22	13	44
Cecidomyiariae	157	104	991
Porricondylariae	25	10	187
LESTREMINAE	32	19	185
Campylomyzariae	24	14	151
Strobliellariae	1	1	1
Lestremiariae	7	4	33
HETEROPEZINAE	14	11	28
GRAND TOTAL	331	206	2515

The subfamilies remain about as they have been in recent years. There are some changes in the Cecidomyinae with which we are not in full sympathy. One is the combination of the *Dasyneuriariae* with

the Oligotrophiariae. This earlier separation was one we found very convenient and, on the whole, satisfactory, though there are some intermediate forms which are not easily placed. The occurrence of the latter by no means invalidates the division, since as our knowledge increases other perplexing genera will doubtless be discovered. The raising of *Brachyneura* Rond. to tribal rank and its placement with the Cecidomyinae, all turn on the characteristics of *B. fuscogrisea* Rond., the generic type. We have been able to discover no evidence that this form possesses circumfili, and the latter certainly is not true of American species we have referred to *Brachyneura*. Granting for a moment that this genus possesses the structures and is properly located and raised to tribal rank, we are then confronted by the fact that the author has placed here such genera as *Kronomyia* Felt and *Haplusia* Karsch, forms without circumfili. The tribe, as given in this synopsis, contains some discordant elements.

We heartily endorse the reference of *Aplonyx* De Stefani to the Lasiopterariae and dissent somewhat to the inclusion in this tribe, of *Camptoneuromyia* Felt, a somewhat synthetic genus with, it seems to us, more affinities with the Oligotrophiariae (our Dasyncuriariae) of this list. The separation of *Prolasioptera* on account of the entire ventral plate, and particularly because of the dorsal group of chitinous hooks on the apex of the ovipositor, does not seem justified, in view of the fact that this combination of characters is not constant in American forms, and especially as the peculiar hooks appear in species referable to both *Lasioptera* and *Neolasioptera*. We likewise confess skepticism as to the validity of *Meunierella* Kieff., at least so far as indicated by the American species the author referred to this genus.

The Oligotrophiariae of this list comprise a large number of genera and introduce some radical departures from the earlier classification. We find *Rhopalomyia* Rubs. restricted to forms possessing reticulate circumfili and unarticulate palpi. The reduction of the palpi indicates within certain limits the degree of specialization, though it happens that in the American forms there is such evident diversity in these organs that we can not bring ourselves to believe such close division advisable, since a rigid application of this rule might, with certain American species, necessitate the referring of one-half of an insect to *Misopatha* Kieff. and the other to *Panteliola* Kieff., though we readily admit that in many instances the number of palpal segments is a character of great value in separating allied genera. In practice we have been unwilling in *Rhopalomyia* and its allies, to separate species simply because of a divergence in the number of palpal segments, and have always looked for some confirmatory character. A similar condition obtains, so far as American forms are concerned, in the

reference to a new genus, of a number of species of *Asphondylia* because of the uniaarticulate palpi. In the Porricondylariae we have an analogous condition in the author erecting *Winnertziola* upon characters which, in American forms, have proved inconsistent in their association, and we consequently believe that this name must become a synonym of *Winnertzia*.

In connection with generic limitation we find, on referring to the above tabulation, that nearly two-thirds, namely, 206, of the genera listed are monotypic. This very large proportion is undoubtedly due in part to the fact that a number of these genera represent forms from countries where the fauna is comparatively unknown, such as Africa and India. Greater familiarity with the gall midges in these regions will undoubtedly show that some of these monotypic genera are representatives of considerable series. Eliminating these from consideration, we would raise a question on general principles as to the advisability of adopting a classification which necessitates so many monotypic genera. Our familiarity with American forms indicates that some of these later divisions must be relegated to synonymy. The disposition of such genera in faunae with which we are unfamiliar can be determined only by a careful study of the material. Excessive division can be easily remedied by consolidation later, and we must certainly credit the author with an honest endeavor to outline the facts as they appear to him. In this connection we would simply voice a sentiment in favor of proposing generic names, only so far as may be necessary for the recognition of well marked groups, rather than the establishment of new concepts simply to indicate minor variations. The many and varied forms of gall midges emphasize the need of conservatism along these lines.

The author, in some instances, specifies the generic type, while in other cases the matter is ignored. We regret an apparent tendency to reduce some of the older genera to synonymy by grouping species under later names. This is a matter where the student must use his judgment to a considerable extent. We have favored wherever possible, the policy of validating and establishing the older generic names, because such procedure tended to reduce the synonyms now so burdensome in many groups. We find a curious condition respecting *Trotteria*, a genus originally defined in 1892 by Rubsaamen as *Choristoneura*. The only species mentioned at the time was *obtusa* Lw. This genus being preoccupied, a new name was proposed in 1897 by Kieffer and three species mentioned, one of which (not the one before the original author of the genus) is cited as type. This we believe to be irregular and a procedure not warranted by the International code.

The author has made an attempt to define the subfamily, tribal and

generic characters of the larvae. He has done more along this line than any one else, and his efforts in this direction warrant the heartiest approbation. It is at best a difficult subject.

Aside from general taxonomic matters outlined above, we must call attention to the occurrence of numerous typographical and clerical errors, a portion of which are probably attributable to the printer. These, while annoying and involving additional labor for the users of the list are, for the most part, readily eliminated. Without attempting to call attention to all the errors, we would simply state that on page 23, *Neolasioptera squamosella* and *N. subsquamosa* are *nomina nuda*, the first being based on an erroneous citation, and the second partly due to the writer's inadvertence in allowing the letters "n. sp." to remain after a detailed characterization of a species established originally in a tabulation. The identity of our numbers, if the two had been compared (which should certainly have been done prior to the proposing of a new name), should have indicated a probable identity to the compiler. A similar blunder is perpetrated in the proposal of *N. agrostidis*, for which the writer is likewise partly responsible. There are some inconsistencies in forms of citation. The author fails to distinguish in all cases between the pagination of separates and entire works; volume or bulletin numbers are sometimes transposed, and there is an occasional orthographical error, the latter apparently being relatively scarce.

The generic references of American species represent, in the main, conditions obtaining in 1908, a period when our classification was in a tentative form. Later studies have resulted in the erection of some new genera, with consequent division of species and, in a number of instances, the compiler has not obtained access to the later data. In spite of these defects, all minor in character, this work must prove of great service to all interested in the general study of gall midges, and the author, in its compilation, has laid his associates under heavy obligations.—E. P. FELT.

Doings of Societies.

AMERICAN ENTOMOLOGICAL SOCIETY.

Meeting of October 23, 1913. Dr. Calvert, President, in the chair. Eight persons were present. The President announced the deaths of Dr. Horace Jayne and Prof. P. R. Uhler, members of the Society.

Mr. Rehn made some remarks on the results of three Orthoptera-collecting trips to the Florida Keys and extreme southern

Florida, made in January, 1904, March, 1910, and July, 1912, by Mr. Hebard and himself. The chief object of these trips was, in addition to securing a representative collection of the Orthoptera of the region, to determine to what extent the region was a meeting ground for tropical types and forms of more northern distribution, by ascertaining what West Indian types were present, what proportion of the whole Orthopteran fauna they constituted and similar data regarding the forms of mainland relationship. The periods of greatest and least activity in animal life were also selected to determine the extent of the seasonal difference in species and abundance of species. An analysis of the distribution of the 108 species secured (all previously recorded from the Keys having been obtained) showed that the range of thirty-one species of northern affinity and distribution had been extended to the extremity of the Florida mainland, of four to the pine keys and of twenty-nine to the scrub keys. Seven West Indian types were recorded from the United States for the first time and more complete data were secured on six species of similar relationship which had been recorded on bare captures. Specimens illustrated the additions to our fauna.

Mr. Laurent exhibited a series of fifteen male specimens of the first brood of *Pieris rapae*, selected from sixty specimens captured from April 19 to May 6, as well as a series of fifteen male specimens of the second brood, selected from a like number of specimens collected from July 10 to 31. The speaker stated that the maculations in the first brood averaged much smaller than those in the second brood, in some cases being entirely wanting, thus representing the variety *immaculata*. In the first brood, the under side of the inferior or hind wings is nearly always of a dark gray or yellow color; while in the second brood, the color is generally light gray or almost white. However, this only holds good with the males, as females of both broods may have the under side of the inferiors yellow. All the specimens were collected in the outlying districts of Philadelphia.

Dr. Skinner exhibited a new species of *Argynnis* from Utah,

subsequently described in *Entomological News* for December, 1913, page 450.

Dr. Calvert exhibited some Neuropteroid insects (exclusive of Odonata) which he had collected in Costa Rica. They were determined by Mr. Nathan Banks and included a new species of Chrysopid.

The annual meeting was held December 8, 1913, Dr. Calvert, President, in the chair. The annual reports were read.

The following was directed to be recorded in the minutes:

Mr. Ezra T. Cresson resigned the chairmanship of the Publication Committee of the Society, after having been a member of this body for more than fifty-two years, and for the greater part of this period its chairman.

This duty involved that of the editorship of the *Proceedings of the Entomological Society of Philadelphia* and the *Transactions of the American Entomological Society*. During the entire period these publications have been carried on in an admirable way that leaves nothing to be desired, and they speak for themselves. His reward must have been derived from the pleasure of the work and the unselfish rendering of service, as he received no other compensation. Nowhere does his name appear as Editor in the forty-five volumes that have appeared under his guiding hand. These volumes largely represent the history of entomology in America and in the future, when tribute is rendered to those who did pioneer work, no one will receive or deserve more praise than the Founder and Treasurer of the American Entomological Society, the great systematist of the Hymenoptera and the Editor of the *Transactions* of this Society. Such a long period of devotion to any cause is the exception to the rule and this Society desires to put on record its deep sense of obligation for this splendid achievement, of our honored and esteemed member.

The annual election for officers was held and the following were declared elected: *President*, Philip P. Calvert; *Vice-President*, Henry W. Wenzel; *Treasurer*, Ezra T. Cresson; *Curator*, Henry Skinner; *Corresponding Secretary*, James A.

G. Rehn; *Recording Secretary*, Henry Skinner; *Librarian*, Ezra T. Cresson, Jr.; *Executive Committee*, Philip Laurent, Henry W. Wenzel and David M. Castle; *Finance Committee*, Chas. S. Welles, David M. Castle, Morgan Hebard; *Publication Committee*, James A. G. Rehn (Chairman), Ezra T. Cresson, Henry Skinner.—HENRY SKINNER, *Recording Secretary*.

Meeting of February 26, 1914. Dr. Philip P. Calvert, President, in the chair. Eight persons present, including Mr. W. T. Davis, of Staten Island.

Notice was read of the death, on the 24th inst., of Charles S. Welles, a member.

Mr. Rehn made reference to the species of the orthopterous genus *Orphulella* occurring on the eastern coast of North America, mentioning the peculiar distribution of *O. olivacea* on the coast as far south as the middle of Florida and again occurring on the Gulf coast, while on the south Florida and Mexican coasts, another species takes its place. He also remarked on the distribution of the genus *Chortophaga* in the United States and West Indies. He also reported the occurrence of a Yucatan species of Orthoptera in Florida. Discussion followed on the difference in the species occurring in South and North Florida, and on some of the peculiarities in the fauna and flora of South Florida.

Mr. Davis said that the dragonflies, especially on the west coast of Florida, were quite a nuisance to collectors on account of their catching many of the smaller butterflies that were disturbed.

Dr. Calvert referred to Prof. Wheeler's recently published paper on Central American Acacia Ants in the Transactions of the Second International Congress of Entomology, commented on it, and showed alcoholic specimens of acacia and ants from Costa Rica, collected by himself.

Discussion followed a question put by a member, as to the proper geographical limits that should be adopted for a local collection for Philadelphia.

E. T. CRESSON, JR., *Secretary pro tem.*

OBITUARY.

CHARLES S. WELLES.

Charles S. Welles died at 4.20 o'clock on the morning of February 24, 1914, at his home, the "Highland," Elwyn, Delaware County, Pennsylvania. His death was due to embolism. He was 67 years old.

Mr. Welles was the son of Charles Roger Welles, and was born in Springfield, Illinois, where his family were neighbors to Abraham Lincoln. For a time his father and Mr. Lincoln were associated in law practice.

He was graduated from Yale in the class of 1870. He was an active member of the Academy of Natural Sciences of Philadelphia, of which he was a life member; a member of the Pennsylvania Historical Society and a life member of the Delaware County Historical Society. He was interested in the Presbyterian Social Union of Philadelphia and a member of the Middletown Presbyterian Church, in Elwyn. His widow, who was Miss Maria Pancoast, of Village Green, and two daughters, Mrs. E. A. E. Palmquist, wife of a Cambridge, Mass., Baptist minister, and Miss Louise Ives Welles, survive.

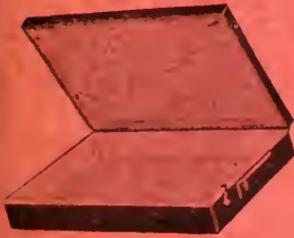
Mr. Welles was elected to membership in the Entomological Section of the Academy of Natural Sciences, and in the American Entomological Society, in 1891, and the minutes of these bodies, as published in the early volumes of *Entomological News*, record his frequent participation in the meetings. He was chiefly interested in the Lepidoptera, but was always glad to aid those engaged in the study of any group of insects, as Mr. C. W. Johnson has intimated in his article in the *News* for March last, page 125. Mr. Welles was the author of an article on the "Destructive Work of *Daremma catalpae*," in the *News* for December, 1898. For many years he served on the Finance Committee of the American Entomological Society. His fellow members tender their sincere sympathy to his family in our common loss.

P. P. C.

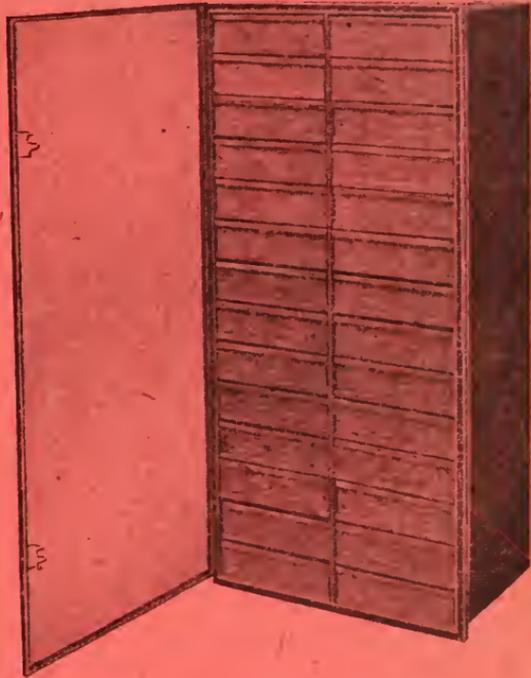
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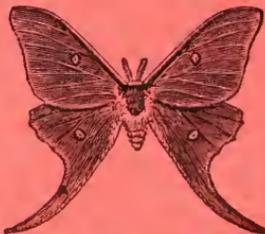
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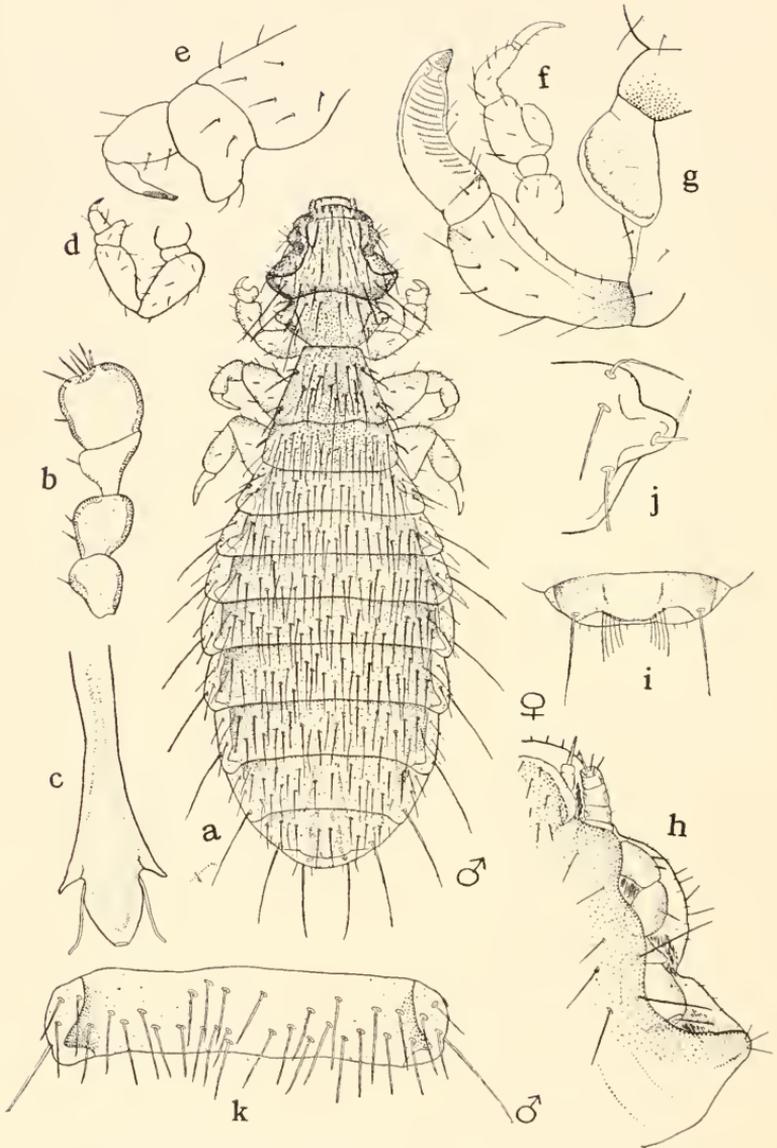
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MALLOPHAGA OF THE VIZCACHA—KELLOGG AND NAKAYAMA

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.



VOL. XXV.

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Mallophaga of the Vizcacha.

By V. L. KELLOGG and S. NAKAYAMA, Stanford University, California.

(Plate VIII.)

The vizcacha (*Lagidium peruanum* Meyen) is a small, long-tailed, long-eared, soft-furred rodent of the Andes, with a head like a rabbit's and body like that of a giant mouse, a mouse as large as a small hare. It belongs with the chinchillas in the family Chinchillidae (or Lagostomidae) which comprises only four living species, confined to Chili, Bolivia, Peru and Argentina. It is, however, a well-represented family in the South American Tertiaries and Pleistocene, at least three-score species having been described from fossils collected all the way from Patagonia to Peru.

Only one ectoparasite has been heretofore recorded from the vizcacha, namely a species of *Gyropus* (Mallophaga) described by Gay in his *Fauna Chilensis* (about 1850), but

utterly unrecognizable from this description. The taking of two score specimens of Mallophaga last January and June (1913) by Dr. C. H. T. Townsend, government entomologist of Peru, from three vizcachas shot at Ninahuanchi, Peru (alt. 13,000 ft.), and one shot at Cerro Picuna, Peru (alt. 8,000 ft.), allows us to make some definite records of the ectoparasites of this interesting rodent.

The specimens from the vizcachas kindly sent us by Dr. Townsend represent several Mallophagan species, of which two, both new (in the face of the impossibility of recognizing Gay's vizcachan *Gyropus*) are undoubtedly peculiar to the vizcacha. For one of these species it is necessary to establish a new genus. In addition, the material, credited to the vizcacha, included two additional species, undoubtedly abnormal stragglers (in game bag or on the skinning table), one of them being the common *Lipeurus baculus* of doves, and the other a *Goniodes* which may have straggled either from doves or pheasants. Dr. Townsend writes us that his Indian collectors do frequently kill doves on their collecting trips, and that, despite his careful instructions, they may well allow their specimens to become too neighborly with each other in the game bag.

Of the two new species, one is a *Gyropus*, while the other, as said, plainly represents a new genus, a two-clawed form—the typical mammal-infesting Mallophaga are one-clawed—of a general appearance rather like that of *Menopon* or *Trinoton* (both bird-infesting genera). Although, as just suggested, most of the mammal-infesting Mallophaga are one-clawed species, belonging to the two genera *Gyropus* and *Trichodectes* (to this latter single genus belongs a considerable majority of all Mallophagan species so far recorded from mammals) a few two-clawed species, representing three of four genera, have been taken from mammals. Especially are these two-clawed species found on marsupials. Also, for almost each of these species a new genus has had to be established. These two special conditions of their occurrence give them a particular interest to students of Mallophaga.

The last genus to be established for the reception of one of these two-clawed mammal-infesting species is *Trimenopon*, containing the single species *T. echinoderma*, described by Bruce Cummings (Bull. Ent. Research, May, 1913) from specimens (males and females) taken from the wild guinea pig, *Cavia aperea* Erxleben, at Villa Rica, Paraguay, in November, 1910, F. Posner, coll. As our new species from the vizcacha, not assignable to any known genus, is also South American, and also resembles both *Menopon* and *Trinoton* in general habitus, and is also strongly spiny, our first thought was that it might be referable to Cummings' new form. But it is not at all possible to assign it thus. It is not only different in species but different in genus from *Trimenopon echinoderma*, despite some slight resemblance in superficialities. What is possible, and necessary, however, in the light of the establishment of the new genus *Trimenopon*, is to call attention to the fact that, if this genus is to be accepted as distinct from *Menopon*—and we do not suggest that it should not be—a species described by Kellogg and Paine in 1910 (Entomological News, vol. 21, pp. 461-462), under the name *Menopon jenningsi*, from specimens taken from the domestic guinea pig, *Cavia cobaya*, by Mr. A. H. Jennings, in the Canal Zone, Panama, must be assigned to this new genus. And, besides, there should be made a careful examination of the two species, to see if they are not identical. The descriptions and figures as given by the authors of the species are certainly much alike. The principal difference seems to be in the measurements, *echinoderma* being larger than *jenningsi* by one-third. If the two species are one, then their (its) name is *Trimenopon jenningsi*.

A special point of interest in connection with the two-clawed mammal-infesting Mallophaga is their obvious tendency, despite their otherwise plainly Amblyceran affinities, to have 5-segmented antennae, which is a prime characteristic of the other Mallophagan sub-order, the Ischnocera. The antennae of *Boopia*, *Heterodoxus*, *Latuncephalum* and, now, *Trimenopon*, are all described as 5-segmented, instead of 4-segmented,

as one would expect to find them. It is true, however, that there is a division of the third antennal segment into two segments in the case of several undoubted species of the large and rather heterogeneous genus *Menopon*, which is the old genus—old in point of priority of establishment by students of the group—to which the new genera are most nearly related. It should be added that it is not easy to determine accurately, or to interpret confidently, the exact condition of the antennae as regards number of segments. The suture dividing the third segment into two, thus increasing the number from four to five, may be so faint as to be capable, under different eyes, of seeming to be distinct enough to be accepted as actual suture, or of not being so accepted. In the case of the new genus which we have to establish for the reception of one of our new Mallophagan species from the vizcacha, we give four as the characteristic number of segments. Four is certainly the correct number for the type species of the genus. We have gone to much pains to ascertain this.

As a matter of fact the whole subject of the Mallophagan parasites of mammals, especially the subject of the two-clawed species, needs careful working over.

The description of the new species follows.

***Gyropus alpinus* n. sp. (Plate VIII.)**

A rather large species, unusually hairy, elongate, and belonging to that group of *Gyropus* species with fore legs and feet smaller than and different from the other two pairs. A pair of prominent laterally projecting lobes on the prothorax, well developed clinging pads on the femora of second and third legs, and the length and irregular arrangement (not in the usual one or two regular transverse rows) of the numerous long hairs on the dorsal surface of the abdomen, especially distinguish the species. General color pale yellowish brown, with thorax darker, and an incomplete darker line running sub-marginally around the head.

Male (Pl. VIII, *a*).—Length of head .29 mm., thorax .40 mm., abdomen 1.02 mm., total 1.71 mm.; width of head .37 mm., thorax .32 mm., abdomen .66 mm. *Female*.—Length of head .29 mm., thorax .43 mm., abdomen 1.25 mm.; width of head .36 mm., thorax .37 mm., abdomen .72 mm.

Head of both male and female wider than long with well expanded squarish temples, antennae (Pl. VIII, *b*) concealed in deep lateral fos-

sae (Pl. VIII, *h*), and numerous long, strong, spiny hairs, six arranged along the occipital border, two in each temple, four in a transverse series about even with the deepest part of the antennal fossae, and eight or ten others anterior to this line. On the other side are a few hairs of which two, one in each temporal region, are particularly long and conspicuous.

The thorax is long and slender, the effect of narrowness being heightened by the coloring which is paler in the lateral margins and angles. The prothorax has a salient blunt lateral projection on each side (Pl. VIII, *j*) and bears six spiny hairs on its dorsal surface. On each lateral process are two short, curved spine-hairs. The long pentagonal mesothorax has straight lateral margins and bears about a score of strong spiny hairs on its dorsum, including two on each lateral margin. In addition each lateral margin bears two short pointed spines. The short metathorax, plainly set off from the mesothorax by a suture, bears about thirty long spiny hairs on the dorsum, unevenly disposed in two transverse series. On the under side of each thoracic segment there are two series of long, spiny hairs, arranged in lines converging posteriorly so as to form a V.

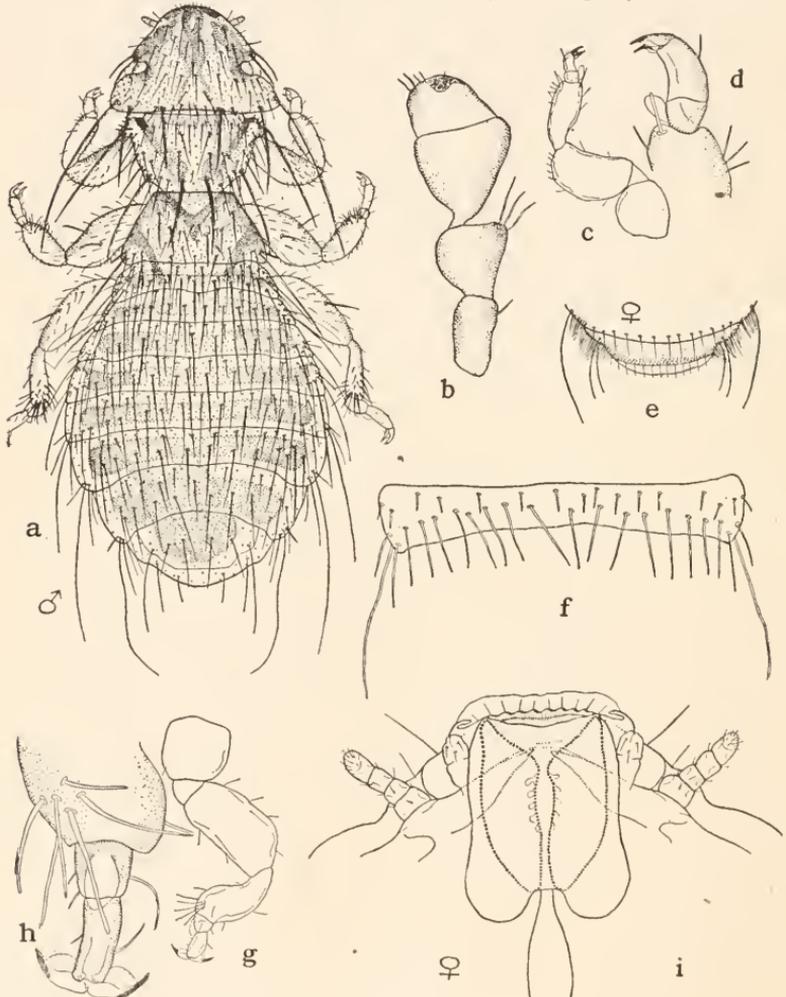
The fore legs are a little shorter than the middle and hind ones and markedly different in make-up. The femora have no clinging pads as have the second and third legs, the first tarsal segment has a strong thumb-like lateral process, and the second segment is not elongate and bears a normal claw (Pl. VIII, *d, e*). The femora of the second and third pairs of legs have a well-developed clinging pad on the side, the first tarsal segment is short, ring-like and inconspicuous, while the second is long, transversely striated and looks like a large, heavy, slightly bent claw (Pl. VIII, *f, g*). As a matter of fact the real claw is simply the slightly differentiated tip of this claw-like segment. (This condition of tarsal segment modified to be a claw-like and tarsal claw acting as its continuous tip is common to most Gyropi.)

Abdomen not quite twice as long as wide, and one-fifth shorter in the male than in the female, about $2\frac{1}{2}$ times as long as the thorax in the male, and three times as long in the female. Conspicuously covered above and below with long, spiny hairs, not evenly arranged in one or two transverse rows as in most Gyropi, but irregularly disposed, although approaching a rough arrangement in three rows (Pl. VIII, *k*). Posterior border without hooks or spines or other projecting processes, except a few conspicuous long hairs (Pl. VIII, *a* and *i*). Each segment with a long spiny hair in each postero-lateral angle. Male genitalia as shown in Pl. VIII, *c*.

Numerous males and females taken from a vizcacha, *Lagidium peruanum* Meyen, Ninahuanchi, Peru, 13,000 ft. altitude, C. H. T. Townsend, collector.

Genus **PHILANDESIA** nov.

A two-clawed genus, occurring on mammals, with four-segmented antennae and other general Amblycerous characters and outline of body. Head with distinct, narrow, and peculiar ocular emarginations. Mouth parts (Text-fig. *i*) of unusual

*Philandesia townsendi* n. sp., nov. gen.

a, male; *b*, antenna of male; *c*, front leg of male; *d*, tip of front leg of male, enlarged; *e*, last abdominal segment of female, ventral aspect; *f*, fourth abdominal segment of male, dorsal aspect showing disposition of hairs; *g*, middle leg of male; *h*, tip of middle leg of male, enlarged; *i*, ventral aspect of front part of head showing mouth parts.

type, the mandibles being long and slender and the other mouth parts together with the hypopharynx and pharyngeal skeleton forming a sort of grasping tube or furrow. The antennae are of the usual capitate Amblycerous type, but segment three is unusually narrow at base, and segment two unusually robust and subspherical in shape. Metathorax distinct although short; prothorax laterally expanded or "winged." Head and thorax with very long, strong, conspicuous spiny hairs, but with no short broad-based spines on the under side of the head as in *Menecanthus* (*Menophon*) or *Heterodorus*. Feet with small colorless broad flaps or pads extending outwards from the base of the claws. Male genitalia characteristic. The only species so far known is from South America (Peru); host, the vizcacha, *Lagidium peruanum* Meyen.

Philandesia townsendi sp. nov. (Text-fig.)

A Mallophagan species of medium size, the male being one and two-thirds, and the female being about two millimeters long. In both male and female the head is almost twice as wide as long, while the abdomen of the male is shorter and broader than that of the female. In general appearance it suggests a very spiny *Menophon* or *Trinoton* with long thorax and short abdomen. Striking features are the narrow, round-ended, ocular emarginations, the curious groove-like appearance of the mouth (Text-fig. i), and the small and delicate but distinct lateral flaps or pulvilli at the base of the claws.

Male (Text-fig. a).—Length of head .30 mm., thorax .35 mm., abdomen .98 mm., total 1.64 mm.; width of head .58 mm., thorax .58 mm., abdomen .86 mm. *Female*.—Length of head .36 mm., thorax .51 mm., abdomen 1.09 mm., total 1.96 mm.; width of head .59 mm., thorax .66 mm., abdomen .99 mm.

Head triangular with small but distinct ocular marginations which are narrow and with sub-parallel margins at the inner ends which are narrowly rounded. On the dorsal aspect a very spiny hair in each temporal angle projecting back almost to abdomen and four other long spiny hairs along the occipital margin. There are two strong spiny hairs in each lateral marginal angle just in front of the ocular emargination, and numerous shorter spine-hairs scattered over the dorsum of the head. On the ventral face there are even more long spiny hairs and numerous shorter ones. The antennae are four-segmented, no signs of a fifth segment (division of segment 3 by a transverse suture) being apparent. A single hair (sense-hair?) rises from the apical angle of segment 1, three longer hairs from the apical angle

of segment 2, and there are several sense hairs and a pronounced sense pit at the tip of segment 4 (Text-fig. *b*). Whole head pale translucent yellowish brown, which is the general color tone of the whole body. Spots of darker opaque brown indicate the special chitinization of mouth parts, etc.

Prothorax large, longer than the head and with conspicuous expanded lateral margins or wings, and covered all over with strong spiny hairs some of them, especially those of the lateral and posterior margins, very long. Ventral face also with long spiny hairs. Mesothorax smaller than prothorax, being little more than half as long, although quite as wide. (N. B.—In Text-fig. *a* the mesothorax is too long.) It is abundantly supplied with spine-hairs, a very long one arising from each postero-lateral angle. Metathorax distinctly set off from mesothorax by suture, but smaller and resembles an abdominal segment in general shape and appearance. Its numerous spine-hairs are disposed as those of the abdominal segments are. The general pale translucent yellowish brown of the thoracic segments is patterned by the showing through of the darker chitin rods of the ventral aspect and endoskeleton.

Legs (Text-figs. *c*, *d*, *h*, *g*) rather long and strong, and very spiny, especially the third pair. The distal ends of the tibiae of this pair are furnished with a conspicuous group of short stout spines, while a less conspicuous group occurs also on the ends of the second tibiae. The legs are concolorous with the body.

The abdomen of the male is broad and only a little longer than head and thorax combined. In the female the abdomen is less broad and is also longer, giving it a decidedly more slender appearance. The entire abdomen, both on dorsal and ventral aspects, is thickly beset with long spiny hairs, those rising from the lateral margins (especially of the hinder segments) being very long indeed. The hairs on the dorsal aspect are disposed in two transverse series, but rather irregularly. The hairs of the hinder series of the two are longer than those in the front one (Text-fig. *f*). Posterior margin of abdomen in both male and female simply and broadly rounded, that of the female (Text-fig. *e*) with numerous fine hairs in close series at the lateral margins, while that of the male has the strongly-chitinized, unusually shaped genitalia either projecting or, if retracted, showing through rather plainly. (Text-fig. *a*.)

Numerous males and females taken from a vizcacha, *Lagidium peruanum* Meyen, Ninahuanchi, Peru, 13,000 ft. altitude, C. H. T. Townsend, collector.

In addition, Dr. Townsend's sending includes a species of Anopluran, represented by one male and three females, evi-

dently all of one species, a species probably undescribed, of *Polyplax*. But all the specimens show some signs of immaturity, notably in the hair covering of the body; so that, although the five-segmented condition of the antennae indicates maturity, we prefer not to describe the species at present. Some mites, also, were included and are almost certainly new, but we shall not undertake their description.

Finally in addition to the ectoparasites from the vizcachas, Dr. Townsend has sent us some Mallophaga taken in Peru from other mammal and bird hosts. The specimens from mammals include the familiar *Trichodectes parumpilosus* from the horse, the curious *Menopon jenningsi*, described by Paine and myself in 1910 from the domestic guinea-pig, *Cavia cobaya*, and recorded by Paine again in 1912 from the wild guinea-pig, *Cavia cutleri*, of Peru, Dr. Townsend's specimens also coming from a domestic guinea-pig, and the interesting *Trichodectes breviceps* from the llama, described by Rudow in 1866, and not again recorded until now. Of chief interest, however, are two Mallophagan species taken from two specimens of the capuchin monkey, *Cebus capuchinus*. We are not as yet clear as to their status.

The specimens from the birds will not be referred to in this paper.

EXPLANATION OF PLATE VIII.

Gyropus alpinus n. sp.; *a*, male; *b*, antenna of male; *c*, genitalia of male; *d*, front leg of male; *e*, tip of front leg of male, enlarged; *f*, middle leg of male; *g*, tip of middle leg of male, enlarged; *h*, ventral aspect of part of the head of male, showing antenna in fossa; *i*, last abdominal segment of female; *j*, lateral margin of prothorax; *k*, fifth abdominal segment, dorsal aspect, showing disposition of hairs.

A Correction.

The *Proceedings* of the Second International Congress of Entomology held at Oxford, August, 1912, have appeared, dated Oxford, February, 1914. They form Volume I of the publications of this Congress, Volume II being the *Transactions* issued in October last. Owing to some error, the name of G. B. Cresson appears on pages 124 and 160 of the *Proceedings*, instead of that of E. T. Cresson, as having been elected an Honorary Member of the Congresses.

An Improved Method of Caring for Specimens of Butterflies on Extended Collecting Trips.

By R. A. LEUSSLER, Omaha, Nebraska.

No doubt every butterfly collector who ever "papered" a lot of desirable material on some extended collecting trip, has experienced more or less disappointment when, on spreading the specimens, those the condition of which, when taken, left nothing to be desired, have been found minus antennae, or legs, the wings rubbed, or the thorax and abdomen flattened and distorted. The spreading of any papered specimens, too, is apt to prove more or less unsatisfactory, especially in those families having strong thoracic muscles, as the Hesperiidæ, since when specimens have lain in papers though for a short time, the wings often show a tendency to revert to the position held while in the papers, which cannot be entirely overcome even though the insects are kept on the spreading boards for a considerable length of time. Also insects that have been once dried and then pinned do not become as firmly fixed on the pin as if pinned when fresh.

During the past two summers I have employed a method of caring for my specimens, when on trips varying in length from a few days to two weeks, which proved so very satisfactory that I feel it deserves description for the benefit of other collectors. In general terms it consists in pinning the specimens while still pliable, reducing the wings to a horizontal position (in other words giving the insect a tentative spreading), and then partially relaxing them when they are to be transported homeward or from one place to another on the trip. Simple as the method is, its most effective application requires that it be described in detail.

The first step is to put the specimens from the killing bottle into tight tin boxes for about 24 hours, when all rigor mortis will have disappeared. For this purpose I use tin shoe polish boxes, and five or six of these boxes will hold 60 to 100 small and medium-sized butterflies. To keep the specimens from damaging each other by contact, I place Japanese crepe paper,

cut to fit the boxes, between the layers of butterflies, and also take measures to prevent the boxes rattling around in the pocket. No pressure is allowed to come on the specimens. If the day is very hot and dry, a few small leaves or some grass may be placed in each box when it is filled, for the purpose of supplying a little moisture. Large butterflies may be pinned directly in an ordinary collecting box.

On the evening of the following day I remove the specimens from the tin boxes and pin them carefully, so that the position of the pin need not afterward be changed, placing them in a cork-lined box, inclining the pin forward at an angle of about 45 degrees, and holding the wings in a horizontal position with respect to the body, by thrusting a long steel pin into the cork so that the side of it rests against the upper surface of the wings. At the same time I also see to it that the antennae are kept away from the pin on which the insect is impaled, so they are not endangered in later handling. In ordinary weather 12 hours is a sufficient length of time for the specimens to become set, after which they can be transferred into the boxes in which they are to undergo transportation.

It is important to the success of this method that these boxes should be provided with some means of partially relaxing the specimens previous to transportation. A cheap and simple, yet effective device for the purpose is found in the form of a small pan about 4 in. x 8 in., $\frac{3}{8}$ in. deep, made of oiled sheet, such as is commonly used in letter press copying. This pan is made by marking off the size lightly with the point of a pocket knife, turning up the edges and fastening them by means of small paper fasteners or clasps. Into this pan are put half a dozen sheets of ordinary blotting paper, and the whole is fastened securely to the inside of the lid of the box with brass paper fasteners reinforced with washers of oiled sheet.

Into these boxes the specimens are pinned after the wings have become set as described above. They can be pinned with wings overlapping or "shingled," so that a great many speci-

mens will find room in a single box. Eight such boxes can be placed in an ordinary suit case together with nets and other paraphernalia, and will accommodate 300 to 400 specimens.

When it is desired to move to another locality or to ship specimens home, the blotters in the boxes are moistened, a few hours in advance, with water to which a few drops of carbolic acid have been added, and the boxes for the time left upside down. The specimens will thus be sufficiently relaxed to stand the roughest kind of journey without the slightest damage, and will remain pliant for from 24 to 72 hours according to the amount of water supplied. If the boxes are wrapped with wax paper and an outer wrapping of stout paper, the moisture is conserved and the period of pliancy accordingly prolonged.

In handling my specimens in the above manner, I place on the pin of each specimen, at the time of pinning, a temporary pin label, bearing a number to indicate the locality, besides the date of capture. This pin label accompanies the specimen during all subsequent handling, and is ultimately replaced by a permanent label carrying full data obtained from a field note book or key.

The advantages of this method may be summed up as follows:

1. Immunity from damage to specimens in transit and handling.
2. Retention of natural shape of bodies of insects.
3. Greater facility in relaxing and spreading, resulting in much better specimens, with wings in better position.
4. Ready examination, selection and identification of material without the delay of spreading.

This method is not entirely original, being first suggested by seeing Mr. R. W. Dawson, of the University of Nebraska, place his specimens in tin boxes at the end of a day's collecting, and pin them on the following day when they were pliable so that the wings readily remained in a horizontal position. Possibly other collectors have hit upon the same scheme, but many have not and it seems good enough to pass along for their benefit.

The Neotropical Tipulidae in the Hungarian National Museum (Diptera)—III.

By CHAS. P. ALEXANDER, Ithaca, N. Y.

(Plate IX.)

Tribe 3—ERIOPTERINI.

Genus *Erioptera* Meigen.

1803. *Erioptera* Meigen; Illiger's Magaz., vol. 2, p. 262.

Erioptera (*Mesocyphona*) *annulipes* Williston.¹

One female from San Bernardino, Paraguay, Fiebrig, 1908; one female from Callanga, Peru.

Erioptera (*Mesocyphona*) sp.

One female from Paraguay, taken by Fiebrig. It is closely allied to *immaculata* Alexander.²

Erioptera (*Mesocyphona*) sp.

One male from Coroico, Bolivia. Closely allied to *caloptera* Say.³

Genus *Molophilus* Curtis.

1833. *Molophilus* Curtis; Brit. Entomol., p. 444.

Molophilus flavidus sp. n. (Pl. IX fig. 2).

Color yellowish; male antennæ elongate; ventral appendage of the male hypopygium deeply bifid.

Male.—Length, about 4.1 mm.; wing, 5.6 mm. Palpi brown; antennæ elongate, the segments covered with a dense pubescence, antennæ very light brown; head dull yellow.

Pronotum pale yellow without apparent stripes, the lateral margin of the sclerite and the sides of the pronotal scutellum very light yellow; scutum, scutellum and postnotum light brownish yellow. Pleuræ light yellow. Halteres, stem yellow, knob broken.

Legs, coxæ and trochanters yellow; femora yellow basally darkened into brownish on the apical half; tibiæ and tarsi brown.

Wings pale yellowish, veins light yellow, indistinct. Venation: basal deflection of *R*₄ plus 5 very reduced, or, in other words, the veins *R*₂ plus 3 and *R*₄ arise almost directly from the end of *R*₅.

Abdomen light yellowish brown. Hypopygium with the ventral appendage (see Plate IX, fig. 2) very deeply bifid, the inner branch shorter, at its tip slightly denticulated, the outer branch very long, bearing

¹ Williston, Trans. Ent. Soc. Lond., p. 294 (1896).

² Alexander, Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 518; pl. 66, fig. 20.

³ Say, Journ. Acad. Nat. Sci. Phila., vol. 3, p. 17 (1823).

along its ventral face a row of spine-like teeth, the tip flattened and provided with a few appressed teeth. The dorsal lobe at its dorso-apical angle provided with the usual curved hook-like appendage, the lobe densely clothed with long, pale hairs; the tip of the lobe ventrad of the hook-like appendage is produced into a short, sharp spine.

Holotype, male, Concepcion, Chile (P. Herbst, coll.), 1904, in the Hungarian National Museum.

The ? *Erioptera uniformis* Blanchard⁴, ? *longipes* Philippi⁵ and ? *pallida* Philippi⁶ may possibly be *Molophilus*. Philippi's description would seem to indicate rather unusual insects, *longipes* being described as having an elongate rostrum. In our present state of knowledge of Chilean Tipulidae, I cannot determine any of the forms before me as Blanchard's or Philippi's species.

Molophilus taurus sp. n. (Pl. IX, fig. 1.)

Color brown; male antennæ short, ventral appendage of the male hypopygium deeply bifid.

Male.—Length, about 4.6 mm.; wing, 6.2 mm. Palpi dark brown; antennæ short, the flagellar segments oval to elongate-oval, brown; head blackish gray.

Pronotum narrow, the scutum yellow, with a brown tinge, a bunch of long black hairs at each outer angle; scutellum light yellow. Mesonotal præscutum light grayish brown; scutum and scutellum light brown; postnotum very dark grayish brown. Pleuræ brownish gray, more yellowish around the wing-root. Halteres pale yellowish brown.

Legs brown. Wings subhyaline, the veins distinct, brown. Venation: *R*₄ plus 5 rather long, longer than the cross-vein *r*.

Abdomen dark brown, densely clothed with long pale hairs. Hypopygium with the ventral appendage (see Plate IX, figure 1) very deeply bifid, the inner branch short bearing on its inner face a number of blunt teeth, including a bunch of about three near the middle, the tip sharp; outer branch long, slender, directed caudad and entad, crossing its mate of the opposite side like a rapier, long, cylindrical, tapering to the sharp point. Dorsal lobe and its appendages about as in *flavidus*.

Holotype, male, Rancagua, Chile. December, 1904 (P. Herbst, coll.), in the Hungarian National Museum.

⁴ Blanchard, Gay, in Hist. fis. y polit. de Chile; Zool., vol. 7, p. 343 (1852).

⁵ Philippi, Verb. Zool-bot. Ges. Wien, vol. 15, p. 616 (1865).

⁶ Philippi, *l. c.*

Molophilus sagittarius sp. n. (Pl. IX, fig. 4.)

Color brown; male antennæ short; ventral appendage of the male hypopygium simple, its caudal margin with about six long serrations.

Male.—Length, about 3.8 mm.; wing, about 6 mm. Palpi dark brown. antennæ brown, short, the flagellar segments oval; head grayish brown.

Pronotum enormously enlarged, fitting around the cephalic margin of the mesonotum like a life belt, bright yellow. Præscutum and scutum dark brown; scutellum yellowish brown; postnotum dark brown. Pleuræ dark brown. Halteres entirely light yellow.

Legs, coxæ and trochanters brownish yellow; femora yellowish brown; tibiæ and tarsi brown.

Wings subhyaline, veins brown, rather distinct.

Abdomen dark brown. Hypopygium with the ventral appendage (See Plate IX, figure 4) simple, flattened, its outer margin with about six long serrations.

Female.—About as in the male but the pronotum is not conspicuously swollen and is not yellow; the thoracic præscutum has indications of three darker dorsal stripes; wings a little browner.

Holotype, male, Coroico, Bolivia. *Allotype*, female, Callanga, Peru. *Paratype*, female, Cillutincara, Bolivia.

Allied to *M. perseus* Alexander⁷, of Colombia, but the ventral appendage of the male hypopygium is much less regularly serrated on its outer margin and the teeth are fewer (about 6 instead of 10 or 12) and longer; dorsal lobe very small and narrow. The hypopygium of *M. guatemalensis* Alexander⁸ has never been described and so I figure the ventral hypopygial appendage (see Plate IX, fig. 3); the appendage is simple, sickle-shaped, on the outer side near the base with a sharp point.

Genus **Gnophomyia** Osten Sacken.

1859. *Gnophomyia*. Osten Sacken; Proc. Acad. Nat. Sci., Phila., p. 223.

Gnophomyia luctuosa Osten Sacken.

One female from the Sierra, San Lorenzo, Colombia; Uj-heyi, collector.

⁷ Alexander, Journ. N. Y. Ent. Soc., vol. 21, pp. 201, 202; pl. 6, figs. 4, 5 (1913).

⁸ Alexander, Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 511 (1913).

Gnophomyia maestitia sp. n. (Pl. IX, fig. 8.)

Color black; a yellow spot on the caudal end of the pronotum; wings dark colored with a darker brown cross band near the cord; halteres black; antennæ of the ♂ elongate. Male, length 5.5 mm.; wing, 5.8 mm. Female, length 5.5 mm.; wing, 5.8 mm.

Male.—Palpi black; antennæ long, extending beyond the base of the wing; flagellar segments elongate, black; head black.

Pronotal scutellum largely light yellow, the median portion dark. Mesonotal præscutum deep black; scutum, scutellum and postnotum black, the scutellum shiny and with a pearly lustre. Pleuræ black; a narrow, light yellow mark extending from the end of the pronotal scutellum almost to the wing-root; a yellow blotch between the middle and hind coxæ.

Halteres black. Legs black. Wings dark colored, a broad, irregular dark band in the vicinity of the cord; cells *R* and *M* almost hyaline. Venation (see Plate ix, figure 8): Cross-vein *r* connecting with *R*₂; *R*₂ very long; *R*_s short, straight.

Abdominal tergites dark brownish black; sternites a little paler.

Female.—Yellow color of the thorax reduced, the pronotal pattern confined to a small rounded spot underneath the pseudosutural fovea; yellow on the mesosternum not indicated; antennæ rather shorter.

Holotype, male, Vilcanota, Peru; *Allotype*, female, Callanga, Peru; *Paratypes*, 1 male, Vilcanota, Peru; 3 males, 2 females, Callanga, Peru; in the Hungarian National Museum; 1 male, 1 female, paratypes, in author's collection.

Most closely allied to *nigrina* Wied.¹⁰ from which it differs in its slightly larger size, difference in body coloration and in wing pattern; *luctuosa* O. S.¹¹ and *tristissima* O. S.¹² are the only other species with which it could be confused, differing from the former by its long antennæ, non-pubescent wings, etc., and from the latter by its black halteres, short and straight radial sector, etc.

Gnophomyia pervicax sp. n. (Pl. IX, fig. 7.)

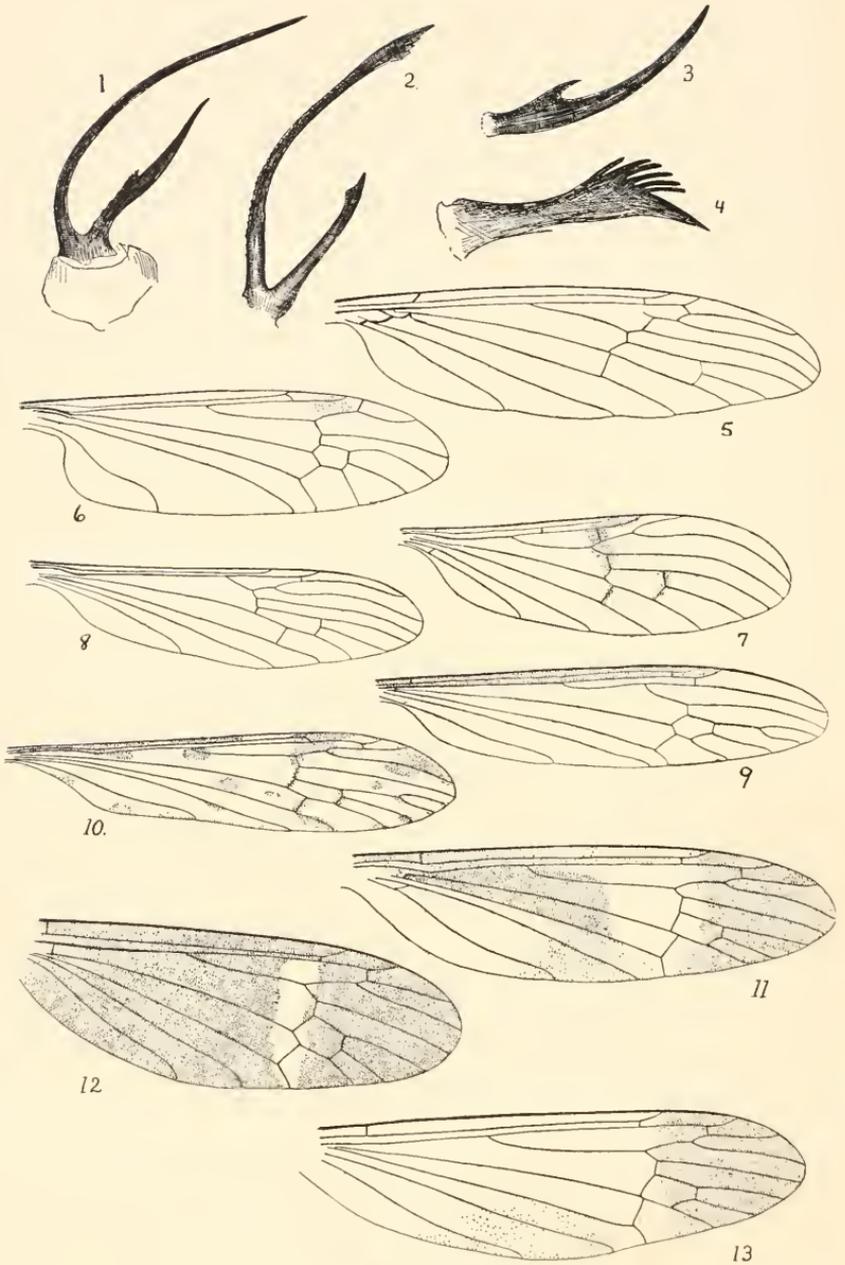
Shiny yellowish; thoracic dorsum with three brown stripes; pleuræ yellow with a dorsal brown band; wings hyaline with a narrow brown seam along the cord; vein *R*₂ short. Male, length 6 mm.; wing, 6.4 mm. Female, length 4.5 mm.; wing, 6 mm.

Female.—Palpi dark brown, the basal segment a little lighter; an-

¹⁰ Wiedemann, Aussereur-Zweifl. Ins., vol. 1, p. 37 (1828).

¹¹ Osten Sacken, Proc. Acad. Nat. Sci., Phila., p. 224 (1859).

¹² Osten Sacken, *l. c.*



NEOTROPICAL TIPULIDAE—ALEXANDER.

tennæ brown; front yellow; vertex brownish; occiput and genæ dull yellow.

Pronotum light dull yellow. Mesonotal præscutum shiny, dull yellow with three very broad brown stripes which are confluent behind, the middle stripe beginning at the cephalic margin of the sclerite; scutum light brown, the middle of the lobes dark brown; scutellum light brown; postnotum light brown, the sides very dark, almost black, especially behind. Pleuræ yellowish, the mesopleuræ tinged with brown; a large rounded dark brown spot between the bases of the halteres and the wings. Halteres light yellow, knob brown.

Legs, coxæ and trochanters yellowish, femora and tibiæ dull yellow, tarsi dull yellow becoming brown on the apical segments.

Wings subhyaline, a brown band extending from the tips of *Sc* and *R* down across the cord to cell *1stM2*; veins brown. Venation (see Plate IX, figure 7): *Sc* long, extending beyond the cross-vein *r*; cross-vein *r* connecting with *R2* plus 3 nearer to its origin than its tip; *R2* very short.

Abdomen with the four basal tergites yellow with a broad, dark brown, lateral margin; remaining tergites dull brown; sternites, basal ones dull yellow, terminal four sclerites suffused with brown.

Male.—This sex shows a dark brown pleural band across the sclerites; femora with a light brown tip, tibiæ with a distinct brown tip; cross-vein *r* about midlength of *R2* plus 3 and a faint brown seam along the outer end of cell *1stM2*.

Holotype, male; *Allotype*, female, Callanga, Peru, in the Hungarian National Museum.

G. pervicax is allied to *G. hirsuta* Alex.¹³ (Brazil) in its peculiar venation but has only a single narrow alar cross-band.

Genus *Trimicra* Osten Sacken.

1861. *Trimicra* Osten Sacken; Proc. Acad. Nat. Sci., Phila., p. 290.

Trimicra sp.

One male from Asuncion, Paraguay, June, 1905. Vezenyi.

Genus *Sigmatomera* Osten Sacken.

1869. *Sigmatomera* Osten Sacken; Mon. Dipt. N. Am., vol. 4, p. 137.

Sigmatomera occulta sp. n. (Pl. IX, fig. 5.)

Wings without dark cross bands; cell *1stM2* closed.

Female.—Length, 13.5 mm.; wing, 14.3 mm. Rostrum and palpi

¹³ Alexander, Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 523, plate 67, fig. 30 (1913).

light yellow, the terminal palpal segments a little more brown; antennæ with the two basal segments dull yellow, flagellum black; head dull greenish brown (greasy in the type).

Thoracic dorsum dull brownish yellow without well defined stripes; caudo-lateral angles of the præscutum brown; scutum and scutellum brown; postnotum greenish brown. Pleuræ dull yellow. Halteres yellow.

Legs light yellow, the tibiæ a little darkened at the tip, tarsi brown.

Wings hyaline, cells *C* and *Sc* yellow; veins *C*, *Sc* and *R* yellow, other veins dark brown. Venation (see Plate IX, figure 5): Deflection of *R*₂ plus 3 with a spur at midlength; cell 1st*M*₂ closed.

Abdominal tergites rich brown with a blackish median blotch; sternites brownish.

Holotype, female, Ascuncion, Villa Morra, Paraguay, Vezenyi, in the Hungarian National Museum.

S. occulta differs from *S. flavipennis* O. S.¹⁴, the only described species with a closed cell 1st*M*₂, in its lack of dark crossbands on the wing.

Genus *Rhabdomastix* Skuse.

1889. *Rhabdomastix* Skuse; Proc. Linn. Soc. N. S. Wales, ser. 2, vol. 4, p. 828.

Rhabdomastix (Rhabdomastix) illudens sp. n. (Pl. IX, fig. 6.)

Antennæ of the ♂ between four and five times as long as the body; a dark brown stigmal spot.

Male.—Length, 7.4 mm.; wing, 7.7 mm.; antennæ, 33 mm. Palpi very short, the first segment light brown, the apical segments almost black; antennæ with the basal segment enormously enlarged, barrel-shaped, the second segment small, rounded, flagellar segments successively elongated, the apical segments very long, the whole antennæ almost five times as long as the body; scapal segments brown, flagellar segments very pale, the extreme tip of each segment narrowly dark brownish black, the apical antennal segments more brown; the whole head underneath the swollen scapal segment is very deep and stout; head light gray.

Thorax brown with a light gray bloom; pseudosutural fovea large, prominent, black; tuberculate pits rather far cephalad, black; scutum and postnotum grayish, scutellum rich brown. Pleuræ pale brownish with a sparse gray bloom. Halteres short, yellowish.

Legs, coxæ and trochanters yellowish; fore and middle trochanters long and slender, the hind trochanter shorter; femora and tibiæ yellowish brown becoming browner on the tarsi.

¹⁴ Osten Sacken, *Smithson. Miscell. Coll.*, vol. 11, No. 256 (1873).

Wings subhyaline; a brown stigmal spot; veins pale brownish yellow. Venation (see Plate IX, figure 6) almost as in *R* (*Sacandaga*) *flava* Alex.¹⁵ but the cross-vein *m*, here, is much longer.

Abdominal tergites yellowish brown, sternites paler, yellowish.

Holotype, male, Coroico, Bolivia, in the Hungarian National Museum.

From *R*. (*R.*) *ostensackeni* Skuse¹⁶ (Australia) it differs in the much greater length of the antennae which is here more than four times as long as the body, in *ostensackeni* not quite twice as long. From the members of the subgenus *Sacandaga*, it differs in the elongate male antennae. The discovery of a member of this subgenus in the New World is of exceptional interest.

Genus *Lecteria* Osten Sacken.

1887. *Lecteria* Osten Sacken; Berl. Entomol. Zeitschr., vol. 31, p. 206.

Lecteria armillaris Fabr.¹⁷

One female from Espirito Santo, Brazil; one specimen, sex uncertain, from Callanga, Peru.

Lecteria abnormis sp. n. (Pl. IX, fig. 9.)

Tibiæ spurred; color grayish with a narrow dorsal brown median line extending from the head to the mesonotal scutellum; wings subhyaline with a brown costal margin; vein *R*₂ obliterated.

Sex, (?) (probably a ♀). Head and thorax, 4.5 mm.; wing, 12.8 mm. Rostrum and palpi dark brown; antennal segments 1 and 2 dull yellow, the first segment very long, the second very short, globular; flagellar segments brownish; front, vertex and occiput yellowish gray with a narrow dark brown median vitta originating between the antennæ and running to the caudal margin.

Pronotum gray with a narrow dark brown median stripe. Mesonotal præscutum brownish, more grayish behind and on the sides, with a dark brown median line; scutum and scutellum light gray, the dark brown median vitta ending on the scutellum; postnotum gray. Pleuræ very light gray. Halteres dull yellow, the knob dark brown.

Legs, coxæ light gray, trochanters dull yellow, femora dull brownish yellow with a dark brown subapical ring close to the tip, tibiæ spurred, dull yellow, brown at the tip; tarsi brownish yellow, the apices of the segments darker, brown.

¹⁵ Alexander, Ent. News, vol. 22, pp. 351, 352 (1911).

¹⁶ Skuse, Proc. Linn. Soc. N. S. Wales, vol. 4, second series, p. 829, pl. 22, fig. 15 (1889).

¹⁷ Fabricius, Syst. Antl., p. 26 (1805).

Wings subhyaline, cells *C* and *Sc* brown, veins brown. Venation (see Plate IX, figure 9) vein *R*₂ entirely obliterated and only two branches of the sector attain the margin.

Abdomen broken.

Holotype, Paraguay, Fiebrig, coll., in the Hungarian National Museum.

L. abnormis belongs to *Psaronius* Enderlein, if this be admitted as a valid genus or subgenus.

We have here a venational phenomenon which is comparable to that in the subgenus *Leiponeura* of *Gonomyia* Meigen, that is, the total obliteration of one of the branches of the radial sector. This condition is presaged by *L. obliterated* Alex.¹⁸ (British Guiana) but in this new species the loss of *R*₂ is complete. In keys to the Tipulid tribes this would run down to the Antochini and students of the family should exercise care in the study of this interesting group of species.

Tribe 4—LIMNOPHILINI.

Genus *Limnophila* Macquart.

1834. *Limnophila* Macquart; Suit. à Bffon, vol. I, p. 95.

Limnophila kerteszi sp. n. (Pl. IX, fig. 10.)

Thorax grayish without distinct stripes; wings long and narrow with brown markings, these largest along the costal border.

Female.—Length, 8.8 mm.; abdomen, 7.6 mm.; wing, 8.6 mm. Rostrum and palpi very dark brown; antennæ dark brownish black; head grayish brown.

Thoracic præscutum yellowish brown without apparent stripes; scutum gray, the lobes dark brown; scutellum and postnotum light gray. Pleuræ brown with a dull gray bloom. Halteres long, very pale, almost whitish, the knob a little brown.

Legs, coxæ brownish, trochanters dull yellow, femora dull yellow with an indistinct brown subapical ring, tibiæ brown, tarsi brown.

Wings whitish with brown marks as follows: Cell *C* brown except the outer quarter; cell *Sc*₁ except the tip; a brown mark at the base of cell *R*, another at the origin of *R*₅; an irregular brown seam along the cord; a large brown blotch occupying the end of cell *R*₂ and the middle of cell *R*₃; a rounded spot in the middle of cell *R*₅; marks on the forks of veins, cross-veins and deflections of veins and at the ends of the longitudinal veins; gray clouds along the anal angle of the wing. Venation (see Plate IX, figure 10): *Sc*₂ longer than *Sc*₁; *R*₅ very long, straight in a line with *R*₂ plus 3; cell *M*₁ present.

¹⁸ Alexander, Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 494, plate 68, figure 41 (1913).

Abdomen long, tergites dark brown; sternites dark brown on the basal third and along the sides; remainder of each segment yellow.

Holotype, female, Sao Paulo, Brazil, in the Hungarian National Museum.

***Limnophila conspersa* Enderlein.¹⁹**

One female from Espirito Santo, Brazil. More properly referred to *Limnophila* than *Lecteria* or *Psaronius*.

Genus **Epiphragma** Osten Sacken.

1859. *Epiphragma* Osten Sacken; Proc. Acad. Nat. Sci., Phila., p. 238.

***Epiphragma cordillerensis* Alexander.²⁰**

One female, Callanga, Peru; one, sex uncertain, from San Antonio, Bolivia.

Tribe 5—HEXATOMINI.

Genus **Eriocera** Macquart.

1838. *Eriocera* Macquart; Dipt. Exot., vol. I, pt. I, p. 74.

***Eriocera perdecora* sp. n. (Pl. IX, fig. 11.)**

Head black; thoracic dorsum reddish; abdomen black; wings brown with a broad yellow cross band and yellowish anal cells.

Female.—Length, about 18.5 mm.; wing, 14.4 mm. Rostrum and palpi black; antennæ black; head black.

Pronotum black; mesonotum entirely light orange-yellow, the extreme lateral margin of the sclerites dark brown. Pleuræ dark brownish black. Halteres black.

Legs, coxæ and trochanters dark brown; femora brown, darker at the tip; tibiæ and tarsi dark brown; middle and hind femora with the basal half brighter, brownish yellow.

Wings dark brown, cells *C* and *Sc* yellow; a broad yellow band across the wing mostly before the cord; anal cells largely yellowish. Venation, see Plate IX figure 11.

Abdominal tergites dark brownish black, the last segments more reddish, valves of the ovipositor dark brown; sternites, basal segments a little brighter, the last segment reddish.

Holotype, female, Callanga, Peru, in the Hungarian National Museum.

In my key to the Neotropical *Erioceræ* (*Psyche*, vol. 21, pp. 34-37. 1914.) *perdecora* would run down to the couplet con-

¹⁹ Enderlein, Zool. Jahrbuch, vol. 32, pt. 1, pp. 49, 50 (fig. D1) (1912). (as *Dactylolabis*).

²⁰ Alexander, Journ. N. Y. Ent. Soc., vol. 21, pp. 202, 203, pl. 5, fig. 8 (1913).

taining *braconides* End.²¹ and *magnifica* Alex.²², species with the head black. It differs from both of these species and from all other banded winged species, in its reddish thoracic dorsum.

Eriocera sublima sp. n. (Pl. IX, fig. 12.)

Head red; thorax black; abdomen black, the last segment orange; wings dark brown with a very narrow white cross band at the cord.

Female.—Length, 13.2 mm.; wing, 11.4 mm. Rostrum and palpi dark brown; antennæ with the scapal segments deep orange-red, flagellar segments dark brown; front, vertex and occiput fiery orange, the genæ darker.

Thorax dark brownish black, the mesonotum without well defined stripes. Halteres black.

Legs very dark brownish black, the tips of the tibiæ and the tarsi much paler, light brown.

Wings dark brown, the alar band white and very narrow, of about the same width as the cell 1stM₂; anal cells of the wing scarcely paler. Venation, see Plate IX, figure 12.

Abdominal segments dark brown, the last segment abruptly fiery orange.

Holotype, female, Minas Geraes, Brazil, 1897. Ex Coll. Fruhstorfer, in the Hungarian National Museum.

This species differs from all of the forms with banded wings in the very narrow, white alar band, and in its very dark brownish coloration.

Eriocera chrysoptera Walker. (Pl. IX, fig. 13.)

1856. *Limnobia chrysoptera* Walker; Ins. Saunders, vol. 1, Dipt., p. 438.

1902. *L. chrysoptera* Kertész; Cat. Dipt., vol. 2, p. 171.

1913. *Eriocera chrysoptera* Alexander; Proc. U. S. Nat. Mus.; vol. 44, No. 1966, p. 490.

1914. *Eriocera chrysoptera* Alexander; Psyche, vol. 21, p. 37.

Female.—Length, 18.8 mm.; wing, 13.6 mm. Rostrum, palpi, antennæ and head very deep black.

Thorax black. Halteres short, black.

Legs, coxæ and trochanters black, basal portion of femora dark brownish black, this dark base narrowest on the fore legs, broadest on the hind legs where it covers almost one-third of the segment, tip of femora black, the middle portion bright yellow; tibiæ and tarsi very dark brown.

²¹ Enderlin, Zool. Jahrb., vol. 32, pt. 1, p. 47, fig. B1 (1912).

²² Alexander, Psyche, vol. 21, pp. 37, 38; pl. 4, fig. 7 (1914).

Wings bright golden yellow, the anal cells gray; tip of the wing from the cord outward dark brown. Venation, see Plate IX, figure 13. Abdomen black.

Two specimens, one a female, one with the abdomen broken, from Coroico, Bolivia. I have but little doubt that this is Walker's *chrysoptera*; the type in the British Museum has lost all the legs, which are quite distinctive in this species.

***Eriocera ohausiana* Enderlein.**

1912. *Eriocera ohausiana* Enderlein; Zool. Jahrb., vol. 32, pt. 1, pp. 45, 46, fig. A1.

1913. *Eriocera ohausiana* Alexander; Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 490.

1914. *Eriocera ohausiana* Alexander; Psyche, vol. 21, p. 36.

One male, Sierra, San Lorenzo, Colombia; Ujhelyi, coll. One male, one female, Callanga, Peru. One female from Songo, Bolivia. One female from Coroico, Bolivia.

These specimens vary much in intensity of the wing-pattern and in coloration, but I cannot find characters which will justify specific separation. The two females from Bolivia lack the dark femoral apices and have the abdominal tergites 5-7 blackish, the wing much more uniform in coloration, etc. The female from Peru has the legs dark brown and lacks black coloration on the abdomen. I have retained one male, one female, for my collection.

EXPLANATION OF PLATE IX.

Figure 1. Hypopygium of *Molophilus taurus* sp. n.; ventral apical appendage from beneath.

Figure 2. Hypopygium of *M. flavidus* sp. n.; ventral apical appendage from beneath.

Figure 3. Hypopygium of *M. guatemalensis* Alexander; ventral apical appendage from beneath.

Figure 4. Hypopygium of *M. sagittarius* sp. n.; ventral apical appendage from beneath.

Figure 5. Wing of *Sigmatomera occulta* sp. n.

Figure 6. Wing of *Rhabdomastix illudens* sp. n.

Figure 7. Wing of *Gnophomyia pervicax* sp. n.

Figure 8. Wing of *G. maestitia* sp. n.

Figure 9. Wing of *Lecteria abnormis* sp. n.

Figure 10. Wing of *Limnophila kerteszi* sp. n.

Figure 11. Wing of *Eriocera perdecora* sp. n.

Figure 12. Wing of *E. sublima* sp. n.

Figure 13. Wing of *E. chrysoptera* Walker.

On the Genus *Phoetalia* of Authors (Orthoptera, Blattidae, Epilamprinae).

By JAMES A. G. REHN and MORGAN HEBARD.

In 1875 Stål erected the genus *Phoetalia*, giving *Nauph. laevigata* P. B. as type, which species is now known to be a member of the genus *Nyctibora*. Thus *Phoetalia* falls into the synonymy under *Nyctibora*. The difficulty was caused by Stål really having material belonging to the genus at present under discussion, but confusing the species with the very different *laevigata* of Beauvois as other authors had already done. We here propose the name *Wattenwyliella* for the genus which has been known as *Phoetalia* by Kirby, Rehn and Hebard and Caudell and as *Phaetalia* by Shelford, and we select *Nauphoeta pallida* of Brunner as the type. The genus includes another species, *Nauphoeta circumvagans* of Burmeister.

Wattenwyliella pallida (Brunner).

1839. *Blatta laevigata* Serville (not of Beauvois, 1805), Ins. Orth., p. 98, No. 21. (Cuba; Martinique.)

1857. *Blatta (Panchlora) laevigata* Guerin (not of Beauvois, 1805), Ramon de la Sagra, Hist. Cuba, Ins., p. 344. (Cuba.)

1864. *Blatta laevigata* Saussure (not of Beauvois, 1805), Mem. Mex. Blatt., p. 99, pl. 1, fig. 16. (Cuba; Martinique; San Domingo.)

1865. *Nauphoeta pallida* Brunner, Syst. Blatt., p. 286. (Cuba.)

1868. *Nauphoeta marginalis* Walker, Cat. Blatt. Br. Mus., p. 41, no. 14. (—?)

1870. *Nauphoeta laevigata* Saussure (not *Blatta laevigata* of Beauvois, 1805), Miss. Sci. Mex., Orth., p. 104. (Antilles; Mexico.)

1893. *Nauphoeta laevigata* Saussure and Pictet (not *Blatta laevigata* of Beauvois, 1805), Biol. Cent.-Amer., Orth., I, p. 101. (Mexico; Guatemala; Cuba; San Domingo.)

1904. *Phoetalia pallida* Kirby, Synon. Cat. Orth., I, p. 116. (West Indies; Brazil; Teneriffe, Canary Islands.)

1910. *Phoetalia laevigata* Rehn and Hebard (not *Blatta laevigata* of Beauvois, 1805), Ent. News, xxi, p. 103. (Key Largo, Florida.)

1910. *P(haetalia) laevigata* Shelford (not *Blatta laevigata* of Beauvois, 1805), Gen. Ins., Fasc. 101, Epilamprinae, p. 8.

1912. *Phoetalia laevigata* Rehn and Hebard (not *Blatta laevigata* of Beauvois, 1805), Proc. Acad. Nat. Sci., Phila., 1912, p. 240. (Key Largo, Florida.)

1913. *Phoetalia laevigata* Caudell (not *Blatta laevigata* of Beauvois, 1805), Proc. U. S. Nat. Mus., xliv, p. 603.

Saussure's description and figure of this species, in 1864, as *Blatta laevigata* Palis. Beauv., are very satisfactory though the colors of the figure are too brilliant.

Brunner, in 1865, misidentified specimens of *circumvagans* as the present species, hence his redescription and use of the name *pallida* for the present insect, which at that time was generally considered to be *Blatta laevigata*.

Wattenwylia circumvagans (Burmeister).

1838. *N(auphoeta) circumvagans* Burmeister, Handb. Ent., II, p. 508. (Santa Catherina, Brazil; Teneriffe, Canary Islands; around the world in ships.)

1858. *Blatta marginicollis* Stål, Eugenie's Resa, Ins., p. 307. (Madeira.)

1865. *N(auphoeta) laevigata* Brunner (not *Blatta laevigata* of Beauvois, 1805), Syst. Blatt., p. 285, pl. vii, figs. 33a-e. (Madeira.)

1910. *P(haetalia) circumvagans* Shelford, Gen. Ins., Fasc. 101, Epilamprinae, p. 8.

Brunner's description and figures of the present species, as *N. laevigata* Pal., are by far the most explicit and satisfactory.

An Adventure While Collecting Bees in Guatemala.*

By WILMATTE PORTER COCKERELL, Boulder, Colorado.

To the wise old saw: Blessed is the man who has a hobby, I would add, and many times blessed the woman. When I think of the good things I might have missed if I had not been collecting bees, I marvel that all travelers do not turn natur-

* Mrs. Cockerell was just a month in Guatemala. So far the following new things have been described from her collections. Many of the things have not yet been worked up. I give only the things actually published: 1 tree (*Phyllocarpus septentrionalis* Donn. Smith), 1 snail (*Thysanophora cockerellae* Pilsbry), 5 gregarines (descr. by Ellis), 4 Ichneumonidae (3 descr. by Viereck, 1 by Ckll.), 1 Chalcidid (descr. by Ckll.), 1 n. g. and sp. Orthoptera (descr. by Ckll.), 36 spp. and 11 subspp. of bees. (One additional bee has been sent for publication, and a paper by Rohwer with numerous new wasps awaits publication.)—T. D. A. C.]

alists or perhaps archeologists, or bibliophiles, for even the collection of idols or old books has elements not to be despised.

My net was always a letter of introduction, for there are naturalists the world over. The first friend to be thus bagged was a young engineer who was taking a job on the great canal only because he wanted to make collections of tropical beetles, and the last was an engineer coming home from South America, the grandson of a celebrated nature writer, and himself an ardent student of color photography. How much these young men added to my going and coming with tales of strange lands and distant peoples! And curiously, the first person I met at the port was a woman, who had lived for years in the little republic and who had an inexhaustible fund of animal and plant lore. Then there were the others, full of kindness to the lady "bug-catcher," but the most gracious of all the friend who took me to her house and guarded my time so that every moment might count for the bees or bee notes of that wonderful tropical land.

Once, however, I found myself suspected and arrested; my net a badge of some strange foreign magic.

We drove from Guatemala City to Antigua, and though it is a scant thirty miles we were the most of the day on the road. It was simply maddening to sit in the carriage and see all sorts of new and wonderful plants growing by the roadside, and every little while a great bee would crawl from its nest in the bank by the road and add greatly to my unhappiness. So when we started home I determined to walk ahead of the carriage, and do some collecting. The carriage was ordered for ten-thirty, and I planned to start at six if possible. At five I went into the dining room hoping to get some breakfast, but the funny waitress, a French negro *ladrina*, declared there was no breakfast for an hour and held up her brown finger to emphasize the information, but a man was eating in the corner and I appealed to him as he spoke English. No, he said, it was not yet breakfast time; the bread had not yet been brought in (it is usually baked by the Indians and brought in by the basket load), and the milk was still at

the finca (farm). This all sounded reasonable enough if the man had not been eating, and so I inquired: "If one, why not another." For a moment he seemed confused, but with a wave of the hand and a bow (the Spanish way of dismissing a troublesome question) he answered: "It is too early for ladies."

I felt that I would better go hungry than to insist in the face of such gallant sentiments but my bibliophile friend appeared. She knows the ways of the country, the language, and best of all has a fund of compliments that even put a Spanish gentleman to shame, and like magic the breakfast appeared—oranges, bread, hot milk, and even pan dulce (sweet biscuit.)

The stars were still shining as I walked through the long quiet streets, lined with adobe houses, all one-story, and rich in Moorish tints of yellow and pink and azure blue. The sun was only just warming up the hillsides when I came into the open country. The road was cut through the hills and on both sides the land rose quickly into a rough foothill region, sparsely covered with trees and flowery bushes. On the first rise there were scattered pines, and in the direction of the city I could see the perfect cones of the volcanoes. The air was fresh and invigorating, and I spent a wonderful three hours on that warm hillside. There was a bush covered with blossoms that looked like our red pentstemons literally full of humming birds and a tree, which for want of a better name, I called the Senecio tree, swarming with bees; and there were birds very like our Baltimore Oriole, but with heavier bills, eating the berries from a Solanum. On the larger trees, I could hear the insistent drumming of woodpeckers, and occasionally I caught a glimpse of one as it flew from tree to tree, a brown-speckled bird with a gleam of azure when it flew. Indian men and women were preparing bundles of wood and passed me now and then with a "Buenos días, Senora." A small boy came down from the pine ridge to try his English upon me. He had once had a little English, at a school in Guatemala City, at least so I gathered, and he

knew half dozen English phrases. "Are you American or English? Is your President Mr. Roosevelt? Are you married? How old are you?" When I satisfied him upon all these important questions, and he had helped me catch a large butterfly, and accepted with great thanks \$2.00 (10 cents) he went back to his wood cutting. A white-throated humming bird came and settled on my net, and every few minutes I added a new species of bee to my collection.

Much too soon it was eleven o'clock, and I felt I must get back near enough to the road to see the carriage. Unfortunately, when I could see the road I could be seen, and, as many Indians were passing along, I found myself inspected by them. I tried to go on with my collecting as though I was quite accustomed to work with fifty Indians looking on. In the main, I did not think them unfriendly, though I was told that they do not like foreigners. I saw no white people and I understood that there were very few in that part of the country. An Indian came and looked over the fence and asked me what I was doing. I explained in Spanish, which I had carefully learned by heart, that I caught butterflies and flies, mariposas and moscas, and I hoped it was permitted. At that he began shaking his stick in my face, and talking volumes of Spanish, none of which I understood. I tried to pretend that I took no further interest in him and went on with my collecting, but when he began to crawl under the fence I crawled out. I could argue the case better on the road, and I expected the carriage every minute. He came up near to me waving his stick, and when I seemed not to be taking the matter as seriously as he intended, he called and a man with a gun appeared, possibly a soldier. He was the funniest sight I ever expect to see—his gun was a most curious old-fashioned sort; he was barefooted, of course, and had on trousers made of flour sacks with "Pillsbury's Best" quite conspicuous on one leg. He said that I was arrested and I laughed—the flour sack trousers were so very funny! I explained again what I was doing, and that I was a friend of the priest, who would be

angry if I were molested. This finished the soldier person, and he disappeared amid much talking and great shakings of the stick by the first officer or brigand.

Still no sound of wheels, but a pleasant-faced Indian woman came along carrying a huge basket on her head, a baby in a blanket on her back and two chickens in her hands. I told her as best I could that I was afraid of the man, and she smiled, let me carry the chickens, and we trotted along together, followed by the militant brigand. But my guide's road turned off from the main road, and I was again alone with the barefooted, blue-calico-dressed officer. Fortunately for my peace of mind, I soon came to a small adobe house, a cantina where all the Indians stopped for a drink. My captor said that I was not to stop, but I stopped. The Indian woman who sold the drinks told me that I must do as the man said—all this in Spanish, so that I mostly guessed at what was said. The officer said in a loud voice that I must go on, *pronto vamoose*. I knew those words, and I sat a little more firmly on the box, and a dozen or more Indians gathered about me, and a little five-year-old girl who had left her burden at the door put her hand in mine with some soft Spanish words. A pleasant-faced Indian began to argue with the officer, I thought in my behalf, and all the time the Indians came in and out of the little room, getting, I am afraid, a little more white eye than was good for them and all stopping to regard the strange Inglese lady. Ten rather anxious minutes went by, and my captor was making further violent efforts with his stick when I heard our driver's insistent "Mula! Mula!" Never will mules look so good to me again as those five that dashed around the corner and drew up with a flourish in front of the little cantina.

The Gualtemaltecan's attitude changed amazingly when he saw five other Americans. He insisted that he thought I was poisoning the plants, but so differently did he feel that he went out and brought a beautiful chrysalis, a souvenir of the occasion, perhaps.

A new Coccid Infesting Citrus Trees in California (Hemip.).

By ROY E. CAMPBELL, Berkeley, California.

In the early part of 1909 student inspectors from Pomona College discovered a soft scale on citrus trees near Claremont, California, which appeared to be different from the common *Coccus hesperidum* Linn. The insect was first identified as *Coccus longulus* Doug., but was later changed to *Coccus elongatus* Sign. Recent investigations by the writer indicate that the scale is a new species.

The insects were observed in no great numbers, but have since become considerably more abundant, and have also been found in a number of other localities.

Coccus citricola n. sp.

Adult Female.—Length, 3 to 6 mm.; width, 2 to 3 mm.; general color, dull gray, interspersed with numerous irregular yellowish spots. Body elongate, ends broadly rounded. Dorsum with small blotches forming a distinct irregular yellow stripe extending from anal plates almost to anterior margin. Two similar less distinct submedian stripes parallel with margin, and occasionally two indistinct submarginal stripes. A yellowish band of the same character extends around the margin. Antennae regularly eight-jointed, occasionally a specimen has seven joints in one and eight in the other, rarely seven in both. Average and most common formula 8-3-1(4-5)-2-6-7. The eighth is practically invariably the longest joint, sixth and seventh the shortest, while the rest vary considerably. No hairs on third and fourth joints. Stigmatic cleft small, with three spines, median spine curved and three times as long as others. Marginal hairs numerous, simple, pointed. Submarginal tubercles very few, or wanting. Anal ring with six long pointed hairs, plates of the anal operculum with the base slightly longer than the outer edge. Four fringe setae in groups of two across anal plates, with the lateral setae of each group longer than the mesal. Three subapical and four apical setae on each plate. Tibia one-third shorter than femur and very slightly longer than tarsus.

Adult Male.—Length, 1 mm.; body width, .28 mm.; style, .25 mm.; antennae, .57 mm.; wing length, .17 mm.; wing width, .05 mm. Color, dark honey yellow, head and thorax slightly darker. Anterior pair of upper eyes brownish, small. Posterior pair of upper eyes dark brown and much larger than anterior pair. Ventral pair dark brown,

equal in size to posterior upper pair. Antennae yellowish, ten-jointed. First joint short, cylindrical, second a little longer but thick and oval, third a little shorter and slender, enlarged toward tip. Fourth, fifth, sixth and seventh subequal, slender, each about twice as long as third; eighth, ninth and tenth subequal, the three being not quite as long as sixth and seventh together; eighth and ninth distinctly swelled, tenth slightly. Three long knobbed hairs at end of tenth joint. All joints except first and second with numerous curved hairs. Legs yellow, with a slightly brownish tinge, quite hairy. Style, lemon yellow, tapering sharply at tip. Wings hyaline, with a microscopic pubescence, heavier at veins. Veins yellowish.

Male Puparium.—Length, 1.7 mm.; width, .7 mm. Glassy white surface, rounded. Two lines, beginning at the anal opening diverge upward for a short distance and then proceed with only a slight divergence to near the anterior end, when they diverge outward again. Surface of the coronet slightly more convex. A quarter of the distance from the anterior end, where diverging lines begin to run almost parallel, is a cross carina; another carina crosses the coronet at a little more than a quarter of the distance from posterior end. Just back of this carina are two spiracular channels, from coronet to each margin. Half way between the two cross carinae are the other two spiracular channels, running from coronet to margin. There is a triangular space for the anal operculum and a cleft from this to the margin.

Egg.—Length, .21 to .24 mm.; width, .12 to .15 mm. Color, lemon yellow; oval shaped. When first deposited, light yellow, changing to a slightly darker tinge before hatching. Eyes show up as minute black spots.

Larva.—Length, .25 to .3 mm.; width, .15 to .19 mm.; length of spines, .1 to .12 mm. Antennae, .07 mm. Color, light yellow, eyes minute black spots, body flat and oval, slightly broader and more rounded at anterior end. Anal spines slightly less than half the length of the body. Antennae six-jointed. Eggs and larva are more yellowish than *C. hesperidum*.

Habitat, as far as known, on the leaves and twigs of citrus trees only. The young scales settle mostly on the leaves and when about half grown migrate to the small twigs. No scales have been found on twigs larger than one half inch in diameter. When the insects are abundant, and such is usually the case, they are arranged on the twigs in a curiously imbricated manner which is quite characteristic. The infestations are largely confined to the lower half of the tree.

Distributed in Pomona, Claremont, Ontario, Cucamonga, Colton, Highlands, Redlands and Riverside in Southern California; in Tulare and Fresno Counties in the lower San Joaquin Valley and slight infestations in Sacramento, Yuba City and Marysville in the Sacramento Valley. It is very probable that the insect has existed in California for some time and has passed unnoticed, or what is more likely, has been confused with and identified as *Coccus hesperidum* Linn., which it closely resembles.

Comparison of Coccus citricola n. sp. and two related species.

<i>Coccus hesperidum</i>	<i>Coccus citricola</i>	<i>Coccus elongatus</i>
Antennae 7-jointed	Antennae 8-jointed	Antennae 8-jointed
Formula (3-7)-4-2-1-6-5	Formula 8-3-1-4-5-2-6-7	Formulae 3-(2-5)-(1-4-8)-6-7 3-5-(2-4)-(6-8)-7
3rd joint longest 4th and 7th almost as long	8th joint longest	3rd joint longest 8th joint one of shortest
4th joint longer than 5th	4th joint usually slightly longer than 5th	5th joint quite constantly longer than 4th
Hairs of anal ring 8, 2 fringe, 2 subapical and 4 apical setae on each plate	Hairs of anal ring 6, 2 fringe, 3 subapical and 4 apical setae on each plate	Hairs of anal ring 8, 4 fringe, 4 subapical, 1 discal and 3 apical setae on each plate
Dorsum with no longitudinal stripes	Dorsum with distinct irregular yellow stripes	Dorsum with no longitudinal stripes
Appearance, yellow minutely specked with brown spots	Appearance, dull gray interspersed with irregular yellow spots	Appearance, dingy pale yellowish gray
4 or 5 submarginal tubercles on a side	Submarginal tubercles very few or wanting	Submarginal tubercles large and numerous
3 or 4 generations a year	One generation a year	
Infests young trees, or a single branch of a single large tree in an orchard	Infests large trees uniformly and most of the trees in an orchard	
Host plants Oleander, Camellia Citrus, Holly Ivy, Laurel Jasmine, Myrtle Phlox and many others	Host plants Citrus trees	Host plants Acacia, Cherimoya Ficus, Lantana Citrus, Palms Ferns, Cherry, Laurel and many others

September Dragonflies about Mesa, Arizona (Odon.).

By E. B. WILLIAMSON, Bluffton, Indiana.

In September, 1912, Mr. B. J. Rainey collected dragon flies extensively about Mesa, Arizona. All species seen by him, with but one exception, were captured, and the following list is probably practically complete for this section at the season when he collected. He kindly turned the entire collection of 588 specimens over to me, and furnished the notes on the habits of different species.

Collections were made at the following locations:

Chandler, 9 miles south of Mesa, desert country with irrigating ditches.

Granite Reef Dam, on Salt River, 9 miles above Mesa, collected along river, up-stream from dam.

Tempe, 6 miles west of Mesa, collected along irrigating ditches.

Mesa is on Salt River. On September 9 he collected along an irrigating ditch, 12 feet wide, 1 mile south and 3 miles east of Mesa.

Hetaerina americana. Common everywhere about swift or slow water: on grass and bushes over water. Sept. 11, south of Mesa; Sept. 12, Eastern Canal, Mesa; Sept. 12, Tempe; Sept. 15 and 22, Granite Reef Dam; Sept. 16, east of Mesa; Sept. 18, Salt River, Mesa: 56 ♂ and 42 ♀.

Argia moesta. Sept. 10, Mesa; Sept. 15 and 22, Granite Reef Dam: 2 ♂ and 6 ♀.

Argia sedula. Associated with *Hetaerina americana*. Sept. 8, along ditch north of Mesa; Sept. 10, 16 and 18, Mesa; Sept. 15 and 22, Granite Reef Dam: 80 ♂ and 5 ♀.

Argia pallens. On islands in Salt River, Mesa, Sept. 18, in grass back from the water; Sept. 22, Granite Reef Dam: 5 ♂ and 1 ♀.

Enallagma civile. Common along irrigating ditches, resting on twigs in water or near water. Sept. 9 and 10, Mesa; Sept. 8, along ditch north of Mesa; Sept. 11, south of Mesa; Sept. 12, Tempe; Sept. 16, east of Mesa: 45 ♂ and 10 ♀.

Enallagma praevarum. August 31, Sept. 18 and 22, Mesa: 10 ♂ and 2 ♀.

Telebasis salva. In grass and on twigs in water. Sept. 8, 9, 10, 11, 16 and 18, Mesa, Salt River, north, east, southeast and south of Mesa; Sept. 17, Chandler: 112 ♂ and 19 ♀.

Ischnura denticollis. Sept. 9, Mesa: 1 ♂.

Ischnura demorsa. Sept. 9, 10, 11, 16 and 18, Mesa, Salt River and east of Mesa: 21 ♂ and 36 ♀.

Ischnura barberi. Sept. 8, 9 and 11, Mesa and south of Mesa; Sept. 12, Tempe: 4 ♂ and 1 ♀. All *Ischnuras* were taken in grass and on twigs in water; flight low.

Progomphus borealis. All were taken away from water 10-40 feet; were resting on tips of twigs, often with abdomen elevated, and none were seen resting on the ground. Sept. 8 and 18, Salt River, Mesa, and desert north of Mesa; Sept. 15 and 22, Granite Reef Dam: 4 ♂ and 6 ♀.

Erpetogomphus compositus. All were resting on dirt banks or broad leaves, always near water; flight swift and straight. Sept. 12, south of Tempe, along canal; Sept. 18, Salt River, Mesa; Sept. 22, Granite Reef Dam: 6 ♂ and 2 ♀.

Anax junius. Flying along ditches in bright sunlight, most numerous during the middle of the day; associated with the next species. Sept. 9, 10, 11 and 13, Mesa and south and southeast of Mesa along canal: 10 ♂ and 2 ♀.

Aeshna multicolor. Associated with the preceding and of similar habits. Aug. 31 and Sept. 9, Mesa and southeast of Mesa along a ditch: 11 ♂ and 2 ♀.

Libellula saturata. Often resting on twigs among dead cacti. Sept. 8, 11 and 18, Mesa and south of Mesa; Sept. 22, Granite Reef Dam: 3 ♂ and 3 ♀.

Libellula comanche. Flying with Aeshnines, only one seen. "Basal coloring of wings much reduced (wanting), c. f. Ent. News XVIII, p. 202; distal brown of stigma reduced (scarcely one-fifth) — Calvert in letter. Sept. 9, southeast of Mesa along ditch, 1 ♂.

Orthemis ferruginea. Usually resting on dead twigs. Sept. 3, 8, 9 and 10, Mesa, along road north of Mesa, southeast of Mesa along ditch; Sept. 17, Chandler: 13 ♂ and 4 ♀.

Perithemis intensa. On twigs in still water and back and forth between resting places. Sept. 3, 8, 9, 10, 11 and 16, Mesa, north, east and south of Mesa; Sept. 17, Chandler: 41 ♂.

Erythemis collocata. About small ponds. Sept. 8, 10, 11, 16 and 18, Mesa, and north, east and south of Mesa; Sept. 17, Chandler: 12 ♂ and 5 ♀.

Sympetrum corruptum. Sept. 8 and 11, north and south of Mesa; Sept. 15, Granite Reef Dam: 3 ♂ and 1 ♀.

Pantala flavescens. Sept. 11, south of Mesa, 1 ♂.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., MAY, 1914.

The Desirability of a Bibliographical Dictionary of Entomologists*.

Fifteen years ago, in locating and studying Burmeister's types of Odonata, it was desirable, as it is in all similar pieces of work, to ascertain the sources from which he had obtained his material, the original collectors, and the dates of the collecting, the successive owners into whose hands the specimens had passed and their fate subsequent to their examination and description by Burmeister. Such of this information as was obtained came after a protracted search through the few early references afforded by Hagen's *Bibliotheca Entomologica* and by papers by authors later than Burmeister which treated of any of the species included in his *Handbuch* of 1839.

Five years ago, in preparing an annotated list of the localities and collectors of Odonata in Mexico and Central America, for the introduction to the Neuroptera volume of the *Biologia Centrali-Americana*, no precise information was acquired as to the parts of those countries visited by such men as Deppe or McNeil, and even in the case of de Saussure it was not complete.

It is not only as to collectors and fate of collected material that data are often needed. It is frequently highly desirable to know when, where and under what conditions the describers, the monographers, the systematists did their work, since such information throws light, in many cases, on the results of their labors and on the views which they adopted. At this present time we wish to know something of the personal history of Brackenridge Clemens, a pioneer in the study of the

* Read at the Atlanta meeting of the Entomological Society of America, December 30, 1913.

American Microlepidoptera. We know that he died in January, 1867, but the *Zoological Record* and the American entomological and zoological journals of that and the immediately following years have, so far, not furnished any references to the existence of anything more than a very brief biographical sketch. In searching for such a reference, we came across a short account of the Nicaraguan expedition of McNiel, of which we were ignorant in 1908 when we most needed it.

These concrete examples show the desirability of a bibliographical dictionary of entomologists, not merely as a matter of historical interest, but as an important guide to the comprehension of the work of our predecessors. By entomologists we mean not only those who have published on insects but also all who have collected or formed collections, including under the latter head public museums.

Such a dictionary as we suggest should contain as far as possible, the following information under each entry:

1. The dates and places of birth and death.
2. The periods and places of activity as collector, writer, etc.
3. The sources of the material which the subject, if a writer, employed.
4. The subsequent fate of the subject's personal collections.
5. Especially and superlatively important, references to any published biographical notices, bibliographies and critical estimates of the subject, if a person. If a Museum, references to historical accounts of the institution, published lists of collections and types contained, etc.

On account of the interrelations of entomologists and different parts of the world, the scope of the dictionary should be world-wide.

We have not in contemplation the preparation of such a dictionary. The chief object of this paper is to call the attention of some one who is bibliographically inclined, and who has leisure on his hands, to a field which lies ready to be tilled. Such a philanthropic author must expect difficulty in finding a publisher for his book when the manuscript has been com-

pleted. To lessen this difficulty, the paragraph devoted to each entry should be as brief as possible, particularly where published information already exists and references to it can be given. This dictionary is conceived of as a work of reference, a guide to sources, not as a compilation of all that is known or may be gleaned from the existing literature.

The task of preparation is not a light one, to be accomplished in two or three years. It will require many years, access to large and complete libraries and the exercise of wise judgment to produce a satisfactory result along the lines indicated. It will be worth the doing, however, and therefore is brought to the attention of entomologists.

Notes and News

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Ambulyx strigilis L. in Florida (Lep.).

Mr. Morgan Hebard has presented to the Academy of Natural Sciences of Philadelphia a specimen of *Ambulyx strigilis* Linn., taken at Miami, Dade Co., Florida, February 2, 1899. It would be of interest to know whether this species is a visitor to Florida or a resident there. This sphinx moth is found in the West Indies and South America.—HENRY SKINNER.

Side Lights on Entomology.

"To an outsider it looks as though the subject of entomology were still largely in the taxonomic stage of development, which is not to be wondered at when one recalls that over half the species of animals are insects."—M. A. CHRYSLER, Professor of Botany, University of Maine, in *Science* for March 13, 1914, page 377.

". . . what has chiefly contributed to the progress of Odonatology during the period under review [1895-1912] is the application of the developmental method as a means of tracing the origin, and so comprehending the significance, of the various parts of the Odonate's body. If the application of this method to these insects seems to students of other animal classes to have been slow, the excuse must be the great number of insect forms, the consequent great mass of detail to be mentally digested, and the relatively smaller number of investigators."—P. P. CALVERT, in *Transactions, 2nd International Congress of Entomology*, Oxford, 1912, page 157, Oct. 14, 1913.

European Heteroptera Alleged to Occur in the United States.

For a long time past, in fact for nearly 10 years, someone or other, myself included, "following copy," has gravely listed certain Heteroptera as being found in the United States. I have endeavored by word of mouth and by letter to find out definitely just *what* was known, but fruitlessly. Finally I concocted the exchange notice which has appeared lately in the NEWS, stating my wants of *European* Hemiptera said to occur in the United States, and naming *Dasycoris pilicornis* Burmeister, *Gastrodes ferrugineus* Linné, *Gonianotus marginepunctatus* Wolff and *Microtoma atrata* Goeze. I met with exactly the success I anticipated, exactly nothing. Incidentally, the solidarity of my co-workers in Hemiptera was revealed. They have all maintained a dignified silence! Now, I emphatically state that any entomologist who perpetrates (and perpetuates) these errors displays a lack of familiarity with his subject. In this matter I'm from Mizzoura; you've got to show me. You've got to show me *Cymus clavicularis* Hahn, and *Sphagisticus rufipes* Stål; also *Notonecta glauca* Linné and *Emblethis arenarius* Fieb.; *Cimex* (or *Clinocoris*) *hirundinis* Jenyns and *pipistrelli* Jenyns; *Ischnorhynchus resedae* Panz., all to be taken within the borders of the United States. They gravely appear in our latest "Catalogue of the Nearctic Hemiptera Heteroptera," so I would much like to see them. Like Mrs. Harris, I think "there ain't no sich persons." Now I repudiate them and all their works. In my opinion they have never been taken and in all likelihood never will be taken in this country. Therefore, they have no legitimate place in our Catalogues, and our catalogue makers should expurge them from the record.—J. R. DE LA TORRE BUENO, White Plains, New York.

A Spider Swathing Mice (Aran.).

[The following letter by a non-entomologist seems of sufficient interest and value to warrant its publication in the NEWS.—A. N. CAU-DELL.]

"An unusual thing and one that will be doubted by many occurred at my home near Upper Marlboro, Maryland, a few days ago. A member of the family was attracted by a slight noise and upon investigating found under the sideboard a young mouse making frantic efforts to free itself from invisible bonds. It resulted that a spider, scarcely larger than a black ant, had caught the mouse and was performing an engineering feat that was truly interesting. This was the task of lifting the mouse from the floor to the bottom of the sideboard, a distance of about eight inches. The rodent kicked almost constantly during the operation, which lasted a little over three hours. The webs were then wiped away and to our surprise a second young mouse, dead and completely swathed in web, was found."—(Signed) GUY CLAGGET, Keokuk Farm, Upper Marlboro, Md.

Summer Work on Lake Erie.

The Lake Laboratory of the Ohio State University at Cedar Point, near Sandusky, Ohio, will be open to investigators free of charge from June 22 to Sept. 1, and for instruction (fee) from June 22 to July 31, 1914. The courses of study include one on Entomology by Mr. W. J. Kostir.

Do House Flies Hibernate? (Dip.).

Mr. E. E. Austen, in the *Entomologist's Monthly Magazine*, for February, 1914, page 39, under the above title calls attention to Dr. Henry Skinner's article under same title which appeared in the *News* for July, 1913, page 304. Mr. Austen states that Dr. Skinner's assertion, "House flies pass the winter in the pupal stage and in no other way," is directly at variance with the results obtained in England by both Newstead and Jepson. However, he further says that in the recent investigations along this line by the Local Government Board, no house flies were found among those hibernating. To further investigation along such lines he makes an appeal to the readers of that journal to send collections of hibernating flies, accompanied with proper data, to the Local Government Board for determination. It will be interesting to learn the results of such a campaign.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the *News*, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

- 2—Transactions, American Entomological Society, Philadelphia.
4—The Canadian Entomologist. 6—Journal, New York Entomological Society. 7—U. S. Department of Agriculture, Bureau of Entomology, Washington. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 12—Comptes Rendus, L'Academie des Sciences, Paris. 13—Comptes Rendus, Societe de

Biologie, Paris. 18—Ottawa Naturalist. 19—Horae Societatis Entomologiae Rossicae. 22—Zoologischer Anzeiger, Leipzig. 28—Archives d'Anatomie Microscopique Paris. 35—Annales, Societe Entomologique de Belgique. 40—Societas Entomologica, Zurich. 49—Annales Historico-Naturales Musei Nationalis Hungarici, Budapest. 50—Proceedings of the U. S. National Museum. 74—Naturwissenschaftliche Wochenschrift, Berlin. 79—La Nature, Paris. 84—Entomologische Rundschau. 86—Annales, Societe Entomologique de France, Paris. 87—Bulletin, Societe Entomologique de France, Paris. 89—Zoologische Jahrbucher. Abteilung fur Anatomie und Ontogenie der Tiere, Jena. 92—Zeitschrift fur wissenschaftliche Insektenbiologie. 102—Proceedings of the Entomological Society of Washington. 116—Zoological Bulletin, Boston. 119—Archiv fur Naturgeschichte, Berlin. 166—Internationale Entomologische Zeitschrift, Guben. 173—Die Grossschmetterlinge der Erde, Fauna Americana, von A. Seitz, Stuttgart. 177—Quarterly Journal of Microscopical Science, London. 184—Journal of Experimental Zoology, Philadelphia. 186—Journal of Economic Biology, London. 189—Journal of Entomology and Zoology, Claremont, Calif. 191—Natur. Halbmonatschrift fur alle Naturfreunde. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole. 216—Entomologische Zeitschrift, Frankfurt a. Main. 258—Mitteilungen, Zoologischen Museum in Berlin. 285—Nature-Study Review, Ithaca, N. Y. 368—The Monthly Bulletin of the State Commission of Horticulture, Sacramento. 369—Entomologische Mitteilungen, Berlin-Dahlem. 411—Bulletin of the Brooklyn Entomological Society. 422—Coleopterologische Rundschau, Wien. 462—The Butterfly Farmer, Truckee, Cal.

GENERAL SUBJECT. Dolleschall, H.—Was uns die eichen bieten, 216, xxvii, 297-8. Doncaster, L.—Chromosomes, heredity and sex: a review of the present state of the evidence with regard to the material basis of hereditary transmission and sex determination, 177, lix, 487-522. Felt, E. P.—Cryptic coloration, 6, xxi, 312. Guenther, K.—Eingeweide-wurmer fleischfressender pflanzen, 191, v, 181-183. Hammar, A. G.—Obituary notice, 102, xvi, 8; 179, vii, 155-7. Hollande, A. C.—Les Cerodecytes ou "Oenocytes" des insectes consideres ou point de vue biochimique, 28, xvi, 1-66. Kneidl, G.—Der entomologe, 216, xxvii, 291-2. Kunze, R. E.—Troubles of early collectors, 462, i, 116. Laven, L.—Auge und sehen der insekten, 191, v, 229-32 (cont.). Newell, W.—A simple and economical method of filing entomological correspondence, 179, vii, 87-91. Olivier, E.

—Obituary notice of, 8, 1914, 67. **Parrott, P. J.**—The growth and organization of applied entomology in the U. S., 179, vii, 50-64. **Patterson, A. J.**—Some insect studies, 285, x, 108-13. **Pierce & Morrill**—Notes on the entomology of the Arizona wild cotton, 102, xvi, 14-23. **Popenoe, E. A.**—Obituary notice of, 179, vii, 155. **Prell, H.**—Ueber einen fall von mimikry durch schutzstellung, 40, xxix, 21-2. **Rudow, Dr.**—Biologische, nicht nur systematische sammlung, 166, vii, 319-321 (cont.). **Sladen, F. W. L.**—Meeting of the entomological branch of the Ottawa Field Naturalists' Club, 18, xxvii, 171-73. **Stellwaag, F.**—Neuere untersuchungen ueber den farbensinn der insekten, 74, xiii, 161-64. **Uhler, P. R.**—Obituary notice with list of his writings, 102, xvi, 1-7.

ARACHNIDA, ETC. **Banks, N.**—A new mite from Thurberia, 102, xvi, 44. **Moles, M. L.**—A n. sp. of pseudoscorpion from Laguna Beach, California, 189, vi, 41-4. **Oudemans, A. C.**—Acarologisches aus maulwurfsnestern, 119, 1913, A, 8, 108-200 (cont.).

APTERA AND NEUROPTERA. **Hilton, W. A.**—The central ganglia of *Xenylla*, 189, vi, 38-41. **Hood, J. D.**—On the proper generic names for certain Thysanoptera of economic importance, 102, xvi, 34-44. **Howlett, F. M.**—A trap for thrips, 186, ix, 21-23. **Schwermer, W.**—Beitrage zur biologie und anatomic von *Perla marginata*, 89, xxxvii, 287-312.

Bacon, G.—*Neanura gigantea* in So. California, 189, vi, 45-47. **Borner, C.**—*Oncopodura*, eine schuppentragende Isotomidae, 22, xliii, 486-7. **Cholodkovsky**—Zur beurteilung der systematischen stellung der Puliciden, 22, xliii, 555-58. **Hogg, W.**—The dragon fly (Note), 462, i, 120-1. **Navas, L.**—New Neuroptera from the U. S., 411, ix, 13-20. **Stitz, H.**—Mantispiden der sammlung des Berliner Museum, 258, vii, 1-49. **Welch, P. S.**—The early stages of the life history of *Polystoechotes punctatus*, 411, ix, 1-6.

ORTHOPTERA. **Luvoni, A. B.**—Notes on the metamorphosis of *Phasgonura viridissima*, 9, 1914, 99-100. **Merle, R.**—Les insectes cataleptiques, 79, xlii, 225-27.

Chopard, L.—Descriptions de Mantides Americains, 86, lxxxii, 752-64. **Walker, E. M.**—A n. sp. of *O.* forming a new genus and family, 4, 1914, 93-9.

HEMIPTERA. **Girault, A. A.**—Preliminary studies on the biology of the bed-bug (*Cimex lectularius*), 186, ix, 27-45. **Glasgow, H.**—The gastric caeca and the caecal bacteria of the Heteroptera, 198, xxvi, 101-170.

Bergroth, E.—Notes on some genera of Heteroptera, **35**, lviii, 23-8. **Cockerell, T. D. A.**—A new cotton scale from Panama, **179**, vii, 148. **Crawford, D. L.**—A contribution toward a monograph of the Homopterous insects of the family Delphacidae from No. and So. America, **50**, lxvi, 557-640. **Davidson, W. M.**—Plant-louse notes from California, **179**, vii, 127-136. **Essig, E. O.**—The mealy bugs of California, **368**, iii, 97-143. **King, G. B.**—*Kermes lindingeri* n. sp., **84**, xxxi, 34. A new species of *Kermes* from Connecticut, **179**, vii, 150-1. A historical *kermes* (new species), **189**, vi, 48-9. **Parker, J. R.**—The life history of the sugar-beet root-louse (*Pemphigus betae*), **179**, vii, 136-141. **Sulc, K.**—Zur kenntnis einiger *Psylla* arten aus dem Ungarischen National-Museum in Budapest, **49**, xi, 409-35. **Vuillet, A.**—Sur la presence de l'*Aphis maidis* Fitch en Afrique occidentale, **87**, 1914, 116-7.

LEPIDOPTERA. **Stephan, J.**—Das erwachen der schmetterlingswelt im fruhlinge, **191**, 1914, 258-260 (cont.). **Webster, F. M.**—Another migration of *Anosia plexippus*, **4**, 1914, 100. **Winn, A. F.**—A protected butterfly, **4**, 1914, 109.

Busck, A.—Two Micro-L. on *Thurberia thespesioides*, **102**, xvi, 30-1. **Davis, W. T.**—*Coscinoptera dominicana*. *Prionapteryx nebulifera*, **6**, xxi, 311, 313. **Harrison, J. W. H.**—The genus *Poecilopsis*, **9**, 1914, 92-4. **Jordan, K.**—*Zygaenidae*, **173**, Lief. 57, 21-31. **Pearsall, R. F.**—Short studies in Geometridae: No. 2, **411**, ix, 21-3. **Michael, O.**—Die *Papilios* des Amazonasgebietes, **216**, xxvii, 304-5 (cont.). **Strand, E.**—Zur kenntnis der neotropischen Noctuidengattung *Eugraphia*. Neue aberrationen der Noctuiden-subfamilie *Catocalinae*, **119**, 1913, A, 8, 62-63, 63-77.

DIPTERA. **Edwards, F. W.**—A remarkable case of venational teratology in *D.*, **8**, 1914, 59. **Fabre, J. H.**—The life of the fly; with which are interspersed some chapters of autobiography. Translated from the French. New York, Dodd, Mead & Co., 1913. 477 pp. **Guyenot, E.**—Etudes biologiques sur une mouche *Drosophila ampelophila*. Necessite de realiser un milieu nutritif defini, **13**, lxxvi, 483-85. **Haines, F. H.**—Do house flies hibernate? **8**, 1914, 60-1. **Lucet, A.**—Recherches sur l'évolution de l'*Hypoderma bovis* (de Geer) et les moyens de le detruire, **12**, 1914, 812-14. **Richardson, N. M.**—A humble-bee attacked by a diptron, **8**, 1914, 93-4. **Whiting, P. W.**—Observations on blow-flies; duration of the prepupal stage and color determination, **198**, xxvi, 184-94.

Alexander & Lloyd—The biology of the No. American crane flies. 1. The genus *Eriocera*, **189**, vi, 12-37. **Cockerell, T. D. A.**

—Three D. from the Miocene of Colorado, **4**, 1914, 101-2. **Enderlein, G.**—Zur kenntnis der Stratiomyiden mit 3-astiger Media and ihre gruppierung . . . (subfamilien: Geosarginae, Analococerinae, Stratiomyiinae), **22**, xliii, 577-615. **Felt, E. P.**—Acaroletes pseudococci n. sp., **179**, vii, 148-9. **Hendel, F.**—Namensanderungen (Aldrichiomyza for Aldrichiella, Haplomyza for Antineura), **369**, iii, 73. **Malloch, J. R.**—Costa Rican Diptera. Paper I. A partial report on the Borboridae, Phoridae and Agromyzidae, **2**, xl, 1-36. Some undescribed No. Am. Sapromyzidae, **161**, xxvii, 29-42. **Melander, A. L.**—A synopsis of the dipterous groups Agromyzinae, Milichiinae, Ochthiphilinae and Geomyzinae, **6**, xxi, 283-300. **Townsend, C. H. T.**—Notes on Exoristidae and allies, **6**, xxi, 301-305. **Tilbury, M. R.**—Notes on the feeding and rearing of the midge *Chironomus cayugae*, **6**, xxi, 305-8. **Walton, W. R.**—A new tachinid parasite of *Diabrotica vittata*, **102**, xvi, 11-14.

COLEOPTERA. **Barber, H. S.**—On interspecific mating in *Phengodes* and inbreeding in *Eros*, **102**, xvi, 32-4. **Bretschneider, F.**—Ueber die gehirne des goldkafer und des lederlaufkafer, **22**, xliii, 490-97. **Dow, R. P.**—The early French Coleopterists, **411**, ix, 6-13. **Stellwaag, F.**—Ueber den flugapparat der Lamellicornier, **22**, xliii, 558-60. **Walsh, G. B.**—A note on deformed antennae in certain beetles, **8**, 1914, 62-3.

Coad & Pierce—Studies of the Arizona *Thurberia* weevil of cotton in Texas, **102**, xvi, 23-27. **Davis, W. T.**—*Calosoma frigidum* and *willcoxi* at Wading River, L. I., **411**, ix, 23-4. **Fruhstorfer, H.**—Eine neue *Agrias*-rasse aus Brasilien, **84**, xxxi, 30. **Graf, J. E.**—A preliminary report on the sugar-beet wireworm (*Limonium Californicus*), **7**, Bul. No. 123. **Harris, E. D.**—*Cicindela longilabris*, **6**, xxi, 31. **Hyslop, J. A.**—Description of a n. sp. of *Corymbites* from the Sonoran zone of Washington State, **161**, xxvii, 69-70. **Leng, C. W.**—*Chlaenius leucoscelis*. *Lophoglossus*. *Ochthebius attritus*. *Ceutorrhynchus hamiltoni*. *Cicindela blanda*, **6**, xxi, 311-12. **Nelolitsky, F.**—Dr. J. Mullers monographie der blinden Trechusarten, **422**, 1914, 28-33 (cont.). **Schaeffer, C.**—Notes on some No. American species of *Rhizophagus*, **6**, xxi, 309-11. **Smith, R. J.**—*Cychrus ventricosus* (Note), **462**, i, 119-120. **Wagner, H.**—Beitrag zur kenntnis der Apion-Fauna Zentral- und Sud Amerikas. Beschreibungen neuer arten, **119**, 1913, A, 9, 137-64.

HYMENOPTERA. **McIndoo, N. E.**—The olfactory sense of the honey bee, **184**, xvi, 265-346. **Malyshev, S.**—Life and instincts of some *Ceratina*-bees (Russian), **19**, xl, No. 8, 58 pp.

Cockerell, T. D. A.—Descriptions and records of bees.—LVII. (Table to some species of *Tetralonia*), **11**, xiii, 272-286. Bees visiting *Thurberia*, **102**, xvi, 31-2. **Crawford, J. C.**—Two new parasitic H. from Arizona, **102**, xvi, 29. **Emery, C.**—*Cephalotes* et *Cryptocerus*. Le type du genre *Cremaloaster*, **35**, lviii, 37-9. **Girault, A. A.**—Hosts of insect eggparasites in Europe, Asia, Africa and Australasia, with a supplementary American list, **92**, x, 87-91 (cont.), **MacGillivray, A. D.**—New genera and sp. of Tenthredinidae, **4**, 1914, 103-108 (cont.). **Newell, W.**—A natural enemy of the Argentine ant, **179**, vii, 147. **Ruzsky, M.**—Myrmekologische notizen, **119**, 1913, A, 9, 58-63.

GENERA INSECTORUM, dirigés par P. Wytsman.—This excellent work is indispensable to the thorough systematist. The first part, or fascicule, appeared in 1902, and as will be observed by the following list of recent issues, 153 parts have already been published. Each part treats of a separate family or subfamily and is by a competent authority.

We take this opportunity to call our subscribers' attention to the recent issues as follows: Orthoptera: Mantidae, subfamily *Perlamantinae*, by E. Giglio-Tos, Fasc. 144, 13 pp., 1 pl., price 5.50 francs. Hemiptera: Pentatomidae, subfam. *Dinidorinae*, by H. Schouteden, Fasc. 153, 19 pp., 2 pls., 9.80 fr. Lepidoptera: Tortricidae, by E. Meyrick, Fasc. 149, 81 pp., 5 pls., 31.20 fr. Diptera: Cecidomyiidae, by J. J. Kieffer, Fasc. 152, 346 pp., 15 pls., 114.20 fr.; Therevidae, by O. Kroeber, Fasc. 148, 58 pp., 3 pls., 22.80 fr. Coleoptera: Carabidae, subfam. *Pentagonicinae*, *Peleciinae*, *Hexagoniinae*, by P. Dupuis, Fasc. 145-147, 4, 5, 4 pp., one plate each, 3.80 fr., 4.00 fr., 3.80 fr.; Scarabaeidae, subfam. *Aegialiinae*, *Chironinae*, *Dynamopinae*, *Hyposorinae*, *Idiostominae*, *Ochodaeinae*, *Orphninae*, by A. Schmidt, Fasc. 150, 87 pp., 3 pls., 26.40 fr. Hymenoptera: Chrysididae, by H. Bischoff, Fasc. 151, 86 pp., 5 pls., 32.20 fr.

These may be procured separately, as can also the previous issues, from M. P. Wytsman, Quatre-Bras, Tervueren, Belgium.

EVOLUTION OF THE COLOR PATTERN IN THE MICROLEPIDOPTEROUS GENUS *LITHOCOLLETIS*. By Annette Frances Braun. Journ. Acad. Nat. Sci., Phila. (2), xvi, pp. 105-168. 26 text figs. Pls. III and IV with 99 colored figures. Febr. 12, 1914.—From a study of the development of the pupal wings of eleven species of *Lithocolletis* and a comparison of the color pattern in adults of 95 species of this genus and its immediate allies, *Porphyrosela* and *Cremastobombycia*, Miss Braun (well known to readers of American entomological journals for her work on our Microlepidoptera) reaches the conclusion that "the primitive color pattern is a series of seven uniformly colored pale, yellow trans-

verse bands, separated from one another by unpigmented areas. . . . These bands, either in their primitive or modified shape, constitute the ground color. Upon this ground color a second darker series of elements, the markings proper, also usually transverse, are superimposed." The two plates present the wings of the species studied arranged in the form of a phylogenetic tree, the branches and twigs of which indicate the order of evolution of these markings as interpreted by our author. Students of other Lepidoptera will be interested in the suggestion, based on these results, that "the uniform yellowish ground color which suffuses the wing in the higher Lepidoptera, beginning at the base and spreading distalward, is the outcome of a phylogenetically older type of marking, originally banded, and later fused to a uniform color, and that the markings are a second series superimposed upon the first."

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of December 17, 1913, at the home of H. W. Wenzel, 5614 Stewart Street, Philadelphia. Twelve members were present. Vice-President Wenzel in the chair.

Mr. Harbeck said he had caught *Cicindela rugifrons* Dej. (Col.) at Manahawkin, New Jersey, September 1, 1913, September 3, 1911, and September 5, 1909, both from the pine district and near the meadows. Those from the latter are much darker, one being almost violet; he was wondering if this would be constant. Some one remarked that on several occasions he had found *Cicindela* very slow in flying, and Mr. Harbeck said he had caught *C. purpurea* Oliv. by picking it up with the hand. Mr. George M. Greene said the first specimen he had collected in northern New Jersey of var. *limbalis* Kl., Howell's pond, April 27, 1901, he had caught in this manner.

Mr. J. W. Green exhibited a short winged Longicorn, *Necydalis mellitus* Say from Pocono Lake, Pa., August 1, 1910, also a box containing mostly weevils which he collected in Davis Mountains, Chisos Mountains and a few other Texan localities in July.

Mr. Kaeber exhibited specimens of *Tillomorpha geminata* Hald. (Col.) from Woodbury, New Jersey, May 13, 1906, and

remarked that, though the New Jersey List states they breed in sumac, he had cut these from oak.

A vote of thanks was tendered Mr. Wenzel, Jr., for the manner in which he entertained us at the November meeting.

Adjourned to the annex.

Meeting of January 21, 1914, at the home of H. W. Wenzel, 5614 Stewart St., Philadelphia. Twelve members were present, Mr. William T. Davis, of Staten Island, New York, visitor; President Haimbach in the chair.

The following officers were elected to serve for the year 1914: *President*, H. A. Wenzel; *Vice-President*, W. S. Huntington; *Treasurer*, H. W. Wenzel; *Secretary*, George M. Greene; *Assistant Secretary*, J. W. Green.

The resignation of Mr. C. Few Seiss was read and accepted.

Mr. Davis exhibited a box of insects and pointed out the following to the members as interesting: A species of grasshopper, *Conocephaloides* (Orth.) from Cape May County, New Jersey, August 16, 25, 1912, which, though more slender than the typical *crepitans* Scudd. from the Middle West, he decided to place in that species; a roach *Leucophaea surinamensis* Linn. (Orth.), which he collected in the turtle pen of the reptile house at the Bronx Zoo, New York, January 12, 1914; an Odonate, *Enallagma recurvatum* Davis, Lakehurst, New Jersey, June 28, 1913, and a species of Coleoptera from South Bay, Lake Okeechobee, Florida, May 1, 1912, *Dorcasta* perhaps new.

Dr. Skinner said he expects shortly to take a collecting trip to that part of Cuba least known entomologically.

Mr. Daecke exhibited a specimen of *Cicindela harrisii* Leng (Col.) from Carlisle Junction (near Harrisburg), Pennsylvania, July 9, 1912, and a box of Diptera collected by Mr. Laurent, in which was a specimen of *Xylomyia americana* Wied., Mt. Airy, Pennsylvania, July 14.

Mr. Wenzel mentioned Col. Casey's latest paper on *Omus* and two by Dr. W. Horn in *Deutsche Entomologische Mitteilungen* on the same genus, and exhibited the species described. Exhibited also a specimen of *Chrysobothris quadri-*

lineata LeC. (Col.) from Jemez Springs, New Mexico, collected by Woodgate; said that Horn mentioned in his paper of only seeing three, two in the LeConte collection from New Mexico and one in his own collection from Arizona.

Mr. Kaeber said he had gotten specimens of *Melasis* from hickory at Essington, Pennsylvania, January 18, 1914.

Adjourned to the annex.

Meeting of February 18, 1914, at the home of H. W. Wenzel, 5614 Stewart Street, Philadelphia. Ten members were present; Mr. Unruh, of this city, visitor; President Wenzel in the chair.

The Secretary read a letter from Mr. C. W. Johnson, of Boston, Massachusetts, in which he calls attention to the September, 1913, minutes of the Social published in the NEWS for February, 1914, page 89, where they read: "Mr. Harbeck exhibited a specimen of *Chloromyia* with abnormal center legs;" Mr. Johnson says this is undoubtedly *inaequipes* Bigot, and is the *normal* condition of the male.

Mr. George M. Greene exhibited two pairs of the Egyptian Sacred Beetle, *Ateuchus sacer* Linn.

Mr. Laurent showed some plates from an old German paper on Lepidoptera, 1829-1839, which were well drawn and colored, but with the terms considerably mixed; also made some remarks concerning lists of "Coleoptera of America north of Mexico," published from 1853 to 1895; discussed by the members.

Mr. Harbeck reported a freshly emerged specimen of *Rhyphus alternatus* Say (Dip.) found on a curtain February 10. Exhibited a specimen of *Eurosta* from South Meriden, Connecticut, collected by Harry Johnson, which he thought was not *comma* Wied., and Mr. Daecke identified it as his own species *elsa*.

Mr. Wenzel exhibited two live specimens of the rare *Elater discoideus* Fabr., which he had cut from a log just above the house February 7.

Adjourned to the annex.—GEORGE M. GREENE, *Secretary*.

THE ENTOMOLOGICAL SOCIETY OF FRANCE.

The *Bulletin* of the Society for its meeting of January 14, 1914, containing the brief addresses of its retiring (J. Sainte-Claire Deville) and incoming (C. Alluaud) presidents, affords some interesting glimpses of the progress and life of this, the oldest of existing entomological societies. The membership has increased as follows: 1832, 98 members; in 1842, 183; 1852, 192; 1862, 323; 1872, 368; 1882, 373; 1892, 431; 1902, 484; 1912, 522. During 1913 the funds of the Society were increased by about 7000 francs, while at this January meeting a bequest of 25,000 francs from Dr. Henri Marmottan, a member, who died January 6, 1914, was announced. M. Alluaud in the course of his remarks said: "Gentlemen, I am certainly not the only one to have remarked that our meetings in general lack a little in animation. The reading of the minutes of the preceding meeting . . . does not suffice to give attraction to our gatherings. It ought not to constitute the principal and sometimes, alas, the only subject of the session." He called for more frequent remarks under the rubric "Captures and Observations," notices of the chief and most interesting additions to the library and a renewal of the former custom of an annual excursion into the country.

OBITUARY.**ERNEST OLIVIER.**

At the meeting of the Entomological Society of France, on January 28, 1914, the President announced the death of Ernest Olivier at Moulins, on January 26, at the age of 70 years. He had been a member of the society since 1873, was for many years editor of the *Revue Scientifique du Bourbonnais* and had especially devoted himself to the study of the fire-flies (Lampyridae). He took part in the Second International Congress of Entomology at Oxford in August, 1912, where he presided at one of the sectional meetings.

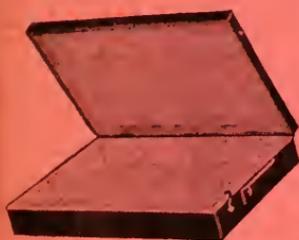
E. A. POPENOE. A. G. HAMMAR.

The *Journal of Economic Entomology* for February, 1914, contains brief biographical sketches of Edwin Alonzo Popenoe (July 1, 1855-November, 1913), for many years professor of entomology at the Kansas State Agricultural College at Manhattan, Kan., and of Alfred Gottlieb Hammar (May 19, 1880-October 15, 1913), at the time of his accidental death an assistant in the U. S. Bureau of Entomology. It will be recalled that resolutions from Cornell University on the death of Mr. Hammar were published in the NEWS for December last, page 480.

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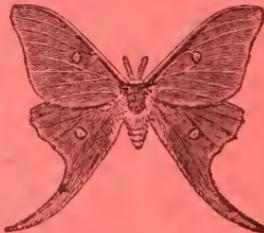
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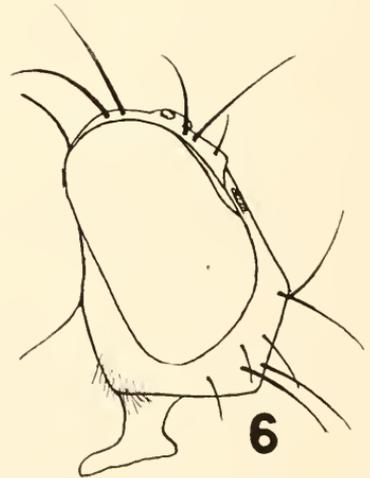
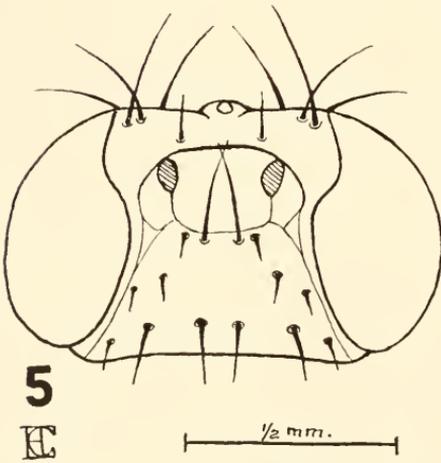
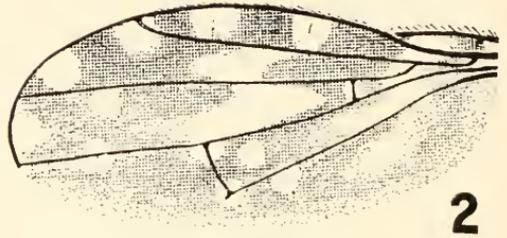
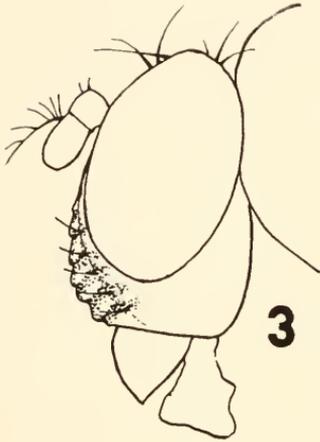
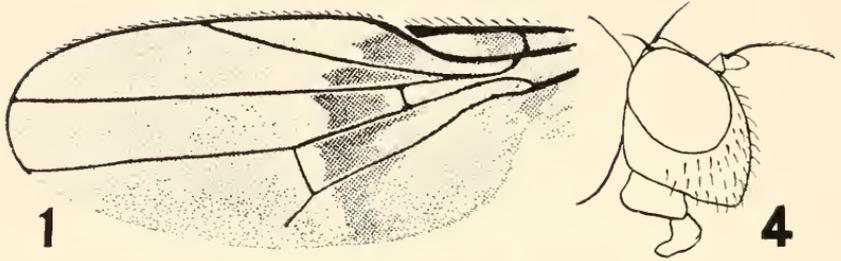
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NEW EPHYDRIDAE—CRESSON.

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ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXV.

JUNE, 1914.

No. 6.

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Descriptions of New Genera and Species of the Dipterous Family Ephyrididae.—I.

By E. T. CRESSON, JR., Academy of Natural Sciences, Philadelphia, Pa.

(Plate X)

In working over some material in preparation of monographic reviews of the members of this family, many new and interesting species were found. Some of these represent new genera which, as well as some of the most interesting species, will be described in preliminary papers of which this is the first.

CEROMETOPUM gen. nov.

Suggesting *Mosillus* Latr. in general form, but differing mostly in the structure of the face and in the pectination of the arista. The frontal bristles are well developed, which is not the case with that genus. The face is not deeply excavated beneath the antennae and with no indication of a tuber-

cle in the middle, but is evenly convex, excepting the shallow antennal depression, and entirely transversely wrinkled. From this diagnosis there will be no difficulty in distinguishing the species of this genus. As *Mosillus* is not apparently represented in South America, this genus probably takes its place there. It may be characterized as follows:

Similar to *Mosillus* Latr. in general build. Head (Pl. X, figure 3) as broad as high; eyes large, elliptical, not prominent. Front broader with orbits parallel, smooth except for small distinct pits; besides the usual vertical and ocellar bristles there is a pro- and a reclinate orbital present. Face gently convex, retreating, depressed at antennae; except directly beneath antennae, strongly transversely sulcate, the sulci somewhat tortuous laterally, the elevations interrupted by the suggestion of orbital grooves, the entire face appearing somewhat honey-combed under moderate magnification; facial bristles hair-like, numerous, situated in a pit in each sulcus in position to corresponding with the orbital groove. Clypeus quadrate, very prominent, usually deflexed. Proboscis and palpi small. Antennae very short, third joint quadrate, second weakly spinose, arista distinctly pectinate above. Thorax quadrate, with 1 prescutellar near roots of scutellum, 1-2 postalaris, 2 notopleurals, 1 humeral, all weak. Scutellum broad, broadly rounded apically, with 4 marginal bristles. Abdomen ovate in both sexes; genitalia inconspicuous. Legs robust; anterior femora finely ciliate beneath apically, but no spines or bristles.

Genotype.—*Cerometopum mosilloides* n. sp.

Cerometopum mosilloides n. sp. (Plate X, fig. 3).

Entirely black, except palpi white or yellowish, all tarsi except apically, apex of middle and hind femora and their tibiae, entirely yellow; all tibiae silvery outside; anterior tibiae brown. Wings luteous, with yellow veins, but costa darker.

Front shining, with no differentiated areas, but with distinct spherical pits as follows: A pair behind and a pair before the line of anterior ocellus and near anterior margin of front. Face shining, with greenish metallic reflections. Cheeks one-half eye-height with weak bristle. Antennae about one-sixth as long as face, third joint nearly

round, arista with five hairs. Mesonotum opaque with greenish gray granular pollinose vestiture and three narrow brown vittae medianly which do not attain posterior margin. Scutellum flattened, of like color and surface. Pleurae except mesopleura polished. Abdomen polished, with slight greenish tinge. Femora polished. Length, 3.0 to 3.5 mm.

♂, Fourth abdominal segment equalling 2 and 3 together, fifth and second subequal.

Holotype.—♂ Baranquilla, Colombia. Collected March, 1912 (Ujhelyi), in the Hungarian National Museum Collection.

Paratypes.—Paraguay: San Bernardino (7, Barbarczy, Feb.-Mar., 1906), Puerto Max, (1, Vezenyi, Jan.-Apr., 1905).

PSILEPHYDRA Hendel.¹

A species was recognized from Costa Rica as belonging to a new genus, and I had drawn up a description of it as such when the *Supplementa Entomologica* came to hand. Hendel's new genus, erected for a species found in Formosa, was at once recognized as being similar to, if not identical with, my new one. The drawing had been made and engraved, or I would have given figures of characters of more specific importance. In addition to the form of the head, there are other essential characters which make it very probable that the Costa Rican species belongs to this genus. It is extremely interesting that species from so widely separated localities should be discovered about the same time belonging to the same and a new genus. The following notes are based on the examination of the Costa Rican specimens only.

This genus may be distinguished by the peculiar shield-like development of the face which extends rather low, appearing somewhat subhemispherical, being evenly and distinctly convex in all directions, including the cheeks. There are no indications of the usual parafacial grooves or areas, and the face is destitute of characteristic bristles or hairs. In general the face appears vaulted or arched, as is typical with *Ephydra* and *Parydra*, but the mouth is not proportionately so large.

¹Supplementa Entomologica No. III, p. 99, 1914.

At the first glance its head suggests affinity to *Ilythea*, but on further examination it is seen to belong to an entirely different subfamily. The form of the head, thorax and abdomen, and its chaetotaxy determines its relation to *Hydrina* and *Axysta*. The abdomen suggests *Gastrops*, having apparently only four segments in the male and five in the female with the second and third much longer than the others. The apical margin of the third, in profile, is horizontal as in *Lytogaster* and *Axysta*.

Psilephydra nemorosa n. sp. (Plate X, fig. 4).

Entirely shining black with faint submetallic lustre, or somewhat obscured by the sparse brown pollen and the granular or scrobiculated surface, especially of thorax and scutellum. Face greenish bronze (to whitish in immature specimens), appearing golden from the dense yellowish microscopic pubescence. Halteres black. Legs black with trochanters, apices and bases of tibiae and all tarsi except apices, yellowish. Wings brown hyaline, immaculate.

Vertex smooth, twice or more times as broad as length of front; frontal orbits converging anteriorly. Face one-half as broad as vertex, nearly three times as long as broad, evenly clothed with scattered hairs and dense pubescence. Cheeks as broad as eye-height, without bristle. Antennae with second and third joints subequal, together somewhat globose; arista as long as width of vertex, thickened at extreme base, microscopically plumose.

Mesonotum and scutellum minutely scrobiculate or granulate. Pleurae and abdomen more shining; segment 2 equals 2×1 , 3 equals 1.5×2 , 4 equals 1. Ventral lobes of dorsal plates nearly contiguous.

Legs with no apparent characteristic bristles. Apical joint of fore tarsi δ dilated, with an apical fan of eight or more long hairs, their claws long and stout, so spread laterally as to diametrically oppose each other, their pulvilli also enlarged. Wings with vein 2 as long as ultimate section of 3; 2, 3 and 4 straight, parallel; 5 sinuate; posterior cross vein three times penultimate section of 4. Length 1.5 mm.

Holotype.— δ , Juan Viñas, Costa Rica. Collected May 1, 1910, 4 p. m., (P. P. Calvert) at a forest brook, 2500 feet altitude. No. 6065. Academy of Natural Sciences of Philadelphia.

Paratypes.—2 ♀ 2 ♂ with same data; 1 male, Rio Siquiaries, Turrucare, Costa Rica.²

²Notes on the Costa Rican localities cited in this paper will be found in Transactions, Amer. Ent. Soc., xl, pp. 1-8, 1914.

This species should not be confused with the Formosa species (*P. cyanoprosofa* Hend.) on account of the black halteres and the structure of the fore tarsi of the male, as well as other characters which may be gleaned from the full description given above.

PLANINASUS new genus.

The position of this genus is doubtful. It evidently is not a typical Ephydrid, although superficially resembling some of the genera allied to *Ephydra*. The preapical tibial bristles are well developed as well as the second basal and anal cells. The dorsocentral bristles are in the same series as the prescutellars, and there are two distinct sternopleural bristles. It is probably to a genus belonging to an independent line originating from the common ancestor of the Ephydridae and Drosophilidae. The genus may be characterized as follows:

Head (Pl. X, figures 5-6) higher than long, broader than high. Eyes nearly as high as head, oblique, bare, not protruding. Occiput concave above, vertex sharp and concave. Front broader at antennae than at vertex; ocellar tubercle small, near occiput; inner and outer verticals present, no ocellars or post-verticals, 1 latero-reclinate and 1 mesally inclined orbitals with their bases close and situated opposite anterior ocellus. Antennae widely separated by an oblique flattened area limited above by the transversely straight lunular ridge and extending to near middle of face. Face broad with lower part vertical, transversely convex, with strong bristles in transverse series near oral margin. Antennal foveae apparent, with parafacial groove running close to orbits. Mouth large, as broad as face above; clypeus retracted. Antennae (as in figure 7) so articulated at first joint that the inner surface of the second is turned obliquely forward.

Thorax longer than broad, obliquely as high with sternopleura well developed. One dorsocentral at suture with few setulae anteriorly, 1 pair of widely separated prescutellars in same series as dorsocentrals, 1 post-, 1 supra-alar, 2 notopleurals, 1 or more mesopleurals, 2 sternopleurals, 2 scutellars. Abdomen ovate narrower than thorax.

Legs normal: fore coxae short, far from attaining base of middle pair; preapical bristles on all tibiae. Claws small curved; pulvilli present. Wings elongate with costa unbroken attaining the fourth vein but with small bristles at end of first; auxiliary vein coalescing apically with first; second basal and anal cells distinct, the latter small rounded apically.

Genotype.—*Planinasus ambiguus* n. sp.

***Planinasus ambiguus* n. sp.** (Plate X, figs. 5-7).

Shining black; lunule area, halteres, coxae, basal half or two-thirds of all femora, bases of fore and hind tarsi, yellow; lower two-thirds of oblique plate metallic-tinged; lower face seen from above densely metallic pale green, becoming opaque black or brown in other aspects; lower angles of front velvety black. Mesonotum and scutellum sparsely yellow pruinose; pleura paler more opaque than mesonotum. Wings brownish, immaculate; veins black. All macrochaetae strong and black.

Front twice as broad as long, with two reclinate bristles on lunule margin. Face two-thirds as broad as vertex with vertical part one-third the height of head; oblique plate half the width of face, longer than broad, with two long upcurved converging bristles on lower margin; lower face with four erect bristles in transverse series near oral margin, a lateral series of two down-curved hairs near lower orbits, and a pair of erect bristles in a vertical series above the outermost bristles of transverse series. Cheeks very narrow. Antennae as in Figure 7.

Abdomen (partly concealed by the somewhat mutilated wings) appears grayish, opaque becoming shining apically. Hypopygium complicated. Fore femora with 1-2 long bristles on lateral flexor margin apically. Wings with second costal section twice as long as third; veins 2, 3, 4 straight, parallel. Length 3.0 mm.

Holotype.—♂, Cachi, Costa Rica, Valley of Rio Naranjo. Collected March 9, 1910, by Dr. P. P. Calvert. In collection at Academy of Natural Sciences, Philadelphia, No. 6069.

***Philygria basalis* n. sp.** (Plate X, fig. 1).

Opaque with apex of abdomen polished. Black, with face, third antennal joint inferiorly, tarsi and tibiae in part, yellow. Halteres white, knob with blackish spot. Head and thorax cinereous with brown markings. Abdomen with opaque white spots and bands. Wings hyaline with basal infuscation as in Figure 1.

Arista with long hairs above; mesonotum with two dorso-central bristles.

Front with a large deltoid mark laterad of antennae, a round dot below anterior ocellus and a dot at base of vertical bristles, black, leaving narrow orbits and oblique stripe from vertical angles to antennae cinereous; narrow facial and buccal orbits silvery white, complete parafacial groove narrowly brown; median area yellowish white pruinose. Occiput black below. Antennae brown except inferior half of third joint.

Mesonotum with five brown vittae; pleura sparsely cinereous above, with brown stripe across mesopleura. Scutellum brown. Abdomen with segments 1 to 3 sparsely brown pruinose; apices of 2 to 3 margined with silver, broadly interrupted medianly; segments 4 to 5 polished, former with four, latter with three, submarginal silvery dots; all segments with lateral margins narrowly silvery. Femora black, apices yellow; fore tibiae entirely, apices and bases of middle and hind tibiae and median ring on latter yellow; apices of tarsi black.

Front hardly twice as broad as long; orbits nearly parallel. Face abruptly narrowed to about width of third antennal joint, with orbits parallel for short distance then broadening into cheeks; but little depressed below antennae and in profile obliquely protruding below, the prominence shining with convex margin; parafacial grooves above close and parallel, separated by an equally narrow yellow stripe which broadens below into the protruding median area; bristles hair-like. Cheeks hardly as broad as third antennal joint. Latter subconical with upper margin straight; arista hardly half as long as third, with 9-10 hairs.

Dorso-central and intra-alar setulae discernible. Chaetotaxy as in *P. calverti*. Scutellum broad, flat, apex truncate. Venation as in Figure 1. Length 1.5 mm.

Holotype.—♀ Tucuman, Argentina (Vezenyi). Collection of Hungarian National Museum.

Paratype.—1 ♀ Asuncion, Paraguay.

There will be no difficulty in recognizing this species from the drawing of the wing.

Philygria calverti n. sp. (Plate X, fig. 2).

Opake; black, head and thorax cinereous variegated with black and brown spots. Abdomen black, segments 3-5 each with four white spots. Legs brown or black becoming yellow on tarsi. Wings infusate, with numerous clear white spots as in Figure 2. Arista long pectinate above. Mesonotum with two pairs dorso-central bristles.

Front with spot at base of verticals, an elongate band from cinereous ocellar tubercle to anterior orbits, brown. Broad facial and buccal orbits white; facial groove brown; median area ochreous to white below; lower occiput black. Antennae black with joint 3 yellow below. Mesonotum with rudiments of two approximated median more or less fused stripes, three pairs of large dorso-central spots, three lateral and one

notopleural spots, black or brown. Pleura black below with upper margin and longitudinal stripe over mesopleura cinereous. Scutellum black with basal angles cinereous. Halteres white with apex of knob infusate. Abdominal spots arranged in four longitudinal series, two on dorsum and one on each ventral lobe of dorsal plate; sometimes apical margins of these segments narrowly-cinereous, or the spots may be absent on most segments. Apices of femora, bases and apices of tibiae, and tarsi except apices, yellow.

Front convex, twice as broad as long. Face depressed above, as broad as length of third antennal joint, below strongly, obliquely projecting, with about 5 hair-like side bristles; facial prominence bare, shining, in profile with straight margin. Cheeks hardly more than half as wide as third antennal joint. Antennae with joint 3 subconical, straight on upper margin; arista with 8-9 hairs which are nearly as long as width of third.

Mesonotal setulae indiscernible except in post intra-alar series; no prescutellars, otherwise chaetotaxy normal. Abdominal marginal bristles proportionately long and suberect. Venation as in Figure 2. Length 1.5 mm.

Holotype.—♀, Alajuela, Costa Rica. Collected September 15, 1909, by sweeping at 3100 feet altitude by P. P. Calvert. In collection at Philadelphia Academy of Natural Sciences. No. 6064.

Paratypes.—1 ♂, Juan Viñas, Costa Rica, April, 1910, (P. P. Calvert); 1 ♂ 1 ♀, Asuncion, Villa Morra, Paraguay (Vezenyi).

Evidently belonging to the *picta* group which has long hairs on the arista and only two dorso-central bristles. It is my pleasure to name this pretty species in honor of my friend, Dr. Philip P. Calvert, who by careful collecting in Costa Rica has brought to light many new and interesting species of this family.

***Lytogaster pallipes* n. sp.**

Shining black, sparingly brown pruinose; antennae except above, palpi, and legs except femora sometimes infusate medianly, yellow; halteres whitish; face and cheeks sparingly cinereous, narrow orbits densely silvery; wings hyaline, yellowish, immaculate, with yellow veins.

Smooth, except abdomen sometimes faintly sculptured especially basally. Front 1.5 times as broad as long; orbitals small. Face half the width of vertex, twice as long as broad, with weak median tuberosity; upper orbits parallel; bristles minute. Cheeks as wide as third antennal joint; latter large, as broad as long; arista short-haired above.

Mesonotum with dorso-central setulae weak. Scutellum convex, rounded. Abdomen elongate, weakly arched, lateral margins rounded; sparsely minute brown pubescent; segment 2 weakly flattened dorsally; dorsal length of 4 more than total length of 1 to 3. Genital segments scarcely exerted. Wings with second costal section two-thirds as long as third; ultimate section of vein 4 two and one-half times as long as preceding. Length 1.7 mm.

Holotype.—♀?, Cachi, Costa Rica. Collected March 10, 1910, at stagnant pool near banks of Rio Reventazon by Dr. P. P. Calvert. In collection of Academy of Natural Sciences, Philadelphia. No. 6068.

Paratypes.—1 with same data; 14, Cartago, January to December; 2, Brook Toyogres near Tierra Blanca, April; 1, Bonnefil Farm, Rio Surubres, October; 1, Turrucares, December. All in Costa Rica.

Distinguished by its pale yellow legs and smooth mesonotum.

***Lytogaster granulosus* n. sp.**

Black, shining, sparingly brown pruinose; mesonotum and scutellum opaque; antennae except above, apices of palpi, legs except apices, tawny; halteres whitish, knobs blackish; face, cheeks and pleura sparingly cinereous, orbits densely white; wings hyaline, yellowish, immaculate.

Front twice as broad as long, weakly punctured, opaque orbits dilating anteriorly. Face one-third of the width of vertex, three times as long as broad; tubercle weak; cheeks slightly broader than third antennal joint. Antennae elongate; third joint twice as long as broad; arista short-haired above. Entire mesonotum densely, granularly sculptured; acrostical and dorso-central setulae discernible. Scutellum similarly sculptured, quadrate, flat. Pleura sculptured as front. Abdomen finely, closely pitted, becoming more shining laterally and apically; lateral margins rounded; venter hollow; segment 4 equalling 2 plus 3. Wing: Costa with third section 1.25 times as long as second. Length 1.7 mm.

Holotype.—♂? Near Guapiles, Costa Rica, June 4, 1909, 1100 feet altitude (P. P. Calvert). Collection at Academy of Natural Sciences, Philadelphia, No. 6067.

Paratypes.—Bonnefil Farm, Rio Surubres, 6, October; Cachi, 1, March; Banana River, 2, November; Juan Viñas, 1, June; all collected by Dr. P. P. Calvert, in Costa Rica.

Although the legs are entirely yellowish, they are darker, are more brownish than are those of *pallipes*, and the mesonotum is not shining.

Gastrops willistoni n. sp.

Shining to polished black, sparingly brown and gray pruinose; antennae except apex, clypeus, proboscis, tibiae, tarsi and wing veins, tawny; halteres, knobs black; wings yellowish-brown, immaculate. Narrow facial orbits densely pruinose; mesonotum subopake with two complete median vittae sometimes more or less coalescing, another laterad interrupted at suture and extending anteriorly along lateral margin to humeral angle, grayish; abdomen bluish-black with a semi-lateral polished bronze spot on segment 4.

Front depressed in middle, with two orbitals. Face two-thirds as wide as vertex, 1.5 times as long as wide; tuberosity above middle; lower slightly retreating part hardly as high as cheeks; five facial bristles with second from uppermost the longest and opposite middle of tuberosity. Clypeus distinct. Cheeks one-half of the height of head, with strong bristle. Third antennal joint twice as long as broad; arista with 12-14 hairs.

Mesonotal bristles strong, normal, scutellum flat, broadly truncate, with two elongate conical or cylindrical apical tubercles, each bearing long bristles; lateral bristles distinct.

Abdomen densely scrobiculate; segment 3 1.5 times as long as 2 and equalling 4; apical margins of all smooth. Legs clothed with long hairs, Hind tibiae more or less polished, swollen and flattened apically. Second costal section twice as long as third; vein 3 sinuate so that first posterior cell is narrowed apically. Length 4.0 mm.

Holotype.—♂ Chapada, Brazil. (H. H. Smith). In the collection at Academy of Natural Sciences, Philadelphia, No. 6066. Possessed through the kindness of Prof. S. W. Williston, the author of this genus, after whom I have the pleasure of naming this large and well marked species.

Paratype.—1 ♀, Bartica, British Guiana.

Allied to *niger* Will. in its immaculate wings with sinuate second vein, but the vittate, subopake mesonotum, the flat bituberculate scutellum and larger size will separate this species.

EXPLANATION OF PLATE X.

- Fig. 1. *Philygria basalis*, wing.
 Fig. 2. *Philygria calverti*, wing.
 Fig. 3. *Ceromctopum mosilloides*, head in profile.
 Fig. 4. *Psilephadra nemorosa*, head in profile.
 Fig. 5. *Planinasus ambiguus*, head in full.
 Fig. 6. *Planinasus ambiguus*, head in profile.
 Fig. 7. *Planinasus ambiguus*, right antenna.

New Proctotrypoidea from Australia (Hym.).

By ALAN P. DODD, Nelson (Cairns), Queensland.

The following species have been found in a collection of Hymenoptera from North Queensland. The types are all in the collection of the South Australian Museum, Adelaide, S. A.

The magnification used was two-thirds-inch objective, one-inch optic, Bausch & Lomb.

Family DRYINIDAE, Subfamily ANTEONINAE.

Genus **Anteon** Jurine.

(1) **Anteon rufiscapus** Dodd. A female of this species has been received from my father, Mr. F. P. Dodd, of Kuranda, and was caught while sweeping on edge of jungle, Kuranda, near Cairns, June, 1913.

(2) **Anteon coriaceus** Perkins. One female taken with the above species.

(3) **Anteon parvulus** Perkins. I have a female of this species caught by Mr. A. A. Girault while sweeping in forest, Nelson, near Cairns, August, 1912.

✓ (4) **Anteon giraulti** sp. nov.

♀.—Length 3.50 mm. Like *superbus* Dodd, but the abdomen is black, a little suffused with brown; the antennae are more brown, and the metanotum is without the two grooves.

♂.—Unknown.

Described from a single specimen caught while sweeping foliage in a jungle, December 30, 1911 (A. A. Girault).

Habitat.—North Queensland (Yungaburra, 2500 ft., Cairns district).

Type.—A female tagmounted. This is the eighteenth species of the genus from Australia.

Family SCHELIONIDAE, Subfamily TELENOMINAE.

Genus **Telenomus** Haliday.

(1) **Telenomus bicolor** sp. nov.

♀.—Length 0.75 mm.

Head and apical two-thirds of the abdomen black; thorax and basal third of the abdomen golden yellow; legs pale yellow; antennae pale yellow, the club light brown.

Head as wide as the thorax; thorax a little longer than wide, finely polygonally sculptured; abdomen a little longer and wider than the thorax, first and second segments striate, first segment short, second segment very large.

Antennae 11-jointed; scape long and slender equal to next six joints combined; pedicel slender, twice as long as wide; first funicle joint shorter and narrower than the pedicel, twice as long as wide; second and third shorter, but longer than wide; fourth as wide as long; club 5-jointed; joints 1-4 wider than long, first joint small, second the longest and widest.

Forewings reaching a little beyond tip of abdomen; rather narrow; hyaline; marginal cilia moderately long; discal cilia very fine and dense; submarginal vein attaining the costa a little before the middle of the wing; marginal vein not as long as the stigmal which is rather short; postmarginal vein very long.

♂.—Unknown.

Described from a single specimen caught while sweeping in forest, April 13, 1913 (A. P. Dodd).

Habitat.—North Queensland (Nelson, near Cairns). *Type*.—A female on a slide.

(2) *Telenomus otho* sp. nov.

♀.—Length 1.30 mm.

Like *oenone* Dodd, but the forewings are broader, the venation darker, the legs are darker, and the head and thorax are reticulately rugulose.

♂.—Unknown.

Described from two specimens caught while sweeping in forest, April, 1913 (A. A. Girault).

Habitat.—North Queensland (Nelson, near Cairns). *Type*.—A female tagmounted plus a slide bearing antennae and forewings.

(3) *Telenomus oenone* Dodd. This common species has been found in another locality, a female having been caught by Mr. A. A. Girault by sweeping grass, etc., Castle Hill, Townsville, North Queensland, 23rd January, 1913.

(4) *Telenomus oeta* sp. nov.

♀.—Length 1.00 mm.

Like *oenone* Dodd, but the femora are black, antennae black, scarcely suffused with red; the short first abdominal segment is striate, the remaining segments are smooth; antennal club only 5-jointed, the third joint the longest and widest; marginal vein only one-fourth as long as the stigmal.

♂.—Unknown.

Described from a single specimen caught while sweeping in an old Chinese garden, overgrown with weeds, November 3, 1912 (A. A. Girault).

Habitat.—North Queensland (Proserpine, near Bowen.)

Type.—A female on a slide. If Walker's three species, which are doubtfully *Telenomus*, are included, this will be the twenty-fourth Australian species of the genus.

Genus *Dissolcoides* Dodd.

(1) *Dissolcoides flavinervus* sp. nov.

♀.—Length 1.35 mm.

Like *exsertus* Dodd, but the ovipositor is not exerted and the forewings are not so broad.

♂.—Unknown.

Described from a single specimen caught while sweeping grass and foliage, roadside, jungle, February 28, 1913 (A. A. Girault).

Habitat.—North Queensland (Halifax, Herbert River).

Type.—A female tagmounted plus a slide bearing antennae and forewings.

Subfamily SCELIONINAE.

Genus *Paridris* Kieffer.

(1) *Paridris rufiventris* sp. nov.

♂.—Length, 1.45 mm.

Like *tridentata* Dodd, but the metanotum and all the thorax ventrad are bright brownish yellow, the marginal vein is nearly as long as the stigmal, the discal ciliation is fine and dense, and the first funicle joint is as long and as wide as the pedicel. Parapsidal furrows absent.

♀.—Unknown.

Described from a single specimen caught while sweeping in forest, May 10, 1913 (A. A. Girault).

Habitat.—North Queensland (Nelson, near Cairns). *Type*.

—A male tagmounted plus a slide bearing antennae and forewings. The sixth Australian species of the genus.

Genus *Ceratoteleia* Kieffer.

This genus is synonymous with *Baryconus* Foerster.

Genus *Baryconus* Foerster.

(1) *Baryconus* (*Ceratoteleia*) *fuscus* Dodd. This species, originally caught at Brisbane, has been found at Nelson, North Queensland, a female having been caught by sweeping in forest, 26th June, 1913 (A. A. Girault).

(2) **Baryconus (Ceratoteleia) fasciatus** Dodd. A male of this species was taken by sweeping forest, Mount Pyramid, 1000 feet, Nelson, 27th August, 1912 (A. A. Girault). The pedicel is short; the funicle joints all long and cylindrical; first funicle joint twice as long as wide; second twice as long as the first; remaining joints subequal.

(3) **Baryconus exertus** sp. nov.

♀.—Length, 2.25 mm. (excluding the ovipositor).

Black, neck of the pronotum and its centre ventrad ferruginous; abdomen a little suffused with brown; legs (including coxae) golden yellow; first four antennal joints a little suffused with red.

Head and thorax with fine dense punctures; parapsidal furrows only indicated posteriorly; postscutellum with a short spine; posterior angles of the metanotum with a sharp spine. Abdomen a little longer than the head and thorax united; distinctly wider than the thorax; first segment with a distinct horn; first and second segments striate; ovipositor exerted for fully the length of the body. Antennae as in *pulcher* Dodd. Forewings as in *pulcher*, but the marginal vein is one-half as long as the stigmal, and the postmarginal is a little longer than the stigmal. ♂.—Unknown.

Described from a single specimen caught while sweeping in forest, Nelson, June 30, 1913 (A. P. Dodd). The fifteenth Australian species of the genus.

Habitat.—North Queensland (Nelson, near Cairns). *Type*.—A female tagmounted plus a slide bearing antennae and forewings.

(4) **Baryconus simplex** sp. nov.

♀.—Length, 1.50 mm.

Black; abdomen dark brown, its base bright yellow; legs (including the coxae), and antennal scape golden yellow; rest of antennae brown.

Head and thorax with very fine surface sculpture, the scutellum smooth; parapsidal furrows distinct. Abdomen petiolate; no longer than the head and thorax united; wider than the thorax; first and second segments striate; first segment as wide as long, without a horn; ovipositor a little exerted.

Antennae 12-jointed; scape long and slender; pedicel slender, twice as long as wide; first funicle joint shorter and narrower than the pedicel, twice as long as wide; second and third subequal, shorter; fourth as wide as long; fifth wider than long; club 5-jointed, joints 1-4 much wider than long.

Forewings reaching a little beyond apex of abdomen; moderately broad; almost hyaline; discal cilia moderately coarse, not very dense;

marginal cilia rather long; submarginal vein attaining the costa about the middle of the wing; marginal vein nearly as long as the stigmal, which is rather short, very oblique; postmarginal vein twice as long as the marginal; basal vein obsolete. ♂.—Unknown.

Described from a single specimen caught while sweeping foliage in a bog, jungle, July 17, 1912 (A. A. Girault).

Habitat.—North Queensland (Innisfail). *Type*.—A female tagmounted plus a slide bearing antennae and forewings with type appendages of *speciosus* Dodd.

Genus **Baeoneura** Foerster.

(1) **Baeoneura giraulti** Dodd. A female of this species was caught while sweeping in forest, Nelson, 21st March, 1913 (A. A. Girault), also another female in the same locality 30th June, 1913 (A. P. Dodd). I have verified the 11-jointed antennae.

Genus **Opisthacantha** Ashmead.

(1) **Opisthacantha nigriceps** Dodd. One female specimen caught while sweeping miscellaneous vegetation, Ingham, North Queensland, February, 1913 (A. A. Girault). This is a new locality for the species.

Genus **Sparaison** Latreille.

(1) **Sparaison australicum** sp. nov.

♂.—Length, 2 mm.

Shining black, legs (except the coxae) ferruginous; antennae black.

Head transverse, a little wider than the thorax; coarsely reticulately rugulose; frontal ledge distinct; eyes large, pubescent. Thorax a little longer than wide, very coarsely rugulose; mesonotum large, without furrows; scutellum large, projecting a little over the metathorax, its posterior edge emarginate; metanotum very short. Abdomen sessile; as long as the head and thorax united; scarcely as wide as the thorax; coarsely longitudinally rugulose.

Antennae 12-jointed; scape slender, equal to next three joints combined; pedicel slender, twice as long as wide; first funicle joint as long as the pedicel; second a little shorter; 3-9 subequal, a little longer than wide; last joint as long as the pedicel.

Forewings reaching apex of abdomen, broad, hyaline; marginal cilia short; discal cilia rather coarse and dense; submarginal vein attaining the costa about the middle of the wing; stigmal vein moderately long, very oblique, its apex curved slightly caudad; venation dark fuscous. ♀.—Unknown.

Described from two specimens caught while sweeping in forest, May 9, 1913 (A. A. Girault), and June 30, 1913 (A. P. Dodd). The first species of the genus from Australia.

Habitat.—North Queensland (Nelson, near Cairns). *Type*.—A male tagmounted plus a slide bearing antennae and forewings.

Genus *Cremastoscielio* Dodd.

(1) *Cremastoscielio nigripes* sp. nov.

♀.—Length, 1.25 mm.

Like *flavipes* Dodd, but coxae and femora fuscous, tibiae suffused with yellow; forewings narrower. The mandibles of both this species and the type of the genus are broad, 4-dentate, the outer tooth the largest, the others small. ♂.—Unknown.

Described from a single specimen caught while sweeping in forest, May 10, 1912 (A. A. Girault).

Habitat.—North Queensland (Nelson, near Cairns). *Type*.—A female on a slide.

Genus *Plastogryon* Kieffer.

(1) *Plastogryon aureus* sp. nov.

♂.—Length, 1.25 mm.

Head black; thorax bright brownish yellow, the scutellum much darker; abdomen golden yellow, the apical third dorsad, black; legs and antennal scape golden yellow; rest of antennae brown.

Head transverse, as wide as the thorax; thorax a little longer than wide; very finely sculptured, pubescent; mesonotum without furrows. Abdomen sessile, as long as the head and thorax united, almost as wide as the thorax; first segment rather long, striate; second a little longer than the first, finely polygonally sculptured; remaining segments short.

Antennae 12-jointed; scape very slender, equal to next 4 joints combined; pedicel slender, twice as long as wide; funicle joints filiform, all a little longer than wide; first and second funicle joints a little longer than the following ones; last joint as long as the pedicel.

Forewings when closed extending well beyond apex of abdomen; moderately broad, the apex rather rounded; a little infuscated; marginal cilia moderately short; discal cilia fine and dense; submarginal vein attaining the costa distinctly before the middle of the wing; marginal vein one-half longer than the stigmal, which is rather short; postmarginal vein one-third longer than the marginal. ♀.—Unknown.

Described from one specimen caught by sweeping along military road, March 3, 1912 (A. A. Girault).

Habitat.—North Queensland (Thursday Is., Torres Strait). *Type*.—A male on a slide.

(2) *Plastogryon niger* sp. nov.

♀.—Length, 1.60 mm.

Coal black, tibiae and tarsi ferruginous.

Structure as in *aureus* Dodd, but second abdominal segment is finely rugulose. Forewings reaching apex of abdomen, broad, the apex squarely rounded; venation fuscous; otherwise as in *aureus*. Antennae 12-jointed; scape equal to next 5 joints combined; pedicel slender, twice as long as wide; first funicle joint shorter and narrower than the pedicel, twice as long as wide; 2-4 as wide as long; club wide, 6-jointed, second joint a little the longest and widest. ♂.—Unknown.

Described from a single specimen caught by sweeping in forest, Nelson, June 30, 1913 (A. P. Dodd). The fourth Australian species of the genus.

Habitat.—North Queensland (Nelson, near Cairns). *Type*.—A female tagmounted plus a slide bearing antennae and forewings.

British Guiana Heteroptera.

By J. R. DE LA TORRE BUENO, White Plains, N. Y.

Last year's collections of Heteroptera made by Mr. H. S. Parish in British Guiana I was fortunately able to secure, and the results are presented herewith. Only two papers on this fauna are known to me, one, published by E. P. Van Duzee in Trans. Am. Ent. Soc., XXVII, pp. 343-352, Dec., 1901, under the caption, "Notes on Some Hemiptera from British Guiana," referring to Bartica; and the other by Prof. Herbert Osborn in Ohio Naturalist, V:1:195-204, Nov., 1904, bearing the title, "Notes on South American Hemiptera Heteroptera," and dealing with Bartica material from Parish and with other South American collections otherwise secured. The former paper includes 89 species and the latter 67 species from Bartica. The lot under consideration contains 86 species, including all undetermined forms; 67 have been determined generically and specifically, 15 generically only, and four obscure species remain unplaced except as to family. Of the determined species and genera, 57 were not recorded by Van Duzee and 50 by Osborn; omitting older records, there are among those we are considering 27 species (33 if we include

also those only generically identified) not heretofore known from this part of South America. The genera not heretofore reported including the 6 above, are 24 in number. It will be seen that in spite of the smallness of the number of forms it is not without interest as a help to the proper knowledge of the distribution of forms in the Neotropical Region.

Attention is called to certain variations in classification and in family names. This is owing to the arrangement of families being in accordance with Reuter's masterly new system (*Bemerkungen über mein neues Heteropterensystem*, Öfr. Finsk. Vet. Soc. Fört. Bd. liv: 1911-12, afd. A, No. 6, pp. 1-62 [of separate?]), a system which, while in my opinion susceptible of certain modifications, is nevertheless a most distinct advance on any now recognized.

It is hoped that this fragment may be found of use and interest in a survey of the neotropical fauna.

Family THYREOCORIDÆ.

Cydnus sp. One specimen from Mallali.

Family SCUTELLERIDÆ Reut.

Augocoris sexpunctatus Fabr. Four specimens from Mallali.

Family CIMICIDÆ (Kirk.)

(= *Pentatomidæ* Reut. et auctt.)

Mormidea ypsilon Linneus. Mallali and Bartica in numbers. This is seemingly the most abundant Cimicid as well as one of great range in America South of the Rio Grande. It is somewhat variable in coloration, size, and form of the thoracic spines.

Solubea ypsilongriseus de G. Bartica and Mallali, common. Apparently not heretofore recorded from British, although known from Dutch, Guiana.

Sibaria armata Dallas. One only from Bartica, although both Van Duzee and Osborn have received it in abundance from the same place.

Galedanta myops Fabr. One example from Mallali.

Euschistus acutus Dallas. One each from Mallali and Bartica.

Euschistus heros Fabr. Mallali, one only.

Berecynthus delirator Fabr. Four from Bartica and one from Mallali.

Taurocercus edessoides Spinola. This pretty species is represented by three examples from Bartica.

Arvelius albopunctatus Deg. Mallali, one specimen.

Brachystethus vicinus Sign. Of this species, not recorded heretofore from British Guiana, there are one from Bartica and three from Mallali in the lot.

Edessa vitulus Fabr. One example from Mallali.

Edessa sp. One example of a large form from Mallali.

Edessa rufomarginata De G. Mallali, two specimens.

Edessa parvula Dallas. Three specimens from Bartica of a species which agrees exactly with specimens so identified by Van Duzee. Not heretofore known from the Guianas.

Cataulax subvittatus Walker. This species heretofore apparently known only from Northern Brazil is now recorded from Bartica, whence one example has been received.

Family ALYDIDÆ Reuter.

(= Coreidæ, Subfamily *Alydinae* L. & S.)

Hyalymenus dentatus Fabr. One only from Bartica.

Hyalymenus vespiformis Fabr. Bartica, one example.

Hyalymenus tarsatus Fabr. Of this common form, there are seven from Bartica and four from Mallali.

Megalotomus pallescens Stål. Of this species, apparently not yet recognized from the Guianas, there is one example from Bartica.

Trachelium tessellatum Dist. Not uncommon in Bartica and Mallali.

Cydamus inauratus Dist. One specimen from Bartica and one from Mallali.

Bactrososoma parallellum Stål. This species seemingly known previously only from Brazil, is represented by four specimens from Bartica.

Leptocoris tipuloides De G. Bartica and Mallali, common.

Pachylis hector Stål. Mallali, four adults and one nymph. Apparently not previously known from British Guiana, its southernmost record being Panama.

Nematopus indus Linné. Bartica and Mallali, very common.

Holymeria intermedia Burmeister. One example of this uncommon form from Bartica.

Anisoscelis gradadia Distant. Mallali, one specimen. This form has not been previously recorded from British Guiana.

Spartocera granulata Stål. One from Mallali—a new record for British Guiana.

Margus obscurator Fabr. Bartica, one example. Although this species ranges from Mexico to Chile, there are apparently no records of it from the Guianas.

Namacus annulicornis Stål. Two specimens from Bartica, which agree with a Mexican specimen of this species in my collection. This locality greatly extends the range of the species and is the first record from the Guianas.

Hypselonotus fulvus deGeer. Fourteen specimens from Bartica and one from Mallali of this common form.

Family DYSODIIDÆ Reuter.

Hesus cordatus Fabr. Mallali, one specimen. This doubtfully recorded by Van Duzee (op. c.), but it is doubtless correct.

Dysodius lunatus Fabr. Also from Mallali; one specimen only.

Family MYODOCHIDÆ.

(= Lygaeidae.)

Oncopeltus fasciatus Dallas. Two examples of this species which ranges from Canada to Brazil. It does not appear to have been previously recorded from the Guianas.

Ninus n. sp. One specimen from Mallali. This does not agree with the one species known from America, and as it is not in good condition, it is best left in this indeterminate state specifically, but is noted for the sake of the generic record.

Micropus variegatus Sign. The two specimens from Mallali are the first recorded from British Guiana, or indeed, outside of Colombia.

Oedancala notata Stål. Bartica and Mallali, very common.

Clerada apicicornis Sign. One example from Bartica, an additional record of this widely spread form, heretofore recorded only from Venezuela for South America.

Heraeus sp. A seemingly new form, one specimen of which is from Bartica. This is not *cincticornis*, with the description of which it does not agree.

Pamera vincta Say. One specimen each from Mallali and Bartica, agreeing with specimens from the United States in my collection.

Pamera sp. Three examples of an undetermined form from Bartica.

Ozophora gracilipes Stål. The seven specimens from Mallali constitute the first record outside of Brazil.

Neocattarus parvus Dist. Heretofore known only from Guatemala. Two specimens from Bartica and a like number from Mallali.

Cistalia alboannulata Stål. One from Mallali, a new record for this species known only from Brazil.

Gonatas divergens Distant. Bartica and Mallali, fairly common. This has been recorded from the former place by Osborn (op. c.), although somewhat diffidently. My entirely independent identification without previous knowledge of this record substantiates it. The species is somewhat variable, and when greasy loses the distinctive light marks of the hemelytra which makes its recognition difficult, it being described by color characters mainly.

There are two other forms in this family not satisfactorily accounted for, one seemingly a new species, and the other an undescribed genus.

Family PYRRHOCORIDAE.

Dysdercus ruficollis Linné. One only from Bartica.

Family TINGIDAE.

Gargaphia nigrinervis Stål. Five specimens from Mallali of this species heretofore only known from Brazil.

Teleonemia prolixa Stål. This form heretofore known only from Brazil and Argentine is now recorded from Mallali, whence two specimens, and Bartica one.

There are two other species of this genus in the lot from Mallali and Bartica, not satisfactorily determined.

Family MACROCEPHALIDAE.

Phymata erosa Linné. One from Mallali.

Family REDUVIDAE.

Pnirontis serripes Fabr. Bartica, one.

Pygolampis spurca Stål. Bartica, three.

Stenopoda cana Stål. One example from Bartica. It has heretofore been recorded only from Brazil.

Rhyaroclopius annulirostris Stål. Bartica two and Mallali one example. Known previously from Brazil only.

Natata fuscipennis Stål. Two specimens of this species from Bartica, making the first record for the Guianas.

Hoplogenius sp. A single specimen from Bartica of a species which seems to belong to this genus, heretofore known only from Patagonia.

Macrophthalmus pallens Lap. One specimen each from Bartica and Mallali.

Lamus geniculatus Latr. A single specimen from Mallali.

Melanolestes morio Erichson. Bartica, one example.

Rasahus hamatus Fabr. Two specimens from Bartica and one from Mallali.

Pothea frontalis Lep. and Serv. Bartica and Mallali, one each of this not uncommon species.

Apiomerus pilipes Fabr. One specimen from Bartica.

Apiomerus elatus Stål. Bartica, one only. Apparently the first South American record.

Apiomerus hirtipes Hahn. One example from Bartica; the first record outside of Brazil.

Micrauchenus lineola Fabr. Five specimens from Mallali and one from Bartica of this common form.

Amauroclopius bispinus Stål. One example from Mallali.

Calliclopius nigripes Linné. Bartica one specimen and Mallali three. A well known form.

Heniarthes flavicans Fabr. A common Guianan species represented by three examples from Mallali and one from Bartica.

Zelus (Diplodus) spp. There are six undetermined species in this lot, apparently undescribed, from Bartica and Mallali.

Graptocleptes varians Champ. One specimen of this species, first described from Panama, was received from Bartica, a new record.

Repipta flavicans A. & S. Two specimens from Bartica and three from Mallali.

Atrachelus crassicornis Burm. Three examples from Bartica and one from Mallali. Recorded only heretofore from Uruguay and Argentine.

Ricolla pallidinervis Stål. Bartica, three examples and Mallali two. Thus far known only from Venezuela.

Ploeogaster mammosus A. & S. One example of this from Bartica.

In addition to the species of Reduviidae above enumerated, there are an undetermined Emesine from Mallali; and three specimens from Mallali and two from Bartica of a Nabid near *Carthasis* and forming apparently a new genus.

Family GERRIDAE.

Brachymetra n. sp. Twenty-three specimens from Mallali which I am unable to satisfactorily place.

Scattered Writings of Dr. H. A. Hagen.

Thanks to Mr. Harry B. Weiss, of the New Jersey Agricultural Experiment Station, our attention has recently been called to two articles, in part by the late Dr. H. A. Hagen, which, from their place of publication, are not likely to be met with by those interested in entomology or in Dr. Hagen. Both appeared in the *Boston Evening Transcript* for 1883. The first, entitled, "Money and What Becomes of it," "written by Dr. H. A. Hagen, of the Agassiz Museum at Cambridge, read at a recent meeting of the Thursday Club," was based on unpublished memoirs of two students of Dr. Hagen's father, Prof. Carl Hagen, of the University of Königsberg, and on the father's papers, and came out in the *Transcript* for February 2. It will be new to some to think of Dr. H. A. Hagen as a political economist. The other article, "The State House in Danger" (*Transcript*, November 15), gives an interview of the anonymous writer with Dr. Hagen in relation to termite injuries to the Capitol at Boston, and extracts from his papers on these insects.

One Hundred Butterflies from the Jemez Mountains New Mexico (Lepid.),

With Notes and Description of a New Species.

By ROSWELL C. WILLIAMS, JR., Philadelphia, Pa.

The following list of just one hundred species and varieties of butterflies were secured during the season of 1913 by Mr. John Woodgate in the Jemez Mts. of New Mexico at an elevation of from 6400 to 7000 ft.

In most cases good series were forwarded and the dates of capture given below usually represent the first appearance. When no definite dates are given the butterfly was common throughout the month mentioned.

Of the new species received, *Pamphila margarita* was described by Dr. Henry Skinner in the Canadian Entomologist. This list will undoubtedly be added to in coming seasons and may be of interest as no similar lists from that part of the State have been published to my knowledge.

1. *Danais plexippus* L. July and Nov.
2. *D. berenice strigosa* Bates. July.
3. *Euptoieta claudia* Cr. July.
4. *Argynnis bremneri* Edw. Aug. 20, Sept. 3 and 20.
5. *Melitaea acastus* Edw. May 28 to June 15.
- *6. *M. fulvia* Edw. June 8.
7. *M. minuta* Edw. July 22.
8. *Phyciodes ismeria* Bd.-Lec. May 14-30.
9. *P. tharos* Dru. May 20 to June 20.
10. *P. camillus* Edw. May 14-29.
11. *P. mylitta* Edw. May-June-July.
12. *P. picta* Edw. June.
13. *Grapta silvius* Edw. July 17-31, Sept. 10.
- *14. *G. faunus* Edw. Sept. 13-21, Nov. 10.
15. *Vanessa antiopa* L. Sept. 11-17.
16. *V. milberti* Godt. June 2-6.
17. *Pyrameis atalanta* L. Sept. 15.
18. *P. cardui* L. May-June-July.
19. *Limnitis weidemeyeri* Edw. June 9 to July 4.
20. *Neonympha henshawi* Edw. June 14.
21. *Coenonympha ochracea* Edw. May 28-30.
22. *Satyrus alope ariane* Boisd. July 6 to Aug. 3.

23. *S. meadi* Edw. One female, Aug. 22.
- *24. *S. silvestris* Edw. June 5 to July 7.
25. *Chionobas chryxus* Dbl.-Hew. June 30.
26. *Lemonias nais*. July 7.
27. *Thecla crysalus* Edw. July 8-12.
28. *T. melinus* Hüb. June 2.
29. *T. itys* Edw. July 4-12.
30. *T. calanus* Hüb. June 25 to July 4.
31. *T. spinetorum* Boisd. Apr. 20, May 17-21.
32. *T. castalis* Edw. May, July 6.
33. *T. behri* Edw. July 6-11.
34. *T. augustus* Kirby. May 12-14.
35. *T. eryphon* Boisd. May 10-28.
36. *T. apama* Edw. May 14-30, July 2.
37. *Chrysophanus arota virginiensis* Edw. July 3-16.
38. *Lycaena fulla* Edw. July 3-16.
39. *L. behri* Edw. May 25 to June 15.
40. *L. podarce* Feld. June 2-7.
41. *L. melissa* Edw. May 13-30, June 20, July 18.
42. *L. acmon* Dbl.-Hew. May 10-30, June 2-6, July 8-18.
43. *L. ladon cinerea* Edw. May 12-14.
44. *L. ladon arizonensis* Edw. May 12-29.
45. *L. amyntula* Boisd. May-June.
46. *L. isola* Reak. June, Sept. 10, Oct. 14.
47. *L. marina* Reak. Apr. 20, May-June-July 1-15.
48. *Neophasia menapia* Feld. July 17-24.
49. *Pieris sisymbri* Boisd. Apr. 19 to May 14.
50. *P. occidentalis* Reak. June 8 to July 23.
51. *P. occidentalis calyce* Edw. Apr. 15.
52. *P. napi pallida* Scud. May 10 to June 16.
53. *Nathalis iole* Boisd. May 6, June 25 to July 12.
54. *Anthocharis sara reakirti* Edw. Apr. 10 to May 9.
55. *Colias caesonia* Stoll. July 22.
56. *C. eurytheme ariadne* Edw. June 2.
57. *C. eurytheme keewaydin* Edw. May-July.
58. *C. eurytheme pallida* Cockerell. May-July.
59. *Terias nicippe* Cramer. July 19-22.
60. *Papilio polyxenes curvifascia* Skinner. Sept. 13.
61. *P. bairdi* Edw. Aug. 3.
62. *P. rutulus* Boisd. May 13.
63. *P. daunus* Boisd. May 30, June 21, July 11.
64. *P. eurymedon* Boisd. May 26-28, July 4.
65. *P. zelicaon* Lucas. May 1-14.
- *66. *Thymelicus garita* Reak. July 1-6.

67. *T. edwardsi* Barnes. July 9.
 68. *Pamphila taxiles* Edw. June 22 to July 9.
 69. *P. comma colorado* Scud. Sept. 20.
 70. *P. juba* Scud. May 19, June-July.
 *71. *P. woodgatei* n. sp. Sept. 10-21.
 72. *P. rhesus* Edw. May 25.
 73. *P. uncas* Edw. June 26.
 74. *P. morrisoni* Edw. May 27 to June 30.
 75. *P. draco* Edw. June 21.
 76. *P. sabuleti* Boisd. June 6.
 77. *P. cernes* Bd.-Lec. June, July 1-4.
 *78. *P. vestris* Boisd. June 25 to July 9.
 79. *P. phylace* Edw. May 25 to June 14.
 80. *P. vierecki* Skinner. May 28 to June 26.
 81. *P. python* Edw. May.
 *82. *P. margarita* Skinner. May 24 to June 9.
 83. *P. oslari* Skinner. May 21-30, June, July 1-9.
 84. *Amblyscirtes vialis* Edw. May 13 to June 9.
 85. *A. aenus* Edw. May 25 to June 12.
 86. *A. cassus* Edw. May 30.
 87. *Pyrgus tessellata* Scud. May, June, July, Sept. 10.
 88. *P. xanthus* Edw. May 12-31.
 89. *Thanaos brizo* Bd.-Lec. Apr. 27 to May 24.
 90. *T. icelus* Lint. May 14-30.
 *91. *T. persius* Scud. Apr. 25-30, May, June, July 1-14, Sept. 10.
 92. *T. horatius* Scud.-Burg. May 4-14, July 11 to Aug. 4.
 93. *T. propertius* Lint. Apr. 20, May, June 1-6.
 94. *T. pacuvius* Lint. June, July 1-7.
 95. *Pholisora catullus* Fab. May 19 to June 7.
 96. *P. pirus* Edw. June.
 97. *Eudamus pylades* Scud. May 10 to June 13.
 98. *E. mexicana* Herr.-Sch. June 6, June 21.
 99. *E. tityrus* Fab. May 11-31.
 100. *E. dorus* Edw. Apr. 19-28.
 and *Megathymus yuccae navajo* Skinner. May 8 to June 4,
 1912. No individuals appeared, however, in 1913.
- *6. *Melitaea fulvia sinefascia* n. aberr.

In the good series of *fulvia* there is a curious ♀ aberration for which I propose this new name. It is the equivalent of var. *obsoleta*, Hy. Edw. of *leanira*, Boisd.

The upper sides of the wings are of a more uniform ground color. The black marginal band is present but the submarginal black band or

line is entirely absent. The row of outer yellowish white spots is present. The discal yellowish white band is present, less intense, on the upper wing, but entirely absent on the lower wing. The yellow white spot in the end of cell of upper wing showing in typical examples, is in this one of the ground color. On the under side the black submarginal bands on both the upper and the lower wings are entirely absent.

*14. *Grapta faunus*.

Is perhaps a northwestern form approaching *hylas*.

*24. *Satyrus silvestris*.

Dark as the Edwards figure of the type and with from 0 to 5 very small ocelli some pupilled with a white point. They may be separated from var. *charon*, from Colorado and Utah by the darker color and the more uniform dark under surface of lower wing.

*66. *Thymelicus garita* Reak.

A very dark insect, above, almost black with coppery reflection and in appearance corresponding with the insect figured by Mr. Wright, Plate xxx, No. 408-b-c, as *Pholisora lena*.

*71. *Pamphila woodgatei* n. sp.

♂ Above orange fulvous, borders brown. The border of upper wing extending in one-third of the surface, shading into the ground color and enclosing the five spots of the *comma* group as follows: First three of about equal size and rectangular, the fourth midway between these and the outer edge of the wing, triangular, with the base towards the border, and the fifth spot quadrate, and a trifle farther from the border than the one above. Discal dash heavy and a patch of dark scales beneath it. Base with darker scales.

Lower wing.—With somewhat darker ground color and border. The fulvous patch occupying about one-third of the surface of the wing and extending towards the margin below the outer angle. The border is more decided at the costal and outer margins than at the inner margin. The outer row of under spots is faintly indicated on the upper side. Veins M₃, Cu₁ and Cu₂ (Comstock) conspicuously black.

Under side: costal margin of upper wing lighter orange fulvous, lower portion yellowish, base black with black streak following location of discal patch; border as above, the five spots as above, silvery white.

Lower wing dark olive green and of uniform color except inner border which is lighter fulvous, silvery white spots as follows: A small dash in the triangle formed by junction of veins R₁ and R₂.

Next a larger double spot consisting of a dash parallel with vein Cu_2 and connected with a V at end of cell forming together a hook-shaped spot. Then an outer row of five spots, the first the largest, quadrate, between vein R_3 and M_1 . The second between vein M_1 and Cu_1 and bisected by vein M_3 , and this followed by three spots, mere points, in the three following interspaces. The last four spots being in almost a straight line from the outer angle to the center of the inner margin.

Fringes, brownish on upper wing shading to gray on lower anal angle. Body blackish above, ashy whitish below. Palpi white.

Antennae, black below with black tips, gray on under side just below tips. Expanse 18 mm. center of thorax to tip of wing. Fore wing has outer margin rounded and not so produced as in *comma* or *juba*.

♀ Similar in color, the spots above showing somewhat more clearly than in the ♂. Hardly any darkening of the disc at the place occupied by the discal dash in the ♂. The veins of the lower wing not showing prominently black as in the ♂. On the under side similar to the ♂, but spots larger and in two specimens with an additional spot near the center of the costal border, and a spur on the last spot extending out towards the anal angle. Expanse 20 mm.

Differs from any butterfly I have seen of the *comma-juba* group in the shape of the upper wing and the color, and shape and arrangement of the spots on the lower wing surface. Named in honor of Mr. John Woodgate, the collector. From 3 males and 3 females. Types deposited in the collection of the Acad. of Nat. Sci. of Phila.

*78. *Pamphila vestris* Boisd.

The type figured by Mr. Oberthur is somewhat lighter than my specimens, but this may be due to fading of the type. It is a ♀ and shows the two larger hyaline spots. The series from Jamez contains ♀ ♀ with the two spots distinct, with the spots obsolescent, and a good percentage entirely without spots; these may be called

annmaculatus n. var.

I cannot however separate *vestris* from *metacomet* Harr., having a good series of the latter from my home collecting ground, Avon, Conn., and from other points in the middle Eastern states.

*82. *P. margarita* Skinner.

This insect is distinct from *pittacus* Edw. The row of spots on the lower wing above and below being in *pittacus*

constantly regular and in a straight line, while in *margarita* the band, while varying from a few spots to an almost continuous band across the wing, is never straight, extending out almost to the outer angle, and the spots always varying in size, giving an appearance decidedly different from *pittacus*, and more like *python*, from which again it differs in size, color and shape of wing.

*91. *Thanaos persius* Scud.

Some of these, a long series, are remarkable for their very small size, a number being 16 mm. from center of thorax to tip of wing.

In conclusion I wish to express my appreciation of the courtesies extended by Dr. Henry Skinner, Curator of the Entomological Section of the Academy of Natural Sciences of Philadelphia, and his valuable assistance and encouragement in the study of these insects.

Fragments on North American Insects—VII.

By A. A. GIRAULT, Nelson (Cairns), North Queensland,
Australia.

(Also on page 283.)

Postpupal Development in *Chilocorus bivulnerus* Mulsant (Col.)

Upon emerging from the pupal stage, the elytra of this beetle are tan-colored, with the red spots pallid, the head and thorax black; four hours later, the natural colors had developed. The pupae were numerous in the middle of June, 1900, at Annapolis, Maryland.

An Ant-lion (*Myrmeleonid*) Without Food (Neur.)

Several half-grown larvae of a common ant-lion occurring about Annapolis, Maryland, were kept in confinement (box full of sand) without feeding for twenty-five days, when they were thrown out.

Culicid Pupa out of Water (Dip.)

At Granite, Baltimore County, Maryland, the last of August, 1900, some mosquito pupae were found in water in a tree hollow; when transferring them to a tin can, one accidentally lodged upon the side of the can, remaining thus for about twenty hours. When it was washed down into the water it moved off at once, apparently none the worse.

Two Colorado Plant Lice (Hemip.-Homop.).

By C. P. GILLETTE, Fort Collins, Colorado.

(Plate XI.)

Asiphum pseudobyrsa Walsh.

Byrsocrypta pseudobyrsa Walsh:—Proc. Ent. Soc. Phil., Vol. I, p. 306, 1862.

Pemphigus pseudobyrsa Walsh:—Proc. Ent. Soc. Phil., Vol. VI, p. 208, 1866. Thomas:—Rept. Ent. Ill., Vol. VIII, p. 151, 1880. Oestlund:—Aph. of Minn., p. 24, 1887. Packard:—Forest Insects, p. 434, 1890. Hunter:—Aph. of N. A., p. 79, 1901.

Schizoncurea populi Gill:—Ent. News, Vol. XIX, p. 1, 1908.

This species, described by Walsh more than fifty years ago, seems to have no recorded observations upon it since, except for the one which was made by the writer in ENTOMOLOGICAL NEWS for January, 1908, where the winged migrants, found in company with an apterous form of a species of *Chermes* upon the bark of the Balm of Gilead, were taken to be the alate form of the same louse.

Figures A and B of Plate XI were used in that paper in connection with the description of the supposed new species. Figures C, D and E of the same original plate (Vol. XIX, Pl. I), used to illustrate the apterous form, I still believe represented a new species which we shall now have to name *Chermes populi*. The alate form of this species I have never seen, though the apterous lice are very common on cottonwood bark in Colorado and especially on the western slope about Grand Junction.

Asiphum pseudobyrsa has been taken several times by Mr. L. C. Bragg about Fort Collins, Boulder and Denver upon the leaves of *Populus coccinea* and I have also received specimens from Mr. Asa C. Maxson from the same tree at Longmont, Colorado.

This species is a true *Asiphum*, the young lice all leaving the stem-mother gall, which is a small almond-shaped pocket about midway on the midrib of the leaf, very soon after being born, and locating on the under or ventral surface. The larvae locate along the main veins into which they insert their beaks

and their bodies soon become snowy white with a dense covering of short wax threads. See Figure D, Plate XI.

All of the second generation lice become winged. An infested leaf brought to the laboratory by Mr. Bragg, June 17, 1913, had one vigorous fundatrix in the gall with a few first instar young, and outside the gall a large number of second generation lice, two of which had developed wings, probably the first of the year. This leaf is shown in two views at Figures C and D.

Another species, *gravicornis* Patch, described in Bulletin 213, Maine Experiment Station, is very similar in its appearance upon the leaf, but is quite distinct.

The Fundatrix (Plate XI, Figure E).

General color a yellowish olive green, lighter over the middle portion of the abdomen; covered more or less heavily with white powder, and some threads about the margins of the body, especially posteriorly; head, eyes and tarsi blackish; legs and antennae dusky; rather broadly oval in form, when fully adult measuring about 4 by 3 millimeters; antenna .55 mm., five-jointed, joint III longest, being a little shorter than joints IV and V together without spur, joint IV shortest, joint II one-half as long as III; permanent sensoria ciliated; beak very short; hind femur and tibia each about .50.

Proportionate lengths of the joints of eight antennae of stem-mothers are as follows:

Joints	I	II	III	IV	V with spur
	10	13	25	10	20
	10	13	25	11	19
	10	11	20	8	16
	10	11	22	8	18
	10	12	22	8	19
	10	12	21	9	19
	10	12	20	9	20
	10	12	23	7	19
Averages	10	12	22.25	8.75	18.75

Alate Fundatrigenia, Plate XI, figures A and B.

The description given by the writer in ENTOMOLOGICAL NEWS referred to above was as follows:

Winged Female.—Length of fore-wing, 3.50 to 3.75 mm.; hind-wing, 2.35 to 2.75 mm. Length of body, 1½ to 2 mm. Antennae, 6-jointed; length, .8 mm. Joints 1 and 2, short and stout, the 2nd a

little longer than broad; 3rd, longest, equaling 4th and 5th together; 5th, a trifle longer than 4th; and 6th distinctly longer than 5th. The proportions of the four distal joints are about as follows: 21, 9, 11, 15. Total length of antenna a little less than one-half length of body. Compound eyes, ocelli, abdomen, tips of tarsi and antennae, and more or less of the thorax above, dusky to black, otherwise pale yellow. The anterior wing has a very distinct, though narrow, black line extending from the base along the subcostal nerve, but a little beneath it and terminating on the costal margin just beyond the stigma. A similar black line starts on the anal margin of the hind-wing close to the body and extends forward and outward to meet the costal nerve and then turns at an acute angle back to the costal margin close to the body. Body and wings are powdered with a white secretion and from thorax and abdomen a white waxy secretion forms in long, slender threads, nearly or quite hiding the body. Antennal spur of 6th joint not over 1-5 length of joint and with a large sensorium at its base, also large oval sensoria near distal ends of joints 4 and 5, and along the underside of joint 3, where there are about 6."

The specimens taken the past summer differ from the above by being somewhat larger, the length of body in plump specimens measuring 3 mm., and the antennae measuring .90. The sensoria on joint III of the antenna are almost uniformly 5, and on joint III, 2, but in some examples they are rather difficult to see well. There is a strong spur near the base of joint III, which does not show in the original figure, but has been added on Plate XI, figure A. The permanent sensoria are ciliated.

Proportionate lengths of antennal joints of 14 alate lice ran as follows:

Joints	I	II	III	IV	V	VI with spur
	10	10	34	16	19	26
	10	11	35	16	20	28
	10	11	36	18	19	26
	10	11	35	16	21	28
	10	11	35	17	18	25
	10	11	34	15	18	26
	8	10	30	16	18	27
	10	11	38	17	22	29
	10	11	34	15	19	27
	10	11	35	16	19	23
	9	10	30	14	16	25
	10	10	33	14	18	22
	9	9	32	15	17	23
	9	9	32	14	16	24
Averages	9.64	10.43	33.79	15.64	18.57	25.64

It is probable that this louse has an alternate host, as the alate form, the second generation, all leave the cottonwoods.

Our records on this louse in Colorado are as follows:

Grand Junction, June 16, 1907; Migrant; Recorded by C. P. Gillette; Host, *Populus candicans*.

Rocky Ford, May 27, 1908; Fundatrix and 2nd generation; Recorded by L. C. Bragg; Host, *Populus coccinea*.

Denver, June 16, 1911; Fundatrix and alate migrants; Recorded by L. C. Bragg; Host, *Populus coccinea*.

Fort Collins, June 17, 1913; Fundatrix and alate migrants; Recorded by L. C. Bragg; Host, *Populus coccinea*.

Longmont, June 17, 1913; Fundatrix and immature young; Recorded by Asa C. Maxson; Host, *Populus coccinea*.

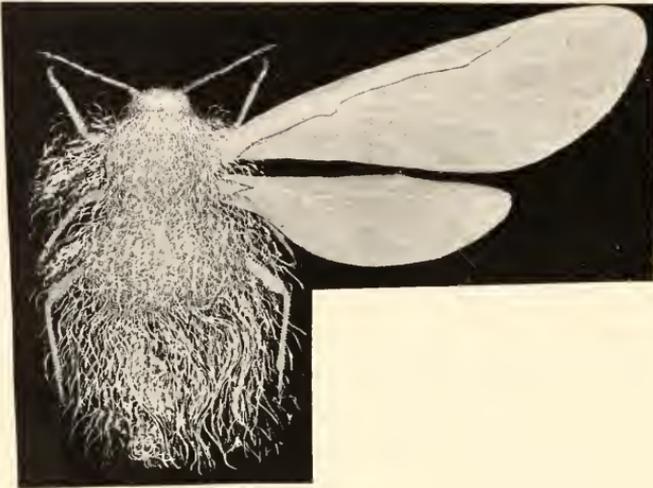
Fort, Collins, June 21, 1913; Migrants; Recorded by L. C. Bragg; Host, *Populus coccinea*.

Phyllaphis quercifoliae n. sp.

In Bulletin 31, page 116 (1895), of the Colorado Experiment Station, Mr. Cowen gave a brief description of a woolly plant louse found upon the under side of the leaves of scrub oaks in Colorado, which he thought to be Fitch's *Eriosoma querci*, but which he placed in the genus *Schizoneura*. Mr. Davis in his paper in ENTOMOLOGICAL NEWS, Volume XXII, 1911, page 242, accepts Cowen's reference of the species, having no examples for study himself.

This is a common louse, which I have often seen on oaks in the mountainous sections of Colorado. A rather careful study of the material in hand has convinced me that the Colorado form is a distinct and new species and not the species described or referred to by Fitch, Thomas, Oestlund and Davis and that it is probably distinct from the species recorded by Clarke and Davidson found on the live oaks of California. I am, therefore, offering the notes and descriptions given below. While I am referring this species to the genus *Phyllaphis*, it does not have the short beak, knobbed cauda, or short second antennal joint found in *P. fagi*, the type of the genus, and the hind wings have but one transverse vein, and any of these characters might be considered of generic rank.

The specimens here described were taken at Manitou, Colorado, September 20, 1913, by the writer, on native scrub oak,



B



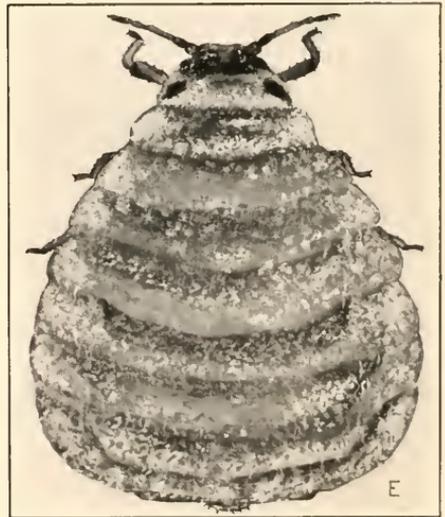
A



C



D



E

COLORADO PLANT LOUSE (*ASIPHUM PSEUDOBYRSA*).—GILLETTE.

where the species was very common, infesting, for the most part, the under (ventral) side of the leaves. The lice were readily detected by the cottony secretion which they produce in great profusion. I found very few of the summer form, but large numbers of oviparous females in all stages of development and also a large number of pupae, all of which were developing into males. A single winged male was also found. The lice seemed to prefer a folded leaf, and colonies were frequently found in folds that had been produced by leaf-rollers or other causes. The punctures of the insect do not seem to have much, if any, effect to cause the curling of the leaves.

Apterous Virgogenia. This form had mostly disappeared. The examples taken were light green, the color being strongest along the lateral margins of the body; body everywhere covered more or less densely with loose cottony secretion; eyes bright red; head and thoracic segments, antennae, except the terminal segments which are somewhat dusky, and legs yellowish to yellowish brown in color; length of body, 1.10; antenna, .50; joints II, III, IV, and V vary but little in length; joint III is usually the longest of those mentioned, but always shorter than joint VI with the spur; joint IV usually shortest, and even joint II sometimes exceeds joint III in length. The only sensoria present are the permanent ones on joints V and VI. The length of the body as given above may be too little, as the specimens taken are rather old and the body segments are somewhat contracted.

Oviparous Female. The color in this form varies, some examples being uniform straw yellow throughout, while others are as uniformly pink, and others are pale yellowish green. Body everywhere covered more or less densely with loose cottony secretion, the wax plates showing very plainly as minute dark dots upon the dorsum, there being three longitudinal rows on either side of the body, with the usual reduction in numbers upon the thorax and terminal segments of the abdomen; two large circular wax plates of remarkable size occur on the under side of the abdomen upon joints V and VI and partially covering joint VII, each of which has two pores or clear spots in it. These plates are covered with a dense deposit of short wax threads making two very conspicuous white patches which may be seen projecting beyond the lateral margins of the abdomen when viewed from above; eyes bright red; antennae, legs, head, anal plate and gland plates dusky in color; hind tibiae and antenna quite dark; hind tibiae much swollen and set with a large number of oval scent glands; beak just surpassing the second pair of coxae, the tip only being black; pores not

raised above the surface and indicated by a dark ring; antenna .55 to .65; joints III and VI with its spur, about equal; joints II and IV, about equal; joint IV about .80 as long as joint V; joints II and IV are about two-thirds as long as joint III or VI; spur about one-fifth as long as joint VI; body about 1.30 to 1.60; cauda broadly rounded; ventral wax plates about .25 in diameter.

Male. The male is very slender compared with the forms above described and varies in general color about the same as does the oviparous female, the prevailing color being pink at first, the color changing to a brownish yellow with age; head, thorax, antennae and wing veins, blackish; eyes bright red; anal plate black; anterior wings with cubital vein twice forked; posterior wings short and narrow and with one transverse vein only, rising at a point about twice as far from the base of the wing as from the tip. Length of body, .95 to 1.05; wing, 1.40 to 1.50; hind wing, .85 to .90; antennae, 1.10; joints III, IV, V, and VI with its spur sub-equal; posterior wing .90; wing veins all heavy and with narrow dusky margins; stigma of fore-wing lanceolate, narrow and translucent; sensoria of antenna about as follows: Joint III, 4 to 5; joints IV to VI, with 5 to 7 sensoria but usually 6; all sensoria oval or circular and the permanent ones surrounded with cilia; antennal joints very rough and irregular in outline; beak attaining third coxae. A day or two after becoming winged, the males have a few long, fluffy cottony threads over head, thorax, and abdomen, even the legs and antennae being more or less covered with these threads and a powdery secretion.

Eggs. The eggs are deposited singly and are covered with short fragments of waxy secretion from the two large wax plates that are on the posterior ventral surface of the abdomen. The oviparous female places these broken wax threads upon the egg while she is depositing it, by means of her hind tarsi which she rubs over the dense mass of short wax threads and then over the egg. I have watched a similar process in species of *Lachnus*. The color of the recently laid eggs is pale green and in shape they are broad oval, being approximately .50 x .30. The eggs observed were all deposited in a breeding cage and were scattered promiscuously over either the upper or lower surface of the oak leaves.

The fundatrix and alate virgogenia I have not seen.

Mr. Asa C. Maxson, Longmont, Colorado, recently sent me a closely allied but apparently distinct species from the leaves of the live oak taken at Spreckels, California, June 28, 1913. In this sending there were both oviparous and viviparous females but no males or other allied form. These lice differ from those taken from the scrub oaks in Colorado by the more

slender form of the egg-laying females. The general type of antenna is the same in both species and they also have the bright red eyes.

EXPLANATION OF PLATE XI.

Asiphum pseudobyrsa: Figure *B*, Alate migrant of the second generation; *A*, antenna of the preceding enlarged 100 times. From Journal of Economic Entomology, Jan., 1908. Drawings by Miss Miriam A. Palmer. From ENTOMOLOGICAL NEWS, Vol. XIX, Plate I.

Figure *C*: Leaf of *Populus coccinea* showing the stem mother gall of *Asiphum pseudobyrsa* Walsh on the midrib; *D*, the underside of the same leaf showing the colony of young in all stages of development located along the main veins. About two-thirds natural size. Original.

Figure *E*: Stem mother of *Asiphum pseudobyrsa* Walsh, body somewhat shrunken in length; enlarged about 15 diameters. Drawing by Miss Caroline M. Preston.

Some Nomenclatorial Notes on the Dipterous Family Trypetidae.

By E. T. CRESSON, JR.

There has recently appeared in the Memoirs of the Indian Museum, Vol. III, No. 3, a paper by Prof. M. Bezzi, entitled "Indian Trypaneids (Fruit flies) in the Collection of the Indian Museum." This paper not only treats of the Indian species but gives an entirely new classification of the genera of this family. There has long been a want of such a reorganization based more upon structural characters than heretofore, and Prof. Bezzi, who has given much study to the fruit flies of the world, has certainly furnished an excellent foundation for the establishment of the genera of this family.

The family is divided into two subfamilies namely, Dacinae and Trypaneinae. The latter is further divided into three tribes, Ceratitinae, Myioptinae and Trypaneinae. The subfamily Dacinae is not represented within the nearctic zone. It probably includes the remarkable *Toxotrypana* Gers. of Mexico. The tribe Ceratitinae is characterized by having the cilia of the posterior orbits composed of fine black bristles

or setulae which are rarely white; mesonotum usually with black pubescence; third vein usually setulose, at least as far as anterior cross vein. It includes the nearctic genera *Acidia*, *Strauzia*, *Trypeta*=(*Spilographa*), *Zonosema*, *Rhagoletis*, *Oedaspis*, *Peronyma*, *Epochra* and *Aciura*.

The tribe Myioptiniinae is not represented in this zone. The tribe Trypaneiniinae is characterized by having the cilia of the posterior orbits composed of thickened, whitish, blunted bristles or setulae; mesonotum with whitish pubescence; third vein bare; proboscis usually long and geniculated. It includes the nearctic genera *Stenopa*, *Terellia*, *Tomoplagia*=(*Plagiotoma*), *Neaspilota*, *Eutreta*, *Paracantha*, *Ensina*, *Euaresta*, *Tephritis* and *Trupanea*.

This classification is certainly an improvement over the one now used, proposed by Loew, and divides the family into groups which are probably more natural. It was characteristic of Loew to disregard the chaetotaxy, so he had to fall back on the wing pattern in most cases. In the study of this paper of Prof. Bezzi's and of a few others, augmented by a small collection, a few interesting problems have come up, dealing mainly with nomenclature, which have given rise to the following notes:

Trypeta Meig. (*Spilographa* Lw.).

Trypeta was first proposed by Meigen in 1803¹ for the species *Musca arnica*, *M. cerasi*, *M. urticae*, *M. artemisiae*. All are credited to Fabricius. Curiously enough, none of these species was included in the genus by Loew in his *Bohrfliegen*, 1862, or has been since. The type species was first designated by Coquillett in 1910² as *Musca artemisiae* Fab. (1794). This species was one of those originally included under *Spilographa* Lw. (1862) so this designation makes the latter genus a synonym of *Trypeta*. This unfortunately causes some confusion in the conception of the two, but there is no other solution unless the other species originally included under *Spilographa* are not congeneric. The species heretofore known as typical Trypetae will

(1) Illiger Magazin für Insekt. ii, 277.

(2) Proc. U. S. Nat. Mus., xxxvii, 618.

now go under *Terellia* Desv. (1830), with *Musca serratulae* Linn. (1758) (= (*Terellia palpata* and *T. luteola* Desv.) as the type species, designated by Coquillett (1910).

Mr. Coquillett in his Type Species of North American Genera, makes *Oedaspis* Lw. (1862) a synonym of *Orellia* Desv. (1830). For the former he designates *Trypeta multifasciata* Lw. (1850); for the latter *Trypeta wiedemanni* Meig. (1826) (as *Orellia flavicans* new species). The two species are evidently not congeneric, so *Oedaspis* may stand for our species as given in Aldrich's catalogue.

Paracantha Coq. (1899).

This was proposed for *Trypeta culta* Lw. Wied. (1830) as distinct from *Carphotricha* Lw. (1862). There were three species originally included under *Carphotricha*, two of which were designated type species of two genera by Rondani in 1856, *Trypeta guttularis* Meig. (1826) type of *Dithryca* Rond. and *Trupanea reticulata* Schrank (1803) [as *Tephritis pupillata* Fall (1814)] type of *Oplocheta* Rond. This leaves only *C. strigilata* Lw. (1862) for its type species. Should this species be congeneric with one of the other two, then *Carphotricha* will have to fall. As regards *Paracantha*, there is a probability of its being a synonym of *Oplocheta* Rond., but my study of *Trupanea reticulata* is limited to one more or less imperfect specimen. As I am not aware that the type species of *Carphotricha* Lw. has ever been fixed, I herewith designate *Carphotricha strigilata* Loew as such.

Tephritis Latreille.

This genus was first proposed by Latreille in the "Nouveau Dictionnaire d'Histoire Naturelle, Tome XXIV, Tableaux Methodiques," dated "AN XII—1804," page 196, No. 585. The species mentioned under this reference are: *Musca arnica* and *Musca cerasi* Fab. These two species are credited to Linn. by Fabricius in his *Entomologica Systematica*, iv, pp. 352 and 358. Therefore one of these species is the only one available as the type species of this genus. Coquillett in 1910 quotes the genus as dating from the "Histoire Naturelle des Crustaces et Insectes

Tome XIV, AN XIII," which is equivalent to 1805. The species included under that reference is *Musca solstitialis* Fab. (1781) which seems to be a homonym of the present *Urophora solstitialis* Linn. (1758) and a synonym of the present *Urophora aprica* Fall. (1820). It will be seen that Coquillett's designation makes *Urophora* Desv. (1830) a synonym of *Tephritis* Latr. (1805), thus confusing the present idea of the genus *Tephritis*. This however is happily averted as will be seen below.

Prof. Bezzi in his Indian Trypetidae (1913) cites *Musca leontodontis* Deg. (1776) as the type species of *Tephritis* Latr. (1805) or, as he quotes the reference, "Hist.d.Crust.et Ins., xiv, 389, (1804)." This species was not included under the original description of *Tephritis* Latr., either in 1804 or 1805, and so cannot be the type species of that genus. He evidently is trying to retain the name for the genus as it is now or has been recognized, but his method is impossible. It is strange how the above mentioned "Dictionnaire d'Histoire Naturelle" has been repeatedly overlooked or ignored by most students. It however furnishes an agreeable solution to the present confusion surrounding this genus in the fact that *Musca arnica* Linn. (1758) is a typical *Tephritis* as the genus is now known and is one of the species originally included under the first reference to this name, and I herewith designate that species (*Musca arnica* Linn.) as the type species of *Tephritis* Latr. (1804).

Tephritis platyptera Lw. (1862) is not a typical *Tephritis* on account of its broad wings and radiating arrangement of the marginal spots; furthermore the foremost dorsocentral bristle is removed back from the sutural region to nearly opposite the supra-alar bristles. It seems to belong to *Campiglossa* Rond., but a study of *Tephritis irrorata* Fall. is necessary to make this certain.

Trupanea Schrank.

This name was evidently first used in 1795 in the "Briefe Donaunmoor." I have not been fortunate enough to have seen this publication and so must take the record at second-hand. The original wording is *Trupanea*, but Prof. Bezzi uses an

emended form *Trypanea*, which I do not think necessary. This name unfortunately must take the place of *Urellia* Desv. (1830). This being the oldest genus in the family has influenced Prof. Bezzi to change the family name to agree. Of course he recognizes Meigen's 1800 genera in which case he is within his rights. I do not recognize the 1800 names and so prefer to retain *Trypeta* Meig. instead of *Euribia* Meig. The name of a family is the one first applied to it provided the genus from which it is named is included. The retention of *Trypeta* will necessitate the changing of Bezzi's tribe Ceratitinae to Trypetinae while his subfamily will be Trupaneinae with Trupaneinae as its typical tribe.

Some Facts About the Egg Nest of *Paratenodera sinensis* (Orth.).

By HARRY B. WEISS, New Brunswick, New Jersey.

The egg nest of this striking and beneficial insect is peculiar in that it consists of a central, somewhat horny, core, containing the eggs, surrounded by a porous rind, which undoubtedly serves to protect the eggs from moisture and sudden changes in temperature.

Thermometric tests of the conductivity of this rind were made with quite a few nests, and the following tables, showing the temperature changes of three nests, indicate what happened generally. In each case a hole was drilled in the nest and the bulb of a thermometer inserted so that it occupied the same position as the core. The nests were then placed in an oven, the temperature of which was 160 deg. F. The nest temperature at the start was 64 deg. F., and a thermometer having no nest attached and reading 64 deg. F. at the start registered the oven temperature 160 deg. F. in two minutes.

EGG NEST A.

Temperature at start	64 deg. F.
Temperature at end of 5 minutes	102 deg. F.
Temperature at end of 10 minutes	148 deg. F.
Temperature at end of 12 minutes	160 deg. F.
Rise in 12 min., 96 deg. F.	

EGG NEST B.

Temperature at start	64 deg. F.
Temperature at end of 5 minutes	120 deg. F.
Temperature at end of 8 minutes	150 deg. F.
Temperature at end of 10 minutes	160 deg. F.
Rise in 10 min., 96 deg. F.	

EGG NEST C.

Temperature at start	64 deg. F.
Temperature at end of 5 minutes	122 deg. F.
Temperature at end of 10 minutes	154 deg. F.
Temperature at end of 12 minutes	160 deg. F.
Rise in 12 min., 96 deg. F.	

Conditions were then reversed, and the following tables show what happened when the temperature was lowered. The temperature of the nests at the start was 62 deg. F., and a check thermometer reading 62 deg. F. at the start registered 36 deg. F. in two minutes.

EGG NEST D.

Temperature at start	62 deg. F.
Temperature at end of 5 minutes	48 deg. F.
Temperature at end of 10 minutes	42 deg. F.
Temperature at end of 15 minutes	36 deg. F.
Fall in 15 min., 26 deg. F.	

EGG NEST E.

Temperature at start	62 deg. F.
Temperature at end of 5 minutes	47 deg. F.
Temperature at end of 10 minutes	40 deg. F.
Temperature at end of 15 minutes	36 deg. F.
Fall in 15 min., 26 deg. F.	

EGG NEST F.

Temperature at start	62 deg. F.
Temperature at end of 5 minutes	46 deg. F.
Temperature at end of 10 minutes	38 deg. F.
Temperature at end of 14 minutes	36 deg. F.
Fall in 14 min., 26 deg. F.	

Upon placing other nests in hot and cold water, the following changes took place:

EGG NEST G.

Temperature at start	68 deg. F.
Temperature at end of 5 minutes	112 deg. F.
Temperature at end of 10 minutes	114 deg. F.
Water temperature at start	148 deg. F.
Water temperature at end of 10 minutes	114 deg. F.

EGG NEST H.

Temperature at start	68 deg. F.
Temperature at end of 5 minutes	116 deg. F.
Temperature at end of 10 minutes	130 deg. F.
Water temperature at start	168 deg. F.
Water temperature at end of 10 minutes	130 deg. F.

EGG NEST I.

Temperature at start	75 deg. F.
Temperature at end of 5 minutes	62 deg. F.
Temperature at end of 10 minutes	59 deg. F.
Water temperature at start	55 deg. F.
Water temperature at end of 10 minutes	59 deg. F.

EGG NEST J.

Temperature at start	74 deg. F.
Temperature at end of 5 minutes	68 deg. F.
Temperature at end of 10 minutes	63 deg. F.
Water temperature at start	54 deg. F.
Water temperature at end of 10 minutes	56 deg. F.

In water the temperature rose 46 deg. F. and 62 deg. F. in 10 minutes, and in air 96 deg. F. in 12 minutes. In water the temperature fell 16 deg. F. and 11 deg. F. in 10 minutes and in air 26 deg. F. in 15 minutes.

Even though conditions were imperfect, the tables show that the eggs are not subjected to sudden changes of temperature. Nests which were entirely immersed in water for $1\frac{3}{4}$ hours, showed interiors perfectly dry. At the end of two hours, however, the porous rind became somewhat moist, but the water had not reached the core.

This porous rind, in practically all nests, varied from two to seven millimeters in width, with an average of 5.6 mm.

Fifteen nests, cut transversely in half, showed the following measurements.

Width of Core.	Width of rind on each side.
12 mm	7 mm
11 "	6 "
13 "	6 "
12 "	7 "
13 "	7 "
14 "	6 "

12	"	.....	5	"
12	"	.....	5	"
12	"	.....	4	"
12	"	.....	2	"
11	"	.....	5	"
10	"	.....	6	"
13	"	.....	6	"
12	"	.....	6	"
12	"	.....	6	"

Twelve nests were weighed, then the cores and rinds separated and weighed by themselves. The table below gives these results.

Nest	Weight	Weight of core	Weight of rind
1	1.85 grams	1.47 grams	.38 grams
2	1.76 grams	1.44 grams	.32 grams
3	1.80 grams	1.54 grams	.26 grams
4	1.31 grams	1.06 grams	.25 grams
5	1.65 grams	1.46 grams	.19 grams
6	2.15 grams	1.78 grams	.37 grams
7	1.82 grams	1.40 grams	.42 grams
8	1.40 grams	1.14 grams	.26 grams
9	1.50 grams	1.18 grams	.32 grams
10	1.10 grams	0.90 grams	.20 grams
11	1.82 grams	1.55 grams	.27 grams
12	1.49 grams	1.20 grams	.29 grams

The average weight of a nest was 1.63 grams, of a core 1.34 grams and of a rind .29 grams, showing that 5-6 of the total weight consists of the core containing the eggs, the remaining sixth, of the porous, protecting rind.

Coming to the number of eggs in a core, these are arranged in from 12 to 18 layers, each containing an average of 15 eggs, making a total average of 225 eggs in each. In Vol. XXIV, No. 9, p. 431 of ENTOMOLOGICAL NEWS, Mr. Laurent records the hatching of 150 nymphs from a small nest and 300 from a large one.

A fascinating account of the habits of these insects and the construction of the nests can be found in Social "Life in the Insect World," by J. H. Fabre.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., JUNE, 1914.

Prevention of Insect-borne Diseases in the Army in Mexico.

An Associated Press despatch to the daily newspapers, dated Vera Cruz, Mexico, May 7, 1914, states that Surgeon G. M. Guiteras, medical officer of that port under the American occupation, has planned a campaign against flies in order to safeguard the public and the army against typhoid fever.

Dr. L. O. Howard, in his book *The House Fly—Disease Carrier*, sums up the ravages of typhoid in the American army during the Spanish War of 1898 as follows:

Every regiment in the United States service developed typhoid fever. All encampments located in the Northern as well as in the Southern States exhibited typhoid in epidemic form. Infected water was not an important factor in the spread of typhoid in the national encampments of 1898, but about one-fifth of the soldiers in the national encampments in the United States during that summer developed this disease, while more than eighty per cent. of the total deaths were caused by typhoid. (Pp. 118, 119).

[And quoting from the report of the Army Typhoid Commission:] "Flies undoubtedly served as carriers of the infection." (P. 117).

Entomologists look to the American Army to make a much better showing in its Mexican experience. It is to be hoped that, whatever that showing may be, it will not be without important effect on the community at large in causing the non-entomological public to realize the influence of insects on human health.

Smicra mariae Riley (Hym.)

On May 3, 1900, a number of individuals of this species were reared from the cocoons of the bagworm, *Thyridopteryx ephemeraciformis* Haworth, taken at Annapolis, Maryland; also May 4, 1901.—A. A. GIRAULT.

Epargyreus tityrus Fabricius in Maryland (Lepid.)

This common butterfly was very common on the wing in Anne Arundel County the first two weeks in August, 1900. They seemed to have gone by the last of the month since it was noted on August 26 that none could be found (Baltimore County). I am indebted to Dr. Henry Skinner for its identification.—A. A. GIRAULT.

Corrections in *Phytophaga* (Coleop.).

Asphaera apicalis Jac. P. Z. S., 1905, p. 411, should be changed to *variabilis*; the name having been previously used by him for a Brazilian form P. Z. S., 1879, p. 442.

Asphaera marginata Jac. (type in my coll.) is a *Nephrica*.—FRED. C. BOWDITCH, Boston, Mass.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia.
 4—The Canadian Entomologist. 7—U. S. Department of Agriculture, Bureau of Entomology, Washington. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 13—Comptes Rendus, Societe de Biologie, Paris. 22—Zoologischer Anzeiger, Leipzig. 36—Transactions of the Entomological Society of London. 74—Naturwissenschaftliche Wochenschrift, Berlin. 79—La Nature, Paris. 84—Entomologische Rundschau. 89—Zoologische Jahrbucher. 119—Archiv für Naturgeschichte. 153—Bulletin, American Museum of Natural History, New York. 164—Science Bulletin, University of Kansas, Lawrence. 179—Journal of Economic Entomology. 180—Annals, Entomological Society of America. 189—Journal of Entomology and Zoology, Claremont, Calif. 216—Entomologische Zeitschrift, Frankfurt a. Main. 244—Zeitschrift, Induktive Abstammungs und Vererbungslehre, Berlin. 254—Archives de Parasitologie, Paris. 281—Annals of Tropical Medicine and Parasitology, University of Liverpool, Series T. M. 284—Bulletin, Museum National d'Histoire Naturelle, Reunion Mensuelle des Naturalistes du Museum, Paris. 285—Nature Study

Review, Ithaca, N. Y. 286—Archiv für Mikroskopische Anatomie und Entwicklungsgeschichte, Bonn. 313—Bulletin of Entomological Research, London. 359—Connecticut Agricultural Experiment Station, New Haven. 369—Entomologische Mitteilungen, Berlin-Dahlem. 447—Journal of Agricultural Research, Washington. 451—U. S. War Department, Office of the Surgeon General, Washington, D. C. 462—The Butterfly Farmer, Truckee, Cal. 472—Bulletin of the Charleston Museum, Charleston, S. C. 473—Mesure d'un Arc de Meridien equatorial en Amerique du Sud, Paris.

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ARACHNIDA, ETC. Berland, L.—Araignees, 473, x, 79-119. Borini, A.—Pseudo-appendicite da Ascaridi, 254, xvi, 428-31. Hal-ler, B.—Das zweite fachertracheenpaar der mygalomorphen spin- nen, 286, lxxxiv, 438-45. Heath, E. F.—A phalangid drinks milk, 4, 1914, 120. Laurens, G.—Corps etranger des fosses nasales ex- pulsion de myriapodes, 254, xvi, 434-7.

APTERA AND NEUROPTERA. Fernald & Bourne—Notes on the onion thrips and the onion maggot, 179, v, 196-200. Hilton, W. A.—The central nervous system of Aphorura, 189, v, 37-42. Houser, J. S.—Conwentzia hageni. Life history notes and varia- tions in wing venation, 180, vii, 73-6. Merle, R.—Les mouches aux yeux d'or, 79, xlii, 305-7.

Bacon, G.—Two n. sps. of Collembola from the mountains of Southern California, **189**, v, 43-6. Longin Navas, R. P.—Neuropteres, **473**, x, 69-78.

ORTHOPTERA. Gerhardt, U.—Copulation und spermatophoren von Grylliden und Locustiden.—II, **89**, xxxvii, Abt. f. Syst., 1-64. McConnell, E.—Some remarks on the abdominal air sacs of *Stenopelmatus*, **189**, v, 47-9. Toedtman, W.—Die spermatozoen von *Blatta germanica*, **119**, 1913, A, 11, 179-85.

Borelli, A.—Dermapterres, **473**, x, 63-8. Chopard, L.—Gryllidae, **473**, x, 45-52. Hancock, J. L.—Tetriginae, **473**, x, 53-6. Rehn & Hebard—A study of the species of the genus *Dichopetala* (Tettigoniidae), **1**, 1914, 64-160. Shelford, R.—Blattides, Mantides et Phasmides, **473**, x, 57-62.

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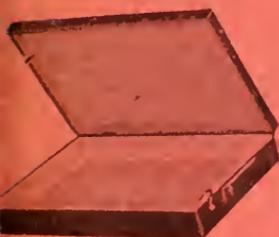
DR. JAKOB HUBER, Director of the Museu Goeldi, Belem de Para, Brazil, died on February 18, in his forty-sixth year.

JOHN A. GROSSBECK, of the American Museum of Natural History, New York City, formerly of the New Jersey Agricultural Experiment Station under the late Prof. John B. Smith, well-known for his work on North American Geometridae, died in Barbados, British West Indies, on April 8. He was born in Paterson, New Jersey, February 2, 1883.

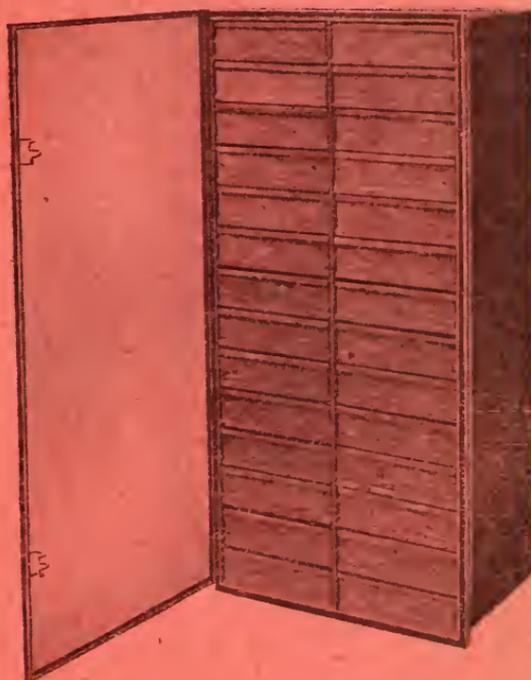
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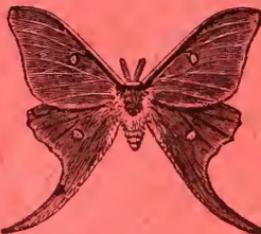
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Died 1867.

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Dr. J. Brackenridge Clemens.

By HENRY SKINNER, M.D., Sc.D.

(Portrait, Plate XII.)

Doctor Clemens was born in Wheeling, Virginia (now West Virginia), in 1829 or 1830, son of James Walton Clemens, M.D., and Elinor Sherrard. His father attended lectures at the University of Pennsylvania in 1823-24. The subject of our sketch attended the Virginia Military Institute for three years previous to entering the University of Pennsylvania at Philadelphia, where he was graduated from the Medical Department in the class of 1849, but he did not actively practice his profession. In 1850 he married Susan Burke Wagener, daughter of David D. Wagener, of Easton, Pennsylvania, who was a congressman from 1838 to 1841. Four children were the result of this marriage: Mary Wagener Clemens, Harold Clemens, James B. Clemens, M.D. (University Penna., 1883), and Maurice Clemens. *The Practical Entomologist*, a journal

published by the Entomological Society of Philadelphia, contains the following (Vol. 2, page 58, 1867):

Died of typhoid fever on January 11, 1867, Dr. Brackenridge Clemens, of Easton, Pennsylvania. It was only the middle of December when he was at the hall of the Entomological Society of Philadelphia, looking as hale and hearty as ever. He was an excellent entomologist, with good, sound, general views, and had devoted his especial attention to the Lepidoptera (moths) of this country. Readers of *The Practical Entomologist* will recall his name as having been more than once quoted as authority in Answers to Correspondents.

April 11, 1859, he was elected a Corresponding Member of the Entomological Society of Philadelphia. When he died the Society adopted suitable resolutions expressive of its appreciation of his intellectual attainments and of the high literary and scientific character of his work, and that the Society "has lost one whose ability was great, and the acuteness of whose mind was large, capable of searching to the greatest depths, and bringing therefrom the long sought knowledge." He was buried at Easton, Pennsylvania.

The distinguished English entomologist, the late H. T. Stainton, F. R. S., Secretary of the Linnaean Society of London, was so impressed by the value of Clemens' writings on the Microlepidoptera that he republished them in book form. The title of this work is "The Tineina of North America, by (the late) Dr. Brackenridge Clemens (being a collected edition of his writings on that group of insects. London: John Van Voorst, Paternoster Row. 1872." Stainton says:

"Little did I think when I received his first letter in 1857, two years before he became an author, that his career was to be so brilliant and so short. I had for some years contemplated putting together such an arrangement of his writings as would enable those who were previously unacquainted with them to profit by his remarks on the habits of new genera, genera with which we in Europe were unacquainted."

In the years 1857 to 1860, Stainton received nine letters from Dr. Clemens and published them in the above mentioned work. They are very interesting and show Clemens to have been a man of unusual culture, education and refinement, and a keen naturalist. He was first attracted to the subject of natural history from the aesthetic standpoint, for he says:

"I have devoted my attention almost exclusively to Lepidoptera—why, I do not know, unless I was first attracted by their beautiful colorings."* "The field of observation here is almost unlimited, poorly cultivated and abounding in the most interesting, beautiful and undescribed rarities." In his first letter he says: "Should I not, even at the risk of being egotistical, give you some introduction to myself? I am yet young, as you have perhaps conjectured, a physician by education and profession, and a graduate of the University of Pennsylvania; but here, I fear, my scientific qualifications to your regard must find an end. I stand merely on the shores of science, gazing on the immensity before me. And as I follow with my eyes the full-freighted intellects which, fanned by the wings of fame, sail over its placid waters in search of unknown truths, I am filled with doubts and the feelings of despair which arise from a consciousness of my own imperfections." Letter No. 4 says, in part: "I determined long since to form no collection for myself and freely gave away all specimens I have systematized. Such specimens as are new I add to the collection of the Academy of Natural Sciences of Philadelphia, where anyone may find them." No. 6: "It is with feelings of some trepidation that I send by present post my first paper on Entomology. Need I say I shall be pleased to have your opinion on it? Do not hesitate to indicate that which you conceive to be objectionable or erroneous. I have honestly expressed the results of my own labors, regardless of the praise or disapprobation they may meet with, and confident that if my conceptions are truthful and accurate they will stand the tests of examination and discussion."

Letter No. 9 (the last) was dated Easton, Pennsylvania, October 29, 1860, mentions the deaths of a lovely and accomplished sister and his father-in-law, whom he greatly respected and loved. These letters show him to have been generous, loving, modest, fearless, and of poetic feeling. He was evidently inspired with the love of science and nature. It was a great pity that such an ardent and capable worker should have been the victim of what is now called "the crime of typhoid fever."

In 1903, August Busck, an authority on Tineina, wrote as follows:

* When Dr. Clemens was attracted to the micro-moths on account of their beauty he probably never imagined that they would become of economic importance. A number of his species attack crops and are very destructive. This is due to the fact that man has upset the balance of nature. *Crambus caliginosellus* Clem. is estimated to do \$800,000 damage to tobacco in Virginia annually, and other species he described in this genus injure grasses, oats, corn, wheat and rye.

"Although a few stray species of American Tineina were described before 1859, that year really marks the beginning of the study of these insects in this country. During that and the following four years Dr. Brackenridge Clemens, of Easton, Pa., published a series of systematic and biological articles which yet remain the most important contribution to our knowledge of American Tineina. These papers contain descriptions of thirty-one genera and about two hundred new species, together with notes on larval habits of many of them."

The Clemens types were presented to the American Entomological Society by his widow in 1867. They were contained in boxes bound as books, in leather, and were labeled "Etudes Entomologiques, Clemens, Vol. I," etc. The specimens were pinned on small corks, gummed to glass, and each cork had a printed number, these numbers corresponding with the names and numbers of a list. Studies of the collection made by Busek resulted in the identification of the types of all but eight of Clemens' two hundred species. Five of these eight have been identified with certainty from Clemens' descriptions, leaving only three species unknown at that time (1903).

Stainton gives a list of seven papers published by Clemens in the Proceedings of the Academy of Natural Sciences of Philadelphia and ten in the Proceedings of the Entomological Society of Philadelphia. He published an important paper in the Journal of the Academy, iv (2), 97, 1859, entitled "Synopsis of the North American Sphingidae." This shows great ability and research and was the foundation for subsequent revisions of the American species. Much was thus accomplished in a few years by this pioneer American Lepidopterist, whose brilliant career was ended in such a sad and unfortunate way.

The non-entomological facts stated in this paper were supplied by Dr. James B. Clemens, of New York City, a son of Dr. Brackenridge Clemens, and by Dr. Ewing Jordan, of the University of Pennsylvania.

Changes of Address.

Kindly change my address from University of California, Berkeley, to Citrus Experiment Station, Riverside, California.—H. J. QUAYLE.

Please address me at 644 Sixth St., N. E., Washington, D. C., instead of 703 East Capitol St.—HERBERT S. BARBER.

A New Species of True Katydid from Western Texas (Orthoptera; Tettigoniidae).

By JAMES A. G. REHN and MORGAN HEBARD.

Pterophylla excelsa new species.

General appearance and form similar to *P. camellifolia* (*Cyrtophyllus perspicillatus* of authors); general form of pronotum similar to that species but resembling that of *Paracyrtophyllus robustus* in the caudal margin of the disk, which is subtruncate, and in the length of the same which is less than the greatest width; ventral margins of lateral lobes of pronotum differ from all other North American species in being moderately oblique, declivent cephalad. Subgenital plate of males distinctive in form and reaching beyond the tips of the tegmina, but apparently showing a development of the type found in *Paracyrtophyllus robustus*. Cerci of male distinctive but showing nearest affinity to *Lea floridensis*.

Type.—Male; Moss Well, foot of Pulliam Bluff, Chisos Mountains, Texas. September 5-8, 1912. Elevation 4700-5000 feet. (Rehn and Hebard.) [Hebard Collection.]

Size and general form similar to *camellifolia*. Head larger and broader than in that species, with fastigium of the vertex more decidedly produced in a spine which projects distinctly beyond the plane of the face; face much flattened, with lateral margins distinctly defined in weak ridges, these ridges subobsolete dorsad; labrum distinctly broader than in *camellifolia*. Pronotum similar to *camellifolia* in contour, transverse sulci and lateral canthi, but with length of disk less than greatest (caudal) width and with caudal margin subtrun-

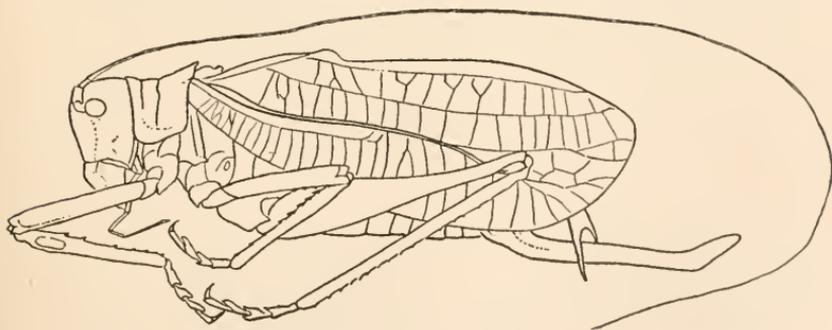
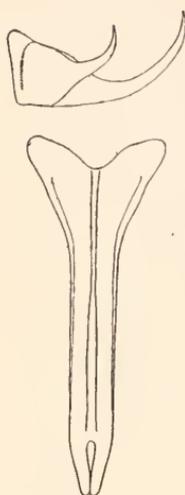


Fig. 1.—*Pterophylla excelsa* n. sp.—Lateral outline of type. (x 2.)

cate; lateral lobes with ventral margin moderately oblique, declivent cephalad with ventro-cephalic angle more broadly rounded than ventro-caudal angle, which is distinctly more ample, weakly obtuse-angulate.



Pterophylla excelsa n. sp.

Fig. 2.—Cercus of male.

(x 5.)

Fig. 3.—Ventral outline of subgenital plate of type. (x 2½.)

Tegmina much less ample than in *camellifolia*, with veinlets more regular and pronounced, stridulating area much as in that species. Wings almost as long as tegmina, by which they are wholly concealed. Limbs and armament of same as in *camellifolia*. Supra-anal plate somewhat longer than broad, sulcate meso-proximad, beyond this portion moderately expanding, with distal margin subtruncate and moderately serrate. Cerci evenly rounded at base, then forking at a distance equal to the basal width and produced in two very slender and little divergent spines which have an even inward curvature, the outer spine nearly twice as long as the inner (dorsal) spine. Subgenital plate nearly as long as the caudal femur; the heavy margins of the produced shaft forming a broad, deep mesal groove both dorsad and ventrad; apical portion split, with the two parts distinct but attingent distad, this portion directed dorsad at a very broad obtuse angle to the produced and horizontal shaft.

Allotype.—Female; Chisos Mountains, Texas. July, 1911. (H. A. Wenzel.) [Academy of Natural Sciences of Philadelphia.]

Similar to the type, but larger. Supra-anal plate longer than broad, distal margin rotundato-truncate. Cerci long, nearly straight, terminating in a sharp tooth. Ovipositor similar to that of *camellifolia*. Subgenital plate nearly divided mesad into two very narrow and transverse lateral lobes, leaving the base of the ovipositor exposed.

Measurements (in millimeters).

	Length of pronotum	Caudal width of pronotum	Length of tegmen	Greatest width of tegmen	Length of caudal femur	Length of Subgenital plate
Type, male	5.	5.9	27.2	11.7	18.9	16.9
Paratypes, males...	4.7-6	5.6-7	24.8-31.9	10.8-13.1	17.8-22.6	16.7-18.9
Allotype, female ...	5.3	6.7	36.4	13.1	23.7	.....

The ovipositor of the allotype is 16.8 mm. long and 3.1 mm. in greatest width.

The tegminal measurements are given for these organs in their convex natural condition; were the tegmina flattened out a decided increase in length and width would result. The type is about the average for the series of males taken by the authors; the male taken earlier in the season with the allotype is very large.

In life the specimens were jade green; this color has become pale on the body and limbs in the majority of dried specimens. The eyes are walnut brown.

The present species is known only from the Chisos Mountains, situated in the southern portion of the Great Bend region of the Rio Grande in western Texas. The following field notes were taken: "This species is everywhere on the hillsides above 4700 feet elevation in low oaks (15 to 25 feet in height) and at dusk the males begin their incessant song which is continued through the night. This song consists of a single rasping note, quuck—quuck—quuck, repeated incessantly and very deliberately. One was startled into giving this note in the early afternoon of a cloudless day when a rifle was fired over the cañon. The specimens are found in the trees usually near the lower branches, perched upon the twigs among the leaves; they are very hard to locate, but when the collector has climbed into the tree an individual will usually recommence its song if he keeps still under it for a few minutes. When closely approached they invariably leap clumsily into space, unless quickly seized, and upon hitting the ground at once begin to crawl away. When seized they often utter their note in an irritated manner."

Specimens examined.—25; 24 males and 1 female.

Chisos Mountains, Texas, July, 1911 (H. A. Wenzel), 1 male, 1 female, *paratype*, *allotype*, [A. N. S. P.].

Moss Well, Chisos Mountains, Texas, September 5-8, 1912, (R. and H.), 23 males, *TYPE*, *paratypes*, [Hebard Collection and A. N. S. P.].

Diptera at High Altitudes.

Prof. T. D. A. Cockerell, in the *Entomologist* for April, 1914, notes that he collected, August 28, 1913, *Stomoxys calcitrans*, *Phormia terrae-novae*, *Musca domestica* and *Allograpta obliqua* at timber line, 11,200 to 11,300 feet altitude, on the Long's Peak trail, Colorado.

Standards of the Number of Eggs laid by Insects (Orthop.)—XI.*

Being Averages Obtained by Actual Count of the Combined Eggs
from Twenty (20) Depositions or Masses.

By A. A. GIRAULT, Nelson, Cairns, Queensland.

15. <i>Periplaneta australasiae</i> (Fabricius)									
No.	Date, 1913	No. counted per mass	Successive Totals	Av. per Egg Mass	Max.	Min.	Range		
1	May 10	26	26	26.	28				
2		26	52	26.					
3		28	80	26.6					
4	May 12	26	106	26.5					
5		28	134	26.8					
6		26	160	26.6					
7		28	188	26.8					
8		24	212	26.5					
9		26	238	26.4					
10		27	265	26.5					
11		28	293	26.6					
12		27	320	26.6					
13		26	346	26.6					
14		28	374	26.7					
15		22	396	26.4	22				
16		28	424	26.5					
17		26	450	26.4					
18		24	474	26.3					
19		26	500	26.3					
20		24	524	26.2					
20			524	26.		28	22	6	Finals

The eggmasses were collected in a private residence at Nelson (Cairns), Queensland, Australia, where the only available food consisted of starch and glue in book bindings, straw used for packing materials, wrapping paper and the like. The residence was used as a laboratory and no food for human consumption was kept about the place nor prepared therein. Another, jet black egg case, longitudinally striate and of an unknown species, rarely found in the same place, averaged about 34 eggs each.

* For the first ten of this series, see Ent. News, 1901, p. 305; 1904, pp. 2-3; 1905, p. 167; 1906, p. 6; 1907, p. 89; 1908, pp. 4, 383; 1909, pp. 355-357; 1911, pp. 14-15 and 1912, pp. 355-356.

A new *Dilar* species from Japan (Neur. Plan.).

By WARO NAKAHARA, Tokyo, Japan.

The genus *Dilar* was not known in Eastern Asia until Navás described a species, *D. septentrionalis* (Rev. Russ. d'Entom., xii, pp. 420-21, 1912), from Siberia, although eleven species of the genus were recognized from various parts of the world before that time.

The new species which is described in the present paper is, therefore, the second species of the genus in the region just referred to.

Dilar nohirae n. sp.

Head ochraceous yellow; ocelli yellow, anterior one marked with piceous; frons and clypeus spotted with fuscous black; palpi fulvous. Antennae of the male fulvous with about 25 joints, a few basal joints are more or less suffused with fuscous, joints in the middle of the antennae are much more elongated than those near the base or near the apex; lateral appendages of nearly equal length present on third to eighteenth joints.

Prothorax wider than long, yellowish, with a transverse impression in middle; three tubercles, of which the median is somewhat smaller than the other two, present before the impression; small tubercles exist on both sides and behind the median impression.

Abdomen fuscous on both ventral and dorsal surfaces; covered with yellowish hairs, especially near apex; lateral surfaces pale. Lateral valve of the male genitalia is shiny yellow and clothed with hairs.

Legs ochraceous yellow, very hairy; extremity of femur of each leg is blackish.

Wings hyaline, slightly colored with yellowish; with numerous small fuscous spots on fore wing and costal area of hind wing; the spots are larger and more deeply colored towards base in the fore wing; the largest fuscous spots with a small whitish centre in middle of the space between the first radial sector and the first branch of the second sector; spots around the largest one are slightly colored. Neuration pale yellow; costal cross veins mostly simple, but some in middle are furcate; about six cross veins between subcosta and radius, about ten between radius and its second sector; radius with two sectors, the second of which has four branches; two series of gradate veinlets very irregular and imperfect; some cross veins present besides those of the gradate series.

Length of body, 10 mm.; of fore wing, 14 mm.; of hind wing, 12 mm.; of antenna, 5.5 mm.; width of fore wing, 6.5 mm.

A single male specimen captured by Mr. Akio Nohira at Yoshino, Province Yamato, is in my collection. There are also a few specimens obtained along with that just mentioned in Mr. Nohira's collection.

This species is quite distinct from all other known species in the number and arrangement of tubercles of prothorax, and of course in many other respects.

Since there has been hitherto a single species of Dilaridae recorded from Japan by McLachlan, the discovery of the present species adds one more to our fauna. The Japanese species of the family, therefore, are as follows:

1. *Dilar nohirae* n. sp. (Yoshino, Yamato)

2. *Rexavius japonicus* (McLachlan) ("Tukushima")

Dilar japonicus McL., Ent. Month. Mag., xix, p. 220 (1883); *Rexavius japonicus* Navás, Mem. de la Real. Acad. de Cienc. y Art. de Barcelona, vii, pp. 665-666 (1909).

A New Sugar Cane Aphis (Hemip., Homop.).

By H. F. WILSON, Entomologist, Oregon Agricultural College, Corvallis, Oregon.

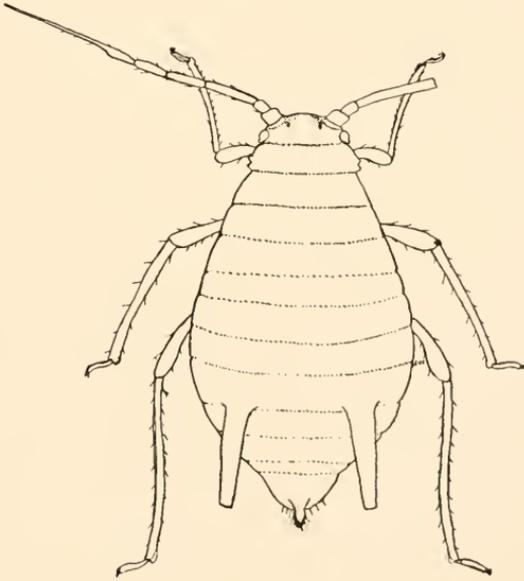
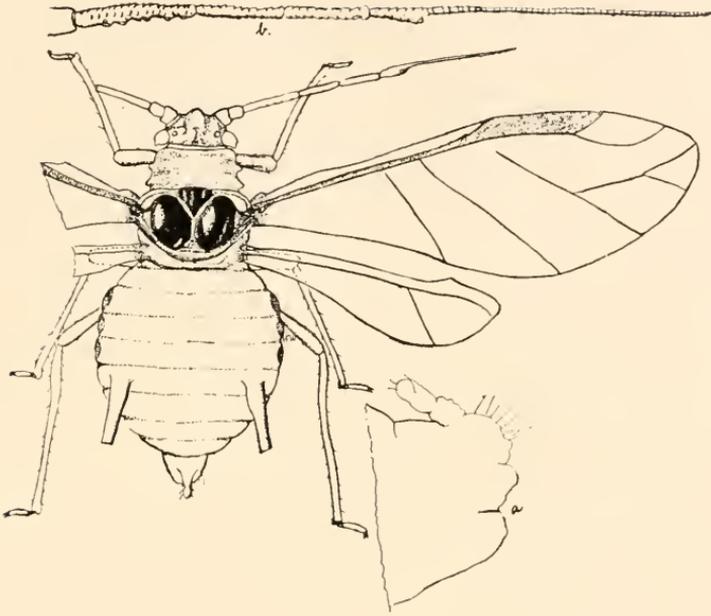
(Plate XIII.)

Aphis bituberculata n. sp.

Specimens of this aphis collected on *Saccharum officinarum* at Audubon Park, New Orleans, Louisiana, were sent to me several times during the season of 1912. I have compared these specimens with descriptions, etc., of the other aphids found on sugar cane without being able to refer this species to any of them. I am therefore describing it as new.

Alate viviparous female.—General color dark green, antennae, legs and nectaries dusky to black. Antennal tubercles present but not elongate; antennae about two-thirds the length of the body, not quite reaching to the base of the nectaries, and with six segments.

The two basal segments are normal, while the third appears thicker and longer than the fourth, or the fifth and sixth together, not including the spur of the sixth; the fourth is slightly longer than the fifth, and the spur of the sixth is nearly as long as the third, fourth and fifth together. The third segment bears six to ten irregular-sized sensoria, all situated on the inner side, the fourth sometimes with a



APHIS BITUBERCULATA N. SP.—WILSON.

single sensorium on the inner side of the segment, about midway from the ends. The fifth with one sensorium near the tip, sixth with usual sensoria at the base of the spur.

Head with distinct frontal tubercle, prothorax long and with two dentate tubercles on each side instead of one, the usual number. Wings hyaline, hind wing with but a single oblique vein. Abdomen stout and with a row of three black spots on each side in front of the nectaries. Nectaries about three times as long as the cauda and tapering. Cauda short and held with the tip extended toward the head (see Pl. xiii, fig. a).

Measurements: Length of body, 1.81 mm.; width at widest part of abdomen, .76 mm.; length of antennae by segments, I, .07 mm.; II, .06 mm.; III, .24 mm.; IV, .19 mm.; V, .15 mm.; VI, .10 mm.; spur, .5 mm.; total length of antennae, 1.31 mm. Length of wing, 1.9 mm. Nectaries, .24 mm.; cauda, .085 mm.

Apterous viviparous female.—General color yellowish to dark green. Abdomen robust and with the anal plate broad and conspicuous. Antennae with six segments and not reaching to the base of the nectaries. Segments one, two, distal part of fifth, sixth and spur dusky to black, other portions opaque. Legs, except femora, dusky to black and the latter dusky at the distal ends. Nectaries black in color and tapering. Cauda short and turned back over the abdomen as in the case of the alate forms.

Measurements: Length of body, 1.76 mm.; width, .9 mm.; length of antennae by segments, I, .065 mm.; II, .06 mm.; III, .22 mm.; IV, .17 mm.; V, .15 mm.; VI, .09 mm.; spur, .5 mm.; length of nectaries, .24 mm.; cauda, .08 mm.

EXPLANATION OF PLATE XIII.

Aphis bituberculata n. sp. Above, alate viviparous female, *a* cauda enlarged, *b* antenna.

Below, apterous female.

Monograph of the Chrysophanids (Lepid.).

My appeal for help from American entomologists has been almost fruitless, only one observer having come to my aid. I want very specially *Heodes feldeni*, *Chalceria snowi*, *cupreus*, *rubidus*; *Satyrinum fuliginosa*. I should like also some specimens of *Gacides xanthoides*, *editha* and *gorgon*. May I again appeal to brother entomologists on your side of the water for help. Palaearctics, exotics or cash given in exchange.—G. T. BETHUNE-BAKER, 19 Clarendon Road, Edgbaston, England.

Butterfly Collecting in Mojave County, Arizona (Lep.).

By J. R. HASKIN, Los Angeles, California.

A glance at the map of the United States will show the southeastern point of Nevada on the thirty-fifth parallel to be separated from Arizona by the Colorado River. About 35 miles east of the river on the line of the Santa Fe Railway is the small town of Kingman.

From the car window the traveler through this country sees only arid stretches of hill and plain—no trees and but a scanty growth of low brush, interspersed with cactus, to serve as a cover to the desert plains. Yet there is a wonderfully attractive something about this land that appeals to men and makes them return again and again. Those who have settled in it seem never satisfied when away for any length of time. Perhaps it is the dry, clear atmosphere and the brilliant sunshine; perhaps the feeling of being out in the limitless open, where each man's individuality stands out and he feels that he really is a man among men and not simply a unit in a group of other similar units.

To nature lovers, to naturalists, what appeals most strongly is the feeling of great open spaces, alive and yet so still, especially when the lengthening shadows subdue the hum of insect life and the occasional call of a belated bird sounds startlingly clear.

In the early spring of certain years, after the light snows have disappeared, western Arizona is like a beautiful garden. The ground is carpeted for miles with bright flowers of innumerable species. The clumps of low brush are fresh and green, and even the various species of cactus seem to have taken a new lease on life. Soon, however, the dry heat of approaching summer causes a rapid change and the country becomes an apparently barren desert except for the few scrubby bushes. About the middle of summer, rains may be expected and heavy downpours occur occasionally as late as September. Yet they have very little effect, as the water runs off so rapidly that the vegetation does not seem to benefit by it.

From my experience during the past four years I have come

to the conclusion that the best season for collecting in this country is in the fall of the year just after the fall-blooming shrubs have begun to blossom. Late in September and through October there is a season of fall flowers. This season varies slightly from year to year and, as it is rather short, one must be on hand at just the right time in order to get the best results. There is one shrub in particular, *Bigelovia graveolens* Gray,* which has proven a sure guide to successful collecting. It occurs in many places in the sandy washes along the foothills, and when its bulk of fine evergreen foliage becomes hidden by dense masses of small, bright yellow, strong smelling flowers, one is sure of making a good catch. The rank smell of this flower seems to have a wonderful attraction for butterflies and other insects and in certain spots one can find *halesus*, *strigosa*, *bachmanni*, and many others, so busily engaged that one can approach without caution and net them at will.

Most of my Arizona collecting has been done in and around the Goldroad district. Goldroad is a mining camp between Kingman and the Colorado River on the west slope of the Black Mountains, or River Range. The road from Kingman crosses the Sacramento Valley and up through a pass over the range, then down a steep winding road into Goldroad. Little Meadows, a water station halfway up the pass, and Silver Spring, below Goldroad, are good collecting grounds in the proper season, as there is rather more vegetation than usual in these spots.

Following is a list of specimens taken during the past few seasons. Probably a more exhaustive search than I have been able to make would result in some further interesting captures.

A. strigosa, *E. claudia*, *M. neumogeni*, *P. gratensis*, *Synchlœ californica* Wright, *P. cardui*, *L. bachmanni*, *L. mormo*, *L. palmeri*, *C. australis*, *T. halesus*, *T. melinus*, *T. leda*, *L. acmon*, *L. isola*, *L. myrina*, *L. exilis*, *P. protodice*, *N. iole*, *E. reakirti*, *C. eubule*, *M. caesonia*, *C. eurytheme*, *T. nicippe*, *P. asterias*, *P. erecutorum*, *P. tessellata*, and three Hesperids not identified.

* Identified by Dr. Anstruther Davidson, Los Angeles, Cal.

Melitaea neumoegeni Skinner, 1895.

About four years ago I caught what I thought was a new species, named it *M. marialta*, and sent photographs and a description to the NEWS. Dr. Skinner, however, wrote me that he had named it *neumoegeni* and that the description could be found in the NEWS, Volume 6, page 113, April, 1895. The types were taken, I believe, by the late Mr. Neumoegen in Utah and from the description I judge they are all males.

Dr. Skinner's description tallies closely with about forty male specimens which I have taken in the past four years. These males are of such a uniform, fulvous color on upper side, and the black markings are so light that their general appearance is much like a small *Argynnis*. No other *Melitaea* approaches it in uniformity of coloration. The fulvous darkens only slightly at the base of the secondaries and not at all on the primaries. The under side, especially of the secondaries, shows it to belong to the *gabbi* group.

In 1911, near Goldroad, Arizona, I was fortunate enough to see four females and to capture two of them. In appearance and habits they differ so widely from the males that, had I not seen one pair trying to mate and another actually in copulation, I would have been very uncertain as to their identity, even though I have never seen any other species of *Melitaea* in this vicinity during four years of collecting.

Of the two female specimens which I have, one was taken near Goldroad, Arizona, on March 30, 1911. In size and markings it is almost exactly like the illustration of the male, *M. augusta*, shown in Plate 14, No. 169, of Wright's *Butterflies of the West Coast*. The only observable difference is in the black bar dotted with a row of round spots across the ends of primaries. This is exactly as in the next figure, No. 169B. On the other specimen, taken at Little Meadows, near Goldroad, on October 4, 1911, the primary is almost the same as the above, but the secondary is almost solidly red and black with hardly a trace of the pale, buff spots. The under sides of both specimens are alike and similar to the males, except that

the males are silvered as in the rest of the *gabbi* group, while the females are not.*

In March, 1911, the male *neumoegeni* were abundant along the sandy roads and dry water courses in the small arroyos, or gullies, below Goldroad. They were flitting continually up and down these sandy stretches with a quick, jerky flight, resting frequently on the ground and occasionally on low twigs and dry weed stems.

The females, three of them, were seen further up on the hillsides in the brush at some little distance from the playgrounds of the males. These three which I saw near the end of March were apparently just out of their chrysalids, as they were very bright and fresh. Most of the males were badly worn and must have emerged a week or two earlier on the average than the females. One female which I caught was only a few hours on the wing. Another was in copulation and a third was flirting with a male. I was so anxious to obtain them that I got excited and missed both easy tries and the brush prevented further pursuit.

I believe this species is double-brooded, as I caught my first specimens in October, 1909, others in March, 1910, and others in March and October, 1911.

Concerning their distribution, I caught eight in March, 1910, near Cinco, California, east of Mojave, California, in the foothills along the Mojave desert. They are abundant in the Goldroad district, Mohave County, Arizona. Mr. Neumoegen's specimens came from Utah. It will probably develop that they are to be found in various sections of the arid country between these points.

***Synchloe californica* Wright.**

I believe nothing has been published concerning this species except the original description in *The Butterflies of the West Coast*, by Mr. W. G. Wright.

*[Months after this paper was accepted for publication, the following additional note was received from the author.—ED.]

In contrast to the two females taken at Goldroad are half a dozen taken in April, 1914, near Johannesburg, Kern County, California, on the Mojave Desert. These are all identical in color and markings with the males and average somewhat larger in size.—J. R. HASKIN.

As Mr. Wright says, this species is different from the other *Synchloes* on account of its constancy of color. I took a series of *Synchloes* in June, 1911, at Georgetown, Texas, that had the same general area of buff and light brown as *californica*, but the details are somewhat different.

All of Mr. Wright's specimens, which I had the pleasure of examining at San Bernardino, were much worn and I believe for that reason even he did not realize how true to one form this species runs. I have found that as the individual becomes old and worn the lustrous black and buff become brown and yellow, giving the specimen a much lighter appearance than when fresh. With forty fresh specimens as uniform as one could obtain in as large a set of *Melitaea* or *Phyciodes*, I believe the following description will be of value as a supplement to that of Mr. Wright.

Expanse, males, 1.2 to 1.5 inches; females, 1.5 to 1.8 inches. Sexes alike on both sides.

Above, base and inner third of wings black, with three yellowish-brown spots arranged in a triangle on primary and one minute spot on secondary. A broad median band across both wings, pale buff on inner half shading abruptly to a light brown on outer half. Near costa of primary the buff shades to whitish. Outside of median band is a band of black with clear white dots between the nervules. Along the margins is a series of light brown crescents, constant on secondary, but with a tendency to disappear on primary of some specimens. The fringe is black, broken by white between the nervules.

Below, similar to above except at the bases. The base of primary is buff, then black to the median band, with a whitish spot at end of cell. The secondary is banded brown, black, white and then broadly black to the median band. The general effect on the basal area is a broad black band across both wings just inside the median band.

S. californica was taken about the scattered flowers along the base of the hills and along the roadsides. In general appearance and actions they are like some of the *Phyciodes* and I thought at first glance that my first specimens would prove to be of that genus.

My first specimens, six in number and all fresh, were taken September 15, 1909, at Little Meadows, near Goldroad, Arizona. I took twenty-seven the latter part of September, 1910,

some badly worn, near Goldroad and Little Meadows. Several more were taken at the same places in 1911 and 1912.

Further east in Arizona at Ash Fork, Jerome, in the Verde River valley below Jerome, and further south at Phoenix, I have not seen *californica* but have taken *S. crocale* in the Verde Valley and at Phoenix. Mr. Wright told me that he took all of his specimens in a canyon in Riverside County, California, on the east slope of the San Jacinto range, about opposite Palm Springs on the Southern Pacific Railroad. In May, 1913, I saw several just a little north of this on a mountain road west of Banning, which I am quite certain were *S. californica*, but could not obtain them as I had no net with me. I rather believe they are to be found in the foothills all along the Colorado River valley, and the valley running up through Imperial and Riverside Counties, which opens into the Colorado valley.

L. bachmanni.

This species is fairly common in the fall season about Goldroad, Arizona. In October, 1910, they were very numerous, especially in the stretch of valley below Goldroad, where *Bigelovia graveolens* was in full bloom. Riding horseback on a windy morning through this brush, I could see twenty or thirty at a time tailing out to leeward from every clump of *graveolens*. Catching them was not an easy matter. I would look forward to netting at least half a dozen specimens from one of these groups, but after one or two ineffectual passes with the net they would all disappear. Observing them carefully, I noticed that instead of flying away they would dart into the thicket and alight on the dead twigs with their wings folded and their antennae pointed forward in line with the perch on which they sat. Here they would remain motionless until my hand or the net approached within a few inches of them, when they would dart away and settle on another perch. The under side of the wings, when folded, has a perfect protective gray coloring which matches the gray of the twigs, and it was interesting to note the evident use these insects made of it.

Another interesting and rather remarkable feature about this swarm of *bachmanni* was the absence of the large projecting palpi on many of the specimens. In a set of forty good, fresh specimens I found thirteen—eight males and five females—without the projecting palpi which give it the curious appearance aptly described by its common name—the Snout Nosed Butterfly. In March, 1911, I caught one fresh specimen and found it to lack the palpi also.

L. mormo.

In the fall of the year *mormo* is found all over the hillsides of the River Range and can be taken by thousands if desired. In general their flight and habits are like those of the common *virquiti* of the west coast.

L. palmeri.

In October, 1911, I took four of this very small species in the bottom land below Goldroad. At first I took one to be a dwarfed *mormo*, but a second glance showed they were a different species. Probably a closer search would have discovered many more of them.

C. australis.

While not common, a special search for these in the vicinity of Little Meadows resulted in the capture of twenty-two perfect specimens in the fall of 1910. These were mostly taken while feeding on various small flowered plants, such as *Lepidospartum squamatum*.

T. halesus.

The most delightful two days of collecting I ever had were October 23-24, 1909, near the Little Meadows. I had been taking quite a few specimens of various sorts when for the first time I came across a great clump of *Bigelovia graveolens* in full bloom. All over its mass of yellow flowers I saw *strigosa*, *bachmanni* and other species flitting about and feeding, while here and there a black something, entirely different from the ordinary forms, gave me a real palpitation of the heart. After some debate as to what method to use, I tried a swift pass of the net crosswise and just above one of these new forms, and was rewarded by a violent fluttering in the small

end of the net. It was my first *halesus*, and by following precisely the same tactics I captured 46 specimens, almost all of them fresh and perfect.

The following year I went over the same ground, but did not see one. In 1911 I was unfortunately just a week or so too early for the flowering of *graccolens* and took only a few scattered *halesus*. I believe that a little later I would have found more of them.

The larva of *halesus* is supposed to feed on mistletoe. I noted a few clumps of it on some small oaks in the vicinity, but none of the butterflies themselves were in close proximity to these trees.

Holland and Wright fail to bring out one point with reference to the sexes, namely, that the males have one small tail, while the females have two—one small, the other long, flat and curled. The females are larger than the males and the metallic green luster is confined more to the base of the wings with more dead black on the outer areas. Denton's beautifully illustrated book on butterflies mentions this difference in the tail structure of the two sexes.

T. leda.

In October, 1911, I caught seven specimens at Silver Spring below Goldroad at about 1500 feet elevation. I caught frequent glimpses of these small, darting insects in the foliage of the mesquite trees, but it was impossible to net them on account of the annoying thorns common on this tree. Finally I found a clump of low flowering shrubs in a secluded corner and had no difficulty in netting a small series while they were feeding.

A careful comparison of these specimens with an extensive series of *T. ines* from Southern California, Southern Arizona and Northern Mexico, in the possession of Mr. Fordyce Grinnel, Jr., and myself, show them to be exactly the same. As Goldroad is only ninety miles west of Prescott, where the types of *leda* were taken, this confirms us in the belief that *leda* and *ines* are synonymous.

N. iole.

This is fairly common. Contrary to a description of the habits, which I read somewhere recently, stating that this species is found only in moist places, I found it only along the dry sandy spaces and on the hillsides about Goldroad and also on the dry plain about Ash Fork further east.

Except for notes on dates and captures, the other species mentioned in my list show nothing of particular interest. If one could spend an entire season in this interesting country, many more interesting features could doubtless be recorded and valuable studies worked out in detail.

Notes on North American Agromyzidae (Dipt.).

By J. R. MALLOCH, Urbana, Illinois.

Since the completion of my paper on the species of the genus *Agromyza** I have had the opportunity of examining the material in the collection of the Illinois State Laboratory of Natural History, and have also seen two species, kindly submitted by Dr. E. P. Felt, which make necessary the present supplementary paper on the group. I have indicated the changes necessary in the synoptic table to permit of the inclusion of the new species.

It may be of interest to mention that *Agromyza melampyga* Loew occurs in Britain. I captured a specimen of this species at Dunoon, Scotland, in July, 1912, while on a visit there. I cannot say whether the species has any European name or not, as the knowledge of this family in Europe is very unsatisfactory, and meanwhile leave our species as *melampyga*.

I have received several letters from correspondents requesting information as to what I have done with *Agromyza acneiventris* Fallen in my paper. I take this opportunity of stating that I have not seen any American specimens which agree with the species considered by European authors as the true *acneiventris*, so have dropped the name entirely. I have found so much confusion amongst the species I have examined, from

* Ann. Ent. Soc. Amer., vol. 6, No. 3, p. 269.

Europe, that I prefer to await the examination of the types of the older authors before changing the names of any of this group (with black halteres), because, as things are at present, there is but little hope of arriving at a correct interpretation of their descriptions, color being almost the only character used, and as this is very similar in all the species it is almost hopeless to attempt identifications.

Mallochiella glabra Fallen.

This species occurs in North America and may be separated from *halteralis* Coquillett by the following characters:

M. glabra.—Male: Black, including face and palpi, only the basal 3 joints of mid and hind tarsi yellowish at base; hind tibia very slightly dilated; last section of fifth vein recurved and shorter than the penultimate section of fourth; last section of fourth slightly less than four times as long as penultimate section. Length, 2 mm.

Female: Similar to the male except that the last section of fourth vein is barely more than three times as long as penultimate section. Length, 2.5 mm.

M. halteralis.—Male: Black, face below antennae, palpi and base of all tarsi yellow; hind tibia very much broadened; last section of fifth vein generally distinctly longer than penultimate section of fourth, last section of fourth vein generally five times as long as penultimate. Length, 1.5 mm.

Female: Colored as the male, and in other respects very similar except that the hind tibia is not conspicuously broadened, showing only a very slight thickening as in *glabra*. Length, 1.75 mm.

Halteralis seems to be widely distributed in North America. I have seen a large series of specimens in the collection of the Illinois State Laboratory of Natural History that were reared from refuse pig hair. The only specimens that I have seen from North America that are referable to *glabra* are several which I took at Frankford, Philadelphia, Pa., during September, 1913. These specimens are in the Academy of Natural Sciences, Philadelphia, with the exception of one which is now in the Illinois State Laboratory of Natural History.

AGROMYZA Fallen.

Owing to the addition of *A. quadrisetosa* in the Addenda to my paper on the genus *Agromyza*, and the description herewith of another species with black third antennal joint, the synoptic table should be altered as given here.

4. Frons black, only the frontal lunule yellow....*xanthophora* Schiner.
Frons yellow, only the ocellar spot black, and the orbits sometimes
blackened posteriorly5
5. Palpi and legs black.....*quadrisetosa* Malloch.
Palpi yellow, legs mostly yellow5a.
- 5a. Wings clear*longispinosa* Malloch.
Wings with a distinct infumation from end of vein 1 to apex of 2
which does not entirely cover the marginal cell...*fumicosta* n. sp.
- Delete No. 5 in synoptic table in the paper in the *Annals* quoted and
insert the above.

***Agromyza fumicosta* n. sp.**

This species is very similar to *longispinosa*, differing only in being slightly smaller, in having the antennae slightly larger, the bristles on the mesonotum weaker; the wings more obtuse, the second vein undulated, the last section of fourth vein less than six times as long as the penultimate section (7-1 in *longispinosa*) and the costa with a distinct infuscation, which disappears before the lower margin of marginal cell is reached. In all other respects, coloration and chaetotaxy, identical with *longispinosa*.

Type.—Swept from blue grass, May 3, 1894, Normal, Illinois. In collection of Illinois State Lab. Nat. Hist.

***Agromyza felti* new species.**

Male: Pale yellow, shining, ocellar spot and back of head black; orbits slightly browned posteriorly; arista brown or black; other parts of head clear yellow. Mesonotum with a large black spot on disc which is most intense on the area covered by the discal mark in *melampyga* Loew; the quadrate area between the posterior lobes is filled with a less intense black color which extends almost to the scutellum and is centrally dentate; pleurae unspotted, or with a reddish triangular mark between fore and mid coxae, postnotum glossy black; scutellum with a small spot at base on each side. Abdomen with a brownish-black fascia on each segment, the posterior margin yellow; sixth segment elongated; hypopygium normal in shape, blackened laterally. Legs yellow, wings clear, veins distinct. Halteres yellow.

Frontal orbits distinct; four pairs of orbital bristles present, the lower pair rather weak, incurved; antennae as in *melampyga*; arista closely covered with pubescence, giving it a rather thickened appearance, its length not equal to that of frons; cheek about one-fifth as high as eyes; vibrissa weak. Four pairs of dorso-centrals on mesonotum, which decrease in strength towards anterior margin; discal hairs distinct. Abdomen as in *melampyga*. Legs of the normal shape; mid-tibia without any posterior bristles. Wings almost identical in

venation with those of *melampyga*, the penultimate section of fifth vein from one-half to three-fourths as long as last section. Length, 1.5 mm.

Locality: Hudson Falls, New York, May 27, 1910, reared from leaves of "walking leaf fern," *Camptosorus rhizophyllus*. Seven specimens. Named in honor of Dr. E. P. Felt, who transmitted the specimens.

Type and *paratypes* in New York State collection; *paratypes* in Illinois State Lab. Nat. Hist. collection.

Since submitting this paper for publication, the writer has reared this species from blotch mines in leaves of the fern *Asplenium pinnatifidum*, collected at Parker, Illinois, April 18, 1914.

This species is recorded as *A. melampyga* Loew, Bulletin 147, N. Y. State Museum, p. 67.

To include this species in the synoptic table in my paper previously mentioned it will be necessary to change couplet 6, second section, to read as follows:

- Mesonotum with black stripe-like marks; or disc black, the center of disc in front of scutellum yellow owing to the abbreviation of the central portion of black mark; or at least a distinct yellow line on the posterior margin of disc in front of scutellum.8
8. Only the margins of discal mark black, the center portions reddish brown*melampyga* var. *marginalis* Malloch.
The whole of discal mark black9
9. Markings on mesonotum dull gray black, not glossy,
borealis Malloch.
- Markings on mesonotum glossy black10
10. The space between the lateral lobes of discal mark filled with black; posterior surface of mid tibiae without bristles. *felti* n. sp.
The space between the lateral lobes, posteriorly, clear yellow; posterior bristles present on mid tibiae.....10a
- 10a. Cheeks posteriorly about one-half the height of eye, arista almost bare*flavonigra* Coquillett.
Cheeks posteriorly much less than one-half the height of eye; arista pubescent*melampyga* Loew.

Agromyza pleuralis n. sp.

Female.—Black, subopaque. Head yellow, only ocellar spot, back of head, and small portion of orbits at upper extremity blackened. Mesonotum slightly grayish pruinose; pleurae yellow, a large spot be-

tween fore and midcoxae, a smaller one behind midcoxa, and postnotum black; abdomen brownish black, subopaque; hypopygium glossy. Legs, including coxae, entirely yellow. Wings clear, veins yellowish. Halteres white. Frontal bristles and thoracic hairs yellow, the other bristles brown.

Frons with four pairs of long orbital bristles; face slightly buccate; cheek one-third as high as eye (antennae in poor condition). Mesonotum with two pairs of dorso-centrals, the posterior pair very widely separated, the anterior pair weak; discal setulae numerous on the anterior half and rather long, becoming sparser on the posterior half. Legs slender, no bristles present. Wing with costa to fourth vein; veins 3 and 4 divergent; inner cross-vein at slightly before end of vein 1 and at middle of discal cell; last section of fourth vein six times as long as penultimate section; last section of fifth one and one-half times as long as penultimate section. Length, 1.75 mm.

Type.—Swept from catalpa, University grounds, Urbana, Illinois, June 21, 1898. (Marten). In collection Illinois State Lab. Nat. Hist.

This species will run down to *citrefrons* Malloch in my synoptic table in the paper previously referred to, but may be readily separated from that species and its allies by its possession of only two pairs of dorso-central bristles.

Agromyza youngi new species.

Male.—Black, shining. Squamae and halteres black. Wings clear, veins black.

Frons very slightly over one-third the width of head, frontal triangle shining, elongated, reaching over half-way to base of antennae and very distinct; orbits very narrow, rather thickly covered with hairs, which become much longer and stronger towards anterior margin, where one or two are setulose, the normal orbital bristles hardly distinguishable in type, all incurved; ocellar bristles widely separated at base and lying subparallel; frons in profile declivous; face short; the anterior margin of cheeks much produced, as in females of the *vibrissata* group; antennae small; arista bare, swollen at base, and very short, being slightly shorter than the width of frons at above antennae; cheeks narrow, about one-sixth the eye height; marginal bristles moderately strong; vibrissa indistinguishable.

Mesonotum with three pairs of dorso-centrals, the length of these slightly decreasing anteriorly, discal hairs very numerous, closely placed and not regularly arranged in rows; the pair of bristles between posterior dorso-centrals absent; pleurae and scutellum normal.

Abdomen short, broad at base, tapering very much to apex, its out-

line subtriangular; hypopygium very small; surface very distinctly hairy.

Legs normal, the posterior mid-tibial bristles absent.

Wings with costa to fourth vein; inner cross-vein at distinctly beyond end of first vein and at three-fourths from base of discal cell; outer cross-vein at about half its own length from inner; last section of fifth vein subequal with penultimate section; veins 3 and 4 very distinctly divergent. Length, 2.5 mm.

Locality: Albany, New York, April 28, 1913, reared from *Taraxacum densleonis*, dandelion. Received from Dr. E. P. Felt, New York State Entomologist.

Three males and one female reared by Mr. D. B. Young, after whom I take pleasure in naming the species.

Type and *allotype* in New York State collection. *Paratypes* in Illinois State Lab. Nat. Hist. collection.

Since submitting this paper for publication, the writer has taken a single specimen of this species at St. Joseph, Illinois, May 17, 1914.

This species will run down to *websteri* Malloch in my synoptic table, but may readily be separated by the much less strongly bristled orbits and the produced mouth-margin. The female of this species may be mistaken for one of the group which has the mouth-margin produced and the male with a conspicuous group of hairs on the vibrissal angle, but none of the species described in that group have more than two pairs of dorso-central bristles. One specimen of *youngi* has four pairs of dorso-centrals in the series before me, but this is abnormal, as in other respects it is identical with the type. The female has the orbits much less hairy, the orbital bristles much more distinct (3), and the mouth margin very much produced.

***Agromyza dubitata* Malloch.**

In my paper in the *Annals*, I inadvertently left the name *californiensis* as that of the species with which I compared *dubitata*. This was due to the fact that I considered, at the time I wrote that description, that the specimen mentioned in the last paragraph dealing with *setosa* Loew was a distinct species and had given to it the name *californiensis*. I subsequently decided to allow this specimen to stand as *setosa*, but

unfortunately I did not change the wording under the name *dubitata*. The specimen with which I compared *dubitata* has only three distinct pairs of dorso-central bristles, hence my locating it in front of *dubitata*. In other respects the description of the latter may be compared with that of *setosa*.

I have to thank Dr. S. A. Forbes and Dr. E. P. Felt for permission to publish the descriptions of the new species included in this paper.

The Origin of Oligotropism (Hymen.).

By JOHN H. LOVELL, Waldoboro, Maine.

Certain statements recently made by Mr. Robertson in regard to the origin of oligotropism (Ent. News, 25: 67) call for brief consideration.

No evidence is offered to support his earlier assertion that *Epeolus* is a parasitic genus. As regards *Tricpeolus donatus* the writer stated that he had taken it on the Compositae only in this locality.

Herman Müller, notwithstanding his great experience as a florocologist, did not foresee the existence of the oligotropic habit. A discovery in retrospect often offers little difficulty. Thus Huxley writes: "My reflection when I first made myself master of the central idea of the 'Origin' was 'How extremely stupid not to have thought of that!'" (Life and Letters, 1: 183.)

It is manifestly futile for Robertson to quote statements of the writer, and merely express difference of opinion. This mode of argument is not common in scientific papers.

Robertson assumes the existence of competition. He says, "My view is that the bee fauna is all that the flora will support." This I do not admit, on the contrary I believe that it can be shown that only a part of the available flower food is gathered by bees. The commonness of an insect species does not depend alone on the quantity of food obtainable, e. g., occasionally the forest caterpillar (*Heterocampa guttivitta*), which feeds on the leaves of deciduous trees, appears in count-

less numbers, defoliating acres of the woodlands and apparently threatening the entire destruction of the hardwood forest; but it speedily disappears again and becomes so rare that its presence is unnoticed. The size of the bee fauna is likewise limited by other factors than the food supply.

It is desirable to consider a few specific instances where there is unquestionable evidence of a surplus of flower food. In Riverside County, California, the orange bloom secretes nectar so freely that it drips upon the clothing of the pruners, and at the end of a day's cultivating in the groves it is necessary to wash the horses and harnesses. Large quantities are lost each year for want of bees to collect it. Hundreds of acres of the sandy coastal plain of Georgia are covered with the bushes of the common gallberry (*Ilex glabra*). It remains in bloom for about a month, the secretion of nectar is constant and but little affected by the weather; but, according to J. J. Wilder, this sea of flowers is not frequently visited by insects. Immense quantities of fine honey are lost annually because there are no bees to gather it; furthermore it is not easy to overstock a gallberry region with the domestic bee, and in one instance 362 colonies did nearly as well as 100 previously. A conservative estimate by Iowa apiarists of great experience places the possible production of honey in that State for a single year at 60,000,000 pounds. The average moisture content of honey is 17.59 per cent., while that of nectar is not far from 75 per cent., so that the weight of the nectar would exceed that of the honey fourfold (Browne, C. A., "Chemical Analysis and Composition of American Honeys," U. S. Dept. Agr., Bur. Chem., Bull. 110, p. 45). This estimate, of course, does not take into consideration the nectar consumed by anthophilous insects other than the honey bee. If a region were already stocked to its fullest capacity with bees, it is clear that it would be impossible to establish a large apiary containing millions of bees, storing twenty or more tons of honey, consuming perhaps twice as much more, and requiring enormous quantities of pollen for brood-rearing. It will be remembered that the honey bee does not usually fly more than two miles from the apiary.

It would be easy to multiply examples in the case of buckwheat, basswood, tupelo, raspberry, heartsease and golden rod, and the extra-floral nectaries of cotton and *Cassia chamaecrista* in the Southern States. Certain plants, as *Bidens aristosa* in the lowlands of the Mississippi, fairly carpet large areas with their myriads of flowers. Fruit growers have learned from experience that the wild bees are wholly insufficient to gather the pollen and nectar of extensive plantations of fruit trees, berry bushes and cranberries; and effective pollination is secured only by the establishment of apiaries of the domestic bee. An immense quantity of pollen, which can be used by bees in emergencies, is produced by anemophilous plants, as the Amentaceae, elms, grasses, sedges, rushes, and a variety of coarse homely weeds. Occasionally honey bees by thousands do resort to anemophilous flowers for pollen; and much less frequently, because their necessities are less, the solitary bees. Many plants have probably remained wind-pollinated, while others formerly entomophilous have wholly or in part reverted to self-fertilization or anemophily in the absence of sufficient pollinators.

In none of his articles has Robertson ever presented satisfactory evidence of existing competition for flower food; and in reply to my earlier paper he now advances the hypothesis that oligotropism originated at some indefinite past time in the evolution of the long-tongued pygidial bees and Andrenidae, etc., from the competition of the former with the Bombidae and of the latter with the Halictidae. This highly imaginary supposition can not be supported by historical data, and would appear to be neither probable nor necessary. The polytropism of *Halictus* is the result of its peculiar economy. The impregnated females hibernate during the winter and appear the following spring; while the new generation flies during the latter half of the season. This economy has no special advantage for *Halictus* is greatly surpassed by *Andrena* in both species and individuals; while *Sphécodes* which has essentially the same economy as *Halictus* is represented by comparatively few species and individuals. It is an advantage for

a social bee to maintain its organization throughout the season; but for a solitary insect it is desirable that it mate and deposit its eggs as soon as possible. The longer the female flies before this happens the greater the probability is that she will be destroyed by some one of many causes. There are numerous other insects besides bees which have a short term of flight. A solitary bee, which like *Halictus* flies throughout the season, and of which the adult females pass the winter dormant is evidently exposed to more dangers than a species which passes the larger part of the year in an immature state in its burrows. Since many polytropic bees have either a short term of flight, or one which does not exceed 100 days, it is clear that a shorter term of flight is not necessarily correlated with oligotropism.

If severe competition did exist among the solitary bees for flower food, the oligotropic habit would not be desirable. It is not an advantage for a bee to restrict its visits to one kind of flower unless it is always certain to obtain the food supply it requires; otherwise it is clearly at a disadvantage as compared with the polytropic species. If severe competition is induced by artificial means, as by overstocking a locality, then the oligotropic bees will either tend to disappear or become polytropic. The small number of oligotropic bees reported from central Europe is noteworthy. If, however, a very common flower yields a surplus of food then a bee with a period of flight nearly coinciding with the period of inflorescence would save time and labor by restricting its visits to this species; and since bees instinctively learn from observation it would naturally be expected that the oligotropic habit would be formed. To some extent, at least, Robertson recognizes the correctness of this inference in the case of a part of the oligotropic visitors of the Compositae. He says, "It is not so surprising that some of these are exclusive when we consider that at their maximum the Compositae form 34 per cent. of the indigenous flowers." (Can. Ent., 42:327.) Why, indeed, should the nest-building bees, which restrict their visits to the great tribes Astereae and Heliantheae do otherwise?

From the very beginning an oligotropic bee saves time and labor, and later may enhance this advantage by learning "to manipulate the pollen better than other bees."

In a previous paper I have reviewed the oligotropic species of Wisconsin *Andrena*, and have showed that there is no evidence that they have acquired this habit in competition for flower food. (Graenicher, S., "The Relations of the Andrenine Bees to the Entomophilous Flora of Milwaukee County," Trans. Wis. Ac. Nat. Sci., 15:89-97.) Six vernal species, including the two earliest on the wing, are oligotropic to *Salix*, a very widely distributed genus producing a great abundance of pollen and nectar. The willow aments are also visited by all the vernal polytropic species, but their average time of flight is 33 per cent. longer than that of the oligotropic species. Of the eleven autumnal Andrenid species ten, or in view of the limited distribution of *A. parnassiae*, practically all are oligotropic to the Compositae. The single exception, *A. parnassiae*, occurs only at Whitefish Bay, Lake Michigan, where it is oligotropic to *Parnassia caroliniana*, a plant very common in that locality. Since the flower is widely distributed, while the bee is local, evidently the former has not determined the habitat of the latter. These figures certainly indicate that the adaptation of the vernal oligotropic species to the Salicaceae and of the autumnal species to the Compositae is determined by the character of the flowers. In a similar manner honey bees restrict their visits almost exclusively during the period of inflorescence to *Solidago*, which yields immense quantities of nectar and pollen; otherwise they would suffer great loss. If their flight were synchronous with the blooming period they would become oligotropic to the golden rods.

An examination of the characters and habits of the genus *Perdita* should throw some light on the origin of oligotropism. This large genus of bees is confined to North America and includes not far from 150 described species and varieties, most common in the arid regions of New Mexico. "Practically all are oligotropic," says Cockerell (*Psyche*, 18:154.) Graeni-

cher also says, "All of the species so far as their habits are known are oligotropic" (Can. Ent., 46: 51.)

"The species are mostly very small." The length seldom exceeds 6 mm., and in some species is only $2\frac{1}{2}$ to 3 mm. "They do not take long flights." So far as my observations go, they settle quickly and may be easily captured without a net. A part of the species are vernal; but the majority fly in late summer and autumn, and many visit the Compositae. A very large number have been found in only one State, approximately 74 in New Mexico (34 in the Mesilla Valley), 11 in Texas, 3 in Arizona, 14 in Colorado, 3 in Nevada, 2 in New Jersey, 1 in New England, and 6 in Mexico. About a dozen have been reported from more than one State, *P. octomaculata* of the East having the widest distribution. Oligotropism is as fully developed or, as the data available show, more pronounced, where there is only one or few species as where there are many. This habit cannot, therefore, be dependent on existing competition between the different species.

Many flowers are visited by more than one species of *Perdita*; *Salix* by 2; *Prosopis* by 2; *Mentzelia* by 1 at Santa Fe, and 2 others at Albuquerque; *Gutierrezia* by 6; *Solidago* by 4 in Colorado, by another in New Mexico, and in New England by a sixth species; while *Bigelovia wrightii*, which is "wonderfully attractive to many kinds of insects" furnished 12 species, etc. This behavior on the part of so many species of *Perdita* and other insects is very similar to that of higher forms of life when they gather at some feeding ground where there is a superabundance of food. The flowers visited by these bees occur in immense profusion and include the best honey plants of this country, as *Salix*, *Solidago*, *Cleome*, *Prosopis*, *Helianthus*, *Verbesina*, *Bidens aristosa* and *Monarda punctata*, a most valuable plant to beekeepers. It is noteworthy that we find these flowers also visited by oligotropic bees belonging to other genera.

The presence or absence of many species of *Perdita*, especially in the case of the Compositae, is determined by the length of the tongue. Cockerell states that the length of the

tongue appears to have increased or decreased according as the total size of the bee has increased or decreased, not to meet special requirements. Species of *Perdita* visit the flowers of both *Verbesina* and *Bigelovia*, but the species on the flowers of the former are much larger than those on the latter. The species of *Perdita* on *Gutierrezia* are still smaller than those on *Bigelovia*. The visitors of the Compositae according to Graenicher, are determined by tube-length more than by any other character of the flower ("Wisconsin Flowers and their Pollination," Bull. Wis. Nat. Hist. Soc., 7: 42.) Thus it is the tube-length of the flower, not competition, which is the factor limiting the visits of many species of *Perdita*. The facts related, as well as many others, are well in accord with the views of the writer. (On *Perdita*, see Cockerell, "The Bees of the Genus *Perdita*," Pr. Ac. Nat. Sci. Phil., 48: 25-107; "Notes on New Mexican Flowers and their Insect Visitors," Bot. Gaz., 24: 104-6; "A List of the Bees of the Genus *Perdita*," Psyche, 18: 134-43. Also Graenicher, "Wisconsin Bees of the Genus *Perdita*," Can. Ent., 46: 51-7.)

The female inquiline bees do not gather pollen and nectar for brood-rearing, but like the males of the nest-builders require only nectar for themselves—the males of the honey bee are even unable to feed themselves. Under these circumstances it should not be expected that they will exhibit the same constancy to flowers as the brood-rearing species. Nevertheless a number of the parasitic bees with a short term of flight visit wholly or largely the Compositae, and under Loew's definition would be called oligotropic species. This is of great interest since it is not claimed that *they* have acquired this habit as the result of competition.

According to the theory proposed by the writer certain bees have become oligotropic because of the direct advantage gained, combined with the fact that their flight was synchronous, or nearly so, with the period of inflorescence of the plant to which they restricted their visits. This theory offers an explanation of the rise of oligotropism by the observation of existing conditions. There may be and often are accessory fac-

tors, but they are of secondary importance. Robertson concedes all that is required, when he says, "The average flight is shorter and there are more of them with a short flight." A large number of oligotropic bees are of small size, as has been pointed out in the case of *Perdita*. I believe that I have sufficient evidence to establish my statement that *Halictoides novae-angliae*, a monotropic visitor here of the pickerel weed, has a weak flight. I have observed hundreds of these bees during a series of years, but I have never seen them fly far nor have I ever taken them on any other flower. But to quibble over minor details seems unnecessary in the absence of any evidence of severe competition among the solitary bees for flower food.

A Locustid Laying Eggs (Orth.)

On October 24, 1900, I observed at Annapolis, Maryland, a very common locustid ovipositing in a hollow weed. It first made an opening with its strong mandibles, slipping the ovipositor through it, then laying. An opening was made for each successive egg.—A. A. GIRAULT.

Comstock Memorial Library Fund.

Exercises in connection with the presentation of the Comstock Memorial Library Fund to Cornell University, on the occasion of the retirement of Professor John Henry Comstock at the close of forty-one years of active service, were held on Saturday, June 13, 1914, at three o'clock, in the Assembly Room, Roberts Hall, Cornell University. Addresses were made by Professors S. H. Gage, L. H. Bailey, and W. R. Lazenby, and by Dr. L. O. Howard, and a letter from President David Starr Jordan was read by Mrs. Ruby G. Smith. The memorial was presented by Prof. J. G. Needham, accepted by Prof. Comstock, presented by him to Cornell and accepted on behalf of the University by President J. G. Schurmann.

Proposed Monument to J. Henri Fabre.

A public subscription, under the patronage of M. R. Poincaré, President of the French Republic, has been instituted to purchase Harmas, the residence of J. Henri Fabre, to convert it into a museum and to erect a monument to him at Sérignan. The appeal, which has been widely distributed, says: "In respectful admiration for the world-wide work of the entomological *savant* your co-operation and subscription are solicited to aid in perpetuating the memory of the most modest and most genial of workers. The assistance of yourself and of all friends of science is counted on for a work whose sole end is the glorification of Science and of Letters." Subscriptions should be sent to M. Henry de la Paillonne, Mayor of Sérignan, Vaucluse, France. The honorary committee on this project includes, among others, Professors Perrier and Bouvier of the Museum of Natural History at Paris, Dr. G. V. Legros, biographer of Fabre, and M. Rostand, the famous dramatist.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., JULY, 1914.

What is a Species?

Linnaeus wrote, in section 157 of his *Philosophia Botanica* (1750):

There are as many species as the Infinite Being produced diverse forms from the beginning; which forms, according to the fixed laws of generation, produced more, but always like themselves. Therefore, there are as many species as diverse forms or structures occur to-day.

Many species, as established by Linnaeus himself, were divided into several species, some of which were referred to one genus, some to another, by his successors, even in the first half of the nineteenth century. Prof. Poulton, in his presidential address to the Entomological Society of London in 1904, gave many illustrations of the divergences of opinion in the separation of species by the structural or form criterion.

In the latest number of the *American Naturalist* (June, 1914), Prof. J. H. Gerould treats of Species-building, largely with reference to his own breeding experiments with the Sulphur Butterflies. He calls the breeding-true criterion, the "always like themselves" of the Linnean dictum, "an unverified dogma." He thinks

The erroneous idea that Linnean species are homogeneous, well-defined groups of equal importance has done much to retard progress in the experimental study of evolution. The limits of a species are often arbitrary, depending ultimately upon the temperament of the describer, and frequently based upon ignorance of the nearest allies of the individuals described, living in other parts of the world.

The most definite criteria of species, viz.: that specific characters are constant and that hybrids of Linnean species are infertile *inter se*, are only approximately correct

Like all things else, our ideas of what constitutes a species change and will continue to change. As a consequence, the work of the taxonomist, the systematist, will never end as long as animals and plants exist. The time never will come when the status of every living thing will be definitively estab-

lished. Monographic revisions will pile on top of monographic revisions and the end will not be yet. The application of the tests of breeding to all supposed species will be a long and tedious task. Type and neotype will not suffice to determine what a species is, when the experimental method is in full possession of the field, and to-day's problems of nomenclature are as nothing to those that will then arise!

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

More Nomenclatorial Notes on Trypetidae (Dipt.).

Since the publication of my "Nomenclatorial Notes on the Dipterous Family Trypetidae" in the NEWS for June, pages 275-279, I have seen a paper by Dr. Hendel in the Wiener Entomologische Zeitung, xxxiii, 73-98, 1914, entitled "Die Gattungen der Bohrfliegen," which is a synoptical table of the genera of the world, with their type-species. In this Dr. Hendel makes *Phorellia* Desv. (1830) equal to *Spilographa* Lw. (1862). This should be *Forellia* Desv. (1830) equal to *Spilographa* Lw. (1862) equal to *Phorellia* Rond. (1870), that is, if Desvoidy's species can be recognized. His (Hendel's) *Ditricha* Rond. (1856) should be *Dithryca* Rond. (1856) as originally proposed, and his *Hoplogaster* Rond. (1856) is evidently meant for *Oplochaeta* Rond. (1856). Both of these are recognized as part of *Carphotricta* Lw. (1862). *Ditricha* Rond. (1870) is a synonym of *Urellia* Desv. (1830). *Paracantha* Coq. (1890) is recognized as distinct from *Oplochaeta* Rond. by the presence of black facial spots. He errs in saying the third vein in *Paracantha* is bristly. It is entirely bare, which character may be used in separating it from *Oplochaeta* Rond. For *Euribia* Meig. (1800) he gives *arnica* Linn. as the type species, but as Coquillett in 1910 made *M. artemisiae* Fab. the type species, Hendel's designation is invalid. This is another instance showing the uncertainty of the status of Meigen's 1800 genera.—E. T. CRESSON, JR.

A Note on *Argynnis laurenti* Skinner (Lepid.).

IN the ENT. NEWS, vol. xxiv, p. 450, 1913, Dr. Skinner describes under the above name an *Argynnis* from Silver Lake, Utah. We greatly fear that this so-called new species is identical with *kriemhild* Strecker, described and figured in the Ruffner Report, p. 1854 (1879), from Rio Florida, Colo. Strecker also mentions other specimens from

Utah and Arizona. We have a specimen from Utah which has been compared with Strecker's type and marked *exact*; this agrees extremely well with Dr. Skinner's description, especially with reference to the sinuate subterminal black line above and dot at base of secondaries, and the absence of silver markings below. We have other specimens from the vicinity of Provo, Utah; Beaver Canon, Idaho, and Yellowstone Park, Wyoming.

Kriemhild Stkr. is at present listed as a variety of *epithore* Bdv., but in our estimation it should stand as a distinct species with *laurenti* Skin. as a synonym.—WM. BARNES, M.D., and J. McDUNNOUGH, Ph.D., Decatur, Ill.

Strecker's *kriemhild* was described from a female according to the description and was compared with *epithore* Bois. He mentions having examples from the Rio Florida, Colorado, from Arizona, and a female specimen mentioned on page 117 of his Catalogue as *bellona*, var. b. Utah. In his list of types (Lep. Rhop.-Hct. suppl. 3) he mentions under *kriemhild* two males from the Rio Florida, Colorado (McCauley), one male, Utah; one female, Arizona.

I wrote to Mr. W. J. Gerhard, Curator, Department of Entomology, Field Museum, Chicago, in relation to the matter and his reply is as follows: "On examining the material under the name *Argynnis kriemhild* in the Strecker collection I found three specimens all marked original type and with the following data: One male, Utah (Johnson); one female, Rio Florida, Colorado (McCauley); one female, Arizona (Neumoegen). From this it is evident that the female from Utah, which he mentions in his Catalogue, either has been lost, or the sex of the specimen was originally wrongly determined. Although he apparently discovered his error when he published the list of types in his collection, nevertheless he makes a similar error when he calls his Colorado specimen a male."

I sent Mr. Gerhard a specimen of *laurenti* and he says: "I have compared your specimen carefully with the three types of *kriemhild* and have not been able to find the least difference among them. Your specimen, which is just a little fresher than ours, agrees with the types spot for spot, as well as in size and color. It looks very much as though your name *laurenti*, or rather species, must be regarded as a synonym of *kriemhild*."

Mr. W. H. Edwards in his Catalogue (1884) put *kriemhild* as a variety of *epithore* and it has so remained until the present time. Synonyms are unfortunate, but sometimes good follows the evil as we live and learn. This little study shows the necessity of a single type and I propose for the type of *kriemhild* Strecker the male specimen from Utah (Johnson).—HENRY SKINNER.

A Jubilee.

We extend to our fellow journal, *The Entomologist's Monthly Magazine*, our heartiest congratulations upon the fiftieth anniversary of its existence, June 1, 1914, and wish it continued success.

The *Magazine* was founded by E. C. Rye, H. T. Stainton, R. McLachlan, Dr. H. G. Knaggs and T. Blackburn. As one after another of these withdrew or deceased, their places were filled by others. McLachlan was the last survivor of the original board of editors and maintained his connection with the journal until his death on May 23, 1904.

The June, 1914, number contains an interesting sketch of the *Magazine's* history, with eight portraits of its founders and early editors.

Colias eurytheme Boisd. and its varieties (Lepid.).

The fixation of a type and the accurate illustration of types will make a considerable difference in our nomenclature and the standing of many species and varieties. *Eurytheme* has been placed as a variety of *chrysotheme* Esper and probably correctly so. Dr. Verity in his "Rhopalocera Palaearctica" has figured Boisduval's types (now in the Oberthür collection) of *eurytheme* Bd. and *amphidusa* Bd. *Keezwaydin* Edw. is a synonym of *eurytheme*, and *ariadne* Edw. is a synonym of *amphidusa*. Strecker, in his Catalogue of American Macrolepidoptera, page 83, describes ab. ♀ *flava*, destitute of every trace of orange. Dr. Verity (p. 273, pl. 49, fig. 41) describes ♀ ab. *flavescens*. If *eurytheme* is considered a variety of *chrysotheme* this would make *flavescens* a synonym of *flava*.

Californiana Menetries is doubtless a synonym of *eurytheme* or *amphidusa*. *Eriphyle* Edw. is a yellow form of which *hageni* Edw. is a synonym. *Intermedia* Ckll. and *autumnalis* Ckll. come in somewhere between the other names. How many names we shall have is largely a matter of opinion. The relationship of so-called species of *Colias* is not well understood. Even *philodice* and *eurytheme* may be forms of one species. In the mountains of North Carolina, they can only be told apart by the color, being either yellow or orange respectively.—
H. SKINNER.

Suggestions for the Bibliographical Dictionary of Entomologists.

Apropos of the editorial in the May NEWS: For Deppe localities see Ann. Mag. Nat. Hist., September, 1910, p. 284. At the New York Botanical Garden they have a system of large envelopes open at the top, in which they put all sorts of data relating to botanists. Each botanist has his envelope. Would not this be a good plan for entomologists? In this way much good material will accumulate for the future historian or biographer. The Philadelphia Academy would

be a good place to keep such a series of envelopes. Living entomologists might be asked to give lists of the places where they have collected. For most it would be no great trouble. I have in MS. a list of the new species described from my collections, with localities. Much information which does not require publishing might usefully be filed somewhere, where it could be got at when needed. The University of Colorado librarian has just published a complete list of writings of the U. of C. faculty from the beginning of the university to the middle of last year.—THEO. D. A. COCKERELL.

Notes on *Lycaena xerces*, *antiacis* and *polyphemus*. (Lep.).

Mr. J. C. Huguenin, of San Francisco, has lately sent me a nice series of freshly caught specimens of *Lycaena xerces* and *polyphemus*, and in addition there are a number of specimens in the collection of the Academy of Natural Sciences of Philadelphia, making in all forty specimens studied. In my opinion *xerces* and *polyphemus* represent but one species, *xerces* being the same as *polyphemus* with the black pupil of the white spots on the under sides of the wings absent. I have been unable to find any other difference.

Mr. Huguenin says the species has been abundant this year and on the second of April he took a large number of them. They were taken in the western district of the Twin Peaks, San Francisco, California. He remarks that they were caught in a very limited area, not more than two hundred square feet, and were flying in every direction among the big blue *Lupinus*. "*Antiacis* and *xerces* always fly together, and I am coming back to my old belief that they are only one species. For the last twenty-five years I always caught more *antiacis* than *xerces*, one-third *xerces* to two-thirds *antiacis*, but this year it is just the reverse, more *xerces* than *antiacis*." Mr. F. X. Williams, ENT. NEWS, xix, 476, 1908, also expresses his belief that the two are identical.

I prefer the name *polyphemus* as the specimens agree perfectly with Mr. Oberthür's figure of the type of *polyphemus* in Lep. Comparee, Fasc. 9, pl. 239, f. 2072. The species would stand as *Lycaena xerces*, Bd. Ann. Ent. Soc. France (2), 10, 296, 1852, with *polyphemus*, Bd. Ann. Ent. Soc. Belg., p. 48, 1869, as a variety. If *antiacis* and *polyphemus* prove to be the same thing, *antiacis* would have priority and stand as a variety of *xerces*.

It is possible that the difference in temperature to which the chrysalids are individually exposed during the winter in the mountains may cause the presence or absence of the black dot (pupil). Heat and cold will produce this effect on chrysalids in confinement as proven by Standfuss in experiments on *Vanessa antiopa* and *io*. *Antiopa* loses its blue spots and *io* its eye-spot (ocellus).—HENRY SKINNER.

Observations on an Insectivorous Larva (Lepid.).

The 7th of October, 1911, I went for one day's collecting in the Sacramento Gulch near Fairfax, Marin Co., California. It was very warm in this little gulch, or valley, and was very dry. The only vegetation was tarweed (*Hemizonia luzulaefolia*), which was in full bloom and grew to a height of two feet. But few butterflies were collected—4 *Anosia plexippus*, 2 *Pyrameis carye*, 4 *Lycæna acmon*, 3 *Colias*, and 4 *Junonia* (very pale in color); 1 *Papilio philenor* (very much worn), 2 *Chrysophanus helloides*, 9 Skippers, a few *Coenonympha*, 5 *Vanessa californica* (very plentiful); 2 *Hemihyalca* moths (very much worn), and 2 *Catocola aholibah* (or near) fresh.

A Noctuid moth (*Heliothis dispaccus*—determined by Dr. Skinner), was exceedingly plentiful flying about the gulch. Twenty-five were collected but not one of them was perfect, all being worn from flying about through the sticky tarweed, I presume. One caterpillar of the moth was found eating the tarweed. The larva was about one and one-half inches in length, a beautiful little caterpillar of a peculiar shade of green, with few hairs. The larva was placed in a breeding cage with the following larvae: *Pontia* (*Pieris*) *rapae*, *Pyrameis carye*, *Papilio philenor*, *Hemihyalca edwardsi* (a noctuid), and a few little moth caterpillars. The larvae lived in perfect harmony for two or three days. When one of the *Pontia rapae* larva pupated, it was attacked in the first stage of the process by the larva of *Heliothis dispaccus* and eaten until not a vestige was left. The next day two *Pyrameis carye* and another *Pontia rapae* pupated. The *Pontia* chrysalid was immediately eaten but the other two pupae were not attacked.

I attributed the carnivorous appetite of the *Heliothis* larva to lack of the proper food plant. To test this possibility another experiment was performed. On the 12th of October the same year I went to the same gulch and found another caterpillar of the same species. This time I took a good supply of the food plant (tarweed). The plant was placed in the breeding cage together with seven or eight larvae and the *Heliothis* larva was then put in. The larva ate the tarweed with relish. Some of the caterpillars turned to pupae at the same time. The only one attacked was the *Pontia rapae* pupa. The chrysalid was attacked in the same way as the two previous ones, the *Heliothis* larva, beginning at the point of the thorax, then eating its way down the dorsal part to the end of the abdomen, and from there to the head, taking a path around the edge of the chrysalid and finally eating all the remaining parts of the chrysalid, it taking five hours to complete the repast.

The next day the carnivorous *Heliothis dispaccus* larva descended from the top of the cage and entered the ground, forming a cocoon one

inch under ground. The pupal period lasted ten days. Two of the moths were raised in this manner.

Conclusions: That the larvae of the *Heliothis dispaccus* will, without being forced by lack of their food plant (tarweed), eat the chrysalids of *Pontia rapae* and apparently no other.—J. C. HUGUENIN.

Some Corrections in Names of South American Tetrigenae (Orth.).

In a paper on South American Tetrigenae by Bruner,* a few corrections of names are made necessary through an oversight of literature.† Some of these names with their proposed changes are as follows: The genus *Lophotettix* Bruner, l. c., p. 137, is preoccupied by Hancock's name of the same spelling, previously applied to a genus of South American Tetrigenae, recorded in the Transactions of the Entomological Society of London, p. 388, 1907. In place of Bruner's *Lophotettix* I suggest the name **Eutettigidea**, the type being *E. lineatus* Bruner. The type of the original *Lophotettix* Hanc., as already recorded, is *L. brevicristatus* Hancock.

Under the genus *Gladiotettix* Hanc., Bruner notes three species, namely: *turgida* Bol., *unicristata* Hanc., and *hancocki* Bruner. The two latter species belong to the genus *Lophotettix* Hanc., the species *Gladiotettix hancocki* Brun. being synonymous with the previously described *Lophotettix alticristatus* Hancock. The genus *Gladiotettix* Hanc. is restricted at present to one species, *G. turgidus* Bolivar.

The genus *Halmatettix* Hanc. is not mentioned by Bruner in this article, but he has plainly described it under the new name *Apteropedon* which necessarily falls as a synonym. Bruner's *Apteropedon apicale*, which forms his type, is also synonymous with the previously described *Halmatettix cristinotus* Hancock.

Under the genus *Sclerotettix*, l. c., p. 104, Bruner described five species. He has designated as the type his second species, *S. tibialis* Brun. The first species mentioned, *S. abbreviatus* Brun., appears from the description to be synonymous with *Crimisus lobatus* Hancock. It is also quite likely that he has confused the species *S. infuscatus* Brun. and *S. minor* Brun. with *Micronotus asperulus* Bol. and *Micronotus dubius* Hanc. respectively.

The genus *Prototettix* Bol., preoccupied, now *Liotettix* Bol., as given by Bruner, l. c., p. 122, is confined to Africa. It should be replaced by *Rytinatettix* Hanc. for the species he characterizes from South America.—J. L. HANCOCK, Chicago, Illinois.

* Ann. Carnegie Mus., vii, 1910.

† It is owing to Bruner's admitted oversight of my paper in the Trans. Ent. Soc. Lond., pp. 387-426, 1907, that the present corrections are suggested.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

- 1—Proceedings, Academy of Natural Sciences of Philadelphia.
 3—The American Naturalist. 4—The Canadian Entomologist. 5—Psyche. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 22—Zoologischer Anzeiger, Leipzig. 34—Proceedings, Iowa Academy of Sciences, Des Moines. 36—Transactions of the Entomological Society of London. 38—Wiener Entomologische Zeitung. 40—Societas Entomologica, Zurich. 50—Proceedings of the U. S. National Museum. 60—Anales, Museo Nacional de Buenos Aires. 65—La Feuille des Jeunes Naturalistes, Paris. 79—La Nature, Paris. 84—Entomologische Rundschau. 86—Annales, Societe Entomologique de France, Paris. 87—Bulletin, Societe Entomologique de France, Paris. 89—Zoologische Jahrbucher, Jena. 92—Zeitschrift fur wissenschaftliche Insektenbiologie. 119—Archiv fur Naturgeschichte, Berlin. 142—Report, Michigan Academy of Sciences, Lansing. 153—Bulletin, American Museum of Natural History, New York. 161—Proceedings, Biological Society of Washington. 166—Internationale Entomologische Zeitschrift, Guben. 176—Archiv fur Entwicklungsmechanik der Organismen, Leipzig. 185—Journal, Quekett Microscopical Club, London. 191—Natur, Halbmonatsschrift fur alle Naturfreunde. 193—Entomologische Blatter, Cassel. 216—Entomologische Zeitschrift, Frankfurt a. Main. 239—Annales, Biologie Lacustre, Brussels. 243—Yearbook, Department of Agriculture, Washington, D. C. 278—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. 324—Journal of Animal Behavior, Cambridge. 353—Arbeiten aus den Zoologischen Instituten der Universität Wien. 384—Archivio Zoologico Italiano, Napoli. 394—Parasitology, Cam-

bridge, England. 407—Journal of Genetics, Cambridge, England. 447—Journal of Agricultural Research, Washington. 461—Bulletin de la Classe des Sciences, Academie Royal de Belgique, Brussels. 462—The Butterfly Farmer, Truckee, Cal. 467—Monthly Bulletin of the American Iron and Steel Institute, New York. 474—Ontario Agricultural College, Toronto. 475—Bulletin de la Societe Vaudoise des Sciences Naturelles. 476—Fortschritte der Naturwissenschaftlichen Forschung.

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89, xxxvii, Abt. f. Anat., 369-464. **Wenck, W. v.**—Entwicklungsgeschichtliche untersuchungen an tardigraden (*Macrobiotus lacustris*), 89, xxxvii, Abt. f. Anat., 465-514.

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Brethes, J.—H. de la America meridional, **60**, xxiv, 35-165. **Cockrell, T. D. A.**—Names applied to the N. A. bees of the genera *Lithurgus*, *Anthidium* and allies, **50**, xlvii, 87-94. **Crawford, J. C.**—H., superfamilies Apoidea and Chalcidoidea, of the Yale-Dominican expedition of 1913, **50**, xlvii, 131-34. **Crosby & Leonard**—An egg parasite of the tarnished plant bug (*Lygus pratensis*), **4**, 1914, 181-2. **Forel, A.**—Fourmis d'Argentine, du Bresil, du Guatemala & de Cuba, **475**, xlix, 203-50. **Gaige, F. M.**—Description of a n. subsp. of *Pogonomyrmex occidentalis* from Nevada, **161**, xxvii, 93-6. **Jorgensen, P.**—Las Tenthredinoidea de la Republica Argentina, **60**, xxiv, 247-88. **Morley, C.**—A monograph of the genus *Joppidium* (Ichneumonidae), **9**, 1914, 137-41. **Rohwer, S. A.**—Descriptions of two n. gen. of parasitic H., **5**, 1914, 79-81.

A TEXT BOOK OF MEDICAL ENTOMOLOGY. By WALTER SCOTT PATTON, M.B. (Edin.), I. M. S., King. Inst. of Preventive Medicine, Guindy, Madras, and FRANCIS WILLIAM CRAGG, M.D. (Edin.), I. M. S., Central Research Inst., Kasauli, Punjab. Christian Literature Society for India. London, Madras, Calcutta, 1913. (Price, one pound one shilling.)

This is a large octavo volume of 764 pages, 89 plates and some text-figures. Some idea of this extensive work may be obtained from a brief mention of the contents. Anatomy and physiology, general structure, internal structure (pp. 1-93). Diptera, Orthorrhapha, Nematocera, Brachycera, Cyclorrhapha, Pupipara (pp. 94-404). Siphonaptera (pp. 405-434). Rhynchota (pp. 435-478). Anoplura (pp. 479-527). Acarina (pp. 528-681). Pentastomida: Linguatulidae (pp. 682-698). Eucoppeoda: Cyclops (pp. 699-705). Laboratory technic (pp. 706-711). Relations of Arthropoda to their Parasites (pp. 712-726).

The authors mention the difficulties the medical and veterinary officers have in the tropics to obtain the necessary literature, which is scattered in many publications, thus making such a work essential. "With the advent of journals specially devoted to the subject the current literature has now become available and it is possible to keep one's knowledge up to date." The present volume is to give a working foundation of what has preceded in the older and more scattered literature. The rapid increase of the literature of medical entomology and the recognition of its practical importance to humanity is well illustrated by this great contribution to the subject. It contains many original illustrations, especially relating to the anatomy of insects that transmit disease. Such a work will be of immense value to the medical man in the tropics or in any place not accessible to good special libraries, and even where libraries are available it is a great aid to have the essentials culled for one, as it saves valuable time.

The subject has developed in a few years into a special field of work and makes one realize that it is indeed the era of insects and they must be studied from every viewpoint. The systematist, the economic student in relation to plant life and other commodities, have struggled with the vast hordes of insects and now the medical entomologist comes in for a large share of the general burden. A few years ago our wildest dreams would not have contemplated a work of the magnitude and character of the one here noticed.—HENRY SKINNER. (*Advertisement.*)

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of March 18, 1914, at the home of H. W. Wenzel, 5614 Stewart Street, Philadelphia. Eleven members were present. President H. A. Wenzel in the chair.

Mr. Daecke said he had sent his *Lachnosterna* to Mr. John J. Davis, a specialist in that group, for verification and found he had some wrongly determined. The specimen in the New Jersey list known as *parvidens* LeC. from Manumuskin, June 23, 1902, should be placed under *aemula* Horn, making now two specimens from New Jersey, the other being DaCosta, June 4, 1905, beaten from a pine tree. The *rugosa* Melsh. record from Merchantville, March 15, should be placed with *luctuosa* Horn, making also two records of this species, the other being Buena Vista.

Mr. Laurent said that on July 5, 1913, previous to a heavy thunder shower, it became so dark that one could not see to read. Looking from the window he saw numerous bright red lights of some species of Lampyridae. The beetle was plentiful enough, but not having a net he succeeded in capturing only one specimen, which proved to be *Photinus pyralis* Linn.

Mr. Kaeber said he had gotten some small twigs of wild cherry at Lester, Delaware County, Pennsylvania, in January, containing many pupae, and upon cutting open one of the stems on February 14th had found an imago of *Dysphaga tenuipes* Hald. (Col.).

Adjourned to the annex.

Meeting of April 15, 1914, at the same residence. Nine members were present. President H. A. Wenzel in the chair.

Mr. Kaeber said since the last meeting he had reared more specimens of *Dysphaga tenuipes* Hald. (Col.), and that the first two had brown elytra with dark spot and the next two reddish black elytra and black thorax.

Mr. Wenzel exhibited wood with larvae of *Prionus* (?) and also burrows of a species of bee. Recorded two specimens of *Chrysobothris convexa* Fall from Chisos Mts., Texas, July 19, one collected by J. W. Green and the other by H. A. Wenzel. The type locality for this beetle is Alamogordo, New Mexico.

Two newspaper articles were read, one on "A Seven-legged Curacao Bug" and one on *Amblychila cylindriciformis* Say.

Mr. Geo. M. Greene remarked on his card catalog of North American Coleoptera and pointed out some "oddities" in a recent paper.

Adjourned to the annex.

GEO. M. GREENE, *Secretary*.

OBITUARY.

DR. CARL CHUN, professor of zoology in the University of Leipzig, died April 11, 1914. Although chiefly distinguished, in recent years, for his oceanographical work as scientific leader of the German Deep Sea Expedition on the steamship *Valdivia*, he published in 1875 an elaborate paper on the structure, development and physiological significance of the rectal glands in insects. He was sixty-two years old.

MR. FRANK E. MOESER, a collector of Lepidoptera and a keen observer of their life histories, died at his home, 239 Guilford Street, Buffalo, New York, on May 15th, being forty-five years of age. His work, among the local Noctuidae especially, proved of interest, in that material brought to notice by Grote, when the latter was with the Buffalo Society of Natural Sciences, was again collected by him. He is survived by a wife, daughter and son.—H. B.

MR. AND MRS. H. H. LYMAN perished in the terrible disaster of May 29, 1914, when the Canadian Pacific steamship,

Empress of Ireland, foundered in the St. Lawrence River off Father Point, Quebec. Those of us whose latest personal association with both of them was at the Atlanta meeting of the Entomological Society of America, last December, feel the suddenness of their removal with especial keenness, remembering the eagerness with which Mrs. Lyman was looking forward to the visit to England so hopelessly prevented at its outset. To our Canadian colleagues we tender our hearty sympathy.

Henry Herbert Lyman was born at Montreal, Canada, December 21, 1854, and took the B.A. and M.A. degrees at McGill University in 1876 and 1880, respectively. He engaged in the drug business, eventually becoming senior partner of the firm of Lyman, Sons & Company and also president of The Lyman Brothers & Company, Limited, of Toronto.

Dr. C. J. S. Bethune wrote of him in the Report of the Entomological Society of Ontario for 1899 (p. 123):

When less than eight years old he began to take an interest in insects and to observe their ways, and when only twelve he started to form a collection, the precursor of what is now one of the finest collections of Lepidoptera in Canada. His first printed observation on insects appeared in the sixth volume of the *Canadian Entomologist* (1874) and showed that even in those early days he was engaged in the rearing of butterflies and moths, a work to which he has largely devoted himself ever since.

The scientific societies with which he was connected include the Entomological Society of Ontario (vice-president 1895-7, president 1897-9), and its Montreal Branch, the Entomological Society of America (fellow), the New York Entomological Society, Cambridge Entomological Club, Natural History Society of Montreal, the International Congresses of Entomology, and the American and British Associations for the Advancement of Science.

Mr. Arthur Gibson, Chief Assistant Entomologist of the Department of Agriculture of the Dominion of Canada, writes:

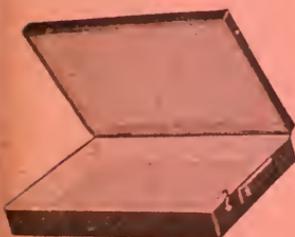
His death is a great loss to our Society, particularly to the entomological branch. He had been looking forward to continuing his entomological work, as in alterations recently made to his house [74 McTavish Street, Montreal] he had arranged for an entomological studio, greenhouse, etc., for studying life-histories.

H. S.

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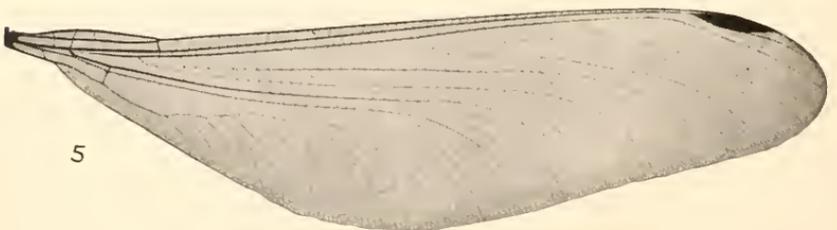
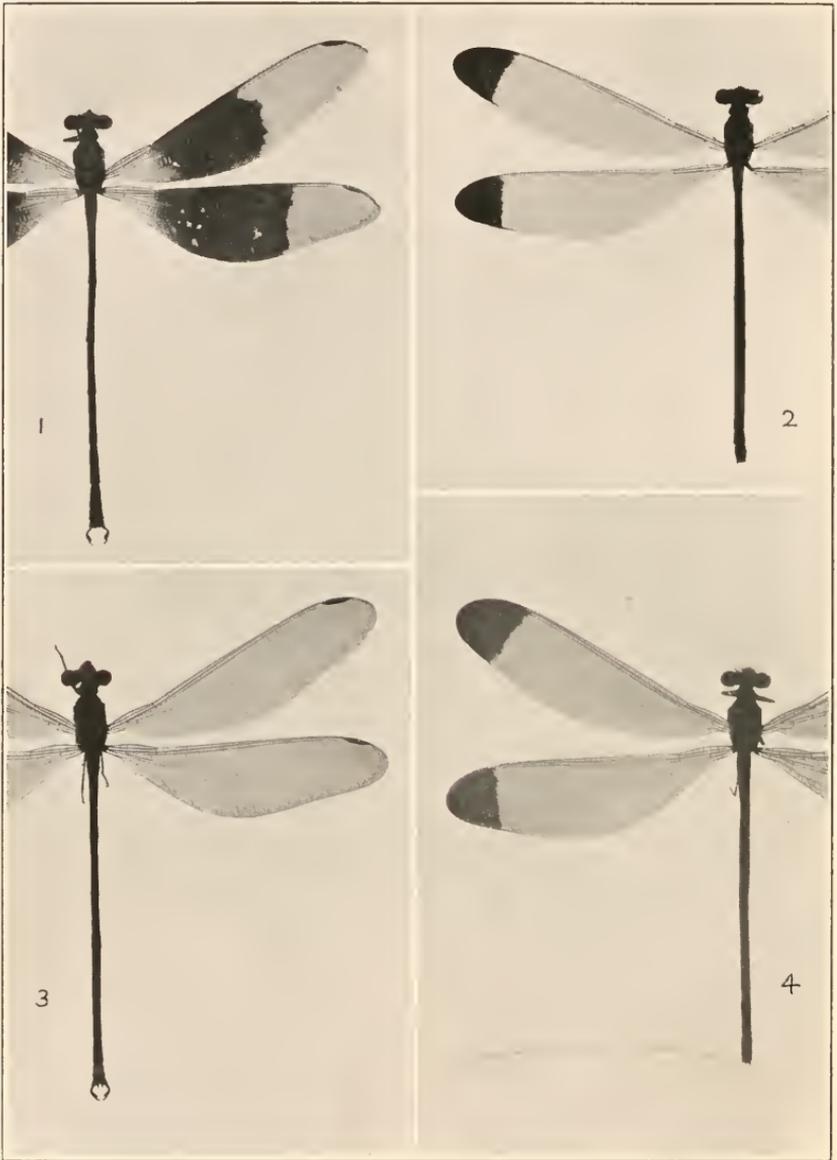
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Studies on Costa Rican Odonata.

V. The Waterfall-Dwellers: *Thaumatoneura* imagos and possible male dimorphism.

By PHILIP P. CALVERT, PH.D., University of Pennsylvania, Philadelphia, Pa.

(Plate XIV.)

HISTORY.

In June, 1897, the late Robert McLachlan, of London, described a new and remarkable dragonfly under the name *Thaumatoneura inopinata*. He introduced his description with these words: "At the recent sale of the collections formed by the late Mr. Reginald Cholmondeley, of Conover Hall, Shrewsbury, I obtained the few *Odonata*, solely on account of a large Calopterygine, which was evidently something unknown, but the remarkable nature of which I did not fully realize until after it came into my possession. The former owner of the collection valued insects and other natural productions, solely for their beauty or forms, and cared little for names, and nothing for localities, so I am unable to say whence this specimen came; but as the pin (or rather skewer!) was similar to those used for some other insects in the same collection which were Chinese or Japanese in origin, I hazard a conjecture that it may belong to the same region." In August,

1900, however, he was able to state that this insect belonged to the New World, as M. Martin possessed a specimen from Chiriqui, in Panama.

About 1903 Mr. C. F. Underwood collected at Carrillo, Costa Rica, six males of *Thaumatoneura* and sent them to London, where they were acquired by Dr. F. D. Godman, and sent to me for study. Four of the six were the *inopinata* of McLachlan with the middle of each wing crossed by a broad, dark brown band. The other two had the wings uncolored, wherefore they received the name *Thaumatoneura pellucida* (Calvert, 1904).

On June 23, 1909, the first day of our first stay at Juan Viñas, Costa Rica, our lepidopterological friends, Messrs. William Schaus and J. Barnes, gave us some Odonata which they had taken there for us, including some males of both *inopinata* and *pellucida* and two female *Thaumatoneurae*, so different from the males that it was impossible to determine to which of the two species they should be referred; they had the *tips* of all the wings dark brown. Thereafter, *Thaumatoneura* became for us one of the principal attractions of Juan Viñas, that delightful spot which, as readers of the NEWS are already aware, furnished us with the remarkable larvae of *Cora*, of *Mecistogaster modestus*, and of other species still to be described.

HABITATS AND HABITS.

Of all the localities in Costa Rica which we visited, Juan Viñas was the only one where we ever saw *Thaumatoneura*. We were not at Carrillo, but in many respects the Odonate fauna of this place, judging from Mr. Underwood's collection recorded in the *Biologia Centrali-Americana*, is very similar to that of Juan Viñas. The former is on the northern, the latter on the southeastern slope of the volcano Irazú and their respective altitudes are 300 and 1040 metres (980 and 3400 feet). *Thaumatoneura* must surely live in still other places in Costa Rica.

In our experience *Thaumatoneura*, as adult or as larva, was never more than a few yards distant from a waterfall and was most abundant within its spray. The sides of the canyon

of the Rio Reventazon at Juan Viñas descend steeply from 1200 to 760 metres (4000 to 2500 feet) at the river, and down the canyon side tumble many small streams and rivulets, often in cascades and in falls of different heights. Where there is slant enough the wet rocks nearby are draped with mosses, maiden hair ferns, begonias, dwarf Selaginellas, Tradescantias, a *Streptocarpus*-like plant, etc., or in quieter more sheltered places are Melastomes (*Miconia*), *Commelina*, etc. Only at three such falls did we ever observe *Thaumatoneura*, two of them at altitudes of about 3300 feet, the third at about 2500 feet. They were most abundant on the whole at one of the former two falls, one whose perpendicular height was the greatest of the three, perhaps 200-300 feet. We were puzzled why these insects should not be found also at other streams under generally similar conditions. An explanation of their absence from one of these streams, the little Rio Naranjo, is suggested in our diary: "At the Naranjo I saw a number of lizards from two inches to a foot in length and these possibly keep down the number of insects. At our two waterfalls [*i. e.* where we frequently found *Thaumatoneura*] we have seen no lizards."

We observed the imagos of *Thaumatoneura* in June (23-28), July 21 to August 3, September 28 and 29, when there was an evident decrease in their numbers; October 1 and December 2, 1909. In February (14-18), and March (21), 1910, none could be found, but they were again visible in April. In June, 1909, the males of *pellucida* appeared to be less numerous than those of *inopinata*. All the males of *Thaumatoneura* observed in July were pruinose, but two teneral females were taken on August 1.

"Males, at least, often remain on the same spot for a long time without moving—I should say for half an hour or longer. Females seem less persistent, but one I timed was ten minutes on the same bit of twig. Except in pairing males, the wings of both sexes, when at rest, are held in the vertical position, folded together but every now and then an individual will open and then close its wings once or several times in succession." "Standing at the bottom of the waterfall and looking up

through the spray and over the vegetation which carpets the almost perpendicular rocks, I could see the *Thaumatoneuras*—two species (*inopinata* and *pellucida*)—fluttering through the spray, chasing each other or alighting upon the rocks and plants. So heedless of the spray are they that it gathers in little drops on the wings or hangs suspended from the hind end of the body." (June 24, 1909).

"At the farther waterfall was one male each of *T. inopinata* and *T. pellucida*. I stayed here fully an hour during which there were periods of bright sunshine, but no more *Thaumatoneuras* came, and the two mentioned remained for long periods almost motionless on twigs until I caught them." (December 2, 1909).

Owing to the habit of *Thaumatoneura* of spending most of the time over vertical wet rocks, the capture of them was often only possible by climbing up on the rocks themselves, or by hanging with one hand to some long, dangling, nearby root or vine and with the other sweeping the net.

Pairing of *T. inopinata* was observed twice on June 24 and once on June 27; of *T. pellucida* once on July 30 and again on October 1. Notes made at the time on the behavior of *inopinata* are to the following effect: The male seeks and flies after the female and seizes her by her prothorax, his superior appendages being deeply inserted behind her prothorax and between it and the mesothorax, while his inferior appendages are applied against the dorsal surface of her prothorax (this from a pair which I caught and held in my fingers). After seizing the female, the male probably applies the ventral surface of his ninth abdominal segment to the ventral surface of his second abdominal segment to charge the vesicle of the latter with sperm; of this I am not entirely sure as I think I saw it but once and the operation itself occupies very little time. Male and female then assume the usual position of the Odonata in pairing. Different pairs of *inopinata* require different lengths of time to effect the attachment of the female to the male, one pair having made four or five attempts before this was accomplished, another pair effecting it at once. In one case on June 24, 1909, where I did not see the actual begin-

ning of mating, it was 3 P. M.; in the other case it began at 3.45 P. M. In both cases the male held his wings horizontal and expanded, the female had hers vertical and folded together. At the end of ten minutes the male released his hold of the female and at the same instant folded his wings together into the vertical position. The female, losing her attachment by her abdomen to the male, assumed in both cases a position about half an inch below the male resting on the same twig or rock on which he was. So the two remained for about four minutes. In the first case male and female then flew away at about the same instant, but not together, she to begin egg-laying. In the second case the female flew six inches or so away and began egg-laying while the male remained for at least ten minutes on the same spot (projecting rock) on which the pairing had occurred. In the case of June 27th, after pairing the male flew away leaving the female resting on the leaf which both had occupied.

No *pellucida* were observed pairing in June and the males of this species were less numerous than those of *inopinata*. On July 30, 1909, after some hours' watching, I saw a male *pellucida* and a female fly to a dead branch on the bank or side of the railroad cutting just west of the farther waterfall and about twenty feet above the tracks. There was no doubt that they were pairing, so it was highly desirable to capture them both. The steep bank was composed of reddish soil, loose stones and soft rock, and was wet from the rains. I climbed up as far as the steepness permitted, but the distance was still too great for the length of my net stick. After two attempts to lengthen it with branches, which chanced to be lying there, but which broke under the weight of the net, the umbrella was utilized for this purpose. Again I climbed the bank, but the soft earth gave way and collector, net and umbrella slid swiftly and separately to the railroad tracks. A second attempt had the same result. A third, made more cautiously, was so successful that the net was thrown over the accommodating pair which had lingered for at least ten minutes on the same branch and by gently dragging the net down over the bank I at last got the insects safe into my hands. Then it was that I realized for the

first time that this female was so like the females which we had seen and taken pairing with *inopinata* males that a minute comparison would be necessary to determine whether there was any difference between them or not. We saw no other pairs of *pellucida* until October 1, 1909, when one was seen and obtained at the same waterfall.

What we presumed to be egg-laying was watched in three or four instances on June 24. The female made the usual abdominal movements seen in the Zygoptera generally, that is those adapted for inserting the eggs into plant substances. Some of these movements were, however, over hard rock and it seems unlikely that any eggs were placed on it. At other times the movements were made against moss and roots. At times the female had her abdomen buried to half its length in the mass of wet moss. Pieces of roots and of moss in which the oviposition had apparently been made were carried to our room at Cartago and kept in water for months but we never obtained any larvae from them. The ovipositing female is not accompanied or followed by the male. Indeed once, on June 24, a female flew close to a resting male without attracting any response from him.

THE FEMALE.

We have three females of *Thaumatoneura* taken while pairing; one is that taken with *inopinata* male on June 27, 1909, the other two taken with *pellucida* males on July 30 and October 1 respectively. Nine other females were taken singly. All twelve females are compared in the accompanying table with respect to all the differences which I have been able to detect between the female of June 27 (No. 9) on the one hand, and those of July 30 (No. 11) and of October 1 (No. 12) on the other. It will be seen that these differences are very slight and that the positions of Nos. 9, 11 and 12 in the whole series are such as to render it unlikely that females of *inopinata* can be distinguished from those of *pellucida* by any of these features.

MALE DIMORPHISM.

This apparent lack of external characters separating the females pairing with *pellucida* males from that pairing with *in-*

COMPARISON OF THAUMATOCERA FEMALES ARRANGED IN ORDER ACCORDING TO THE RATIO $\frac{b}{a}$

	1 June 28	2 July 21	3 Aug. 1	4 Apr. 30	5 June 23	6 June 26	7 Aug. 1	8 May	9 June 27	10 June 28	11 July 30	12 Oct. 1
Length of left hind wing in mm. (<i>a</i>).....	45	48.5	49.5	49	49	49	49	50.5	46	47	49.5	48
Width of left hind wing at origin of M_2 , measured at right angles to costa, in mm. (<i>b</i>)..	10.5	11.5	12	12	12	12	12	12.5	11.5	12	13	13
Value of ratio $\frac{b}{a}$.....	.233	.237	.242	.245	.245	.245	.246	.247	.25	.255	.263	.27
Width of left hind wing at proximal edge of brown spot at tip, measured parallel to width <i>b</i> , in mm. (<i>c</i>).....	10.	10.5	10.5	10.	10.5	11.	10.5	11.5	9.5	10.5	11.	11.
Distance from tip of left hind wing to proximal edge of brown spot measured at right angles to <i>b</i> and <i>c</i> , in mm.....	9.	10.	8.5	8	9	10	9.5	10.5	8.	9.5	8.5	9
Point of beginning of two rows of cells between M_2 and K_3 with reference to the proximal edge of the brown spot at tip (front wings only).....	5 cells distal	distal	3 (R) 5 (L) proximal	1 (R) 2 (L) cells proximal	at (R) distal (L)	at	at	at (R) 1 cell proximal (L)	at	at	4 cells proximal	3 (R) 5 (L) cells proximal
Formulae showing how the increase in density of reticulation between M_1 and Cu_1 begins (front wings only).....	2,3,3,3, 3,3,3,3, 4... (R) 2,2,3,3, 2,3,3,3, 4... (L)	2,3,3,3, 3,3,3,3, 4... (R) 2,2,3,3, 3,3,3,3, 4... (L)	2,3,3,3, 3,3,3,3, 4... (R) 2,2,2, 3,3,3,3, 4... (L)	2,3,3,3, 3,3,3,3, 4... (R) 2,2,2, 3,3,3,3, 4... (L)	2,3,3,3, 3,2,3,3,4 (R, L)	2,2,3,3, 3,3,3,3, 4... (R) 2,2,3,3, 2,3,3,3, 4... (L)	2,3,3,3, 3,3,3,3, 4... (R) 2,2,3,3, 2,3,3,3, 4... (L)	2,2,3,3, 1... (R) 2,2,2, 3,3,3, 4... (L)				
Length of the abdomen (including appendages) in mm.....	50	50	51.5	54	55	54	52	53	51	53	54	53

* Taken pairing with *inopinata* ♂. † Taken pairing with *pellicida* males.

The year of No. 4 is 1910, of all others 1909.

opinata male suggests the query as to whether we are dealing with two or one species here. A number of species of Odonata are known (not to mention other groups) in which there is one form of male and two forms of females within the same species. Such are members of the genera *Ischnura*, *Anomalagrion*, *Ceratura*, *Agriocnemis* and *Neurothemis*, *Erythrodiplax umbrata* and *funerea*. While some of these so-called dimorphic females are explicable as due to differences in age, others can not be interpreted in that way. Can *Thaumatoneura* present an inverse case in which there are two forms of males and but one form of female in the same species? This leads us to consider the differences between the *pellucida* and *inopinata* males.

When I originally described *pellucida* male, I could find only two differences between it and *inopinata* male. One of these was the absence of any coloring on the wing, the other the presence of "a transverse pale citron band on nasus and on frons connecting the yellow genal spots," this band being absent in *inopinata* male. The pale citron of dried specimens, I now know, is pale blue in life. This diversity in the coloring of frons and nasus holds true for the majority of the present examples, but of the fourteen males of *inopinata* two have the pale band very well marked and three others have indications of some pale color on these parts. All fourteen *pellucida* males have the pale band. The *inopinata* males are slightly larger, average length of the abdomen 58.7, range 55-61 mm.; hind wing, average 47.6, range 45-49 mm. (14 specimens). *Pellucida*: Abdomen, average 57.25, range 52-61; hind wing, average 46.85, range 44.5-49.5 mm. (14 specimens). I have not been successful in finding any other differences in the imagos. There is no reason to think that the two forms represent age differences because no transitional individuals (so far as the presence or absence of the coloring of the wings is concerned) have been found. We have seen both forms emerge from the larval exuviae at metamorphosis, and both forms become equally pruinose on the body although so markedly different in wing coloring.

The seasonal distribution of our males is as follows: *In-*

opinata, June 23, 6 males; June 24, 2 males; June 26, 1 male; June 27, 1 male; July 21, 1 male; July 27, 1 male; December 2, 1 male; May 2, 1 male. *Pellucida*: June 23, 1 male; June 24, 2 males; June 26, 1 male; June 27, 1 male; July 22, 1 male; July 27, 1 male; July 30, 1 male; August 3, 1 male; September 28, 2 males; October 1, 1 male; December 2, 1 male; May 1, 1 male. This list gives the actualities, not the possibilities, of capture; on many occasions the insects were not molested as we wished to observe their habits and behavior. This list does show that both forms occur at the same times and, we may add, at the same waterfalls.

Among our exuviae of *Thaumatoneura* we have one from which we saw *inopinata* male emerge, another from which *pellucida* male emerged. A minute comparison of these two exuviae has failed to furnish any differences other than those due to injuries sustained by the larvae previous to transformation.

A definitive answer to the question raised on page 344 as to the relationships between the two male forms of *Thaumatoneura* to each other and to the apparently single form of female, can only be obtained from breeding experiments. As far as present evidence goes, I am inclined toward the dimorphic male hypothesis. If it prove to be true, *Thaumatoneura* would furnish a case more or less parallel to those described by Westwood (1839) for certain Staphylinidae, Leuthner (1885) for Lucanidae, and Skinner (1913) for *Lycaena pseudargiolus*.

ADDITIONAL DESCRIPTIVE NOTES.

Some additional notes on our Juan Viñas material of *Thaumatoneura* are added.

Description of the Colors of T. pellucida male, taken Dec. 2, 1909.

Description made immediately after death. Eyes dark brown, almost black. Each gena with a round yellow spot below the base of the antenna; frons between the right and left yellow spots pale blue as also is the nasus, but the fronto-nasal suture has a black line and black encroaches on each side of the nasus from below. Thoracic sutures and mid-dorsal carina lined with orange-yellow. A short occipital line, four small spots on the front prothoracic lobe and a pair of mid-dorsal spots on the middle prothoracic lobe are also orange-yellow.

The rest of the body is black, covered with pruinosity on labium, under and lateral surfaces of thorax, most of abdominal segment 1, a

large part of the dorsum of 2, a transverse basal ring on 3-7, sides of 8, much of 9 and 10, especially on the dorsum.

Legs yellowish, articulations and tarsi blackish.

The colors immediately after death of T. inopinata male, also taken December 2, 1909, agreed with those noted above for *pellucida*, including the pale colors of frons and nasus, but there was very little pruinosity except on the ventral surface of the thorax and on the posterior abdominal segments. The dark band on the wings varies somewhat in width; its proximal edge is at the nodus, its distal edge at the costa is from 16 to 20 mm. distad on the front wings, from 21 to 25 mm. distad on the hind pair. The male of May 1, however, has the proximal edge of this band 6 mm. beyond the nodus and the distal edge at 21 and 26 mm. from the nodus on front and hind wings respectively; the costal and radial spaces between nodus and the proximal edge of the band are more or less brown.

The colors of the body of Thaumatonera females (dry, I have no notes on living colors) are as in *inopinata* males. In none of them is a distinct pale band on frons and nasus present, such as can be seen plainly on the dried *pellucida* males; Nos. 2, 5, 6, 8, 10, 11 and 12, of the table on page 343, show traces of pale color on these parts. The markings at the tips of the wings are shown in Pl. XIV, Figs. 2, 4, and the dimensions of this brown area are given in the table just quoted. Dorsum of abdominal segment 10 with a median longitudinal carina; hind margin a little excised; appendages subequal to 10 in length, straight or nearly so, a little compressed, tapering to an acute apex, black. Ovipositor proper (gonapophyses of 8 + median gonapophyses of 9) reaching caudad not as far as the level of the hind end of 10, each lateral half having ten to twelve obliquely transverse ridges on its external (ectal) surface before the apex. Genital valves (lateral gonapophyses of 9) reaching caudad beyond the level of the hind end of 10, ventral edge of each in its caudal half hairy and denticulated, hind end emarginated, valvular process attached at the deepest point of the concavity and directed caudad and ventrad.

The variation in the number of antenodals is as follows, the numbers giving percentages of wings:

	14 <i>inopinata</i> ♂	14 <i>pellucida</i> ♂	12 <i>Th.</i> ♀
Front wings			
with 3	67.87	71.4	70.83
with 3 and rudimentary 4th	3.57	3.57	
with 4	28.57	25.0	25.0
with 2			4.16
Hind wings			
with 3	75.	71.4	62.5
with 3 and rudimentary 4th	3.57	7.1	
with 4	21.42	17.85	37.5
with 5		3.57	

In all cases the "rudimentary 4th" antenodal is a small stump projecting from the anterior side of the subcosta toward, but not reaching, the costa.

The relationships of *Thaumatoneura* have been discussed by McLachlan (1897), Needham (1903), Foerster (1909), and the writer (1902, 1913).

The larva of *Thaumatoneura* will be described in the next number of these studies.

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EXPLANATION OF PLATE XIV.

- Figs. 1 and 2. Male *Thaumatoneura inopinata* and female taken pairing at Juan Viñas, Costa Rica, June 27, 1909. x $\frac{3}{4}$.
- Figs. 3 and 4. Male *Th. pellucida* and female taken pairing at the same place, October 1, 1909. x $\frac{3}{4}$.
- Fig. 5. Right hind wing of *Th. pellucida* ♂, shown in Fig. 3. x 2 1-6.
- All five figures from photographs by Mr. H. A. Walters.

The Larva of *Papilio homerus* (Lepid., Rhop.).

By E. M. SWAINSON and HENRY SKINNER, M.D.

(Plate XVI, fig. 2.)

Papilio homerus, the largest American butterfly, one of the largest of the *Papilio* family, is said to be found only in the Island of Jamaica, West Indies.

The larva is very curious and differs from most of the caterpillars of the Papilionids in not having the two fleshy retractile tentacles upon the back of segment next the head. The color is green and brown; across the "neck" is a band of white, in shape something like a half moon, and on this band are spots of blue; in front of this is a band of brown with a spot at each end, in the centre of which is a line of pale blue. These spots look very like eyes when the larva is at rest. The caterpillar is about two and a half inches long. It generally rests on top of the leaf and is about the same color of green; this may account for its not being easily found as the tree is a lofty one. Five or six caterpillars will lie all together near the leaf stalk, and the eye-like spots on their heads give them the appearance of being on the watch for something.

One of us has published some notes on the occurrence of this species at Bath, Jamaica, in Volume I of the Journal of the

Institute of Jamaica. First noticed it about in October, 1890; very seldom see more than one at a time. October 14th caught a large specimen, $6\frac{1}{2}$ inches across. November 6th a friend captured a female specimen; she deposited 12 eggs of a light green color. 1891 first saw one in April; did not see another until July, and on the 17th caught a good specimen, 6 inches across; got this one up the Fountain Road. August 21st captured another in my garden. Since then have not seen one down here, but up Beacon Hill, two miles above Bath, on September 27th saw a poor specimen, but could not catch it. October 13th captured a good specimen, $6\frac{3}{4}$ inches across the wings; it was the largest *homerus* I have ever seen.

The larva is described by E. Stuart Panton in the same Journal, I, 375, 1893, from a larva sent by Mrs. Swainson. On p. 381 it is said that the food plant was doubtfully determined as the mahoe, *Hibiscus elatus*, var. *abutiloides*.

The larva was also described by C. B. Taylor in ENT. NEWS, V, 101, 1894. He says the food plant is a tree growing to a large size and of great height, bearing subovate leaves with long stalks, deep glossy green. The local name, "Water Wood"; botanical name unknown. A note by the then editor of the NEWS says the food plant is probably *Chimarrhis cymosa* Jacq.

Colonel Wirt Robinson* found what is probably the true home of this *Papilio*, at the summit of Cuna Cuna pass in the Blue Mountains. On July 13th he took fifteen specimens and between July 10th and 20th caught 44. His account of the journey after *homerus* is very interesting.

Our half-tone illustration is from a colored drawing of the larva made by Lady Blake.

Changes of Address.

Please insert in next issue of the NEWS my change of address from Lima, Peru, to U. S. National Museum, Washington, D. C., which will be in force after July 1st.—C. H. T. TOWNSEND.

I beg to announce my change of address from The California State Commission of Horticulture, Sacramento, California, to The Department of Entomology, University of California, Berkeley, California.—E. O. ESSIG.

*Ent. News XIV, 17, 1903.

A New Proctotrypoid Egg-parasite from the West Indies (Hym.).

By ALAN P. DODD, Nelson, via Cairns, Queensland.

Family SCELIONIDAE, Sub-family TELENOMINAE.

Genus *Phanurus* Thomson

Phanurus flavus sp. nov.

♀. Length, 0.80 mm. Golden yellow, the eyes and ocelli black.

Head transverse quadrate, scarcely as wide as the thorax. Thorax one-half longer than wide; mesonotum finely polygonally sculptured, without furrows. Abdomen as long as the head and thorax united; much narrower than the thorax, pointed ovate, twice as long as wide, second segment occupying almost the entire length; first and base of second segment striate.

Antennae 11-jointed; scape slender, equal to next four joints combined; pedicel slender, twice as long as wide; first funicle joint much narrower than the pedicel, scarcely longer than wide; second and third subequal, a little longer than the first; fourth very small; club 5-jointed, joints 1—4 quadrate, first joint small.

Forewings extending well beyond tip of abdomen, moderately narrow, hyaline, longest marginal cilia equal to one-half greatest wing width; discal cilia fine, moderately dense, arranged in about 20 rows; submarginal vein attaining the costa at about two-fifths wing length; marginal vein one-half as long as the stigmal, which is moderately long, rather oblique; postmarginal vein twice as long as the stigmal.

♂. Antennae 12-jointed, filiform, funicle joints 1-3 slender, subequal, twice as long as wide; 4-9 subequal, scarcely longer than wide; last joint as long as the pedicel.

(From several specimens, two-thirds inch objective, 1 inch optic, Bausch and Lomb).

Described from several specimens of each sex, on two slides, received from Dr. L. O. Howard, and labeled "360-1912. Bred from eggs of *Ormenis* sp. collected 19th Apr., '12. Rio Pedras, P. R. Thos. H. Jones." The host is a *Fulgorid*, and I know of no other *Telenomid* reared from leafhopper eggs.

Habitat.—West Indies (Rio Pedras, Porto Rico).

Types.—United States National Museum, No. 16364, 3 males, 2 females on a slide.

The Neotropical Tipulidae in the Hungarian National Museum (Diptera).—IV.

By CHAS. P. ALEXANDER, Ithaca, New York.

(Plate XV.)

Sub-family TIPULINAE, Tribe TIPULINI.

Genus *Macromastix* Osten Sacken.

Macromastix pygmaea sp. n. (Pl. XV, fig. 1).

Size small (wing of ♂ about 10.5 mm.); wings with *R*₂ obliterated; halteres very long and slender.

Male.—Length 8 mm.; wing, 10.3 mm.; antennae about 9.5-10 mm.

Palpi dark brown; frontal prolongation of the head brown, antennae a little longer than the body, the flagellar segments being greatly elongated, antennae densely clothed with rather short delicate hairs; fore part of the vertex produced into a prominent conical tubercle; front and vertex gray, occiput brownish.

Mesonotal praescutum light brown somewhat darker in front and on the sides, but without apparent stripes; scutum with the lobes brown; scutellum and postnotum light brownish yellow. Pleurae, mesopleurae darker brown than the yellowish metapleurae. Halteres very long and slender, yellowish at base, the remainder brown.

Legs, coxae and trochanters dull yellow; femora dull yellow basally soon passing into brown; tibiae and tarsi brown.

Wings subhyaline, cells *C* and *Sc* more yellowish; stigma scarcely indicated; veins brown. Venation, *R*_s very short, *R*₂ obliterated. (See Plate XV, figure 1).

Abdomen with the two basal segments light brown; remainder of abdomen dark brown; hypopygium simple.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The reference of this species to *Macromastix* is somewhat provisional. It agrees with *M. chilensis* Philippi¹ in its antennae and simple hypopygium, but the obliteration of vein *R*₂ is a character suggesting certain of the *Dolichopezini*. I do not care to erect a new genus upon a single specimen. As I have shown before,² Enderlein's *M. appendens* (Zool. Jahrb., Vol. 32, pt. I, pp. 14, 15) is not a *Macromastix* at all, but a true *Tipula*.

¹Philippi, Verh. Zool. bot. Gesell. Wien. Vol. 15, p. 617 (1865).

²Alexander, Ann. Ent. Soc. Am., Vol. 5, No. 4, p. 355 (1912).

Genus *Holorusia* Loew.*Holorusia flavicornis* sp. n. (Pl. XV, fig. 2).

Antennæ of ♂ elongate, without bristles; thoracic dorsum rich chestnut; pleuræ yellow above, paler beneath, a dark lateral stripe; wings pale brown.

Male.—Length, 13.2 mm.; wing, 19.3 mm.; antennæ, about 7.5 mm. Fore leg, femur, 10.8 mm.; tibia, 12.3 mm.; tarsus, segment I, 21.4 mm.

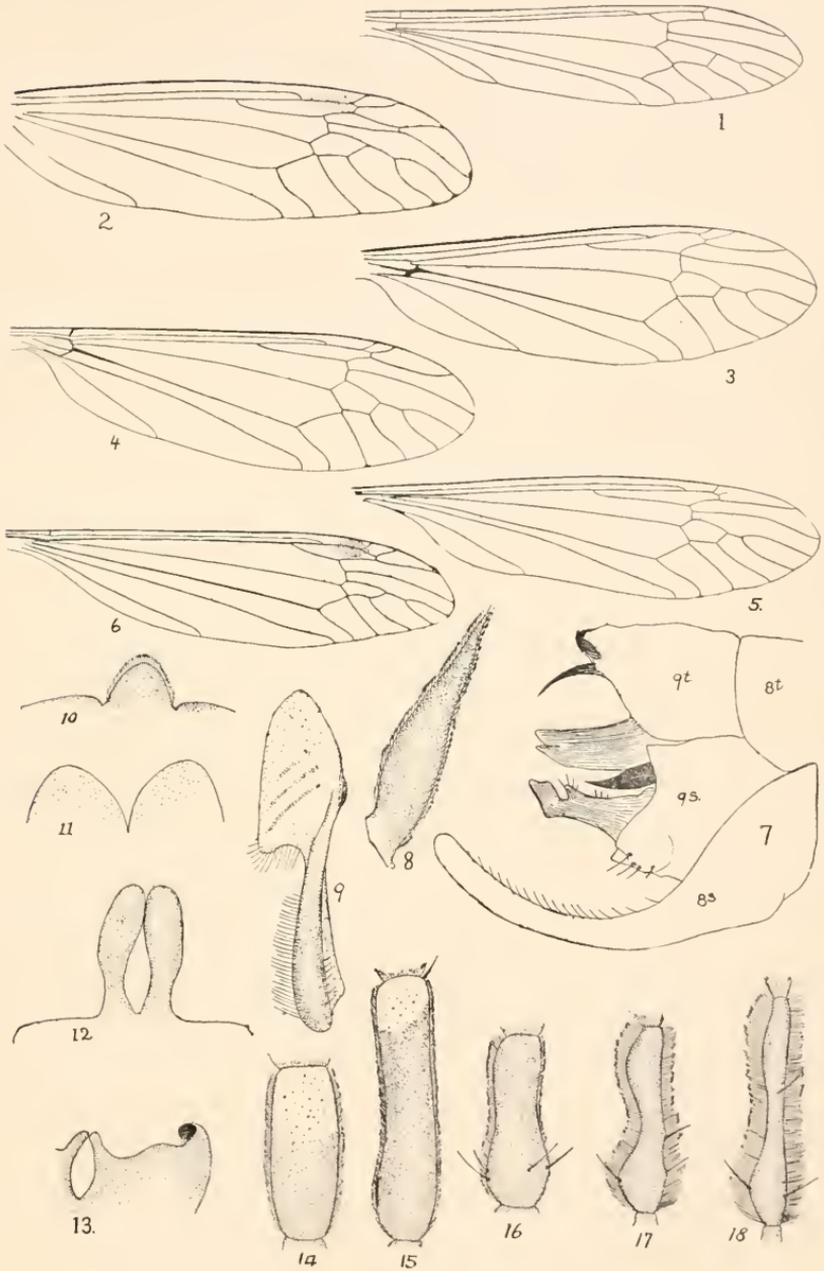
Palpi rather short, dark brownish black, the frontal prolongation of the head rather long, the nasus very long and sharply pointed, the prolongation is brown, rather darker on the sides; antennæ elongate, scapal segments very small, the first only a little longer than the second, the flagellar segments elongate cylindrical, not incised, without bristles but densely clothed with very short pale hairs; antennæ light yellow, the apical flagellar segments a little darker; head with a light brown median stripe, the sides behind the eyes rich chestnut brown.

Pronotum rich chestnut medially, light yellow on the sides, this color being the anterior end of a broad pale stripe underneath the mesonotal præscutum. Mesonotal præscutum rich chestnut brown, stripes not very distinct, the lateral margins of the sclerite rather darker; scutum dark brown; scutellum brown; postnotum dark brown in front, light dull yellow behind. Pleuræ rather pale; a yellow stripe, described above, running from the pronotum almost to the wing root; ventrad of this, a dark brown stripe running from the cervical sclerites almost to the wing root; ventral pleural sclerites brownish yellow. Halteres rather short, brown.

Legs, coxæ and trochanters dull yellow; femora yellowish brown, passing into brown, the tip dark brown; tibiæ brown, the extreme base pale, almost white; tarsi brown; legs long and slender.

Wings with a pale brown suffusion, cell *C* more yellowish, stigmal region dark brown; a brown cloud at the origin of *Rs*; subhyaline droplets in cell *1stR1*, end of *R5*, *M1*, base of *M2* and tip of *1stA* near the vein *2ndA*. Venation, see Plate XV, figure 2. The wing figured shows an adventitious crossvein in cell *R3* dividing this into two cells the other wing being normal.

Abdominal tergites brown, the genitalia more yellowish, sternites a little more yellowish. Hypopygium small, 8th tergite rather narrow, especially medially; 8th sternite rather short, produced caudad into a very short sheath for the 9th sternite. Ninth tergite rather square, the caudal margin deeply concave, the latero-caudal angles produced into prominent lobes which are somewhat divergent, the tips and caudal margin provided with numerous black bristles. Ninth sternite rather large, pleura not distinct, near the base of the sclerite on the



NEOTROPICAL TIPULIDAE, IV.—ALEXANDER.

ventro-median line underneath the protecting sheath of the 8th sternite is a median lobe directed ventrad, deeply divided medially to form two cylindrical lobes which are densely clothed with long, appressed silky hairs. Pleural region with the following appendages: a large pale external appendage, directed dorsad in a position of rest, its tip rather sharp-pointed, on its outer margin near the middle, with a prominent chitinized tooth, the whole appendage clothed with long pale hairs; inner appendage smaller, flattened, fleshy, pale, clothed with abundant pale hairs. Inside of the genital chamber, just beneath the lobes of the 9th tergite is a pair of irregular appendages very densely provided with small, rounded chitinized tubercles.

Holotype.—Male, Venezuela, ex. Coll. H. Fruhstorfer, in the Hungarian National Museum.

From the species of what seem to be *Holorusia pallidivervis* Mcqt. (Dipt. Exot., Suppl. I, p. 16) and *albocostata* Mcqt. (l. c., pp. 15, 16), this differs in its wing-pattern and long pale yellow antennae. From *H. maya* Alex. (Ann. Ent. Soc. Am., Vol. 5, p. 358, 1912) it differs in its much smaller size and quite different color.

Holorusia laevis, sp. n. (Pl. XV, figs. 8, 15).

Flagellum of antennæ without bristles; antennæ of ♂ moderately long, flagellum bicolored; mesonotum reddish brown with indistinct darker lines; wings light brown, a square spot in cell *M* near the middle of its length.

Male.—Length, 13.4 mm.; wing, 18 mm.; fore leg, femur, 11 mm.; tibia, 11.5 mm.; tarsus, segment I, 19 mm.

Palpi moderate in length, dark brown; frontal prolongation of the head rather short, nasus very long and prominent, front light brown; antennæ moderately long, if bent back, extending a little beyond the wing root, segment I rather short, about one-half as long as the third segment, flagellar segments cylindrical, not constricted, unarmed with bristles except a small pair at the tip, segments 1 and 2 light brown, 3 dark brown, 4 to 8 dark brown, yellowish at the tip, 9 to the end dark brown, the entire flagellum densely covered with white downy hairs; head rich brown. (See Plate XV, fig. 15).

Pronotal scutum reddish brown, scutellum almost white. Mesonotal præscutum reddish brown with very narrow indistinct darker lines; scutum reddish brown; scutellum and postnotum pale yellowish white. Pleuræ uniform pale yellowish. Halteres rather long, brown.

Legs, coxæ and trochanters light yellow, femora light yellowish brown, dark brown at the tip; tibiæ brown, scarcely darker at the tip; tarsi brown.

Wings subhyaline, cells *C* and *Sc* brownish, stigmal region brown, a brown cloud at the origin of *Rs*, a square patch in the middle of cell *M* over the vein *Cu*; base of cell *M* dark.

Abdominal tergites 1-5 dull yellowish, 6-8 dark brown, 9 yellowish, pale; segments 3-6 pale on the lateral margin; apical sternites dark brown; 9th and caudal part of the 8th light yellow. Hypopygium: 9th tergite from above, rather quadrate, the caudal margin with a median notch, the whole posterior face provided with numerous black bristles as in this group of species (*flavicornis*, et al). Eighth sternite short, dark basally, pale reddish yellow apically; 9th sternite very elongate giving the caudal margin of the hypopygium an oblique appearance when viewed from the side, pleural suture incomplete; outer pleural appendage long, flat and tapering to a point, fleshy, pale, clothed with long hairs. (See Plate XV, fig. 8). Inner appendage short, fleshy, concave on the outer face.

Holotype.—Male, Asuncion, Paraguay, May 5, 1904 (Vezényi), in the Hungarian National Museum.

Holorusia orophila sp. n. (Pl. XV, fig. 14).

Flagellum of antennæ without bristles; antennæ short, the flagellum bicolored; mesonotum light brown with about five narrow darker lines; wings with a square spot in cell *M* near the middle of its length.

Male.—Length, 13.5 mm.; wing, 16.8 mm. Fore leg, femur, 9.6 mm.; tibia, 10.8 mm.

Palpi rather short, dark brown; frontal prolongation of the head short, nasus very long and prominent, brown; antennæ short, if bent backward, not attaining the wing root; the first segment elongate as long as the succeeding three segments combined; flagellar segments short-cylindrical, without bristles; first three antennal segments dull yellow; segments 4-10 dark brown basally, yellow apically, terminal antennal segments dark brown; head dark brown, narrowly paler behind adjoining the eyes. (See Plate XV, figure 14).

Thoracic notum, præscutum light brown with about five narrow darker lines, one median and with two indistinct lateral stripes on either side; scutum and scutellum light brown, the latter paler, yellowish; postnotum dull yellow, darker on the sides. Pleuræ pale dull yellow, unmarked. Halteres rather long, brown, a little paler basally.

Legs, coxæ dull light yellow; trochanters and femora yellowish brown, the latter a little darker at the tip, tibiæ and tarsi brown.

Wings subhyaline; cells *C* and *Sc* brown; stigma brown; a brown spot in cell *M* near the middle of the length of *Cu*; cells *R* and *M* brown at the base.

Abdomen with the basal tergites dull yellow; 5-6 with a broad brown median stripe; 7 with the caudal margin dark brown; 8 en-

tirely dark brown; 9 yellowish. Sternites 1-6 dull brownish yellow, the apical sternites dark brown.

Holotype.—Male, San Lorenzo, Sierra, Colombia (Ujhelyi), in the Hungarian National Museum.

Holorusia peruviana sp. n.

Flagellum of antennæ without bristles; antennæ dark brown; mesonotum light brown with broad brown stripes; wings without well defined markings.

Male.—Length, 13.3 mm.; wing, 17.1 mm.; fore leg, femur, 7.8 mm.; tibia, 8.9 mm.; tarsus, 14.2 mm.

Palpi short, dark brown; frontal prolongation of the head very short and stout, brown, nasus distinct, large; antennæ, scapal segments short, brown, flagellar segments elongate-cylindrical, dark brown, without bristles, but clothed with a dense fine pubescence; head brown, a median line and the region adjoining the eyes very dark brown.

Mesonotal præscutum pale with three broad brown stripes, the median one very broad, bisected by a dark brown line; scutum brownish gray; scutellum and postnotum light gray with a narrow indistinct brown median line. Pleuræ with a broad light band across the dorsal sclerites extending from the pronotum to the wing root; median pleural sclerites light gray with three oval dark brown spots which form an interrupted lateral band; mesosternum gray with a light brown suffusion. Halteres rather long, brown, pale at the extreme base.

Legs, coxæ light gray; trochanters dark brown; femora brown, darker at the tip; tibiæ and tarsi brown.

Wings with a light gray suffusion; stigma light brown; a rounded gray cloud at the origin of *Rs*; a subhyaline blotch in cell *1stA* at the margin. Venation: Cell *1stM2* very long, petiole of cell *M1* short or lacking.

Abdominal tergites light brown, a slightly darker median stripe; segments 6-8 dark brown; sternites, segment 1 dark brown, 2-5 light yellow, dark brown medially, 6-8 dark brown.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The reference of some of the above species to *Holorusia* is doubtful, but they agree better with that genus than with the typical *Tipula* and so I describe them as species of *Holorusia*.

Genus *Tipula* Linnaeus.

Tipula gladiator sp. n. (Pl. XV, figs. 6, 7).

Antennæ of the male elongate, basal segments yellow, flagellum dark brown; thorax dark grayish brown; wings dull yellowish; 8th sternite of the ♂ genitalia produced caudad into a long curved sabre-like appendage.

Male.—Length, 16.2 mm.; wing, 14 mm.

Palpi with the basal segments a little darker than the dull yellow apical segments; frontal prolongation of the head short, nasus distinct, darker brown above, more yellowish beneath and on the sides; antennæ elongate, if bent backward extending about to the 3rd abdominal segment; segments 1 and 2 light yellow, flagellar segments dark brown covered with short pale hairs; the segments not cylindrical, but feebly incised on the lower face; head gray, a little clearer on the occiput.

Pronotal scutum dark brown bordered with gray. Mesonotal præscutum brown with indistinct darker brown stripes of which the median one is double; scutum brownish gray; scutellum brown; postnotum light gray. Pleuræ pale with a clear light gray bloom on the mesopleuræ. Halteres brown, pale at the base.

Legs, coxæ pale yellow with a sparse grayish bloom, most pronounced on the fore coxæ; trochanters dull yellow; remainder of legs broken.

Wings with a brownish yellow suffusion; stigma oval, brown. Venation as in Plate XV, figure 6.

Abdominal tergites dark brown; a large triangular yellow blotch on the sides of the second segment on the caudal half; genitalia yellowish; two basal sternites dull yellow, 3-7 dark brown. Hypopygium: Eighth tergite broad; 8th sternite with the caudal margin produced backward in a long curved appendage, much exceeding the remaining parts of the hypopygium; its dorsal face concave, the appendage sparsely clothed with short appressed hairs. Ninth tergite with a blunt lobe on the caudal margin on either side of the concave median portion, the latero-caudal angles produced backward into long, slender, chitinized spines which are directed caudad and slightly ventrad; 9th sternite small. Appendages which seem to come from the pleural region are: first, a ventral appendage, irregular, rather chitinized apically, its dorsal margin near the tip with a rounded notch; second appendage, above the first, a sharp, heavily chitinized spine directed caudad; third appendage, large, feebly chitinized, its apex notched (possibly median in position as it seems to be unpaired); fourth, dorsad of these three appendages and just underneath the spines of the 9th tergite is a sub-fleshy lobe more chitinized apically, clothed with long delicate hairs (not shown in the figure). Lateral aspect of the hypopygium shown in Plate XV, figure 7.

Holotype.—Male, Theresopolis, Brazil, in the Hungarian National Museum.

The remarkable hypopygium of the male at once separates it off from the other species in the Neotropical fauna.

Tipula guarani sp. n.

Antennæ brownish yellow; thorax brownish gray with brown stripes; femora brownish yellow, tip broadly brown; wings hyaline with brown spots and gray clouds.

Female.—Length, 33 mm.; wing, 23.2 mm.; fore leg, femur, 11.6 mm.; tibia, 14.4 mm.

Palpi rather long, the three basal segments rather stout, the last segment slender, palpi dark brown; frontal prolongation of the head rather long, brown; antennæ, segment 1 elongate, first flagellar segment rather stout, antennæ brownish yellow; head pale yellowish brown with a narrow stripe of dark brown.

Thoracic pronotum pale gray, dark brown medially. Mesonotal præscutum light brownish-gray with dark brown stripes, the median stripe broadest in front, a little narrowed behind, the thoracic stripes contrasting strongly against the pale ground color; scutal lobes largely brown with an isolated rounded brown spot on the cephalic margin of each lobe, this being the caudal end of the lateral præscutal stripe; median portion of the scutum brown; scutellum and postnotum grayish brown medially. Pleuræ dull gray with brown spots on the mesopleuræ. Halteres rather long, brown, the knob darker.

Leg, coxæ grayish brown; trochanters dull yellow; femora brownish yellow, the tip broadly dark brown; the fore legs, especially, show a broad yellow subapical ring; tibiæ brownish yellow, the tip indistinctly darker; tarsi brown.

Wings hyaline with brown spots and gray clouds, as follows: Brown spots at the base of the wing, midlength of the distance between the base of *R*₁ and the origin of the sector; at origin of *R*_s, stigmal region, brown seam to vein *Cu* and most of the crossveins and deflections of veins; tip of cells *R*₂ and *R*₃ grayish brown; gray clouds in all the caudal cells of the wing. Venation: *R*_s long, slender, lying rather close to *R*₁; crossvein *m-cu* present.

Abdominal tergite 1 brownish gray; 2-8, dull orange-yellow, a little suffused with darker; segment 9 and ovipositor brown; sternites yellow, median line brown. Ovipositor, tergal valves very long, very slender and straight, the margins smooth, tips scarcely expanded, sternal valves short.

Holotype.—Female, Rio Grande, Brazil, in the Hungarian National Museum.

The specific name is that of a native Indian tribe.

Tipula oblique-fasciata Macquart.

One female from Chiriqui, Central America.

Tipula sp.

One female, *monilifera* group, Mexico.

Tipula apterogyne Philippi.

Three males, Concepcion, Chile; P. Herbst, 1903, 1904.

Tipula abortiva sp. n.

Female with rudimentary wings; wings black with a whitish cross-vein in the neighborhood of the cord.

Female.—Length, 16 mm.; wing, 8 mm.; fore leg, femur, 5.3 mm.; tibia, 5.4 mm.; tarsus, 6.1 mm.

Palpi short, dark brownish black; frontal prolongation of the head brown, the nasus rather prominent; antennæ, segments 1 and 2 brown; flagellum brownish black; head light brown, more gray on the occiput, with a very indistinct, narrow brown median line best indicated on the occiput.

Pronotal scutum dark brownish black, a little paler on either side behind; scutellum pale grayish with three brown marks. Mesonotal præscutum suffused with dark brownish black in front, light gray with three very pale brown stripes, the median one broadest, the lateral ones very indistinct. Scutum, scutellum and postnotum dull gray, the two latter with an indistinct median brown mark. Pleuræ mostly dark brown. Halteres rather short, brown.

Legs, coxæ grayish brown; trochanters brownish yellow; femora, tibiæ and tarsi dark brown.

Wings very short, dark brown with a faint white crossband across the cell 1stM2 extending from the end of cell R to the middle of cell M3.

Abdominal tergites with segment 1 brown, segments 2-8 reddish brown, the lateral margins suffused with brown; sternites reddish brown, the segments with an indistinct median brown mark; segments 8-9 dark brown; caudal segments of body and ovipositor shiny; tergal valves of the ovipositor long, slender, straight; sternal valves much shorter.

Holotype.—Female, Callanga, Peru, in the Hungarian National Museum.

Tipula camp sp. n. (Pl. XV, figs. 5, 9-12, 18).

Color of the thorax light gray; basal abdominal segments orange-yellow; subterminal segments dark brown; antennæ of the ♂ very long.

Male.—Length about 11 mm.; wing, 14.4 mm.; fore leg, femur, 8 mm.; tibia, 8.6 mm.; tarsus, 11 mm.

Palpi very short, dark brown; frontal prolongation of the head short, light gray; antennæ very long, if bent backward extending about to the eighth abdominal segment, scapal segments light brown, flagellar segments very dark brown; after the first, each segment is swollen at its base and less so before its tip, provided with a few black bristles and abundant long pale hairs. (See Plate XV, figure 18). Front with a well defined tubercle which is bisected by a deep median furrow; head gray.

Pronotum dark brown, bordered with gray; mesonotal præscutum very light gray with four bright brown stripes, one on either side of the median line, pale and indistinct in front, clearer behind; lateral stripes short, lateral margin of the sclerite of the same color; scutum gray, the anterior end of each lobe with a rounded chestnut brown spot; scutellum and postnotum light gray, the latter dusky on the sides. Pleuræ clear light gray. Halteres light brownish yellow basally, passing into brown.

Legs, coxæ light gray, trochanters yellow; femora light brown, dark brown at the tip; tibiæ and tarsi brown.

Wings subhyaline, cells *C* and *Sc* pale brown, a brownish tinge in the vicinity of the stigma, at ends of cells *R*₂ and *R*₃; hyaline blotches not well defined. Venation, see Plate XV, figure 5.

Abdomen, tergites 1-4 bright yellow, 5-8 passing into brown; 9 light yellow; sternites yellowish; the lateral margins of the tergites are broadly dark brown. The male genitalia with the 8th tergite broad, dark colored, except at the base where it is reddish; 9th tergite very pale yellow, viewed from above (see Plate XV, figure 11), large, subquadrate, the outer lateral angles rounded, caudal margin with a very deep median notch; viewed from the side the caudo-lateral margin with a rather sharp protuberance. Eighth sternite (Plate XV, figure 10) with the caudal margin rounded and with a prominent median protuberance. Ninth sternite (from beneath, see Plate XV, figure 12) with the caudal margin produced backward as a prominent, sub-lyriform appendage; viewed from the side, the 9th sternite is small, the pleural piece complete, almost oval, its ventro-caudal margin applied closely to the caudal appendage of the 9th sternite. Pleural appendages two, the more cephalic and dorsal being a long, cylindrical fleshy appendage, pale, clothed with long hairs, directed dorsad; the second appendage is large, viewed from behind (see Plate XV, figure 9); it is slender basally, with the inner part of the base clothed with long pale hairs, the tip expanded out like a knife blade, meeting its mate of the opposite side on the median line, the caudal face of this blade with a few transverse ridges, the outer face somewhat chitinized, in contact with a chitinized appendage having the same general blade-like shape which lies between the caudal appendage and the 9th tergite.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The specific name, *campa*, is that of a native Indian tribe living in eastern Peru.

This species and the two following belong to the same group of species as *inca* Alexander,³ possessing short palpi, short legs, and the peculiar genitalia of the male as described above. These three species are closely related to one another and differ from *inca* in the bright orange-yellow color of the abdominal tergites, in the structure of the antennae, etc.; they are separable amongst themselves by very striking differences in the antennae of the male and in the details of the male hypopygium.

Tipula piro sp. n. (Pl. XV, figs. 4, 13, 17).

Color of the thorax light gray; basal abdominal segments orange yellow; subterminal segments dark brown; antennae of ♂ moderate in length.

Male.—Length, 12.3 mm.; wing, 15.5 mm.; fore leg, femur, 8.4 mm.; tibia, 9.6 mm.; tarsus, 13 mm.

Palpi very short, dark brown; frontal prolongation of the head moderate in length, grayish, tinged with brown on the sides; antennae moderately long, if bent back they would extend about to the base of the fourth abdominal segment, the scapal segments light brown, flagellum dark brown, the ventral face of each flagellar segment very deeply incised (see Plate XV, figure 17); head gray tinged with brownish.

Thorax light gray; pronotum with a short, dark brown median line; mesonotal præscutum light gray with a very narrow, indistinct median brown line, and, behind, with indications of a pale brown stripe on either side of the middle; lateral margin of the sclerite and a short lateral stripe brown, the latter much lighter and brighter; scutum light gray with two bright brown rounded spots on each lobe; scutellum and postnotum light gray suffused with dusky on the sides. Pleuræ light gray, a large brown spot on the mesoepisternum and another on the mesoepimerum. Halteres rather long, brown, paler at the base.

Legs, coxæ gray, trochanters and femora brown; tibiæ and tarsi darker brown.

Wings with a faint brown tinge, cells *C* and *Sc* yellowish; hyaline

³ Ann. Ent. Soc. Am., Vol. 5, pp. 351, 352; pl. 24, fig. c.; pl. 25, fig. 1, (1912).

spots on the wing disk, one being in cell *1stM2*, another in the middle of cell *M*, etc. Venation as in Plate XV, figure 4.

Abdomen with the first tergite gray; 2-4 bright yellow, remainder brown, including the genitalia; lateral margins of the tergites broadly dark brown; sternites dull yellow. The genitalia agree with *T. campha*, differing as follows: Ninth tergite (see Plate XV, figure 13) with the caudal margin more tuberculate, on either side of the elongate-oval median notch is a short, cylindrical lobe, the caudolateral angles slender and reflexed; 8th sternite dark brown, only the median lobe being paler; the second pleural appendage, viewed from behind, has the narrowed base very elongate, the blade relatively small, the whole appendage being hidden beneath the 9th tergite.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The specific name, *piro*, is that of a native Indian tribe of eastern Peru.

Tipula curinao sp. n. (Pl. XV, figs. 3, 16).

Color of the thorax light gray; basal abdominal segments orange yellow, subterminal segments dark brown; antennæ short.

Male.—Length, 12 mm.; wing, 15.5 mm.; fore leg, femur, 8.1 mm.; tibia, 9 mm.

Palpi very short; frontal prolongation of the head moderate, grayish brown; antennæ short, if bent backward, extending about to the base of the halteres, dark brownish black, the scapal segments alone a little paler, flagellar segments short, cylindrical, the base enlarged (see Plate XV, figure 16); frontal tubercle rather prominent; head dull yellow, more brownish in the middle of the vertex and on the occiput.

Pronotum dark brown; mesonotal præscutum light gray, the lateral margin of the sclerites very dark brown, a very broad light brown median stripe, broadest in front, narrowed behind, partially bisected from behind by a pale line, lateral stripes of the same color; scutum light gray with two light brown spots on each lobe; scutellum and postnotum light gray with a brown median vitta and with the sides of the sclerites tinged with dusky. Pleuræ brown with a sparse gray bloom. Halteres rather long, brown.

Legs, coxæ and trochanters brown; femora reddish brown passing into brown at the tip, and with an indistinct yellowish brown annulus before the tip; tibiæ and tarsi dark brown.

Wings light brown, cells *C* and *Sc* a little brighter; a dark brown spot at the origin of *Rs* and others in the stigmal area; a hyaline spot in cell *1stM2* and a smaller one in cell *M*. Venation as in Plate XV, figure 3.

Abdomen, tergites 1-7 orange yellow, the lateral margins broadly brownish black, segments 8-9 dark brown; sternites orange, apical sternites more brownish. The genitalia agree with *T. campa*, differing as follows: Ninth tergite without a median incision on the caudal margin; 8th sternite about as in *campa* but the lobe larger and more pronounced; 9th sternite with a great median notch which divides the segment into two except behind; the inner angles of each of the lobes thus formed is a rounded ball densely clothed with long hairs; the second pleural appendage has the blade very small and inconspicuous, the appendage being mostly stem.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The specific name, *curinao*, is that of a native Indian tribe of eastern Peru and western Bolivia.

Genus *Microtipula* Alexander.

Microtipula amazonica Alexander.⁴

One male from Surinam (Michaelis).

Genus *Pachyrrhina* Macquart.

Pachyrrhina consularis Osten Sacken.

Seven specimens in the collection that agree sufficiently with *consularis*; that this last named species is specifically distinct from *P. elegans* Fabricius, as stated by Osten Sacken, is by no means certain. The present material is as follows:

Bolivia, Coroico, 1 female; Peru, Vilcanota, 1 male; Brazil, Rio Grande, 1 female; Paraguay, San Bernardino, March, 1908 (Fiebig), 2 females, 1 male; Argentina (Vezenyi), 1 male. The Peruvian specimen and one of the San Bernardino females have been retained; the remainder of the material is in the collection of the Hungarian National Museum.

EXPLANATION OF PLATE XV.

Figure 1. Wing of *Macromastix pygmaea*, sp. n.

Figure 2. Wing of *Holorusia flavicornis*, sp. n.

Figure 3. Wing of *Tipula curinao*, sp. n.

Figure 4. Wing of *Tipula piro*, sp. n.

Figure 5. Wing of *Tipula campa*, sp. n.

Figure 6. Wing of *Tipula gladiator*, sp. n.

⁴ Ann. Ent. Soc. Am., Vol. 5, pp. 361, 362; pl. 24, fig. i; pl. 25, fig. q (1912).



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1.—EUPHYDRYAS PHAETON NEAR FORM STRECKERI.—FRANZEN.

2.—PAPILIO HOMERUS, LARVA.—SWAINSON AND SKINNER

Figure 7. Hypopygium of *Tipula gladiator*. Lateral aspect; 8s, 9s, equal 8th and 9th sternites; 8t and 9t equal 8th and 9th tergites.

Figure 8. Hypopygium of *Holorusia laevis*, sp. n. Lateral aspect of the pleural appendage.

Figures 9-12 Hypopygium of *Tipula campa*, sp. n. 9, 2nd pleural appendage from behind; 10, 8th sternite, ventral aspect; 11, 9th tergite, dorsal aspect; 12, 9th sternite, ventral aspect.

Figure 13. Hypopygium of *Tipula piro*, sp. n., 9th tergite, dorsal aspect.

Figure 14. Sixth antennal segment of ♂ *Holorusia orophila*, sp. n.

Figure 15. Sixth antennal segment of ♂ *Holorusia laevis*, sp. n.

Figure 16. Sixth antennal segment of ♂ *Tipula curinao*, sp. n.

Figure 17. Sixth antennal segment of ♂ *Tipula piro*, sp. n.

Figure 18. Sixth antennal segment of ♂ *Tipula campa*, sp. n.

Minnesota Butterflies (Lepid.).

By JOHN WERNER FRANZEN, Minneapolis, Minn.

(Plate XVI, fig. 1.)

The following list of butterflies taken in Minnesota, mostly from Hennepin County, with dates of capture and notes on distribution, is based on the collection of the author, and those of the Museum of the Academy of Science, and at the University of Minnesota.

I acknowledge gratefully the assistance of Professor Oscar W. Oestlund of Minnesota University; Dr. Harrison G. Dyar, of Washington, and Mr. P. O. Fryklund, of Badger, Minn., in the preparation of this list.

Where only two dates are given, they represent the earliest and the latest records. The numbers in brackets refer to Dyar's List of North American Lepidoptera, U. S. N. M. Bull. No. 52.

Family PAPILIONIDAE.

1 (5b) **Papilio ajax** var. **marcellus** Bd. Lec. Zebra Swallow tail.

A single specimen in the University collection taken in the downtown districts of the city of Minneapolis; evidently accidental and escaped from some pupae brought in by shipment.

2 (11a) **Papilio glaucus** var. **turnus** Linn. Tiger Swallow tail.

The distribution of this species in the state is peculiar. In Hennepin and Ramsey Counties it is rare, while about 50 miles north-east of Minneapolis close to the Wisconsin line, it is common. At

Lake Vermillion and at Badger and Roseau it is found in countless thousands. I have a large number of specimens from Roseau taken in May and June. One specimen from Minneapolis, May 25.

3 (13) **Papilio troilus** Linn. Green-clouded Swallow tail.

Rare; in the vicinity of Minneapolis I have only seen two or three specimens during the past ten years. One specimen from Hennepin County, July 15.

4 (14) **Papilio thoas** Linn. Giant Swallow tail.

One specimen in the University collection taken close to the city of Minneapolis, much worn and battered and evidently a migrant from the south.

5 (22) **Papilio polyxenes** Fab. Black Swallow tail.

This is a common butterfly in the state, from April to middle of September; specimens from Fort Snelling April 10, May 30, July 13, July 31 and September 5. One specimen from Badger, Roseau County, July 6.

Family PIERIDAE.

6 (37) **Pontia protodice** Bd.-Lec. Checkered White.

Common. In the summer of 1910 this species outnumbered the rapæ ten to one. In 1912 the rapæ was again predominating. July 13, October 15.

7 (37a) **Pontia protodice** var. **vernalis** Edw.

In the University collection from Lake Superior district and one specimen from Minneapolis.

8 (38) **Pontia napi** Linn. Gray-veined White.

Rare; in this vicinity, but common in the northern parts of the state. Specimens from Roseau County, August 17, 1912. There are two specimens in the Academy's collection labeled Minneapolis.

9 (40) **Pontia rapæ** Linn.

Very common; and at times extremely abundant. Specimens from Minneapolis April 10, October 14. In University collection from Cass County, July 7, 1893.

10 (41) **Nathalis iole** Bd. Dainty Sulphur.

Rare. I have one specimen from Fort Snelling, August 13, 1911. In University collection from Anoka County, September 30, 1897, and from Lake Nokomis, Hennepin County, August 30, 1912.

11 (52) **Callidryas eubule** Linn. Cloudless Sulphur.

One specimen from Faribault, July 12, 1912, taken by Mr. C. Webster, and is now in his collection.

12 (61) **Zerene caesonia** Stoll. Dog's-Head.

Common. It was unusually abundant in this vicinity in the summer of 1907. In 1908 and 1909 but a few appeared, and in 1910 it was totally absent. In 1912 about half a dozen were seen, while in 1913 it again was very common. June 15, August 25.

13 (61a) **Zerene caesonia** var. **rosa** McN.

Of this interesting form I have one specimen, taken at Fort Snelling late in the fall of 1905.

14 (65) **Eurymus eurytheme** Bd. Orange Sulphur.

Common. This species was more abundant in 1908 than at any other year within my memory. In 1909 and 1910 it was rare, in 1912 it again appeared in large numbers, while in 1913 it was scarce. In the female of this species in late summer a form occurs (albinic var). My earliest record of any such forms is August 25.

15 (65) **Eurymus philodice** God. Roadside Sulphur.

Common; but is never found in such large numbers as the preceding species. Like *eurytheme*, the female of this species is subject to albinism. I have taken such albinos as early as July 4. Of the typical form *philodice* I have several specimens from Roseau County. From Minneapolis, June 30, October 17.

16 (81) **Pyrisita mexicana** Bd. Mexican Sulphur.

One specimen taken by Mr. C. Webster at Fort Snelling, October 5, 1912.

17 (85) **Eurema euterpe** Men. Little Sulphur.

Rare. I have one specimen taken at Columbia Heights, northeast Minneapolis, August 28, 1912.

Family NYMPHALIDAE.

18 (92) **Euptoieta claudia** Cr. Variegated Fritillary.

Not very common in this vicinity. I took my first specimen of this species in 1908, and have since taken several every summer. This species goes much further north than formerly supposed. I have specimens from Roseau County although it is not common there. Specimens from Minneapolis, June 25, October 15. A number of larvae of this species found feeding on garden pansy in his garden by Mr. H. H. Welch of this city and reared to imagos in 1913.

19 (95) **Speyeria idalia** Dru. Regal Fritillary.

Common locally; in July and August in open fields. In the northwest corner of Fort Snelling reservation, on an area of about 60 acres, numbers of these butterflies can be found every summer, while outside of this tract they are totally absent. Specimens from Fort Snelling, July 4, September 5. Reported as common in the Red River valley, between Fergus Falls and Crookston, by M. P. Somes, 1912.

20 (99) **Argynnis cybele** Fab. Great Spangled Fritillary.

This, the commonest of the larger fritillaries in the state, flies from June to September. Very common at Badger and Roseau (Fryklund). Specimens from Fort Snelling, June 12, August 7.

21 (100) **Argynnis aphrodite** Fab. Aphrodite.

Rare. I have only two specimens from the state. Fort Snelling, July 6, 1911, August 11, 1912.

22 (100a) **Argynnis aphrodite** var. *alcestis* Edw.

Rare. I have three specimens from Fort Snelling, June 12, 1910, and July 4, 1913.

23 (102) *Argynnis atlantis* Edw. Mountain Fritillary.

Very rare in this vicinity. More common in the extreme northern parts of the state. There is one specimen in the Academy's collection labeled Minneapolis. I have three specimens from Roseau County, August 18, September 2, 1912, and June 22, 1913. Also in the University collection from Cass County, July 2, 1893. Reported from Duluth, Allen Junction and Burntside Lake, 1912 (Somes).

24 (131) *Brenthis myrina* Cr. Silver-bordered Fritillary.

Very common, in low meadows throughout the summer.

25 (141) *Brenthis bellona* Fab. Meadow Fritillary.

Much rarer than the preceding species. It was unusually abundant in the vicinity of the Twin Cities during the later part of June and early July, 1913. Specimens from Badger, Roseau County, July 13, 1913; from Minneapolis, May 25, August 29. In University collection from Hamilton, Minn., June 30.

26 (146) *Euphydryas phaeton* Dru. Baltimore.

Common, in meadows, in June and July. From Minneapolis, July 4, and from Hopkins, June 18.

27 *Euphydryas phaeton* near form *streckerii* Ellsw. (Plate XVI, fig. 1).

This interesting specimen was taken at Hopkins, June 18, 1911. I am indebted to Dr. Dyar for the identification.

28 (169) *Cinclidia harrisii* Scud. Harris's Butterfly.

Rare. One specimen taken at Minneapolis, June 18, 1911, by C. Webster.

29 (185) *Charidryas nycteis* Dbl.-Hew. Silver Crescent.

Common. Specimens from Minneapolis, June 15, June 26. In University collection from Cass County, June 15, July 20.

30 (186) *Charidryas ismeria* Bd.-Lec. Ismeria.

I have only taken one specimen. There are five in the Academy's collection from Minneapolis, also in University collection from Ramsey County.

31 (189) *Phyciodes tharos* Dru. Pearl Crescent.

There are several specimens in the Academy's collection from Hennepin County. In University collection from Cass County, June 17, 1893.

32 (189a) *Phyciodes tharos* var. *morpheus* Fab.

Very common; all over the state from June to September. June 15, August 18.

33 (205) *Polygonia interrogationis* Fab. Violet Tip.

Common. The Academy's collection contains a number of specimens from the state.

34 (205a) *Polygonia interrogationis* var. *umbrosa* Lint.

Very common. I have specimens from Fort Snelling, June 25, July 3, August 31.

35 **Polygonia comma** Harr. Hop Merchant.

Common. The hibernating brood of this species appears early in April, when it can be seen in company with *antiopa*, sipping the sap from wounded trees. Specimens from Fort Snelling, April 10, July 27, August 13-20, and September 27. From Northome, July 20.

36 (206a) **Polygonia comma** var. **dryas** Edw.

Common; it was very numerous in this vicinity during the first week of July, 1913; June 22, July 6.

37 (209) **Polygonia faunus** Edw. Green Comma.

Not common; only found in the northern parts of the state. One specimen from Itasca County, July 23, 1910.

38 (214) **Polygonia progne** Cr. Gray Comma.

Rare; in this vicinity. I have only one specimen from Hennepin County.

39 (215) **Eugonia J.-album** Bd.-Lec. Compton Tortoise.

A rare insect all over the state. Have only seen and taken two specimens. One specimen from Northome, July 23, 1910.

40 (217) **Euvanessa antiopa** Linn. Mourning Cloak.

Very common throughout the summer, and occasionally seen on the wing on warm days in February.

41 (218) **Aglais milberti** God. American Tortoise-shell.

Not common. I have one specimen from Minneapolis, July 17, and from Roseau County, August 12.

42 (219) **Vanessa atalanta** Linn. Red Admiral.

Common; in some years very common. It was very abundant in 1912 and 1913. Specimens from Fort Snelling, June 18, August 10.

43 (220) **Vanessa huntera** Fab. Painted Beauty.

Not common. I have not seen over half a dozen specimens in any one season. July 8, August 10.

44 (221) **Vanessa cardui** Linn. Cosmopolite.

Common in most years, but scarce in others. Before the destroying hand of man fell on the thistles that formerly grew below Minnehaha Park, these butterflies could be found in large numbers there. Now, the thistles are gone and so are the cosmopolites. July 8, August 31.

45 (223) **Junonia caenia** Hüb. Buckeye.

My first capture of this butterfly was on August 10, 1908. Since, I have taken specimens, July 4, 1911, September 2, 1912, July 4 and August 17, 1913. It is not common. Reported from Crookston and Fergus Falls (Somes).

46 (236) **Basilarchia astyanax** Fab. Red-spotted Purple.

During all my rambles with the net I never met with this fine spe-

cies until in the summer of 1913. On the 26th of June, while returning from a collecting trip, I saw one of these beautiful creatures resting on a branch of a linden, but I did not succeed in catching it. On the following Sunday, the 29th, I had better luck, as I caught one then and two more on July 6. It is very rare in this vicinity.

47 (237) **Basilarchia arthemis** Dru. Banded Purple.

Common; it was very abundant during June, 1913. Reported as common at Badger and Roseau (Fryklund). Specimens from Fort Snelling, June 22, August 1. In University collection from Cass County, June 17.

48 (239) **Basilarchia archippus** Cr. Viceroy.

Common, from June to middle of September. June 11, August 17.

49 (244) **Chlorippe celtis** Bd.-Lec. Gray Emperor.

Rare. I have one male and one female taken at Fort Snelling, July 17, 1909, and one female from the same locality, July 6, 1913. Recorded from Redwood Falls, July 1, 1912. (Somes).

50 (248) **Chlorippe clyton** Bd.-Lec. Tawny Emperor.

Rare. I have one male taken July 17, 1909, and one female, July 4, 1913, at Fort Snelling.

Family AGAPETIDAE.

51 (258) **Cercyonis alope** var. **nephele** Kby. Dull-eyed Grayling.

Very common, from June to October. July 4, September 2.

52 (281) **Coenonympha ochracea** Edw. Ochre Ringlet.

Rare. One specimen from Hennepin County.

53 (284) **Coenonympha typhon** Rott. Plain Ringlet.

Rare. I have one specimen from Hopkins, August 5, 1910, and one from Frazee, June 29, 1913. I follow the classification of Dyar as to the name *typhon*, but my specimens differ very much from the European *typhon*, the latter having on the under side of the hind wing several black, white-pupilled ocelli in light yellow rings.

54 (286) **Enodia portlandia** Fab. Pearly Eye.

This species was totally absent in this vicinity during the summer of 1912. In 1913 but a very few were seen; in other years very common. Specimens from Fort Snelling, June 26, July 11. In University collection from Cass County, July 7.

55 (288) **Satyrodes canthus** Linn. Eyed Brown.

Like the preceding species, it was absent in 1912. In other years, common in swampy places in June and July. From Minneapolis, June 30, July 4. Common in Roseau County (Fryklund).

56 (299) **Cissia eurytus** Fab. Little Wood Satyr.

This little butterfly is common in the state, flying from late in May to middle of July. It prefers sparsely wooded tracts with underbrush.

Family LYMNADIDAE.

57 (308) *Anosia plexippus* Linn. Monarch.

Very common. This familiar butterfly is always very numerous in late summer. Its migratory habit is well known. In this vicinity single individuals begin to appear as early as April 29. In the first week of September they begin to assemble in large numbers preparatory to their southward journey. One of these assembling places is located on 54th Street South and the River Parkway below Minnehaha Park. The writer has seen the trees covered with these gaudy creatures for two solid blocks at this place. By the middle of September they are usually gone, but belated ones may be seen much later. I have seen single individuals as late as October 23. May 11, October 9.

Family LIBYTHEIDAE.

58 (311) *Hypatus bachmani* Krlt. Long-beak.

One specimen in University collection from Faribault.

Family LYCAENIDAE.

59 (339) *Thecla acadica* Edw. Acadian Hair-streak.

Common; in marshy places in July. From Fort Snelling, July 6, July 21.

60 (345) *Thecla edwardsi* Saund. Edward's Hair-streak.

I have one specimen from Fort Snelling, July 20, 1913. The Academy's collection contains 6 specimens from Minneapolis.

61 (347) *Thecla calanus* Hüb. Banded Hair-streak.

Very common, in June and July. I was much impressed with the abundance of these little butterflies during the first week of July, 1913. At Fort Snelling they were swarming by the thousands in the open clearings of the woods. From Fort Snelling, June 26, July 6. In University collection from Red Rock, Washington County, July 9, 1899.

62 (349) *Thecla liparops* Bd.-Lec. Striped Hair-streak.

Rare. I know of only one specimen taken at Frazee, by Mr. C. Webster, in the summer of 1913.

63 (384) *Strymon titus* Fab. Coral Hair-streak.

Not common in this vicinity. Specimens from Fort Snelling, June 25, 1911, July 5, 1912, July 20, 1913.

64 (390) *Gaeides dione* Scud. Great Copper.

Common, in marshy places from middle of June to middle of July. Very numerous during the first week of July, 1913.

65 (393) *Chrysophanes thoe* Bd. Bronze Copper.

Rather rare. From Fort Snelling, June 15, August 24. Also in University collection.

66 (396) *Epidemia helloides* Bd. Purplish Copper.

In some years common locally, in low meadows in June and July.

Very numerous during July, 1913. From Fort Snelling, June 15, September 6.

67 (399) **Heodes hypophleas** Bd. American Copper.

Common, from June to October. June 10, August 2.

68 (420) **Nomiades lygdamas** Dbl. Silvery Blue.

I found this species in large numbers at Columbia Heights, Minneapolis, May 12, 1913, but taken as a whole it is rather rare. May 1, May 12.

69 (432) **Rusticus scudderi** Edw. Scudder's Blue.

I have two specimens taken on the Minnesota Geological and Natural History Survey, July 11, 1893.

70 (440b) **Cyaniris ladon** var. **marginata** Edw. Marginated Spring Form.

From Fort Snelling, May 1, 1910.

71 (440c) **Cyaniris ladon** var. **violacea** Edw.

Wayzata, May 17, 1914.

72 (440f) **Cyaniris ladon** var. **neglecta** Edw.

This form is more common than the preceding. From Fort Snelling. June 15, July 4 and August 11. I have one female taken at Fort Snelling, July 4, 1913, that corresponds with the typical *ladon ladon* Fdw. only a trifle smaller, but to be on the safe side I let it pass as *neglecta*.

73 (442) **Everes comyntas** God. Tailed Blue.

Very common throughout the summer.

74 (444) **Hemiargus isola** Reak. Reakirt's Blue.

I have taken specimens at Fort Snelling, September 18, 1910, July 14, 1912, and August 2, 5, 11, 1913.

Family HESPERIDAE.

75 (469) **Pamphila palaemon** Pall. Arctic Skipper.

Two specimens in the Academy's collection taken at Minneapolis, July 5, 1896, by Mr. H. W. Eustis. One specimen taken at Frazer, in the summer of 1913, by C. Webster.

76 (472) **Ancyloxypha numitor** Fab. Least Skipper.

Rather common, in swampy places in June, July and August. It was unusually common in this vicinity in June and July, 1913. From Pearl Lake, Minneapolis, June 29, and from Fort Snelling, August 2, 1913. In University collection from Gray Cloud Island, Washington County, July 24.

77 (483) **Atrytone zabulon** Bd.-Lec. Zabulon Skipper.

Common, in low swampy places in May and June. From Fort Snelling, May 15, May 22.

78 (484) **Atrytone hobomok** Harr. Mormon.

I have two specimens from Fort Snelling, June 9, June 16, 1912.

79 (484a) **Atrytone hobomok** var. **pocahontas** Scud.

One specimen from Minneapolis, June 16, 1912.

80 (488) *Erynnis sassacus* Harr. Indian Skipper.

One female from Fort Snelling, June 16, 1912.

81 (496) *Erynnis metea* Scud. Cobweb Skipper.

The Academy's collection contains three specimens from Minneapolis, 1894.

82 (519) *Thymelicus otho* Sm.-Abb. Otho Skipper.

One male from Minneapolis, July 14, 1912.

83 (523) *Thymelicus cernes* Bd.-Lec. Tawny-edged Skipper.

Two specimens from Minneapolis, July 14, 1912.

84 (526) *Polites peckius* Krby. Yellow-spot.

Common, in swampy meadows, in June and July. June 25, July 4.

85 (529a) *Euphyes vestris* var. *metacomet* Harr.

I have one female, Fort Snelling, July 21, 1912, and one male from Badger, Roseau County, July 6, 1913. There are specimens in the University collection from Cass County, July 7.

86 (559) *Limochroes dion* Edw.

There are two specimens in the Academy's collection from the state, July 8, 1896.

87 (564) *Phycanassa viator* Edw. Broad-winged Skipper.

One specimen in the Academy's collection from Minneapolis, July 12, 1895.

88 (566) *Phycanassa vitellius* Fab. Vitellius Skipper.

One male and one female, Fort Snelling, July 21, 1912.

89 (584) *Epargyreus tityrus* Fab. Silver-spotted Skipper.

This, the largest of our skippers, is also the commonest. Throughout the summer.

90 (601) *Thorybes pylades* Scud. Northern Cloudy-wing.

One specimen from Badger, June 14, 1913.

91 (618) *Thanaos icelus* Lint. Dreamy Dusky-wing.

Two specimens in the Academy's collection from the state.

92 (624) *Thanaos lucilius* Lint. Lucilius Dusky-wing.

One specimen from Fort Snelling, August 1, 1913.

93 (625) *Thanaos juvenalis* Fabr. Juvenal's Dusky-wing.

Wayzata, May 17, 1914.

94 (642) *Hesperia tessellata* Scud. Tessellated Skipper.

In some years very common, in open fields, in late summer and fall. From Minneapolis, August 1, October 14.

International Commission on Zoological Nomenclature.

Under date of July 20, 1914, Dr. C. W. Stiles, Secretary of the Commission, announced that a majority of the Commission had voted to accept the resignation of Geheimrath Schulze, of Berlin, from that body, and to elect Professor Anton Handlirsch, of Vienna, in his stead.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., OCTOBER, 1914.

Aids to Scientific Work.

In our editorial in the NEWS for May last, we urged the desirability, if not the necessity, of a world-wide bibliographical dictionary of entomologists. Those who appreciate the importance of such material aids to investigation will find much that is suggestive and helpful, in considering possible advances in our science, in Professor Wilhelm Ostwald's "Memorial on the Foundation of an International Chemical Institute," translated into English and published in *Science* for July 31, 1914. Many "possible and necessary undertakings of general value" for which the International Chemical Institute is projected are similar to the needs of entomology. For some of them the International Entomological Congresses are already striving to provide. The development of chemistry and of chemical literature has proceeded to a much greater degree than in our own field, so that the quantitative problems are much heavier there than with us. The organization and methods by which the chemists hope to digest and make useful their vast mass of data, ought to aid us in devising means to attain our ends. Prof. Ostwald has sketched out, in much detail, plans not for the conquest of "the highest spheres of creative scientific work," but for the accomplishment of

those tasks in the realm of chemical science which are ever recurring in the same form [and which] are to be carried out there once for all and placed at the service of every one; especially the literary reference work and everything connected with it; that is the most trivial and routine labors which are necessary for the advancement of the science. Consequently in the future it should be a fundamental principle in our science that no task of this kind once carried out need ever be repeated, for the finished work should be kept continually and regularly at the disposal of those whom it concerns.

A New *Melissodes* (Hymen.).

Melissodes asteris n. sp. ♀.—Of the size and form of *M. simillima*; black, except the scopa and some hairs on the face, cheeks, collar, pleura, metathorax, legs and base of abdomen, which are ochraceous.

Carlinville, Illinois. Six female specimens, taken September 12-20, on flowers of *Aster ericoides villosus* and *Boltonia asteroides*.

In my table of local *Melissodes*, Trans. Am. Ent. Soc. 31: 368, 1905, this was included in *simillima* in the clause beginning "sometimes entirely black," but I think it should be separated.—CHARLES ROBERTSON, Carlinville, Illinois.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia.
 4—The Canadian Entomologist. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 12—Comptes Rendus, L'Academie des Sciences, Paris. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 25—Bolletino, Musci di Zoologia ed Anatomia Comparata d. R. Universita di Torino. 31—Abhandlungen, Senckenbergischen Naturforschenden Gesellschaft, Frankfurt am Main. 36—Transactions of the Entomological Society of London. 44—Verhandlungen, K. k. zoologisch-botanischen Gesellschaft in Wien. 51—Novitates Zoologicae, Tring, England. 68—Science, New York. 72—Transactions, Kansas Academy of Science, Topeka. 75—Annual Report, Entomological Society of Ontario, Toronto. 76—Journal of the Cincinnati Society of Natural History. 77—The National Geographical Magazine, Washington, D. C. 79—La Nature, Paris. 84—Entomologische Rundschau. 89—Zoologische Jahrbucher, Jena. 97—

Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 102—Proceedings of the Entomological Society of Washington. 119—Archiv fur Naturgeschichte, Berlin. 123—Bulletin, Wisconsin Natural History Society, Milwaukee. 143—Ohio Naturalist. 153—Bulletin, American Museum of Natural History, New York. 161—Proceedings, Biological Society of Washington. 166—Internationale Entomologische Zeitschrift, Guben. 174—Bulletin of the U. S. National Museum, Washington. 178—Acta Societatis pro Fauna et Flora Fennica, Helsingfors. 179—Journal of Economic Entomology. 184—Journal of Experimental Zoology, Philadelphia. 190—Deutsche Entomologische Zeitschrift "Iris," Dresden. 191—Natur. Halbmonatschrift fur alle Naturfreunde. 194—Genera Insectorum. Diriges par P. Wytsman, Bruxelles. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole. 216—Entomologische Zeitschrift, Frankfurt a. Main. 272—Memorias, Real Academia de Ciencias y Artes de Barcelona. 275—Philippine Journal of Science, Manila. 278—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. 279—Jenaische Zeitschrift fur Naturwissenschaft. 298—Ofversigt, Finska Vetenskaps-Societetens Fordhandlingar, Helsingfors. 324—Journal of Animal Behavior, Cambridge. 334—Proceedings of the American Academy of Arts and Sciences, New York. 368—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, California. 369—Entomologische Mitteilungen, Berlin-Dahlem. 394—Parasitology, Cambridge, England. 401—Catalogue of the Lepidoptera Phalaenae in the British Museum, London. 407—Journal of Genetics, Cambridge, England. 411—Bulletin of the Brooklyn Entomological Society. 438—Bulletin of the Illinois State Laboratory of Natural History, Urbana. 443—Unsere Welt. Bonn. 447—Journal of Agricultural Research, Washington. 456—Kosmos, Handweiser fur Naturfreunde, Stuttgart. 463—Bulletin of the U. S. Department of Agriculture, Washington, D. C. 477—The American Journal of Tropical Diseases and Preventive Medicine, New Orleans. 478—University Studies of the University of Nebraska, Lincoln. 479—Washington University Studies, St. Louis. 480—The Annals of Applied Biology. 481—Transactions of the Hertfordshire Natural History Society and Field Club, London. 482—"Bios" Rivista di Biologia Sperimentale e Generale, Genova.

GENERAL SUBJECT. Fritzsche, R. A.—Das mendeln theoretisch betrachtet fur raupen und falter-zucht, 216, xxviii, 56-60 (cont.). Hauri, J.—Das problem der mimikry, 443, vi, 442-47. Hewitt, C. G.—The Canadian entomological service, 4, xlv, 214-16. Howard, L. O.—The education of the entomologist in the

service of the U. S. Department of Agriculture, 179, vii, 274-80. **Lonnberg, E.**—What is binary nomenclature? 11, xiv, 134-8. **Reuter, O. M.**—Obituary by O. Heidemann, 102, xvi, 76-8. **Rothschild, L. W.**—Mimicry and protective resemblance, 481, xv, 105-120. **Urff, G. S.**—Pflanzengallen, 456, 1914, 292-5.

ARACHNIDA, ETC. **Main, H.**—The building of a millepede's nest, 481, xv, 121-3.

Roewer, C. F.—Die familien der Ichyropsalidae und Nemastomatidae der Opiliones-Palpatores, 119, A. A., H. 3, 99-169.

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Davis, W. T.—The dragon fly *Anax longipes* on Long Island, N. Y., 44, ix, 34-7. **Jordan & Rothschild**—On the position of *Notiopsylla*, a new gen. of Siphonaptera. Katalog der Siphonapteren des Koniglichen Zool. Mus. in Berlin, 51, xxi, 219-23, 255-60. **Longin Navas, R. P.**—Dilaridae, 194, fasc. 156, 14 pp. Mantispidos nuevos. Neuropteros nuevos o poco conocidos, 272, xl, 83-103, 105-19. **Martin, R.**—Odonata, Libellulidae, Cordulinae, 194, fasc. 155, 32 pp. **Meunier, F.**—(See under Orthoptera). **Petersen, E.**—Megaloptera. Raphididae, 194, Fasc. 154, 13 pp. **Rothschild, N. C.**—New Siphonaptera from Peru, 51, xxi, 239-51. **Walker, E. M.**—The known nymphs of the Canadian species of *Lestes*, 4, xlvi, 189-200.

ORTHOPTERA. **Barber, M. A.**—Cockroaches and ants as carriers of the vibrios of asiatic cholera, 275, B, ix, 1-4. **Bretschneider, F.**—(See Coleoptera.) **Butler, H.**—An unusual occurrence of walking-sticks, 179, vii, 299. **Caudell, A. N.**—The egg of *Pseudosermyle truncata*, 102, xvi, 96. **Puschnig, R.**—Bemerkungen zur arbeit H. Karny's "Ueber die reduktion der flugorgane bei den O.", 89, xxxiv, Zool. Phys., 515-42. **Rudow, D.**—(See under Neuroptera.)

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HEMIPTERA. Hoy, W. E.—A preliminary account of the chromosomes in the embryos of *Anasa tristis* and *Diabrotica vittata*, **198**, xxvii, 45-51.

Crawford, D. L.—A monograph of the jumping plant-lice or Psyllidae of the new world, **174**, No. 85, 186 pp. Distant, W. L.—Cicadidae, Gaeaninae, **194**, fasc. 158, 38 pp. Ball, E. D.—Two new California *Thamnotettix*, **4**, xlvi, 211-13. Hood, J. D.—Studies in tubuliferous Thysanoptera, **161**, xxvii, 151-72. McAtee, W. L.—Key to the nearctic genera and species of Geocorinae, **161**, xxvii, 125-36. Reuter, O. M.—Amerikanische Miriden, **298**, lv, No. 18, 64 pp.

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ÉTUDES DE LÉPIDOPTÉROLOGIE COMPARÉE. By Charles Oberthür, Vol. 9, part 2, Rennes, France, May, 1914.—Mr. Oberthür has again made a splendid contribution to the study of the American butterflies which will clear up a number of species not properly understood here. He was awarded the Cuvier prize of the French Academy of Sciences, for his *Études d'Entomologie* and *Études de Lépidoptères Comparée*, a well deserved honor. The first thirty-three pages of part two are taken up by a review of the South American species of *Apatura*, illustrated by nine plates and many colored figures. The Lepidoptera of the Tibetan region are also mentioned and certain species are figured. Nearly all of these are species described by Mr. Oberthür. A new species of *Castnia* from Uruguay is described and figured. Then follows what concerns us most, the continuation of the beautiful figures of the Californian butterflies described by Doctor Boisduval. This section comprises fourteen pages of notes on the species, seven plates and forty-one colored figures. These will necessitate a number of changes in the synonymy and also the standing of the species in our American catalogues. The difficulty now is to understand the exact status of the species described by Doctor Behr. Unfortunately his types were destroyed when the earthquake and fire destroyed the building of the San Francisco Academy of Sciences. Fortunately Mr. W. H. Edwards figured a number of Doctor Behr's species, which he doubtless received from that author. We could also accept the specimens mentioned by Strecker as the types. In his *Lep. Rhop. Het. Suppl. 3*, he says he possesses the types of *Argynnis coronis*, *rupestris montivaga* and *monticola*, all described by Behr. At the present time these might be considered cotypes or possibly only metatypes.

The principal changes will likely be as follows:

Arg. callipe. This is as understood by American students.

Arg. zerene. This has been misunderstood, and what Mr. Edwards figured as *zerene* is quite another insect. *Purpurascens* Hy. Edws. is quite close, if not the same.

Arg. mormonia. *Eurynome* and its numerous varieties will probably have to be considered varieties of *mormonia*.

Arg. juba. *Liliana* Hy. Edws. is a synonym. This is one of the surprises shown by these figures.

Arg. hydaspæ. *Rhodope* Edwards and *sakuntala* Skinner are very close to this.

Mel. orsa is a synonym of *montana* Behr.

Mel. epula is a synonym of *mylitta* Edw.

Mel. sonora is a synonym of *gabbii* Behr.

Mel. pola is a synonym of *minuta* Edw.

Mel. callina is close to *perse* Edw. and the latter name may have to fall.

A number of aberrations are figured and named and a new species described, *Syrichthus mac-dunnoughi*. Mr. Oberthür must be credited with the name *Satyrus ariane-okius* as Doctor Boisduval apparently did not publish any name with this form, although he described it.

The California butterflies have been in a chaotic condition for years, and we are now getting light on the subject. The genus *Lycaena* was particularly hopeless, as a number of authors were describing differences that they did not understand. An examination of the genitalia will place them on a firmer foundation, but the final placing of the varieties, forms and species will come from a study of their life histories and breeding numerous specimens from known parentage.

A very valuable and interesting feature of this part is the collection of portraits of distinguished lepidopterists.

This series shows likenesses of Boisduval, Herrich-Schaeffer, Rambur, Graslin, Guenée, Millière, Fallou, Bar, Guillemot, Fetting, Martin, Macker, Constant, Moore, Lafaury, Allard, Reverdin and Oberthür.—
HENRY SKINNER.

Doings of Societies.

PACIFIC COAST ENTOMOLOGICAL SOCIETY.

The forty-fifth regular meeting was held on the evening of September 14, 1912, at the residence of Dr. F. E. Blaisdell, 1520 Lake Street, San Francisco, California.

President Van Dyke in the chair. Eleven members responded to roll call. Nine guests were present.

A communication was read from Mr. Fordyce Grinnel, in which he stated that Messrs. Newcomb, Haskin and Coolidge had recently (last of August) taken a nice series of *Lycaena neurona* Skinner on Mt. Wilson.

Mr. Huguenin made a few remarks about collecting in Marin County, California.

Percy Baumberger, who is engaged in the work of extermination of mosquitoes, reported on the manner in which the campaign was being carried on.

Mr. Fuchs distributed to the members of the Society some specimens of *Aegialites fuchsi* Horn taken on the Farallone Islands.

Mr. Cottle gave an account of his summer's vacation in July at Castella, Shasta County, California, stating that specimens of *Monohammus maculosus* Hald. had been taken at an elevation of about 3000 feet.

Mr. Bridwell gave his experiences in collecting in the Imperial Valley. Mr. Reynolds reported the results of his work at San Diego, California.

Dr. Van Dyke discussed the distribution of the species of *Harpalus* and *Aegialites*, with an account of work done on a collecting trip to Strawberry Canyon, Eldorado County, elevation 6000 feet.

Mr. Huguenin exhibited specimens of Coleoptera and Lepidoptera taken in the Yosemite Valley.

Mr. Reynolds presented a series of *Cicindelae* from San Diego, California.

Mr. Cottle showed a collection of Coleoptera and Lepidoptera taken at Castella, California.

Miss Wright exhibited several specimens of Coleoptera and Mr. Bridwell a number of insects from the Imperial Valley, California.

Adjournment and refreshments.

The forty-sixth meeting was held on the evening of December 3, 1912, at the residence of James E. Cottle, 2117 Bush Street, San Francisco, California.

President Van Dyke in the chair. Ten members responded to roll call. Eight guests were present.

Mr. J. C. Huguenin read a paper on the collecting of *Calligrapha sigmoidea* for three consecutive winters—1910, 1911 and 1912—on the Sunnyside Hills, at an elevation of 500 feet, in the suburbs of San Francisco.

A communication from Mr. F. X. Williams, giving an interesting account of the general conditions of the country in

Kansas, and of the Biological Expeditions sent out by the University of Kansas, was then read.

Mr. Grundel reported a prolonged collecting trip to the Sierras.

Mr. Harold C. Bryant gave a very instructive talk on "Protective Devices in Insects." He asked for the opinions of the members present. It was stated that bee-birds (*Tyrannus verticalis* and *T. vociferans*) feed only upon the drone bees. Dr. Blaisdell stated that he was positive that they feed abundantly upon the worker-bees (*Apis mellifica*), for, during fourteen years in which he had worked in an apiary, he had shot hundreds of bee-birds to protect the worker-bees. The stomachs of the birds were repeatedly examined and found filled with bee-stings which appeared to be indigestible.

Mr. Ralph Hopping, who is engaged in the Forestry Service for Insect Control, gave an account of the work done in the service, speaking in particular on the ravages of *Dendroctonus* and *Phloeosinus*; the former killing the trees on which they depredate, the latter only the branches.

Mr. Bridwell spoke of two rare or little known species of Hymenoptera which he had collected—*Methoca californica* Westwood, female, from Monte Rio, Sonoma Co., California, parasitic in the burrows of tiger-beetles, and the female of a new species of *Myrmosa* taken on the University of California campus, Berkeley.

Mr. Grundel stated that the larvae of *Arctia* become abundant at times in the Santa Cruz Mountains and defoliate all of the live oaks.

President Van Dyke gave a review of the genera of the *Elateridae*.

Dr. Blaisdell exhibited specimens of *Thysanocnemis helvolus* and *Idiostethus tubulatus* collected by beating in the vicinity of Baltimore, Md.; two specimens of *Synctocephalus autumnalis* Fall, collected at Mokelumne Hill, Calaveras County, California, in October, from the foliage of the live oaks (*Quercus wislizeni*).

Adjournment and refreshments.

The forty-seventh meeting was held on the evening of March 1, 1913, at the residence of Dr. F. E. Blaisdell, 1520 Lake Street, San Francisco, Cal.

President Van Dyke in the chair. Ten members answered to roll call and nine guests were in attendance.

A communication from J. N. Bowman in regard to the Society meeting with the Pacific Association of Scientific Societies was discussed.

The death of Mr. L. E. Ricksecker was announced. Mr. Cottle moved that the secretary be instructed to express the regrets of the Society to Mrs. Ricksecker and family. The motion was seconded and unanimously approved.

Prof. Wm. A. Hilton, editor of the Pomona Journal, Claremont, California, and Miss Ximena McGlashan, of Truckee, California, were elected members of the Society.

The secretary read a paper by Mr. R. F. Sternitzky, the author being absent. It was a "Report on Two Collecting Trips to Lake Tahoe." During the latter part of August Mr. Sternitzky collected seven large larvae of a Syrphid, probably of the genus *Microdon*, from ants' nests. He mistook the *Microdon* larvae for a species of Coccid—a Lecanid. Its markings are radial lines, similar to those of some Coccidae. He stated that he was sure of one thing—that these larvae do not derive nourishment from the ants, as they thrive quite well on moist wood. It was thought that the ants might have some use for them. The following is a list of the rarer Coleoptera taken during the trips: *Buprestis connexa*, *Acmaeodera vandykei*, *Ulochaetes leoninus*, *Tragosoma pilosicornis*, *Pterostichus morionides*, *Tachys fallii*, *Argonus cinerarius*, *Leptura valda*, *Pachyta spurca*, *Adelocera rorulenta*, *Melasis rufipennis* and *Serropalpus barbatus*. Dr. Van Dyke believed that the Syrphid larvae were dependent on the ants.

Mr. Bridwell stated that he took *Dichelonycha clypeata* in Wild Cat Canyon back of Grizzly Peak, Alameda County, California, on February 13, 1913. Eight specimens were secured. The beetles were flying high up among the laurel trees.

Dr. Van Dyke said that *Dichelonycha clypeata* was described from a unique. Later Mr. Ricksecker collected many. Mr. A. Kusche found four or five in San Mateo County; Mr. Bridwell took males in Contra Costa County. The species was first recorded from the Alameda side of the Bay. *D. valida* is also found in Alameda County, in April, on Redwood Peak.

Adjournment and refreshments.

A special meeting was held in conjunction with the Pacific Association of Scientific Societies, on Thursday evening, April 10, 1913, in Room 113 of the Agricultural Hall of the University of California, Berkeley. Twelve members and guests were present.

The meeting was called to order at eight o'clock by President Van Dyke. After a few appropriate remarks the following program was presented:

New Species of Tenebrionidae and the Technique for Studying the Genitalia of the Coleoptera, by Frank E. Blaisdell, Sr.

A Review of the Coccinellidae, by F. W. Nunenmacher.

The Littoral Coleopterous Fauna of the Pacific Coast, by Edwin C. Van Dyke.

Remarks on the Use of the Lantern in Illustrating the Insects of Economic Importance, by Prof. C. W. Woodworth.

The forty-eighth meeting, or Field Day, was not held as no arrangements or decisions had been made at the forty-seventh meeting.

F. E. BLAISDELL, *Secretary*.

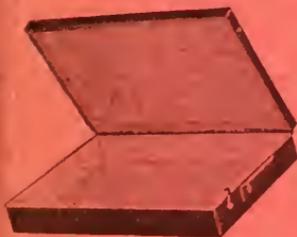
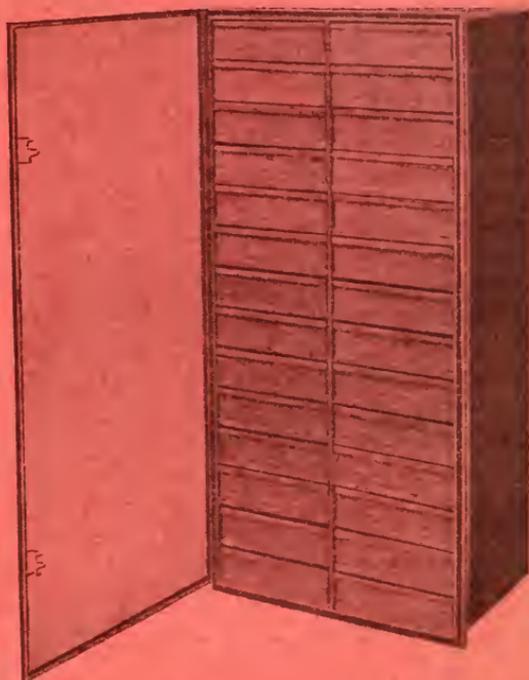
OBITUARY.

An obituary notice of CARL FUCHS, well known as a coleopterist, was published by Dr. F. E. Blaisdell in *Science* for July 17, 1914. Mr. Fuchs was born in Hanau, Frankfurt-am-Main, November 25, 1839, and died in Alameda, California, June 11, 1914. His visit to the Eastern United States, a few years ago, is still fresh in the memory of his friends.

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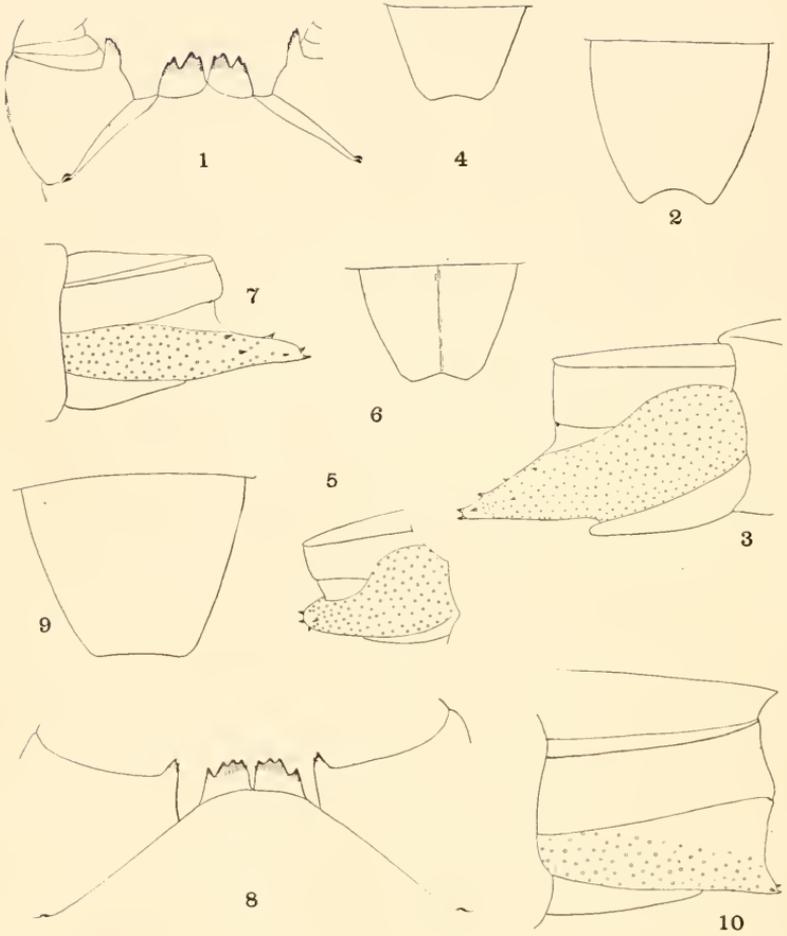
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NEW EAST INDIAN CHILOPODS—CHAMBERLIN.

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Notes on Chilopods from the East Indies.

By RALPH V. CHAMBERLIN, Cambridge, Mass.

(Plate XVII)

The following chilopods were secured by Dr. Thomas Barbour, of the Museum of Comparative Zoology, during his trip in the East Indies and neighboring parts, 1906-1907, incidentally to his other collecting. All of the specimens, including the types of the four new species here described, are deposited in the Museum at Cambridge.

SCOLOPENDROIDEA.

CRYPTOPIDAE.

1. *Otocryptops melanostomus* (Newport).

Locality.—Java: Tjibodas.

This species is widely distributed in the tropics of the entire earth.

OTOSTIGMIDAE.

2. *Otostigmus punctiventer* (Tömösvary).

Locality.—Dutch New Guinea: Sorong.

The single specimen obtained is variant in having three lat-

eral spines on the coxopleural process (with two dorsal) and in having the median pits of the sternites of the middle region of the body very weak. The species was previously known from Borneo and New Britain.

3. *Otostigmus nemorensis* Silvestri.

Locality.—Java: Buitenzorg.

A number of specimens were obtained. In all of these the last ventral plate is clearly narrowed caudad, being less quadrate than would be inferred from the accounts of Silvestri and Kraepelin. The species was previously known from Sumatra.

4. *Otostigmus barbouri* sp. nov. (Pl. XVII, figs. 1-3).

Dorsum olive green, with the head and prosternum a little more brownish. Venter paler and less greenish than the dorsum. Legs greenish distad of the prefemora.

Head shining. Distinctly punctate, as is also the first dorsal plate. Unfurrowed.

Antennae composed of 20 articles. The proximal 2 1-3 articles glabrous and shining; the others densely clothed with fine short hairs of the usual type.

Dental plates of prosternum moderately long. Teeth 4 plus 4; the inner pair and the outer pair on each side separated by a wider and deeper interval than that between the members of each pair; the most ectal tooth much smaller than the adjoining one, as is also, though less so, the most mesal.

Dorsal plates from the fourth to the twentieth longitudinally bisulcate, the sulci fine but distinct, excepting on the fourth plate, where they are less pronounced at ends. Plates of the middle and caudal regions of body with a flat, inconspicuous or often obscure median keel, but with no lateral keels whatsoever. Plates from the ninth to the twenty-first distinctly margined; the seventh and eighth also with margins less sharply set off by longitudinal depressions; the twenty-first plate most sharply margined. Plates of the middle and caudal regions weakly longitudinally rugose at sides and finely sparsely scabrous, the minute spinous points becoming more distinct caudad.

Last dorsal plate with the median keel obscurely indicated on the anterior two-thirds of length, the keel being followed caudad by a moderate longitudinal depression. Caudal margin obtusely angular, mesally a little rounded.

Ventral plates distinctly subdensely punctate. Those from the second to the nineteenth inclusive with distinct traces of longitudinal

sulci, these being evident only across the anterior borders in the anterior region of body, but in the middle and caudal regions extending to the middle of plates. None of the sternites with any distinct pits or depressions.

Last ventral plate strongly narrowed caudad; sides convex; caudal margin deeply subangularly excurved. Smooth, without furrows.

First seven pairs of legs with 2 tarsal spines; the eighth to twentieth inclusive with one.

Coxopleural process moderately long, ending in 2 stout points; bearing in addition either 1 or 2 dorsal spines and 3 lateral. (See Fig. 3.)

Prefemur of anal legs with 4 spines in the ectal ventral series and 3 in mesoventral series, 5 more occur in a series at or a little ventrad of the middle of the ventral surface, and dorsomesally are 2 in addition to the spine at the distal corner. Other joints unarmed.

Length, 43 mm.

Locality.—Dutch New Guinea: Sorong.

Two specimens.

This species seems to be closest to *O. spinosus* Porat of Java and Borneo. Among the various differences, it is readily to be distinguished from that species through the absence of the characteristic spinae on the prefemur of the twentieth legs.

5. *Otostigmus malayanus* sp. nov. (Pl. XVII, figs. 4, 5).

Dorsum brown, tinged with dilute bluish green; a deeper narrow bluish green band along the middle of caudal margin of each plate. Head and, to a less extent, the first dorsal plate a little paler and less greenish. Antennae pale. Legs somewhat testaceous, tinged with bluish green distad, the green more pronounced in the caudal pairs.

Head and first dorsal plate subdensely but not coarsely punctate. Otherwise smooth.

Articles of antennae 21, of which only the first 2 to 2 1-3 are glabrous and shining.

Prosternal teeth 4 plus 4, the two most mesal on each side largest, a minute denticle at edge of mesal incision on each side, including which the teeth number 5 plus 5. Lines setting off dental plates meeting at an obtuse angle. Process of prefemur with two denticles on mesal side below apex.

Dorsal plates from the fifth on and somewhat obscurely also the third and fourth, with mostly 7 more or less clearly defined longitudinal keels which are not sharp edged. Keels, especially caudad, finely but neither finely nor especially conspicuously scabrous. Plates from the third caudad distinctly and sharply margined, the raised edge thin.

Last dorsal plate parallel-sided; rather sharply bowed out caudad,

without keels or cornicles. A very short but sharply impressed median longitudinal furrow immediately cephalad of the caudal margin.

Ventral plates with two distinctly impressed longitudinal sulci which in the anterior region mostly cross the entire plate but caudad may extend only one-half to three-fourths the length. Without pits; but some of the plates showing a transverse depression or furrow between the middle and the caudal margin.

Last ventral plate strongly narrowed caudad. Caudal corners obliquely excised. Caudal margin incurved.

First 15 pairs of legs with 2 tarsal spines; sixteenth to nineteenth with 1 tarsal spine; the twentieth with none.

Coxopleural process short, subtriangular; terminating in 4 points or spines. A single lateral spine; none dorsally.

Length about 27 mm.

Locality.—Malay Peninsula: Johore State.

(Taken January 10, 1907.)

This species stands closest to *O. scaber* Porat, occurring in China, Siam and the Nicobars, and *O. insularis* Haase, known from Ceylon and the Seychelles. From the former it is readily separated in having 2 tarsal spines on the first 15 pairs of legs instead of on the first 7 only, etc.; and from the latter in having no tarsal spine on the twentieth legs, in having fewer pairs with 2 tarsal spines, in having the antennae 21-jointed, etc.

6. *Otostigmus moluccanus* sp. nov. (Pl. XVII, figs. 6, 7).

Olivaceous, with the head and first few plates somewhat paler.

Head and first dorsal plate finely and uniformly punctate.

Articles of antennae 18. The first 2 or 2¼ glabrous and shining.

Dental plates moderately long, the lines setting them off meeting at an angle. Teeth 3 plus 3, of which the outermost on each side is separated by a wider and deeper interval from the median one, than the latter is from the most mesal, the median and most mesal being fused nearly to their apices.

Dorsal plates from third to fifth caudad margined. A median keel only obscurely indicated. Lateral portion of plates in caudal region weakly longitudinally rugose; only finely and weakly scabrous.

Last dorsal plate subangularly bowed out, with a conspicuous median longitudinal depression immediately in front of the caudal margin.

Ventral plates with distinct paired longitudinal sulci extending mostly about two-thirds the length of the plate or very nearly so. In addition to the paired sulci there is a median longitudinal sulcus or furrow distinctly impressed on the anterior portion of the plate, espe-

cially in the anterior and middle region of the body, but tending to be reduced to an indistinct impressed dot caudad. Plates punctate.

Last ventral plate strongly narrowed caudad. Caudal margin conspicuously and somewhat angularly incurved. A weak median longitudinal sulcus.

Only the first 5 pairs of legs with 2 tarsal spines.

Coxopleural process long and subcylindrical, ending in 2 points. Lateral spines 3, of which the two most proximal are larger than the distal one. Also with 1 stout dorsal spine. (See Fig. 7.)

Length, cir. 20 mm.

Locality.—Moluccas: Ternate. One specimen.

This species appears to be nearest in structure to *O. punctiventer* (Tömösvary), above listed. It differs from that species in having the last ventral plate more conspicuously narrowed caudad; in the longer and more strongly marked sulci of the ventral plates; and in various minor points.

7. *Trematophychus immarginata* (Porat).

Locality.—Upper Burma: Katha and Tagourg (December 19 and 20, 1906). Java: Buitenzorg.

This species is widely distributed in the East Indies and adjacent lands, having been reported previously from Sumatra, Borneo, India and the Philippines.

8. *Trematophychus longipes* (Newport).

Locality.—Java: Buitenzorg.

This species is distributed throughout the tropical regions of both hemispheres.

9. *Ethmostigmus rubripes* (Brandt).

Locality.—Dutch New Guinea.

Also known from Australia, Java, Thursday Islands and China.

10. *Ethmostigmus cribrifer* (Gervais).

Localities.—Moluccas; Ceram Is.; Wahaai; Halmaheira Is.; Sain.

Originally described from this same general region.

SCOLOPENDRIDAE.

11. *Scolopendra morsitans* Linné.

Localities.—Dutch New Guinea. Java: Buitenzorg.

A cosmopolitan species.

12. *Scolopendra subspinipes* Leach.

Localities.—Dutch New Guinea: Manokwari and Sorong.

13. *Scolopendra subspinipes dehaani* Brandt.

Locality.—Java: Buitenzorg.

Four very large specimens were secured at this place.

14. *Scolopendra gracillima* Attems.

Localities.—Java: Buitenzorg. Moluccas: Ceram Is., Wa-haai.

Originally described from Java, heretofore the only known locality.

15. *Trachycormocephalus indiae* sp. nov. (Pl. XVII, figs. 8-10).

Brown; with a somewhat obscure slightly greenish dark median longitudinal band along the dorsum, the band being about one-third the total width of plates; each plate with a narrow stripe of much deeper greenish color along caudal margin, this being the width of the longitudinal band; the longitudinal band widens across the first plate and embraces the entire head which is distinctly greenish in color. Antennae green. Legs testaceous, the last pair tinged with green.

Head subcordate, conspicuously narrowed cephalad. Smooth, not punctate; a distinct transverse furrow a little in front of the caudal margin; on each side a V-shaped impression with apex at transverse furrow, the inner arm extending a little distance cephalad parallel with its fellow of the opposite side and the outer arms diverging ectocephalad; two short submedian parallel longitudinal furrows between the V-shaped impressions; all these impressions rather weak.

Antennae composed of 18 articles. Short, reaching to or a little caudad of the middle of the third pediferous segment. The 3-5 proximal articles nearly glabrous; the fifth to seventh or eighth somewhat intermediate; the others fully clothed.

Dental plates of prosternum long, each bearing 4 distinct, subacute teeth or with a small fifth tooth at mesal end. Of these teeth the most ectal is a little more widely removed than the others are from each other, the latter being more or less fused at bases. Line setting off dental plates subsemicircular.

Dorsal plates from the third to the twentieth inclusive longitudinally bisulcate, the sulci all complete and distinct. Only the twenty-first plate distinctly margined.

Last dorsal plate with caudal margin subsemicircular or bow-shaped. With a distinct and complete median longitudinal sulcus.

Ventral plates from the second to the twentieth inclusive bisulcate; otherwise nearly smooth.

Last ventral plate conspicuously narrowed caudad. Sides straight or nearly so. Caudal margin nearly straight or but slightly incurved, with the corners a little rounded.

First 19 pairs of legs with a tarsal spine. All legs, including also the anal, with spines at base of claws, those of claw of last pair very small.

Coxopleurae but slightly extended at caudomesal corner, the very short process distally rounded and bearing 3 points or spines. A single small spine laterad of process on caudal margin.

Anal legs short. The prefemur twice as long as greatest thickness or very nearly so. Prefemur bearing ventrally an ectal row of 2 spinules, a submedian one of 3 and an inner or mesal one of 2; dorso-mesally a series of 3 spinules; the corner process at distal end bearing 2 or 3 spinules. Other articles unarmed. The claw with small fine spines at base.

Length, 22-23 mm.

Locality.—India: Jeypore (November 8, 1906). Two specimens.

The separation of this species from the two previously described may be made as follows:

- a. The last dorsal plate with a distinct and complete median longitudinal sulcus.
 - b. Claw of anal legs without basal spines, dorsal plates from seventeenth to nineteenth caudad margined; antennae with 19 articles *T. mirabilis* (Porat)
 - bb. Claw of anal legs with distinct basal spines; only the twenty-first dorsal plate margined; antennae 18-jointed,
 - T. indiae* sp. nov.
- aa. The last dorsal plate without a median longitudinal sulcus.
 - Antennae 17-jointed; only the twenty-first dorsal plate margined; claw of anal legs with basal spines.... *T. afer* (Meinert)

GEOPHILOIDEA.

MECISTOCEPHALIDAE.

16. *Mecistocephalus punctifrons* Newport.

Localities.—Java: Batavia. Upper Burma.

This is proving to be a common form in the warmer parts of both hemispheres.

ORYIDAE.

17. *Orphnaeus brevilabiatus* (Newport).

Locality.—Java: Buitenzorg.

Common in the warmer parts of America as well as throughout the East.

SCUTIGEROMORPHA.

SCUTIGERIDAE.

18. *Thermopoda* sp.

One young specimen apparently belonging to this genus. It is lacking the head, making further identification impossible.

EXPLANATION OF PLATE XVII.

Otostigmus barbouri sp. nov.

Fig. 1. Portion of prosternum and prehensors showing dental plates.

Fig. 2. Last ventral plate.

Fig. 3. Lateral aspect of the twenty-first segment, showing coxopleura.

Otostigmus malayanus sp. nov.

Fig. 4. Last ventral plate.

Fig. 5. Lateral aspect of twenty-first segment, showing coxopleura.

Otostigmus moluccanus sp. nov.

Fig. 6. Last ventral plate.

Fig. 7. Lateral aspect of twenty-first segment, showing coxopleura.

Trachycormoccephalus indiae sp. nov.

Fig. 8. Portion of prosternum and prehensors showing dental plates.

Fig. 9. Last ventral plate.

Fig. 10. Lateral aspect of twenty-first segment, showing coxopleura.

Insects found on Nursery Stock Imported into New Jersey during 1913.

By HARRY B. WEISS, in Charge of Nursery and Imported
Stock Inspection, New Brunswick, N. J.

The inspection of imported stock is primarily of course for the purpose of preventing the introduction and spread of insects and diseases not already established. According to the report of the Federal Horticultural Board by C. L. Marlatt, there were imported into the United States in 1912 44,781 cases of nursery stock, of which amount about one-fifth entered the State of New Jersey.

A list of the insects, therefore, which were imported on stock entering New Jersey during the year 1913 should not be without interest to those engaged in inspection work in other States. As a rule, one is not aware during the inspection seasons of what is taking place in other States and it seems that

some system of co-operation, whereby the different inspectors could be informed of such happenings, would be of value in putting one on his guard, at least with respect to some species. By consulting the charts, one can get an idea of the proportion

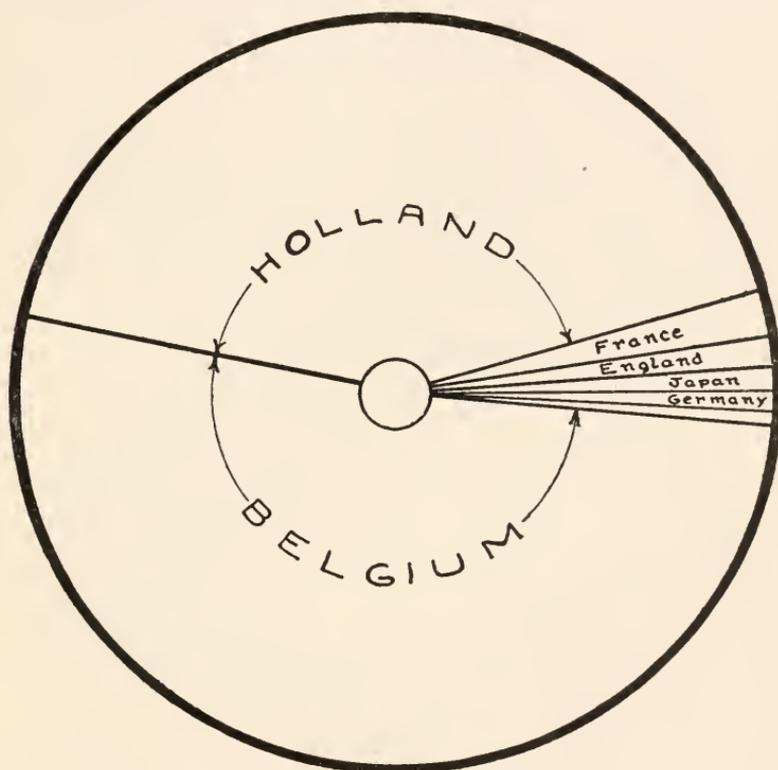


CHART I.—Importations of Nursery Stock into New Jersey, Spring of 1913.
6600 parcels.

of stock received from various European countries, Holland and Belgium being by far the largest exporters, at least into New Jersey. The narrow blank sector in each circle represents the amount of stock from all other foreign countries.

The majority of the stock coming from Holland consists of boxwood, evergreens, fruit trees, roses and deciduous plants; from Belgium we get palms, bay trees, azaleas, rhododendrons and shade trees; from France, shrubs, fruit stock, evergreens;

from Germany, greenhouse stock, evergreens, fruit trees, roots; from England, roses and fruit trees; from Scotland, roses and rhododendrons; from Ireland, roses; from Japan, evergreens, fruit stock, miscellaneous plants. Belgium occupies the largest space on both charts by reason of the numerous shipments of bay trees, palms and azaleas which come from that country.

During the spring the following species were intercepted:

Pseudaonidia paconiae Ckll., on azaleas from Japan; *Pseudococcus azaleae*, on azaleas from Japan; *Parlatoria pergandei* Ckll., on maples from Japan; *Diaspis pentagona*, on *Prunus persica* from Japan; *Aspidiotus hederac* Vall., on bay trees from Belgium; *Aspidiotus britannicus* Newst., on bay trees from Belgium; *Coccus hesperidum* Linn., on bay trees from Belgium.

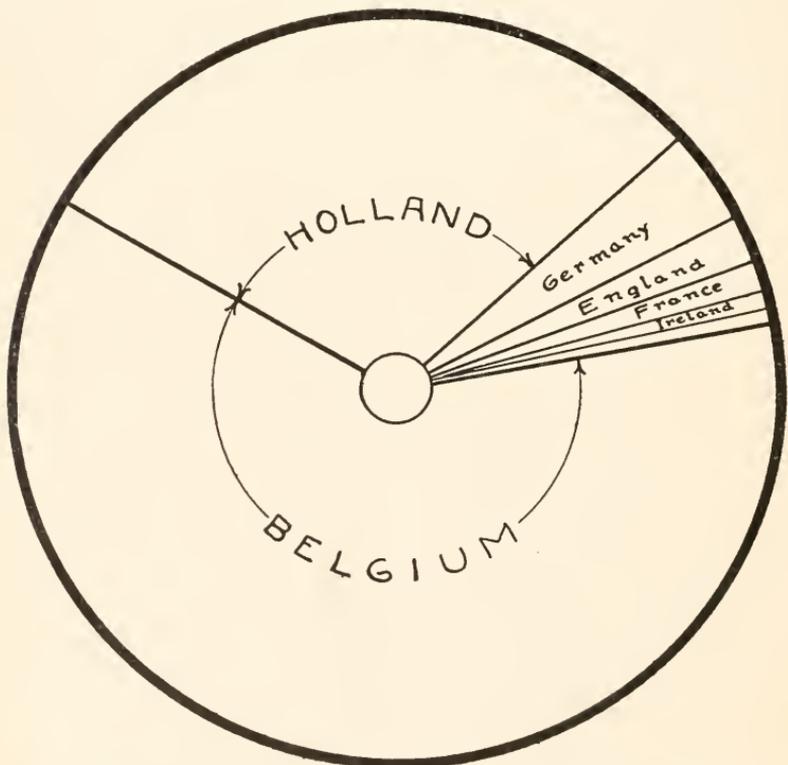


CHART II.—Importations of Nursery Stock into New Jersey, Fall of 1913.
5600 parcels.

During the fall the shipments infested were as follows:

Aleyrodes sp., on thirty-one shipments azaleas, Belgium; *Aleyrodes* sp., on one shipment azaleas, Holland; *Aleyrodes* sp., on one shipment aucubas, Holland; *Aleyrodes* sp., on one shipment bouvardias, England; *Lepidosaphes ulmi* Linn., on fourteen shipments boxwood, Holland; *Tingitidae*, eggs, on one shipment of rhododendrons, Belgium; *Coccus hesperidum* Linn., on nine shipments bay trees, Belgium; *Pseudococcus* sp., on five shipments palms, Belgium; *Pseudococcus* sp., on two shipments bays, Belgium; *Pseudococcus* sp., on one shipment *Metrosideros*, Belgium; *Pseudococcus* sp., on one shipment bamboo canes, England; *Chrysomphalus aonidum* Linn., on one shipment palms, Belgium; *Chrysomphalus dictyospermi* Morg., on one shipment palms, Belgium; *Aspidiotus britannicus* Newst., on one shipment bays, Belgium; *Aspidiotus hederæ* Vall., on one shipment bays, Belgium; *Aspidiotus hederæ* Vall., on one shipment oleanders, Belgium; *Aspidiotus hederæ* Vall., on one shipment palms, Belgium; *Aspidiotus hederæ* Vall., on one shipment *Yucca tricolor*, England; *Diaspis boisduvalii* Sign., on one shipment orchids, England; *Hemichionaspis aspidistrae* Sign., on one shipment ferns, Belgium; *Hemichionaspis aspidistrae* Sign., on one shipment ferns, England; *Macrosargus cuprarius*, on one shipment azaleas, Belgium; *Peronia* sp., on one shipment azaleas, Belgium; *Gracilaria* sp., on one shipment azaleas, Belgium; *Acanthia saltatoria* Linn., on azaleas from Belgium, Det. Dyar.; *Gracilaria azaleæ* Busck., on azaleas from Belgium, Det. Busck.; *Peripsocus* sp., on bay trees from Belgium, Det. Banks; *Apion ulicis* Forster, in seed pods of *Ulex europea*, from England, Det. Pierce.

Mr. C. L. Marlatt and Mr. E. R. Sasser identified most of the scale insects, Mr. Busk the *Peronia* and *Gracilaria* sp., and Mr. Walton, *Macrosargus cuprarius*. Practically all of the insects, with the exception of the *Aleyrodes* sp., which happens to be new, are more or less distributed in the United States. This, however, is no excuse for allowing them to enter in abundance. The infested plants received during the spring from Japan were destroyed, while the bay trees were cleaned by the consignees before being sold. In most cases the fall infestations were not serious, *Coccus hesperidum* and *Aleyrodes* sp. being the most numerous. During the entire year no brown-tail nests or gypsy moth egg masses were noted.

A New Genus of Chalcidoid Hymenoptera of the Family Cleonymidae from Australia.

By A. A. GIRAULT.

The following genus belongs to the Cleonyminae.

EPICAUDONIA new genus.

Female.—With the build of *Epistenia* Westwood, but the abdomen noncarinated along each side, the second, sixth and seventh segments longest. Head rather large, the antennae 13-jointed, inserted in the middle of the face, three ring- and club-joints, the first funicle joint elongate. One mandible 4-dentate (other not seen). Parapsidal furrows four-fifths complete. Scutellum simple. Pronotum transverse, the propodeum without a median carina but with a fovea more than halfway to the round-oval spiracle from the meson at cephalic margin. Postmarginal vein three-fourths or more the length of the marginal, the stigmal about half the length of the marginal. Like *Caudonia* Walker otherwise. Anterior femora distinctly swollen, the posterior still much more so, but neither of them excised nor dentate. Wings subhyaline, the infuscation very faint or totally absent. Stigmal knob small.

Male.—Not known.

Type.—The following species.

1. *Epicaudonia scelestus* n. sp.

Female.—Length, 3.90 mm.

Dark metallic green, the mesothorax with rather inconspicuous pubescence somewhat like that of *Catolaccus*. Tegulae, venation, trochanters, knees, tarsi, scape, pedicel and joints 2 and 3 of funicle reddish brown; antennae black; tips of tibiae white. Thorax finely reticulately punctate (including the propodeum). Legs concolorous. First club joint forming half of that region, the distal funicle joint distinctly longer than wide but less than half the length of the first, joints 2 and 3 subequal, 4 about equal in length to the pedicel. The three ring-joints large.

Described from one female captured by sweeping in a jungle, July 26, 1913.

Habitat.—Meerawa (Cairns District), Queensland.

Type.—In the Queensland Museum, Brisbane, the above specimen on a tag, a fore and hind leg and the head on a slide.

Catalogue of the Membracidae of Uruguay (Hemip., Homop.).

By FREDERIC W. GODING, Guayaquil, Ecuador.

The Membracidae are insects belonging to the order Hemiptera, sub-order Homoptera, which includes the Cicadidae, Fulgoridae, Cercopidae, Psyllidae, Aphididae and Coccidae. As a general rule they are easily separated by the well-developed prothorax into a multitude of shapes and forms.

To facilitate the identification of the different species found in Uruguay, the following synoptic table has been prepared:

- 1 (28). Tibiæ simple, not broadened or flattened.
- 2 (15). Third apical area of tegmina elongate, base truncate, never petiolateSubfamily DARNINÆ.
- 3 (8). Posterior process covering all or nearly all of tegmina; destitute of horns; convex, smooth, median carina obsolete.
- 4 (7). Form robust; ocelli distinctly nearer to each other than to the eyes.
- 5 (6). Lateral yellow border of prothorax originating behind eyes, extends nearly to apex, and occupies nearly half of sides of prothorax*Stictopelta latilinea*.
- 6 (5). Lateral yellow border of prothorax originating behind humeral angles, terminates at apex of posterior prothoracic process, occupying very narrow edge....*Stictopelta limbata*.
- 7 (4). Form slender; ocelli nearly equi-distant from each other and the eyes*Cryptoptera acutula*.
- 8 (3). Tegmina almost wholly uncovered.
- 9 (14). Corium of tegmina with two discoidal areas.
- 10 (11). Prothorax elevated in front, armed with a sharp horn extended outward above each humeral angle; ocelli nearer to each other than to the eyes*Pyranthe acaciae*.
- 11 (10). Prothorax depressed in front, armed in front with a horn turned downward; ocelli nearer to the eyes than to each other.
- 12 (13). Front horn obtuse at apex, not spatulate, median carina of which is much more elevated than lateral edges; upper surface of horn not bi-sulcate*Argante incumbens*.
- 13 (12). Front horn broadly spatulate at apex, its median carina equal to elevation of lateral edges forming on each side a distinct longitudinal sulcus*Argante tremolaris*.
- 14 (9). Corium of tegmina with one discoidal area; prothorax unarmed, with a median carina, posterior process acute,
Smiliorhachis proxima.

- 15 (2). Third apical area of tegmina triangular, base petiolate,
Sub-Family SMILINAE.
- 16 (27). Tegmina free; posterior process of prothorax narrow behind humeral angles.
- 17 (26). Base of tegmina emitting two longitudinal veins; five apical areas, three discoidal areas.
- 18 (19). Posterior process of prothorax 3-forked; apical areas of wings stylated*Cyphonia clavigera*.
- 19 (18). Posterior process of prothorax simple, not 3-forked; armed above each humeral angle with an acuminate horn; front elevatedGenus *Ceresa*.
- 20 (21). Humeral horns and apex of posterior prothoracic process ferruginous; frequently a fuscous spot on costa near apex of tegmina*Ceresa uruguayensis*.
- 21 (20). Humeral horns concolorous, or apex and below fuscous.
- 22 (25). Apex of humeral horns directed outward and backward.
- 23 (24). Humeral horns strong; front of prothorax convex between humeral horns; ocelli distinctly nearer to each other than to the eyes*Ceresa pauperata*.
- 24 (23). Humeral horns slender, very acute, a little recurved; front of prothorax distinctly convex between humeral horns; ocelli nearly equi-distant from each other and eyes,
Ceresa brunnicornis.
- 25 (22). Apex of humeral horns directed distinctly outward, forward and upward, concave between*Ceresa cavicornis*.
- 26 (17). Base of tegmina emitting three longitudinal veins, four apical and one discoidal areas in corium; dorsum of prothorax convex, posterior process acuminate; size small,
Acutalis variabilis.
- 27 (16). Tegmina almost wholly covered by posterior prothoracic process, with two longitudinal veins, two or three discoidal areas, interior basal area very broad,
Phormophora archavclata.
- 28 (1). Front tibiæ dilated, flattened, foliaceous,
Sub-family MEMBRACINAE.
- 29 (30). Prothorax compresso-elevated, produced in front in a horn, gently decreasing in altitude backward, horn with a lateral carina on each side in anterior superior part which does not extend behind humeral angles, summit foliaceous; four small carinae on each side of median carina on under surface of horn*Enchophyllum imbellis*.
- 30 (29). Prothorax tricarinate, lateral carinae extended at least to lateral borders behind humeral angles; front produced in a high angle or horn*Enchenopa monoceros*.

Subfamily SMILINIÆ.

Genus **Cyphonia**.

1832. Laporte, Ann. Soc. Ent. Fr. Ser. I, p. 229.

C. clavigera Fabr. Syst. Rhyng. p. 17. 1803.

A single example is in the National Museum of Uruguay, labeled "Uruguay." It is also found in Paraguay and Brazil.

Genus **Ceresa**.

1843. Amyot et Serv. Hemip. p. 539.

C. brunnicornis Germ. Silb. Rev. Ent. III, p. 236. 1835.

Two examples are in the Uruguayan National Museum collection, labeled "Uruguay."

C. pauperata Berg. Add. et Emend. Hemip. Argent. p. 149. 1884.

There are three examples in the Uruguayan National Museum collection. It feeds on *Acacia farnesiana* Willd. in Uruguay.

C. uruguayensis Berg. Add. et Emend. Hemip. Argent. p. 148. 1884.

Very similar to *ustulata* Fairm., from which it may be separated by the more slender horns above the humeral angles, the greenish coloring and the fuscous spot on the apex of the tegmina. It lives on *Acacia farnesiana* Willd. and has been taken at Canelones and on the Corralito River in Uruguay. Three examples are in the Uruguayan National collection.

C. cavicornis Stal, Freg. Eug. Resa. Ins. p. 284. 1859.

This species is not represented in the Uruguayan National collection. Stal received it from Montevideo.

Genus **Acutalis**.

1846. Fairm. Ann. Soc. Ent. Fr. Ser. 2, IV, p. 241.

A. variabilis Berg. Hemip. Argent. p. 244. 1879.

This species, not represented in the Uruguayan National collection, closely resembles *plagiata* Fairm. It differs from that species in its larger size, apex of posterior process not black, and absence of the reddish markings on the prothorax. It differs from *anticonigra* Fairm. in the very faint lateral prothoracic impression, in the venation of the tegmina, and in the fuscous spot on the head.

Habitat.—Uruguay.

Genus **Phormophora.**

1869. Stal, Hem. Fab. II, p. 28.

P. arechavaleta n. sp.

Testaceous, densely punctured; median carina nearly obsolete; a broad, diagonal stripe on each side behind humeral sinus, lateral borders from sinus posteriorly, and a spot on each tegmen in front of middle, yellow; sides of chest, and sometimes spots on posterior process of prothorax, tarsi, costa, two longitudinal veins, and veins surrounding fourth apical area, ferruginous; basal half of costal and interior basal areas, and large part of apex of tegmina, fuliginous.

Long. 7, lat. inter hum. ang. 3 mm.

Described from four females; *types* in Uruguayan National collection and in collection F. W. G.

Hab.—Uruguay.

The fourth and fifth apical areas united equal width of the broad interior basal area; whereas, in *maura* Fab., the only other member of the genus, the same space is occupied by the fifth area alone; also the third apical area is not small, as in *maura*, but is of the usual size and rather long and narrow.

The examples in the Uruguayan National collection are labeled "*Darnis amargosi* Berg.," which doubtless is a manuscript name as no description seems to have been published. It feeds on *Syringium* sp. in February.

Pupa.—There is in the Uruguayan collection one example of the pupa of this species, badly mutilated, the body missing; but, as descriptions of pupae of this family are rarely published, the following has been prepared.

Testaceous, mottled with ferruginous, pubescent; head similar to the mature insect, but more rugose; prothorax dome-like, deeply excavated at base in the middle, on each disc of which it has several black spots; dorsum highly elevated and rugose, with a deep impression on each side in front; posterior edge extending towards the summit, on each side, suddenly extending backward in a triangular shape, on the top with three large longitudinal fuscous marks; the apex of the triangle nearly reaches the base of abdomen; at the summit is a crest-like foliation resembling a cock's comb, red, extending forward; the metathorax is exposed behind the posterior border of the prothorax. The wing pads are strong, flat, and joined together, over the abdomen, by a broad flat membrane. Abdomen is exposed, along its median

line on the dorsum, is a line of small tubercles, one on each segment.

The pupa is about half the size of the adult.

I take great pleasure in naming this interesting species after the distinguished botanist and director of the National Museum of Uruguay, recently deceased, who was the father of the study of natural history in Uruguay. The *Flora Uruguayensis* will cause Dr. Arechavaleta's name to be respected for all time.

Subfamily DARNINAE.

Genus **Stictopelta**.

1869. Stal, Hemip. Fabr. II, p. 32.

S. latilinea Walker, List Hom. Brit. Mus. Suppl. p. 147. 1858.

There are two examples in the Uruguayan National collection, labeled "Uruguay"; Walker's material was received from Constanca, Province of Rio, Brazil.

S. limbata Burm. in Silb. Rev. Ent. IV, p. 173. 1836.

Four examples are in the Uruguayan National collection, from Uruguay.

Genus **Cryptoptera**.

1869. Stal, Hemip. Fab. II, p. 32.

C. acutula Fairm. *ibid.* p. 481. 1846.

Although this genus is widely distributed from Mexico to the River Plate, *acutula* is the only species so far found here. The two examples in the Uruguayan National collection are smaller than Fairmaire's type, but otherwise agree with his description.

Hab.—Uruguay. Also Mexico, Panama, Brazil (Fowler).

Genus **Pyranthe**.

1867. Stal. Ofv. Vet-Ak. Forh. p. 558.

P. acaciae Berg. Add. et Emend. Hemip. Argent. p. 152. 1884.

It is closely related to Stal's *bimaculata* and *laticornis*, but differs from both in the robust, acuminate humeral horns which are directed a trifle upward and backward.

Berg describes the larva which, with the mature insect, is found on *Acacia farnesiana* Willd. The Uruguayan National collection possesses one female.

Hab.—Uruguay.

Genus *Argante*.

1867. Stal, Ofv. Vet-Ak. Forh. p. 558.

A. incumbens Germ. in Silb. Rev. Ent. III, p. 239. 1835.

A series of eight examples are in the Uruguayan National collection, from Uruguay. It is found in the month of May, on the leaves of *Eryngium agavifolium* Grb.

A. tremolaris n. sp.

Black, smaller, more depressed, and much more slender than *incumbens*. Head broad, short, apex rounded transversely, much retracted forming a sharp edge; ocelli pale, between themselves and the eyes doubly distant; punctured. Prothorax armed in front with a strong, dependent, curved horn extending forward and downward which is broadly spatulate at apex; the spatulate apex is furnished with a well marked median carina; the edge on each side is elevated which forms a deep channel on each side; median carina prominent to a line passing between humeral angles, thereafter nearly obsolete, the lateral carinæ also extending to humeral angles; prothorax convex, laterally somewhat depressed or flattened; posterior process broad at base, convex, gradually decreasing in breadth to apex which extends a trifle beyond tip of abdomen, strongly punctured. Tegmina rather narrow, blackish brown almost to extremities, where they are narrowly yellowish white and transparent; wings have four apical areas, base of second truncate. Legs concolorous, front tibiæ not dilated. Female similar to male, larger, and median carina percurrent.

Long. from apex of front horn to extremity of tegmina 8, lat. inter hum. ang. 2 mm.

Described from one male and four females.

Types.—in Uruguayan National collection, and coll. F. W. G.

Hab.—Piriapolis, Uruguay. Collector, J. Tremolares. Feeds on *Syringium* sp.

This species differs from *incumbens* in the absence of a median carina on the posterior prothoracic process of the male, broad spatulate form of the apex of the front horn, in the elevated lateral edges toward the apex which equal the median carina; in the tegmina being very narrowly white at extremities, and black base of clavus.

So long ago as the year 1835 Germar, and later Berg, mentioned the spatulate form of the front horn in some of the examples labeled *incumbens*, and doubtless had one of this

species before them at the time. It is altogether a more slender insect.

This species is dedicated to Senor J. Tremolares, late sub-director of the National Museum of Uruguay, who, almost alone, is keeping up an interest in the entomology of Uruguay. He is now on the staff of the Uruguay Geological Survey.

Genus **Smiliorhachis**.

1846. Fairm. *ibid.* p. 290.

S. proxima Berg, *Add. et Emend. Hemip Argent.* p. 154. 1884.

No examples of this species are in the Uruguayan National collection; but the type was taken in Uruguay. It is close to *variegata* Fairm. and *octolineata* Stal. It differs from the former by the design of the prothorax and color of the tegmina; from the latter in its smaller size, absence of eight lines, and color of the tegmina. It is found in November, on *Acacia farnesiana* Willd.

Hab.—Uruguay (Berg).

Subfamily MEMBRACINÆ.

Genus **Enchophyllum**.

1843. Amyot et Serv. *Hem.* p. 534.

E. imbelle Stal, *Ofv. Vet-Ak. Forh.* p. 271. 1869.

It is not represented in the Uruguayan National collection.

Hab.—Montevideo, Uruguay. (Arechavaleta.)

Genus **Enchenopa**.

1843. Amyot et Serv. *Hem.* p. 535.

E. monoceros Germ. in *Mag. Ent.* IV, p. 28. 1824.

The Uruguayan National Museum possesses four examples. It feeds on *Acacia farnesiana* Willd.

Hab.—Uruguay.

The entomology of Uruguay is well represented in the collection of the National Museum of Uruguay, where the insects are well taken care of. It is to be hoped that arrangements will soon be made for the correct identification of the material not already determined by the late zoologist, Senor J. Tremolares.

New Species of North American Dolichopodidae (Diptera).

By M. C. VAN DUZEE, Buffalo, New York.

Systemus americanus n. sp.

Male: Length 3.2 mm. Face covered with white pollen; proboscis and palpi black; front metallic bluish-green, more blue in the center, rather long on account of the antennæ being inserted so low down on the head; antennæ black, the third joint more brown, first and second joints short, third joint long and flattened, about the length of the front; arista terminal, stout, fully one-half as long as the third joint; cilia of the upper orbit black, of the lateral and inferior orbit white.

Dorsum of the thorax and the scutellum dark metallic blue-green, bright but somewhat dulled with almost invisible brown pollen; pleuræ darker-colored than the dorsum and with gray pollen.

Abdomen metallic green, more bronze black on the dorsum towards the apex; hypopygium large, black, the peduncle about as long as the diameter of the hypopygium, and forming a sort of slender seventh segment to the abdomen, being concolorous with it; hypopygium with a small black appendage ciliate with brown hairs on the outer surface near the tip; outer lamellæ yellow, somewhat sickle-shaped with a crooked spine at the base of the bend.

Coxæ and legs black; fore and middle coxæ with white hairs on the front surface, those on the fore pair long and abundant; hind coxæ with a white bristle and several long white hairs on the outer surface; femora with a greenish reflection; the fore pair with a fringe of long white hairs on the lower outer edge; trochanters and knees yellowish; bristles of the tibiæ small; hind metatarsi two-thirds as long as the second joint. Tegulæ, their cilia and the halteres yellow.

Wings tinged with blackish; fourth vein bent forward near the middle of the last section, but parallel with the third vein toward the tip, and ending in the apex of the wing.

Described from one male from the Black Mountains, North Carolina, May (collection of Mr. Nathan Banks).

Gymnopternus flaviciliatus n. sp.

Male: Length 3 mm. Face covered with silvery-white pollen; front blackish with white pollen, which appears brown when viewed from above; antennæ of moderate size, yellow, third joint slightly darkened at apex, somewhat rounded at the tip.

Dorsum of the thorax dark blue-green almost black, thickly covered with brown pollen; scutellum bronze-brown with a central longitudinal ridge.

Abdomen bronze-green with white pollinose spots on the sides of segments three and four; venter, extreme lateral edges of the dorsum of the abdomen, and the epimera metathoracica yellow; hypopygium black with pale yellow lamellæ which are ciliate with yellow hairs.

Coxæ yellow, the middle pair slightly darkened on the outside; fore and middle coxæ with black hairs and bristles on the front surface; hind coxæ with an erect bristle on the outside; the usual row of bristles on the fore tibiæ rather stout, fore tibiæ also with two or three longer bristles on the upper surface; middle and hind tibiæ with stout bristles. Halteres and tegulæ yellow, the latter with black cilia.

Wings grayish hyaline; veins dark brown, yellow at the root of the wing.

Female: Agrees with the male in all but sexual characters.

Described from fourteen males and seven females, taken at Spring Creek, Decatur County, Georgia, July 16th to 29th, by Dr. J. C. Bradley and Mr. M. D. Leonard.

This species runs to *G. ventralis* in the keys, but can be distinguished from that species by the lamellæ of the hypopygium being ciliate with yellow hairs, while in *ventralis* the ciliae are black; the hypopygium is also a little smaller, the antennae a little more pointed, and the pollen on the sides of the abdomen forms distinct spots on the sides of the third and fourth segments, while in *ventralis* it is more evenly distributed.

***Leucostola terminalis* n. sp.**

Female: Length 4.75 mm. Face wide, thickly covered with white pollen; palpi large, whitish with black hairs; front black shining, dulled with gray pollen; antennæ yellow, third joint short, brown except the base; arista dorsal; cilia of the upper orbit black, of the lateral and inferior orbit white; postvertical bristles stout, black.

Dorsum of the thorax bright metallic green with broad reddish coppery stripes on the sides above the root of the wings, and two fine coppery lines one on each side of the acrostichal bristles; these lines are easily overlooked; dorsum with white pollen along the front and lateral edges; pleuræ black with thick white pollen, and with the posterior edges yellow.

Abdomen with the first three segments yellow; the narrow hind margins of these segments and the whole of the fourth and fifth metallic green with coppery reflections and covered with white pollen.

Coxæ yellow, fore pair with a row of five long black bristles on the front surface towards the tip; middle pair black on the outer surface

and with long black hairs on the front surface; hind coxæ with an erect bristle on the outer surface; legs yellow; fore and middle tarsi darkened towards the tip; tips of the hind tibiæ and hind tarsi brown. Tegulæ and halteres yellow, the former with white cilia.

Wings hyaline, strongly tinged with yellowish brown, and with yellowish brown veins.

Described from one female taken by Mr. Nathan Banks at Great Falls, Virginia, June 21st.

This species can readily be recognized by its yellow antennæ and also by the conspicuous coppery spots above the roots of the wings.

***Thinophilus frontalis* n. sp.**

Male: Length 6 mm. Face wide, dark metallic green, with coarse brownish yellow pollen along the sides below, the portion below the suture nearly one-half as long as the upper portion and with a longitudinal ridge; palpi very large, reddish yellow, each as large as the face and covered with coarse black hairs; front broader than the face, widest at the vertex; ocellar tubercle prominent, a carina from this tubercle to the eye margin where the outer vertical bristles are inserted and forming an excavated basin above the antennæ, the outer upper corner of which is reddish coppery, the center violet, and the sides green; front with only a little brownish-yellow pollen near the antennæ; antennæ yellowish below, brownish above, first joint bare above, second as long as the first and as broad as long, third very short with the arista inserted at the base above; orbital cilia black above, yellowish below.

Dorsum of the thorax metallic black with violet reflections, polished, with a central green vitta which reaches the scutellum; scutellum concolorous with this vitta; a deep black spot above the root of the wing; dorsum with coarse yellowish-brown pollen; scutellum with two large and two small marginal bristles; pleuræ blackish-green with thick yellowish-gray pollen.

Abdomen metallic green, with six visible segments, the sixth as long as the others, the incisures bronze-black; abdomen dusted with gray pollen which is thickest along the lower lateral edges; hypopygium small, partly imbedded, rounded behind, with two pairs of long, thick, black lamellæ, which reach the ventral hind margin of the fifth segment, this margin projecting somewhat below and with a pair of black spine-like bristles.

Coxæ black with yellow tips and thick gray pollen; fore and middle pairs with black bristles on the front surface; middle and hind coxæ each with a large black bristle on the outer surface; femora yellow; fore and middle pairs with black hairs below, the former with four

black bristles near the tip on the lower outer edge; hind pair slightly darkened above at tip; fore tibiæ brown with three bristles below, close to the tip; middle and hind tibiæ black; fore and middle tarsi yellow with all the joints black at the tip; hind tarsi black with the first and second joints equal; pulvilli and empodium well developed. Tegulæ, their cilia and the halteres yellow.

Wings grayish-hyaline, brown in front of the third vein; fourth and fifth longitudinal veins and the posterior cross-vein bordered with brown; last section of the fourth vein slightly approaching the third at tip; there is an upward sinus at the center of the last section of the fourth vein.

Female: Agrees with the male in all but sexual characters, except that the palpi are blackish, with white pollen and yellow edges, and the thorax is more thickly covered with pollen. There are six dorsocentral, one large and one small humeral, a post-humeral, one notopleural, two supraalar and one postalar bristles, also one or two small presutural bristles; on the prothorax there is a transverse row of yellowish bristles, those near the fore coxæ large, but those on the dorsal part of the row small. In the male (which I make the type of the species) all the bristles are missing from the mesonotum and scutellum although the specimen is in good condition otherwise.

Described from one male and one female which I took on a salt-marsh on the Manatee River at Bradentown, Florida, in March.

Why do Honey-Bees Discriminate Against Black? (Hym.)

By JOHN H. LOVELL, Waldoboro, Maine.

There has long been a widespread belief among apiarists that a beekeeper will receive more stings when dressed in black than when wearing white clothing. A large amount of evidence has been published in the various bee journals showing beyond question that honey-bees under certain conditions discriminate against black. A few instances may be cited in illustration. Of a flock of twelve chickens running in a beeyard seven black ones were stung to death, while five light-colored ones escaped uninjured. A white dog ran among the bee-hives without attracting much attention, while at the same time a black dog was furiously assailed by the bees. Mr. J. D. Byer, a prominent Canadian beekeeper, relates that a black

and white cow, tethered about forty feet from an apiary, was one afternoon attacked and badly stung by bees. On examination it was found that the black spots had five or six stings to one on the white. All noticed this fact, although no one was able to offer any explanation. A white horse is in much less danger of being stung, when driven near an apiary, than a black one. It has, indeed, been observed repeatedly that domestic animals of all kinds, if wholly or partially black, are much more liable to be attacked by bees, if they wander among the hives, than those which are entirely white.

Many beekeepers have reported that a dark suit always receives more stings than a white one; and a well-known Canadian apiarist will not permit any of his assistants to work in his apiary unless wearing light-colored clothing. A black felt hat will be "literally decorated with stings," while a gray hat will not get a single sting. A dozen bees will follow the black glass head of a hat-pin all over the bee-yard, jabbing viciously at it. Mr. E. R. Root, editor of *Gleanings in Bee Culture*, after relating his personal experience, adds that so much proof has been adduced to show that bees will sting black more than white that he does not see how the fact can be questioned.

Bee-keeping in the Transvaal, South Africa, is carried on in a very careless manner, and as a result bees belonging to neighboring apiaries not infrequently attempt to rob each other. Among the stock lost in one instance, when the bees went on the rampage, were black pigs, fowls and a black dog; while a buff-colored dog on the premises did not receive a single sting. In another instance 29 black fowls and a black and white cow were killed by the bees. There were nine Buff Orpington fowls in the yard with the others, which were very carefully examined after the fray, but only three stings were found on them, while the dead black fowls were literally covered with stings. (*Gleanings in Bee Culture*, 41, 612.)

The observations recorded are from very widely separated localities, and were described by apiarists of very extensive experience, while the apparent antipathy of bees to black was very pronounced. But the instances cited occurred for the

most part incidentally to the regular routine work of the apiary and hitherto little or no endeavor has been made to test the matter experimentally. The following series of experiments, therefore, were performed for this purpose.

On a clear, warm day in August I dressed wholly in white with the exception of a black veil. Midway on the sleeve of my right arm there was sewed a band of black cloth ten inches wide. I then entered the bee-yard and, removing the cover from one of the hives, lifted a piece of comb with both hands and gently shook it. Instantly many of the bees flew to the black band, which they continued to attack as long as they were disturbed. Not a single bee attempted to sting the left sleeve, which was of course entirely white, and very few even alighted upon it.

This experiment was repeated a second, third and fourth time; in each instance with similar results. I estimated the number of bees on the band of black cloth at various moments was from thirty to forty; it was evident from their behavior that they were extremely irritable. To the left white sleeve and the other white portions of my clothing they paid very little attention; but the black veil was very frequently attacked.

A few days later the experiments were repeated, but the band of black cloth, ten inches wide, was sewed around my left arm instead of around the right arm as before. When the bees were disturbed, after the hive cover had been removed, they fiercely attacked the band of black cloth as in the previous experiences; but the right white sleeve and the white suit were scarcely noticed. At one time a part of the black cloth was almost literally covered with furiously stinging bees, and the black veil was assailed by hundreds. The bees behaved in a similar manner when a second hive on the opposite side of the apiary was opened.

A white veil, which had been procured for this purpose, was next substituted for the black veil. The result was most surprising, for, whereas in the previous experiments hundreds of bees had attacked the black veil, so few flew against the white veil as to cause me no inconvenience. Undoubtedly beekeep-

ers will find it greatly to their advantage to wear white clothing when working among their colonies of bees and manipulating the frames of the hives.

It has been suggested that possibly a white band on a black dress might be attacked in the same manner as a black band on white apparel. To test the matter by experiment I entered the apiary dressed in a black suit with a band of white cloth, six inches wide, around my right sleeve. Three hives were opened in succession, and in each case a throng of angry bees endeavored to sting the black clothing but scarcely noticed the white band.

It is not the quality of the material which irritates the bees since they will attack a band of black paper, so smooth that they cannot cling to it, as fiercely as a band of black cloth. They have likewise been seen to discriminate against black felt, feathers, hair and glass.

Experiments were also made with four spectrum colors. When yellow and green bands were successively substituted for black, the bees paid absolutely no more attention to these colors than if they had been white. A blue band irritated the bees a little more than white, but very much less than black. There were never more than four or five attempting to sting this color at the same moment. A red cloth band, on the contrary, was attacked almost as fiercely as black, although less persistently. Throughout all the experiments with the various colors the white suit and veil attracted the notice of the bees only to a very small extent.

I have no theory to offer in the present paper in explanation of the behavior of the bees toward black and white and the spectrum colors, but should be pleased to have an expression of opinion from the readers of ENTOMOLOGICAL NEWS. I would premise, however, that black *per se* does not appear to irritate the bees, since they do not attack a black garment thrown over a hive, or suspended from a pole in the apiary. They only discriminate against black when it is worn by an animal or human being which appears to threaten the safety of the colony.

Dragonflies (Odonata) collected in Texas and Oklahoma.

By E. B. WILLIAMSON, Bluffton, Indiana.

During part of May and June, 1907, Dr. D. A. Atkinson and Mr. G. A. Link, of Pittsburg, and the writer collected in Texas and Oklahoma. The first two named gave their attention to herpetological material, while I collected dragonflies. In addition to the material collected at this time, I later obtained specimens collected in Oklahoma in August and September, 1907, by Frank Collins, a boy with whom I became acquainted at Wister; and also specimens from Mr. C. A. Hart, of the University of Illinois, collected at Brownsville, Texas, November 25, 1910.

A brief itinerary of our collecting trip follows:

May 11, 1907, arrived at Brownsville, Texas.

May 12, spent most of the day at Isabel on the coast and later in the day about the fort at Brownsville.

May 13, above Brownsville along Alice road.

May 14, drove to Mercedes via Santa Maria, where we ate dinner; returned to Brownsville at 2.30 A. M., May 16.

May 16, en route St. L. B. & Mex. R. R. to section house at Black Bayou, where the railroad crosses the Guadalupe River, Texas.

May 17, at cypress swamp on left bank of river, along the river, and along a small tributary on right bank just above railroad bridge.

May 18, about shallow, marshy lake south of railroad track, on the right of the river, and about one mile from the section house. (See under May 21.)

May 19, same as May 17.

May 20, about lake north of section house and on the left side of the river. (See under May 21.)

May 21, same as May 18.

The two lakes or ponds mentioned above (May 18 and May 20) are entirely different in character. The one south of the track is in grass and alder country, and dragonflies of several

species were numerous. About this lake cotton-mouth snakes were uncomfortably numerous in the alders. The lake north of the track lies in a more barren country, is surrounded with bulrushes, and fairly teems with alligators. Neither bulrushes nor alligators were noticed at the other lake. When we were at this north lake dragonflies were very rare, excepting *Brachymesia gravida*, of which there were a great many general individuals. Snakes were very numerous (we caught 57 large ones one day), but no cotton-mouths were seen. In one day we caught 39 alligators, one of them over 9 feet in length. Alligator paths were everywhere through the tall bulrushes, and the large alligators were in holes and burrows among these rushes, while the small alligators lay in the mud in shallow water about the edges of the lake. Large handsomely colored bullfrogs were also taken in considerable numbers at this lake, but were not seen at the other.

May 22, about Black Bayou, near the section house, and later at the lake visited May 20.

May 23, about Black Bayou and in railroad cut near it, and *en route* to Bay City, Texas.

May 24, at pools along St. L. B. & Mex. R. R. and along Colorado River, near Bay City.

May 25, at Matagorda, along shore and along river.

May 26, at Williams Lake, reached by driving from Bay City.

A beautiful small lake which would well repay careful and prolonged collecting.

May 27, pools along railroad near Bay City, and in evening to Clifton, Texas.

May 28, rained all day.

May 29, along North Bosque River above Clifton.

May 30, along river below Clifton.

May 31, along very small stream on left bank of river above Clifton.

June 1, same as May 31.

June 2, *en route* to Wister, Oklahoma.

June 3, about artificial lake along railroad about 1½ miles north of Wister.

June 4, same as June 3.

June 5, along stream west of Wister, and packing to return home.

Most of my material was papered. A few vials of alcoholic material were collected and sent to Dr. Calvert, who identified and reported on this material in a letter to me. The larvae and exuviae collected have not been studied, and the following records refer only to imagos.

Six papers have been published which mention material collected for this paper. They are:

1. A New Dragonfly (Odonata) belonging to the Cordulinae, and a revision of the classification of the subfamily. E. B. Williamson. *Ent. News*, Nov., 1908, pp. 428-434.

2. The North American Dragonflies (Odonata) of the genus *Macromia*. E. B. Williamson. *Proc. U. S. Nat. Mus.*, Vol. 37, Dec., 1909, pp. 369-398.

3. Studies in *Tetragoneuria* (Odonata). R. A. Muttkowski, *Bull. Wis. Nat. Hist. Soc.*, Vol. IX, July, 1911, pp. 91-134.

4. *Hetaerina titia* and *tricolor* (Dragonflies—Odonata). E. B. Williamson. *Ent. News*, March, 1912, pp. 98-101.

5. The dragonfly *Argia moesta* and a new species (Odonata). E. B. Williamson. *Ent. News*, May, 1912, pp. 196-203.

6. *Gomphus pallidus* and two new related species (Odonata). E. B. Williamson. *Ent. News*, Feb., 1914, pp. 49-58.

SPECIES COLLECTED.

1. *Hetaerina americana*.

Texas: Clifton, May 29, 30 and 31; 65 ♂, 33 ♀.

Oklahoma: Wister, Aug. 4 (Collins), 19 ♂, 11 ♀.

2. *Hetaerina titia*.

Texas: Black Bayou, May 17 and 19, 12 ♂, 4 ♀, several of them teneral; Bay City, May 24, teneral ♂; Clifton, May 30, 2 ♂.

Oklahoma: Wister, Aug. 1-6 (Collins), 18 ♂.

This species has been discussed in the paper No. 4 above listed.

3. *Lestes alacer*.

Texas: Bay City, May 24, 1 ♂; May 27, 4 ♂ in alcohol, det. Calvert.

4. *Lestes simplex*.

Texas: Clifton, May 31, 2 ♂, 2 ♀. These specimens seem distinct from *alacer*, and I believe are *simplex*.

5. *Lestes sigma*.

Texas: Black Bayou, May 18 and 21, 1 ♂, 1 ♀.

Several individuals were seen, but all flew at once back into the dense alder thickets, where the collector must follow often on hands and knees, and where brush prevented the use of the net even if approach to the wary and restless dragonfly was possible. Add to these difficulties the fact that the poisonous and sluggish cotton-mouth snakes were common at the same places where the *Lestes* occurred, and some idea of the labor and excitement involved in the capture of these dragonflies may be grasped. The two specimens I succeeded in collecting are identical with specimens from the interior of Guatemala (Gualan) taken under easier circumstances in June, 1909.

6. *Lestes inequalis*.

Oklahoma: Wister, June 3 and 4, 1 ♂, 2 ♀; several seen, but they were very wary and active, escaping in vegetation.

7. *Argia tibialis*.

Texas: Black Bayou, May 17, 1 ♂ in alcohol, det. Calvert.

Oklahoma: Wister, June 3 and 4, and Aug. 2 (Collins), 6 ♂, 3 ♀; 3 pairs and 3 ♂ in alcohol, det. Calvert.

8. *Argia moesta*.

Texas: Bay City, May 24, 2 ♂, 2 ♀; Clifton, May 28 and June 1, 16 ♂, 9 ♀.

Oklahoma: Wister, June 3, and Aug. 2 and 4 (Collins), 7 ♂.

9. *Argia intruda*.

Oklahoma: Wister, Aug. 2 and 4 (Collins), 15 ♂, 17 ♀.

10. *Argia translata*.

Texas: Clifton, May 30 and 31, and June 1, 24 ♂, 2 ♀; 3 pairs and 3 ♂ in alcohol, det. Calvert.

11. *Argia sedula*.

Texas: Brownsville, May 13, 2 ♂ in alcohol, det. Calvert; Black Bayou, May 17, 19 and 22, 4 ♂; 8 ♂ in alcohol, det. Calvert; Matagorda, May 25, 1 ♂; Williams Lake, May 26, 2 ♂; Clifton, May 29, 30 and 31, and June 1, 47 ♂, 7 ♀; 4 pairs and 9 ♂ in alcohol, det. Calvert.

12. *Argia apicalis*.

Texas: Brownsville, May 13, 3 ♂, 1 ♀ in alcohol, det. Calvert; Black Bayou, May 17, 19 and 21, 1 ♂; 2 ♂ and 1 pair in alcohol, det. Calvert; Bay City, May 24 and 27, 4 ♂; Williams Lake, May 26, 1 ♂; Clifton, May 29, 30 and 31, and June 1, 4 ♂, and 3 ♂, 1 ♀ in alcohol, det. Calvert.

Oklahoma: Wister, June 4 and Aug. 2 (Collins), 8 ♂, 1 ♀.

13. *Argia vivida*.

Texas: Clifton, June 1, 1 ♂ in alcohol, det. Calvert.

14. *Argia immunda*.

Texas: Clifton, May 29, 30 and 31, and June 1, 61 ♂, 5 ♀; 6 ♂, 1 ♀ in alcohol, det. Calvert.

The antenodal cells in both front and hind wings were counted for all the papered material with the following result: *Front wing*, 2 antenodal cells, 1 wing; 2½ antenodal cells, 1 wing; 3 antenodal cells, 115 wings; 3+ antenodal cells, 1 wing; 4 antenodal cells, 4 wings; total, 122 wings.

Hind wing, 2 antenodal cells, 5 wings; 2½ antenodal cells, 1 wing; 3 antenodal cells, 113 wings; 3+ antenodal cells, 2 wings; 4 antenodal cells, 1 wing; total, 122 wings.

The 5 ♀ have 3 antenodal cells in every case.

15. *Argia violacea*.

Texas: Clifton, June 1, 2 ♂.

Oklahoma: Wister, June 3 and 4, 3 ♂; 1 ♂ in alcohol, det. Calvert.

(To be continued)

A Note on the Abundance of the Thistle Butterfly, *Pyrameis cardui* (Lepid.).

Recently I made a trip to Buttonwillow in the southern part of the San Joaquin Valley, California, to make some investigations concerning a band of about 400 head of California elk (*Cervus nanodes* Merriam) that ranges over the 500,000-acre ranch of Messrs. Miller and Lux, the well-known cattle company. Two days (April 24-25) were spent on the ranch. When hunting for the elk we drove with a team of horses around in various and devious ways, through the immense fields of alfalfa, oats, barley and yellow mustard, across irrigating ditches, and over greasewood plains. The days were bright and sunny, and many things unique and of great interest were noted, but I shall at this time tell of only one of them, namely, the marvelous abundance of a certain species of butterfly, the Thistle Butterfly or Painted Lady, *Pyrameis cardui* Linnaeus.

As we drove through the fields of yellow mustard these beautiful butterflies flew up in front and on either side of us literally *by the thousands*. There must have been millions of them; they were everywhere in the fields, and the fields contained hundreds of acres. With a net one could have obtained several in one cast. I never saw anything like it, not even among grasshoppers in Kansas in 'hopper years.

I have understood, of course, that *Pyrameis cardui* is one of the most widely distributed butterflies, and that, in many places, it is an abundant species, but I never dreamed any butterfly was so marvelously abundant anywhere. What a fine field Buttonwillow would be for anyone to visit who cared to study individual variation in this beautiful and interesting species!—BARTON W. EVERMANN, California Academy of Sciences, San Francisco.

A new Genus of *Platygasteridae* from Australia (Hymen.).

By ALAN P. DODD, Nelson, via Cairns, Queensland, Australia.

Trichacoides nov. gen.

♀ (?). Head rather wide, a little wider than the thorax; eyes moderately large, bare; ocelli rather close together, very far distant from the eye margins. Antennae 10-jointed, scape rather long, pedicel slender; first funicle joint much narrower and shorter than the pedicel; second distinctly longer and wider than the first; the others gradually widening towards the apex, all distinctly longer than wide. Thorax twice as long as wide; pronotum visible from above on the sides only; mesonotum longer than wide; parapsidal furrows distinct, almost joining at the posterior edge of the mesonotum; scutellum not much lengthened, a little longer than wide, rounded posteriorly, raised from the mesonotum, convex, covered with dense, rather short, sharp spines. Forewings reaching apex of abdomen; broad; veinless. Abdomen as long as the head and thorax combined; as wide as the thorax; fusiform; first segment a little wider than long, second segment equal to one-half the abdominal length, distinctly longer than wide. Legs moderate; tarsi 5-jointed.

A genus distinguished by the peculiar, thorny scutellum.

Type.—*Trichacoides scutellaris* described herewith.

Trichacoides scutellaris sp. nov.

Female (?).—Length, 2.20 mm. Shining black; legs (including coxae) and first six antennal joints golden yellow.

Head and mesonotum with fine polygonal scaly sculpture. Abdomen with first and base of second segment striate; rest of abdomen smooth. Forewings hyaline; marginal cilia rather short; discal cilia moderately coarse and dense.

(From 1 specimen, 2-3 inch objective, 1 inch optic, Bausch and Lomb.)

Habitat.—North Queensland (Nelson, near Cairns). Described from one ♀ (?) caught by sweeping grass along streamlet in forest, August 7, 1913 (A. P. Dodd).

Type.—In the South Australian Museum, a ♀ (?) tag-mounted plus a slide bearing antennae and forewings.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., NOVEMBER, 1914.

Sanitation in Vera Cruz, Mexico.

Statements have been recently received from Vera Cruz which show considerable improvement in the general health of the community there. There was a marked reduction in the civil death-rates per thousand of population, per annum. During June and July, 1913, the mortality was 39.55, and during the same months this year the mortality was 32.29. During the latter period there were 161 deaths from communicable diseases. What concerns us most in this report, is that in large part, these diseases may be transmitted by insects. Those known to be thus conveyed, entirely or in part, are malaria, typhoid fever, dysentery, tuberculosis and enteritis. The statement has been made that mosquito-breeding has been largely suppressed and that twenty-five miles of ditches have been dug and miles of vacant lots and hundreds of acres of swamps drained. Dysenteries and diarrhoeas have been brought under control and foodstuffs protected from flies by appropriate screening.

The significant fact is that the work has been properly and efficiently done and the result apparent. By contrast let us look at the conditions in places not in Mexico. Perhaps in the majority of large cities in the United States these conditions are the same as in Philadelphia, where many kinds of food are exposed to street dirt and insects, particularly house-flies. We have laws against the exposure of food substances to flies and street dirt and dust, but the lawyers tell us the laws can't be enforced. The writer of this statement sees, each day, basketfuls of fruit, to be retailed, exposed on the sidewalk, dusted off with a filthy brush, and large quantities of apples, polished with a dirty rag.

The brush removes enough dessicated horse-manure and dried tubercular sputum to render the fruit less unsightly and the rag removes most of the fly-excrement from the apples. The brushings are needed several times a day, particularly during dry weather, when clouds of street filth are wafted into the air.

It is a curious attitude toward things, that in Cuba, Mexico and Panama preventive medicine has reached a high degree of efficiency, while in most municipal governments in the United States it is at a very low ebb.—H. S.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

The Collection of the Late G. W. Kirkaldy.

The collection of the late G. W. Kirkaldy has come into my hands. From letters to me it would appear that there is some loaned material contained therein. If the lenders will communicate with me, I shall return whatever of this loaned material may still be in existence.—
J. R. DE LA TORRE BUENO, 14 Dusenbury Place, White Plains, New York.

Changes of Address.

J. E. Hallinen *from* Cooperton, Kiowa Co., Oklahoma, *to* Interlaken School, Rolling Prairie, Indiana.

Fordyce Grinnell, Jr., *to* Southwest Museum, Marmion Way and Avenue 46, Los Angeles, California.

W. R. McConnell *from* Greenwood, Mississippi, *to* Hagerstown, Maryland.

J. Percy Baumberger *from* 791 Buena Vista Avenue, San Francisco, Calif., *to* Bussey Institution, Forest Hills, Boston, Mass. (where he is taking graduate work in Entomology).

H. A. Horton *from* McPherson, Kansas, *to* Turner, Oregon.

Victor E. Shelford *to* Department of Zoology, University of Illinois, Urbana, Illinois.

Henry L. Viereck *to* California State Insectary, Commission of Horticulture, Sacramento, California.

Richard F. Pearsall *to* Allaben, Ulster Co., New York.

Cimex pipistrelli Jenyns in North America? (Hemip. Heter.)

In ENTOMOLOGICAL NEWS for May, 1914, I notice an article on page 230, by Mr. J. R. de la Torre Bueno, regarding certain European Heteroptera whose occurrences in North America are questioned. Among the species listed is *Cimex pipistrelli* Jenyns.

Several years ago a Silver-haired Bat, *Lasionycteris noctivagans* (LeConte), taken at Lincoln, Nebraska, came into my hands, and from it I secured a specimen of a *Cimex* which I identified as *pipistrelli*. This specimen I compared later with another, labeled *C. pipistrelli*, which was loaned by Prof. C. P. Gillette, of Fort Collins, Colorado, and which proved to be conspecific with mine. Both of these agreed well with the descriptions of the species in question given by Professor Herbert Osborn, on pages 162 and 163 of Bulletin 5 of the U. S. Bureau of Entomology, which descriptions include a copy of the original one by Jenyns. It is possible that these descriptions are

not complete enough in detail for the separation of *C. pipistrelli* and any parallel but distinct species which may occur in North America, but I have always been of the belief that the North American form was not distinct; at best I believe that it will prove to be not more than a variety of the typical form, although I have never had the opportunity to compare specimens from both continents to make certain of this point.

My specimen of this bat-infesting bug is deposited in the collection of the University of Nebraska at Lincoln, and I do not have the exact data here at hand, but I submit this note for what it may be worth.—
JOHN T. ZIMMER, Manila, P. I.

Theses on Entomology in American Universities, 1914.

According to *Science* for August 21, 1914, the degree of Doctor of Philosophy was conferred, during the present year, on the following persons who presented entomological theses.

Cornell University: Lucy Wright Smith, Studies of North American Plecoptera (Pteronarcicinae and Perlodini); Ruby Green Smith, The Evolution of the Venation in the Anal Area of the Wings of Insects.

Harvard University: Rudolf William Glaser, Caterpillar Diseases, with Especial Reference to the Wilt of Gypsy Moth Caterpillars; Axel Leonard Melander, A Taxonomic Study of the Empididae, a Family of Dipterous Flies; Bradley Merrill Patten, A Quantitative Determination of the Orienting Reaction of the Blowfly Larva (*Calliphora erythrocephala* Meigen) to Light.

University of Illinois: Stanley Black Fracker, The Classification of Lepidopterous Larvae.

The Johns Hopkins University: William Lee Dolley, Reactions to Light in *Vanessa antiopa*, with Special Reference to Circus Movements.

Notes on *Calligrapha sigmoidea* Lec. (Coleop., Chrysomelidae).

I herewith present some notes and observations on the collecting of *Calligrapha sigmoidea* Lec. in the suburbs of San Francisco, on the Sunnyside Hills, at an elevation of 500 feet, for three consecutive winters, 1910, 1911 and 1912.

On February 26th, 1910, three specimens were collected; March 11th, seven; April, nine; December 7th, three; December 18th, six; January 3rd (1911), five; February 15th, four; February 20th, five; March 12th, nine; March 21st, eight; April 11th, five, and two larvæ were seen but not collected, the weather was fine but slightly cold. On April 19th, two imagos and one larva about two weeks old were observed, weather very fine and warm. April 29th, one imago and two larvæ observed; May 9th, one imago; weather fine. On June 1st

and 12th, none; the food plant—wild hollyhock (*Sidalcea malvaeflora*) plants—all dried up. July 8th, none; September 15th, none; October 28th, none; November 16th, none, hollyhock plants not out yet; November 28th, none; December 9th, none, the weather very hot; December 20th, none, and the food plant not out yet; January 29th (1912), fourteen imagos observed, the weather very fine and warm; February 14th, six imagos seen but not collected, weather fine; May 17th, eight imagos seen but not taken. After March 17th, 1912, I did not visit the locality again.

It therefore appears that *Calligrapha sigmoidea* is a winter and spring species. I have found the eggs, and young larvæ hatching in the winter and spring months. I also do not believe that the imagos observed were the hibernating individuals that were coaxed out by the fine weather during the months mentioned above, as some of my colleagues have intimated.—J. C. HUGUENIN, San Francisco, California.

Third International Congress of Entomology.

The Congress will take place in Vienna from the 5th to the 12th of September, 1915, in the rooms of the University.

Besides numerous lectures, discussions, demonstrations concerning the different branches of theoretical and practical entomology, it is intended to visit the scientific institutions and public collections of Vienna and to make some excursions in the neighborhood of the town. Annexed to the meeting of the congress, it is intended to travel across the Alps to the Adriatic coast and to visit some of the Karst caves.

An entomological exhibition will be open during the whole meeting, showing in the first place: Private collections important from a biological, ethological, geographical, economical or any other point of view; objects of historical interest. Pictures, books, tables, maps, etc.; optic or mechanic instruments; means of instruction, school collections, models, etc.; objects of agriculture, sericulture and other branches of practical entomology.

All entomologists having the intention of taking part in the congress or in the exhibition are invited to subscribe as early as possible. Tickets for a member for life: at least 240 kroner. Tickets of the member of the Third Congress, 24 kroner. Supplementary tickets for accompanying family members, 12 kroner. Certain benefits (theatres and other amusements) are strictly dependent on the succession of the ticket number.

All entomologists who intend to hold lectures in the meetings or to send objects for the exhibition, are requested to give the necessary indications for a definite program as soon as possible.

Office of the III. International Congress of Entomology: Vienna I, Burgring 7.—DR. F. MAIDL, *General Secretary*. A. HANDLIRSCH, *President*.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings of the Academy of Natural Sciences of Philadelphia. 2—Transactions, American Entomological Society, Philadelphia. 3—The American Naturalist. 4—The Canadian Entomologist. 5—Psyche. 6—Journal, New York Entomological Society. 7—U. S. Department of Agriculture, Bureau of Entomology, Washington. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 14—Proceedings of the Zoological Society of London. 18—Ottawa Naturalist. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 35—Annales, Societe Entomologique de Belgique. 38—Wiener Entomologische Zeitung. 40—Societas Entomologica, Zurich. 68—Science, New York. 84—Entomologische Rundschau. 92—Zeitschrift für wissenschaftliche Insektenbiologie. 132—Transactions, City of London Entomological and Natural History Society. 131—Proceedings, South London Entomological and Natural History Society. 153—Bulletin, American Museum of Natural History, New York. 166—Internationale Entomologische Zeitschrift, Guben. 173—Die Grossschmetterlinge der Erde, Fauna Americana, von A. Seitz, Stuttgart. 179—Journal of Economic Entomology. 180—Annals, Entomological Society of America. 184—Journal of Experimental Zoology, Philadelphia. 193—Entomologische Blätter, Cassel. 195—Bulletin, Museum of Comparative Zoology, Cambridge. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole. 216—Entomologische Zeitschrift, Frankfurt a. Main. 221—New Hampshire Agricultural Experiment Station, Durham, N. H. 285—Nature Study Review, Ithaca, N. Y. 291—Proceedings of the Staten Island Association of Arts and Sciences, Lancaster, Pa.

295—Handbuch der Vergleichenden Physiologie. Herausgegeben von Hans Winterstein, Jena. 322—Journal of Morphology, Philadelphia. 338—University of Minnesota Agricultural Experiment Station, St. Paul. 369—Entomologische Mitteilungen, Berlin-Dahlem. 373—Contributions to the Natural History of the Lepidoptera of North America, by Wm. Barnes and J. H. McDunnough, Decatur, Ill. 411—Bulletin of the Brooklyn Entomological Society. 420—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington. 447—Journal of Agricultural Research, Washington. 452—Lepidopterorum Catalogus, editus a H. Wagner. 462—The Butterfly Farmer, Truckee, Cal. 463—Bulletin of the U. S. Department of Agriculture, Washington, D. C. 483—Zoologiska Bidrag fran Uppsala. 484—Report of the British Association for the Advancement of Science, London. 485—Journal of the Royal Microscopical Society, London. 486—Journal of the Elisha Mitchell Scientific Society, Chapel Hill, N. C. 487—Proceedings of the Boston Society of Natural History. 488—Journal of the East Africa and Uganda Natural History Society.

GENERAL SUBJECT. Anon.—The Canadian Entomological Service. A separate branch formed [Agric. Gaz. of Canada, i, 270]. Anon.—A national collection of Canadian insects, 4, 1914, 251. Anon.—Entomologische neuigkeiten, 40, xxix, 58, 64, 68, 74. Biedermann, W.—Farbe und zeichnung der insekten, 295, iii, Heft 1, 1657-1922 (cont.). Blume, E.—Ein neuer Lichtfang-apparat, 92, x, 243. Cockerell, T. D. A.—The entomology of Helianthus, 9, 1914, 191-6. Cook, O. F.—Fiat nomenclature, 68, xl, 272-3. Dixey, F. A.—The geographical relations of mimicry, 484, lxxxiii, 518. Eastman & Von Zittel—Text-book of Paleontology (2d edition), Vol. I. Insect, p. 785-821 [Macmillan & Co., 1913]. Fuchs, C.—Obituary note by F. E. Blaisdell, 68, xl, 91-2. Gambera, M.—Ein neues universal entomologenmikroskop, 369, iii, 193-97. Graef, E. L.—Some early Brooklyn entomologists, 411, ix, 47-56. Hallett, H. M.—A chloroform killing and relaxing bottle, 8, 1914, 175-6. Heath, E. F.—Obituary by A. G., 4, 1914, 299-300. Hegner, R. W.—The history of the germ cells in insects with special reference to the keimbahn-determinants, 322, xxv, 375-510. v. Linstow, Dr.—Die ocellen der insekten, 166, viii, 115-16. Lyman, H. H.—Obituary by C. J. S. Bethune, 4, 1914, 221-6. Moeser, F. E.—Obituary notice by H. Bird, 4, 1914, 268. Poulton, E. B.—Discussion on mimicry, 484, lxxxiii, 518-20. Richardson, C. H.—Some comments on the value of warning colors and mimicry in insects, 5, xxi, 136-7. Sanderson & Peairs—The relation of temperature to insect life, 221, Tech. Bul. No. 7. Sherman, F.—Studies of the animal life of North Carolina with suggestions for a biological survey,

486, xxx, 69-89. **Scott, A. W.**—Metallizing flowers and insects, 462, i, 188-9. **Webster, F. M.**—Good and bad bugs on the farm (The Breeder's Gazette, lxxv, 1173-1174, 1914). **Weiss, H. B.**—Insects and pain. The destructive insects of N. J., 4, 1914, 269-71; 322-3.

ARACHNIDA, ETC. **Cockle, J. W.**—The occurrence of *Rhyncholophus* sp. on Lepidoptera observed at Kaslo, B. C., 4, 1914, 332. **Murphy, R. C.**—Reactions of the spider *Pholcus phalangioides*, 6, xxii, 173-4.

Brues, C. T.—A new peripatus from Colombia, 195, lviii, 375-82. **Chamberlin, R. V.**—On a collection of Myriapoda from Costa Rica, 2, xl, 185-194. Notes on Myriapods from Douglas Lake, Mich. A new *Julus* from California, 4, 1914, 301-6, 314-15. A new diplopod from the Galapagos Islands, with notes on the Chilopods, 5, xxi, 85-92. The genus *Watobius*, 195, lvii, 107-12.

APTERA AND NEUROPTERA. **Creighton, J. K.**—On *Pediculus capitis*, 488, iv, 145. **Cummings, B. F.**—Scent organs in Trichoptera, 14, 1914, 459-74.

McGregor, E. A.—Some notes on parasitism of Chrysopids in So. Carolina, 4, 1914, 306-8. **Navas, L.**—Some Neuroptera from the U. S., 411, ix, 60-2. **Paine, J. H.**—Note on *Linognathus forficula*, 5, xxi, 117. **Woodruff, L. B.**—Some dragonflies of a Connecticut brook, 6, xxii, 154-9.

ORTHOPTERA. **Caudell, A. N.**—Regeneration of antennae, 68, xl, 352-3. **Comstock, A. B.**—Cricket music, 285, x, 204-6.

Burr, M.—On some Central American Dermaptera in the U. S. N. M., 4, 1914, 273-76. **Caudell, A. N.**—Some bromeliadiculous Blattidae from Mexico and Central America, 420, ii, 76-80. **Davis, W. T.**—A cricket new to Long Island, N. Y., 6, xxii, 171-2. **Rehn & Hebard**—A revision of the Orthopterous group *Insarae* (Tettigoniidae, Phaneropterinae), 2, xl, 37-184. United States and Mexican records of species of the genus *Doru*. Records of Dermaptera and Orthoptera from West Central and Southwestern Florida, collected by W. T. Davis, 6, xxii, 89-96, 96-116. **Somes, M. P.**—The Acridiidae of Minnesota, 338, Bul. No. 141, 98 pp.

HEMIPTERA. **Davis, W. T.**—The seventeen-year cicada on Staten Island in 1912, 291, iv, 99. **Ewing, H. E.**—Notes on regression in a pure line of plant lice, 198, xxvii, 164-8. **Tower, D. G.**—The Mechanism of the mouth parts of the squash bug, *Anasa tristis*, 5, xxi, 99-108.

Barber, H. G.—New Hemiptera-Heteroptera, with comments upon the distribution of certain known species, 6, xxii, 164-71. In-

sects of Florida, II—Hemiptera, **153**, xxxiii, 495-535. **Bergroth, E.**—Eine neue neotropische Cicade, **38**, xxxiii, 175-6. **Davidson, W. M.**—Walnut Aphides in California, **463**, No. 100. **Distant, W. L.**—On a few undescribed Cicadidae from California, **11**, xiv, 165-7. **Hood, J. D.**—Notes on N. Am. Thysanoptera, with descriptions of a new family and two n. sps. Two Porto Rican Thysanoptera from sugar cane. A new T. from Panama, **420**, ii, 17-22, 38-41, 49-53. **Quaintance & Baker**—Classification of the Aleyrodidae, Part II, 7, Tech. Ser. No. 27, pt. 2.

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Barnes & McDunnough—Synonymic notes on No. Am. L. Some new N. Am. Pyraustinae, **373**, ii, 198-223, 224-50. **Bethune-Baker, G. T.**—On the correlation of pattern and structure in Rhopalocera with special reference to Rurallidae, **21**, xxvi, 177-84. **Busck, A.**—A destructive pine-moth introduced from Europe, **179**, vii, 340-1. A new *Gracilaria* on Azalea. The chestnut bastminer. Seven n. sps. of *Ethmia* from Tropical America, **420**, ii, 1-2, 3-4, 53-57. **Chapman, T. A.**—Lepidopterology, **21**, xxvi, 176-7. Some Lycaenid notes, with a discussion of the segmentation of the abdomen in L., **122**, 1912-13, 67-74. **Comstock, W. P.**—Erycinidae and Lycaenidae from the island of Trinidad, **6**, xxii, 152-4. **Von Dalla Torre, K. W.**—Thyrididae, **452**, Pars 20. **Dyar, H. G.**—Two new

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Doings of Societies.

AMERICAN ENTOMOLOGICAL SOCIETY.

Meeting of April 23, 1914. Dr. Philip P. Calvert, President, in the chair. Ten persons were present.

Mr. Rehn, Chairman of the Publication Committee, said the committee had inaugurated a scheme of addressing a circular letter in relation to the *Transactions* of the Society, making an appeal for subscriptions. It is now possible for persons to subscribe for separate papers on various orders. A summary of the results obtained to date was given.

The President exhibited photographs of entomologists formerly belonging to the late Prof. P. R. Uhler and presented to the Society by Mrs. Uhler. On motion a vote of thanks was extended to Mrs. Uhler for her gift.

Mr. Hornig said he had observed recently hatched larvae of mosquitoes on the 6th and on the 16th of April. They pupated, and emerged by the 20th. They were found in a sheltered pool about two by three feet, the species being *A. sylvestris*.

Mr. Rehn made some remarks on the genus *Scudderia*; he and Mr. Hebard studied about a thousand specimens. The differences in the male sub-genital plates were described in detail and a new species mentioned as having been found.

Dr. Skinner exhibited a collection of butterflies from pupae

which had been subjected to heat and cold respectively. The specimens so altered were reared by Prof. Standfuss.

Mr. Rehn referred to the colors of *Neophasia terlooi* and said the Orthoptera found in the foothills of So. Arizona, Texas and New Mexico showed that the orange color is intensified.

Dr. Skinner made some remarks on the genitalia of the genus *Thanaos*. Mr. Williams spoke of the remarkable constancy of these organs in the genus.

Dr. Calvert showed specimens of *Anomalagrion hastatum* from the vicinity of Cartago, Costa Rica, remarking that it and *Pantala flavescens* are the only species of Odonata common to that locality and Philadelphia, a rather remarkable fact considering the smallness of *Anomalagrion*.

Mr. Rehn spoke of the coming meeting of entomologists in Philadelphia next December. He moved that the chair appoint a committee to arrange for their entertainment. Adopted.

Meeting of June 8, 1914. Dr. Philip P. Calvert, President, in the chair. Nine persons present.

Mr. Rehn said the system of circulating letters in relation to the *Transactions* had been well received.

Mr. Hornig presented a collection of mosquitoes, comprising three species and twenty-eight specimens.

The following persons were appointed by the President as an Entertainment Committee for the meetings of entomologists to be held in Philadelphia next December: Henry Skinner, H. W. Wenzel, J. A. G. Rehn, Morgan Hebard, E. T. Cresson, Jr., and George M. Greene.

The President read a letter soliciting subscriptions to establish a monument in honor of Fabre, the French entomologist. It was moved and adopted that the Treasurer of the Society be authorized to receive subscriptions for this purpose.

Mr. Rehn referred to a remark made by Mr. W. T. Davis that celluloid mounts would be seriously affected by carbon bisulphide. Experiment showed that such was not the case.

Mr. Hornig said he had found cocoons of *Callosamia cyn-*

thia badly parasitized by *Spirochalcis mariae*. These specimens of parasites were only half the size of those that came from the cocoons of *Platysamia cecropia*.

He also referred to having found *Aedes triseriatus* breeding in a cistern, away from the woods. The species had been supposed to breed in the woods or near them in all cases. He also spoke of the scarcity of *Culex pipiens* at the Point Breeze Amusement Park, Philadelphia.

Mr. Greene said there was an excellent collecting place near the Overbrook Seminary at Merion, and spoke of the rare insects he had found there, particularly Hymenoptera and Coleoptera.

Mr. Williams referred to the species of *Lycaena* from which he had extracted and mounted the genitalia. He said species in this genus, in some cases, apparently distinct by maculation characters, had identical genitalia. The species in the genus found on the Pacific coast of the United States had evidently come from Europe originally, and became fewer as they neared the south, as there were only two species found in Mexico.

Mr. Rehn referred to genitalic characters in the Orthoptera. In one genus they may be good to separate species, and in others valueless.

Dr. Calvert spoke of the term species and gave the Linnaean definition and referred to recent work in the breeding of *Colias*.

HENRY SKINNER, *Secretary*.

FELDMAN COLLECTING SOCIAL.

Meeting at the home of H. W. Wenzel, 5614 Stewart Street, Philadelphia, May 20, 1914. Twelve members were present. President Wenzel in the chair.

Professor Calvert showed larvae and pupae of *Xylomyia pallipes* Say (Diptera, family Leptidæ) found beneath the bark of a living Carolina poplar in West Philadelphia, April 16, 1914, from which he bred the imago identified by Mr. E. T. Cresson, Jr. A description of the puparium and pupa of this species, under the name *Subula pallipes* Loew, was published by C. H. T. Townsend, in ENTOMOLOGICAL NEWS IV, p. 163,

May, 1893, but the present specimens differ in some details from that description.

Mr. Harbeck exhibited a specimen of *Brachyopa* taken by Mr. Lewis Unruh on Dogwood blossoms at Wenonah, New Jersey, May 10, 1914. There are no specimens of this Dipterous genus mentioned in the New Jersey List, but he has taken *vacua* O. S. at Roxborough, Pennsylvania. The one exhibited does not agree with any of the species he knows. Also exhibited a specimen of *Myiolepta strigilata* Loew taken by himself at Iona, New Jersey, May 17, 1914. Said that *Gnorimus maculosus* Knoch (Col.) was quite common on Dogwood blossoms at Wenonah, New Jersey, May 10, 1914.

Mr. Daecke described some of the interesting collecting places around Harrisburg, Pennsylvania, of which there are many in the mountains of that district. Recorded and exhibited the following two species of Coleoptera, family Elateridæ: *Corymbites fulvipes* Bland, Rockville, Pennsylvania, April 19, 1914, and *Limonius stigma* Herbst, same locality and date.

Mr. Kaeber said that the meadows of the Philadelphia Neck have been filled in and there are many young willows there; though they look perfectly healthy, fully 75 per cent. are infested with *Cryptorhynchus lapathi* Linn. (Col.). He has bred the following Coleoptera: (1)—*Alaus oculatus* Linn. from decaying oaks, April 27, 1914, (2)—*Melasis pectinicornis* Melsh. from hickory, May 3, 1914 (and every warm day since), (3)—*Desmocerus palliatus* Forst. April 28, 1914, (4)—*Xylotrechus colonus* Fabr. June 21, 1913, and (5)—*Acanthoderus decipiens* Hald. June 15, 1913; numbers 3, 4 and 5 were raised from larvae (in glass tubes). He exhibited a pair of brass forceps of his own make with a small cup arrangement on the tips for picking up small insects found under bark.

Mr. H. W. Wenzel said he had taken the usual spring forms (which are very early this year) in southern New Jersey on the pine, including eight *Buprestis ultramarina* Say. He exhibited *Elater sayi* LeC. Philadelphia, May 14, and *Buprestis decora* Fabr. Philadelphia, May 15, both accidentals captured by George Mahoney.

Mr. H. A. Wenzel exhibited a dozen specimens of *Hetaerius brunnipennis* Rand. and its host from Malvern, Pennsylvania, May 10, 1914. Said he had found these beetles under a large perforated stone in company with large black ants, and all the specimens were in these perforations and not in the galleries of the nest. The beetles are about 1-16 inch in diameter and the ants and had found some of the specimens in the galleries. the under side of the ant and are carried away. Mr. Laurent stated that while out collecting with Mr. Liebeck on April 11, 1914, at Mt. Airy, Philadelphia, Mr. Liebeck found a colony of black ants, from which they took a number of specimens of this Histerid, but had not noticed any of them being carried by the ants and had found some of the specimens in the galleries.

Adjourned to the annex.

Meeting at the same place June 17, 1914. Eleven members were present, Mr. Lewis Unruh visitor, President H. A. Wenzel in the chair.

Mr. Daecke said he had caught many insects on Force Mt., Pennsylvania, in the vicinity of Harrisburg, in the clearing made where the oil pipe line crosses the ridge. He had often wondered what mosquitoes fed on in the wilds where there were no human beings until seeing a box tortoise in this clearing one day with some insects flying about it, he caught them in his net, and they proved to be *Culex canadensis* Theobald filled with blood. He exhibited a micro-moth *Hememene* n. sp. from Rockville, Pennsylvania, May 3, 1914, on papaw,—this was formerly recorded from the State of Texas and Cincinnati, Ohio; another moth *Mesoleuca ruficiliata* Gn., Dauphin, Pennsylvania, May 24, 1914, was shown. He said he had noticed two leaves (which were opposite each other) curled up on a viburnum bush at Inglenook, Pennsylvania, June 7, 1914, and upon examining them found a fine specimen of the beetle *Centrodera decolorata* Harr., which is of a light brown color the same as the leaves where found.

Mr. Huntington said that in the evening of June 7 at Great Falls, Virginia, a searchlight was thrown on the falls and in-

sects were seen in the rays by the thousands.

Dr. Castle said he had been to Pine Beach, New Jersey, May 14, and had caught five species of *Cicindela*. He found some flat fungus on the ground which he placed in a tin box and bred from it *Caenocara oculata* Say (Col.). At Glasgow, Delaware, May 24, he had beaten the weevil *Brachystylus acutus* Say from persimmon.

Mr. Geo. M. Greene reported collecting as good in his usual collecting spot, Overbrook, Pennsylvania. He exhibited a species of Coleoptera from there which he had never had before, *Mycetochara binotata* Say, June 7, 1914, and two species that he had but had never himself taken: *Perothops mucida* Gyll., May 30, 1914, and *Eurymycter fasciata* Oliv., June 7, 1914; also a series of *Melandrya striata* Say, May 31 and June 7, 1914, and *Ithycerus novaboracensis* Forst., May 30 and May 31, 1914. The two wasps recorded last season, *Ibalia maculipennis* Hald. and *Arotes amoenus* Cress. (no males seen), are again numerous, as are three species of *Megarhyssa*: *atrata* Fabr., *lunator* Fabr. and *greenci* Viereck, both sexes.

Mr. H. W. Wenzel said that at Anglesea, New Jersey, May 30, 1914, he saw the first large washup of insects for years, among which were five species of *Calosoma*: *externum* Say, *scrutator* Fabr., *willcoxi* LeC., *frigidum* Kirby and *calidum* Fabr. He exhibited a pair of *Chrysobothris gemmata* LeC. collected by F. H. Snow, one at Douglas, Arizona, in August, the other in the Baboquivari Mts., Arizona.

Adjourned to the annex.

GEO. M. GREENE, *Secretary*.

OBITUARY.

DR. THEODORE NICHOLAS GILL, who died in Washington, September 25, 1914, although chiefly known as an ichthyologist, took an active part in the meetings of the Entomological Society of Washington years ago. He was born in New York City, March 21, 1837. An obituary notice has appeared in *Science* for Oct. 16, 1914.

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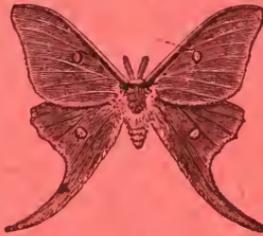
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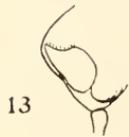
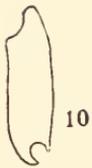
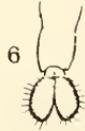
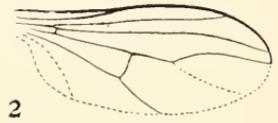
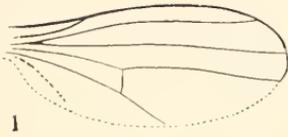
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New Species of North American Dolichopodidae (Dip.).

By M. C. VAN DUZEE, Buffalo, New York.

(Plate XVIII.)

Neurigona nigricornis n. sp. (Plate XVIII, Figs. 1, 4).

Eyes separated by the face in the male, antennae and dorsum of the abdomen black, hypopygium and thorax reddish-brown. Length 2 mm.

♂. Face narrow, dark green or blackish-green; palpi and proboscis dark brown; front and occiput black; orbital cilia black, very short; antennae black, third joint very small and clothed with rather long pubescence; arista, also with long pubescence, inserted near the base of the third joint; arista with two joints, the first of which is short.

Thorax, scutellum and metanotum reddish-brown, darker along the front of the thorax, at base of the scutellum and on the flattened space before the scutellum, the latter with a little gray pollen, the rest of the thorax shining; pleurae pale yellow below, becoming more reddish above and with a black spot before the halteres; acrostichal bristles in two rows; scutellum with two long bristles.

Dorsum of the abdomen dark brown or black, sometimes the hind margins of the first and second segments pale; venter yellowish, in some specimens almost brown; hairs of the abdomen and the bristles on the hind margins of the first, second and fifth segments black; hypopygium and its appendages reddish-brown (Fig. 4).

Coxæ pale yellow, fore pair with minute black and several long but extremely delicate pale hairs on the front surface, and black bristles at tip; middle pair with black hairs and bristles near the tip in front; hind coxæ with a minute black bristle on the outer surface; legs yellow or yellowish-brown, femora paler especially at base; tarsi growing darker towards their tips; hind legs rather hairy; hairs on the femora mostly yellow; fore metatarsi three-fourths as long as their tibiæ; hind tarsi with the second joint longer than the first.

Halteres yellowish-brown with brown knobs; tegulæ yellow with their tips and cilia black, the cilia however appear yellowish-brown in certain lights.

Wings grayish hyaline; veins brown; costa black; last segment of the fifth vein about twice as long as the posterior cross-vein; third and fourth veins parallel beyond the cross-vein; tip of the fourth vein beyond the apex of the wing (Fig. 1).

Described from four males taken at Colden, Erie County, New York, August 3.

This species differs from all other known North American species in having the antennae and the cilia of the tegulae and orbit black, also in having the knob of the halteres and the tips of the tegulae infuscated. It resembles *N. dorsalis* described in this paper in the color of the abdomen and pleurae, also in size. The hypopygium of these two species when drawn out appears to be attached by a slender peduncle; *N. setosa* V. D. has about the same structure.

Neurigona dorsalis n. sp. (Plate XVIII, Fig. 3).

♂. Eyes contiguous; thorax metallic green or purple on the dorsum; flattened space before the scutellum not very conspicuous; hypopygium yellow, tipped with black; front tibiæ with black bristles. Length 2 mm.

Eyes meeting so as to almost obliterate the face; palpi with silvery white pollen; proboscis yellow; front blackish with gray pollen; ocellar bristles strong, divergent. Antennæ yellow, first joint with a few black bristly hairs above at apex, second joint short, third joint pointed, about as long as broad, infuscated along the upper edge; arista brownish, pubescent.

Dorsum of the thorax metallic green (in the type specimen reddish purple on the most of its surface), dulled with gray pollen; pleuræ

and humeri yellow, the former with a black spot in front of the halteres which connects with the black of the black metanotum; scutellum bronze-brown, black at base and on the lateral corners (in one specimen concolorous with the dorsum).

Dorsum of the abdomen greenish-black; more or less of the sides of the first and second segments and the venter yellow; hypopygium yellow, rather large, with conspicuous black outer, and equally large, yellow inner appendages (Fig. 3).

Coxæ and feet pale yellow, tips of the tarsi slightly darker; front coxæ with a few yellowish bristles on the anterior surface; in some lights these bristles appear brown; middle coxæ with a few black hairs on the front surface and one large black bristle on the outer surface; hind coxæ with one erect black bristle on the outer surface; fore tibiæ with a row of black bristles on top; these bristles, which are hardly as long as the diameter of the tibia, do not reach the base or tip; fore metatarsi hardly one-half as long as their tibiæ; hind femora with a black bristle on the outside near the tip; hind tarsi hardly as long as their tibiæ, with the first joint a little shorter than the second.

Tegulae, their cilia and the halteres yellow.

Wings grayish, hyaline, narrowed at base, the anal angle being obsolete; last section of the fourth vein nearly straight, approaching the third vein towards the tip; posterior cross-vein about two-and-one-half times its length from the wing margin measured on the fifth vein; veins brown.

♀. One specimen from Ithaca, New York, seems to be the female of this species, but is in rather poor condition. The color is about the same as in the male except that the dorsum of the thorax is black where it is metallic in the male, but it seems to be a little greasy, and I take that to be the reason for the difference; it also has the row of small bristles on the fore tibiæ. The ovipositor is short and blunt, shining, and of a reddish-yellow color.

Described from two males, one taken by me on the trunk of a tree at Elma, Erie County, New York, on August 27; the other in the Cornell University collection, taken at Ithaca, New York, July 9. The female from Ithaca, New York, July 8.

This species runs to *tibialis* in the key of males in my paper on this genus, but in this species the hypopygium is large with the outer appendages black, while in *tibialis* the hypopygium is small with small yellow appendages.

While working up the genus *Neurigona* last year I rejected this species after describing it, as the flattened space in front of the scutellum is not as conspicuous as in most of the other species; the legs are somewhat stouter, and the first joint of

the antennae has several stout hairs above, but I hardly think that these differences justify the erection of a new genus. The form of the hypopygium is typical of *Neurigona*, and the third and fourth veins are converging, the acrostichal bristles in two rows, the body color partly yellow, and the flattened space can be traced quite readily.

Paraclius ovatus n. sp. (Plate XVIII, Figs. 5, 6).

♂. Length 3 mm. Face covered with silvery white pollen; the front and occiput dull green with white pollen, which is thicker on the former; antennae reddish-yellow, third joint mostly brownish and somewhat pointed; arista brown, pubescent; cilia of the inferior orbit white.

Dorsum of the thorax metallic green, only thinly dusted with grayish pollen; pleurae more blackish with white pollen; a large black bristle above the fore coxae.

Abdomen metallic green with some coppery reflections, white pollinose on the sides below; hypopygium black (Fig. 5), somewhat shining, its lamellae large, oval, yellowish-white with a narrow black border on the lower and apical edge (Fig. 6), ciliate with black hairs.

Coxae yellow, the middle pair darkened on the outer surface; fore and middle coxae with black hairs and bristles; hind coxae with a bristle on the outer surface; legs yellow; the tarsi slightly darkened, middle femora with a preapical bristle; hind femora with two preapical bristles, one near the upper and one near the lower edge; fore tibiae with a row of small and two large bristles; middle and hind tibiae with a glabrous strip above between two rows of large bristles; hind tarsi longer than their tibiae and with the first joint shorter than the second.

Tegulae and halteres pale yellow, the former with black cilia.

Wings grayish hyaline; posterior cross-vein about its length from the wing margin measured on the fifth vein.

Described from two males from Decatur County, Georgia. Taken by Mr. M. D. Leonard, July 16 and 19, 1912.

Paraclius angulatus n. sp. (Plate XVIII, Fig. 7).

♂. Length 4 mm., length of wing 3 mm. Face wholly covered with snow-white pollen, narrowed in the center, being about as wide, a little above the middle, as the width of the third antennal joint; palpi, proboscis and antennae black, the latter of moderate size, the third joint somewhat pointed, about as long as broad; arista with scarcely perceptible pubescence; cilia of the upper orbit black, of the lateral and inferior orbit white; front covered with grayish pollen.

Thorax, abdomen and coxae dark metallic green, almost blackish-green; pleurae and coxae dull with whitish pollen; the spot of white

pollen in the sutural depression conspicuous. Abdomen with considerable white pollen along the sides, and with the posterior margins of the segments blackish in certain lights; hypopygium dull black; lamellæ black, rather large, with the outer part subquadrate and the slender stem at right angles to this outer part (Fig. 7).

Legs entirely black; fore coxæ with black hairs and bristles; femora with a slight greenish lustre; all the tarsi about as long as their tibiæ, the first joint of hind tarsi a little longer than the second.

Tegulæ and halteres yellow, the former with black cilia.

Wings strongly tinged with blackish, more hyaline on the basal and posterior portions; fourth vein ending close to the tip of the third vein, not at all recurved at tip.

♀. Differs from the male only in having the face broader and with the sides nearly parallel, and the pollen of the abdomen so laid on as to leave the hind margins of the segments and the center of the dorsum darker colored.

Described from three males and one female taken at Colden, Erie County, New York, August 3, 1913.

This species runs, in Prof. Aldrich's key, to *P. nigripes* Ald. and agrees with his description of that species in most points, but the lamellæ of the hypopygium are large and angulated, while in *nigripes* they are small and rudimentary.

***Peloropeodes flavipes* n. sp.** (Plate XVIII, Figs. 8, 9).

♂. Length 1.75 mm. Face wide above, narrowed below to about the width of the small black proboscis, thickly covered with grayish-white pollen, and with a subquadrate, brown spot above the palpi; palpi small, white; front broad, covered with gray pollen; cilia of the inferior orbit white, of the upper orbit black. Antennæ brownish black, about as long as the head and thorax, first and second joints short, third joint very long, somewhat flattened, tapering, with long pale pubescence (Fig. 8); arista apical, one-half as long as the third joint, with long pale pubescence, and with a minute black spine at tip. (This spine seems to represent the second joint of the arista.)

Dorsum of the thorax, scutellum and abdomen dark metallic green; dorsum of the thorax dulled with gray pollen, which is thickest along the fore part; pleuræ black with white pollen; scutellum with one pair of widely separated bristles; acrostichal bristles absent; other thoracic bristles well developed; hypopygium black, with only a few minute hairs and yellow appendages, hardly one-half as large as the abdomen (Fig. 9).

Legs yellow with very short hairs; tarsi scarcely darkened at the tips; fore coxæ yellow with a few pale bristle-like hairs on the front surface; middle and hind coxæ blackened at base; middle coxæ with

brown hairs on the front surface; middle tibiae with two and hind tibiae with three bristles on the upper surface; middle and hind femora with a preapical bristle.

Tegulae yellow with black tips and brownish cilia; halteres yellow.

Wings grayish hyaline, with brown veins; rounded at tip.

Described from one male taken by Mr. Nathan Banks at Falls Church, Virginia, on May 30.

I place this little species in this genus as it is closely related to *P. salax* Wheeler, although his generic description would have to be modified to receive it, as this species has but two scutellar bristles and the wings are rounded at the tip. I should give the characters of the genus as: Antennae of the male as long as the head and thorax with thick terminal arista, third joint and arista pubescent, first joint bare above; hypopygium large, sessile, with small hook-like appendages; wings with the third and fourth veins parallel; sixth vein distinct; posterior cross-vein perpendicular to the wing margin, distant from the tip of the fifth vein about twice its length. Prof. Wheeler does not mention the bristles of the thorax, but in my species there are no acrostichal bristles; the other bristles are strong.

PSILOPIELLA n. gen.

Wings with the fourth longitudinal vein forked, and the sixth longitudinal vein present; posterior cross-vein twice its length from the wing margin, measured on the fifth vein; face of female wide, scarcely narrowed below; front wide, vertex not excavated; ocellar tubercle not prominent; there are ocellar, vertical and postvertical bristles; antennae with the first joint bare above, second joint with small bristles at apex, third joint short in the female, pubescent; arista dorsal, pubescent.

Thorax with a small flattened space before the scutellum; without acrostichal bristles; five dorsocentral, a humeral, a very small presutural, two notopleural, and a supraalar bristle, all these bristles rather small; a minute bristle above the fore coxae; scutellum with a pair of large bristles and a pair of small hair-like bristles outside of these.

Legs rather slender; hind coxae with an erect bristle on the outer surface; tibiae with one or two small bristles; first and

second joints of hind tarsi of equal length. Abdomen partly yellow.

This genus is related to *Leptorhethum* by the forking of the fourth vein, and the vertex not being excavated; to *Neurigona* still more closely by the bare first antennal joint, the flattened space before the scutellum and the yellow abdomen.

Type.—*Ps. rutila* n. sp.

Psilopiella rutila n. sp. (Plate XVIII, Fig. 2).

♀. Length 2 mm. Face and front wide, thickly covered with white pollen; palpi small, yellow with a few black hairs; antennæ yellow with the rounded third joint brown; arista brown; orbital cilia black above, white below.

Thorax reddish coppery, thickly covered with gray pollen; bristles black except the one above the fore coxæ, which is yellowish; pleuræ black with white pollen, and with the hind edge a little yellowish.

Abdomen yellow, shining, with blackish bands on segments 2 to 5.

Coxæ yellow with yellow hairs and bristles; erect bristle on the hind coxæ also yellow; each tibia with a small black bristle near the knee; tarsi blackish towards their tips.

Wings grayish hyaline; fork of fourth vein rather weak and in a straight line with the basal portion.

Described from one female taken at Bradentown, Florida, in March.

Medeterus emarginatus n. sp. (Plate XVIII, Fig. 10).

♀. Length, exclusive of the ovipositor, 5 mm., length of ovipositor 2 mm. Face, palpi, proboscis and front black; proboscis shining with several long pale hairs below and a row of short pale hairs along the edge; antennæ with the first joint reddish-yellow, second joint black, the third joint brownish-black with an apical arista; orbital cilia black above, pale below; four black bristles above the fore coxæ.

Thorax black, but so thickly covered with brown pollen on the dorsum as to appear seal-brown with a broad, poorly-defined lateral stripe of darker on each side; acrostichal bristles rather large; on the front of the dorsum inside of the humeri is a space covered with short black bristles; scutellum and flattened space before, pleuræ and coxæ covered with gray pollen.

Abdomen black with gray pollen along the sides; ovipositor with two small yellowish lamellæ and about six long slender hairs at tip.

Coxæ and legs black; extreme tip of middle coxæ and of all femora reddish-yellow; fore and middle coxæ with black bristles at the tip; hind coxæ with one bristle on the outer surface; fore coxæ with a

circular emargination at tip; (Fig. 10) all femora with rather long hairs below; middle tibiae with a pair of small bristles at basal fourth; fore and hind tibiae without bristles; hind tarsi with the first joint a little more than half as long as the second.

Halteres pale yellow with the stem brown; tegulae whitish, bordered with brown, and with white cilia.

Wings grayish, hyaline; veins dark brown, a little paler at base of wing; posterior cross-vein and distal segment of fifth vein of about equal length.

Described from one female taken at Kearney, Ontario, July 6, 1909.

This runs in Wheeler's key to the species of this genus to *M. maurus* Wheeler, but differs from that species by the antennae having only the first joint yellow, no trace of bluish on the face or body, and by having brown pollen on the dorsum of the thorax. The emargination of the fore coxae is, I think, a character peculiar to this species.

The ovipositor in the described specimen is very much exerted; this may not be the case normally, but I think that it is.

Medeterus modestus n. sp.

♂. Length 2.75 mm. Altogether brownish black; face shining with a greenish luster in some lights, with gray pollen in the suture and along the orbits below the suture; proboscis shining black, moderately large; cilia of the lateral and lower orbits white; pleurae and coxae with white pollen.

Dorsum of the thorax with brown pollen and black bristles; two gray stripes are quite distinct on the forepart of the thorax in some specimens; scutellum with greenish reflections and with four marginal bristles.

Abdomen shining on the dorsum and with white pollen on the sides; hypopygium long and rather slender, the inner appendages somewhat yellowish.

Fore coxae with minute pale hairs on the front surface, those at the tip bristle-like; middle coxae with whitish bristles on the front surface; hind coxae with one erect whitish bristle on the outer side and three or four pale bristles above the fore coxae; second joint of hind tarsi about twice as long as the first.

Halteres brown on the outer surface, paler on the inner side in some specimens; tegulae and their cilia brownish.

Wings grayish, hyaline, a little yellowish at the root; veins dark brown or black, scarcely paler at the base of the wing; posterior cross-vein straight, about as long as the distal segment of the fifth vein.

♀. Length 3.25 mm., agrees with the male in all but sexual characters.

Described from two males and two females, taken at Avon, New Jersey, September 27, 1908, by Mr. H. S. Harbeck.

This species comes close to *M. nigripes* Loew, but has white bristles above the fore coxae; the halteres and cilia of the tegulae are brownish, and the fore coxae have minute but distinct white pubescence on their anterior surfaces, and pale bristles at their tips; while *nigripes* has black bristles at the tip of the fore coxae which are otherwise bare, the bristles above them are also black; the halteres and cilia of the tegulae are whitish in *nigripes*, and the first joint of the hind tarsi is shorter in proportion than in this species.

Medeterus lobatus n. sp. (Plate XVIII, Fig. 11).

♂. Length 2.3 mm. Proboscis and palpi small, brown; face rather wide, metallic green; front blue, narrowly green along the orbits; antennae black, first and second joints of about equal length, third joint about half as long as the second and rounded at tip, pubescent; arista apical, about as long as the height of the head, pubescent; orbital cilia black above, pale below; the bristle at the upper corner of the eye large, curved forward.

Thorax and abdomen metallic green with coppery reflections, and some bluish reflections on the pleurae and forepart of the dorsum; thorax thinly gray pollinose; acrostichal bristles small, in two rows; humeral bristle large; three dorsocentral, a posthumeral, one notopleural, a presutural, and a postalar bristle, all black and rather large; a small yellowish bristle above the fore coxae; scutellum yellow below with four large bristles, the outer pair the smaller.

Hairs of the abdomen pale; hypopygium long, black, the basal part somewhat metallic, the outer part opaque, appendages rather long, yellow.

Fore and middle coxae metallic green on their front surfaces with yellow tips; hind coxae green at base; all the hairs and bristles of the coxae pale, including the bristle on the outer surface of the hind coxae; legs yellow; tips of the tarsi scarcely darkened; hind femora with about five slender bristles near the base on the upper edge, and a row of four stouter bristles on the outer surface towards the tip; hind tibiae with two bristles at basal third and one preapical bristle, all on the upper surface, also a row of yellow hairs on top which are longer towards the tip; middle tibiae with two bristles at basal third; fore tarsi longer than their tibiae, the second joint slightly enlarged,

third joint with a flattened lobe on the front side, this lobe nearly as large as the joint (Fig. 11); middle tarsi longer than their tibiae; hind tarsi about the same length as their tibiae, with the first joint nearly two-thirds as long as the second and with a bristle at tip below.

Tegulae, their cilia, and the halteres yellow.

Wings hyaline, strongly tinged with yellowish-brown lack as far as the fourth and fifth veins, leaving a broad hind margin hyaline; veins brown; venation typical of the genus; posterior cross-vein one and a half times its length from the wing margin, measured on the fifth vein.

Described from one male, taken by Mr. H. S. Harbeck, at Barnegat City Junction, New Jersey, on August 11, 1910.

This interesting little species is related to *M. aberrans* Wheeler, which was also taken in New Jersey, it having the small proboscis and bright metallic coloring of that species.

Asyndetus harbeckii n. sp. (Plate XVIII, Figs. 12, 13).

♂. Length 3.25 mm. Face subquadrate, metallic green with thin gray pollen; palpi very small, brown with brown hairs; front metallic green with coppery reflections in the center, shining; antennae black, third joint brown; second joint long, arcuated, with a bristly basal projection; third joint large, flattened, with short pubescence, rounded below, with two points at apex, attached to the second joint near the center of the upper edge; arista inserted near this central point, distinctly pubescent. (The third joint in the type specimen is larger in the left than in the right antenna; it is hard to say which is the normal form, Figs. 12 and 13). Orbital cilia short and black above, below forming a rather thick beard of a sordid white color.

Thorax metallic green with coppery reflections on the front of the dorsum; pleurae and scutellum more blue-green, the former with brown pollen; bristles of the thorax large; acrostichal bristles in an irregular row; scutellum with a pair of large medial and a pair of small outer bristles.

First three segments of the abdomen dark bluish-green, the last two more bronze-black; hairs of the abdomen long, black, those at the sides of the base longest; hypopygium small, with small black appendages, bristles at the tip rather large.

All the coxae black with black hairs and bristles; fore coxae somewhat greenish at base; all femora metallic green, shining, ciliate with bristlelike black hairs below; fore tibiae and metatarsi yellow, fringed with long blackish hairs on the outer upper edge; last four joints of the fore tarsi short with a few stout hairs at the tip of the fifth joint; middle and hind tarsi black; middle and hind tibiae with two bristles above, inserted at first and second thirds.

Tegulae and their cilia whitish; halteres brown with a whitish knob. Wings grayish, hyaline; venation about as in *S. syntormoides* Wheeler, except that the bend in the last section of the fourth vein is a little more abrupt.

Described from one male taken by Mr. H. S. Harbeck at Wenonah, New Jersey, June 26.

The location of the types of the new species described in this paper is as follows:

Asyndetus harbeckii, Type in the collection of Mr. H. S. Harbeck, Philadelphia.

Medeterus emarginatus, Type in the collection of the author.

Medeterus lobatus, Type in the collection of Mr. H. S. Harbeck.

Medeterus modestus, Type in Mr. H. S. Harbeck's collection.

Neurigona dorsalis, Type in the author's collection.

Neurigona nigricornis, Type in the author's collection.

Paraclius angulatus, Type in the author's collection.

Paraclius ovatus, Type in collection of Cornell University.

Peloropecodes flavipes, Type in the collection of Mr. Nathan Banks.

Psilopiella rutila, Type in the author's collection.

The location of the types of the new species described in the NEWS for November, 1914, pages 404-407, is as follows:

Gymnopternus flaviciliatus, Type in the Cornell University collection.

Leucostola terminalis, Type in the collection of Mr. Nathan Banks.

Systemus americanus, Type in the collection of Mr. Nathan Banks.

Thinophilus frontalis, Type in the author's collection.

EXPLANATION OF PLATE XVIII.

- Fig. 1. *Neurigona nigricornis* n. sp., wing.
2. *Psilopiella rutila* n. gen., n. sp., wing.
3. *Neurigona dorsalis* n. sp., hypopygium.
4. *Neurigona nigricornis* n. sp., hypopygium.
5. *Paraclius ovatus* n. sp., hypopygium, side view; 6, rear view of the same, showing the form of the lamellae.
7. *Paraclius angulatus* n. sp., hypopygium.
8. *Peloropecodes flavipes* n. sp., antennae; 9, hypopygium of the same.
10. *Medeterus emarginatus* n. sp., fore coxa.
11. *Medeterus lobatus* n. sp., fore tarsus.
12. *Asyndetus harbeckii* n. sp., left antenna; 13, right antenna of the same.

Changes of Address.

Ernest Keil from Granville, Ohio, to 970 S. Villa St., Pasadena, California.

F. E. Pomeroy from 551 Brighton Ave., Boston, Mass., to 342 College St., Lewiston, Maine.

Dragonflies (Odonata) collected in Texas and Oklahoma.

By E. B. WILLIAMSON, Bluffton, Indiana.

(Continued from p. 415)

16. *Argia agrioides*.

Texas: Clifton, May 29, 30 and 31, and June 1, 37 ♂, 1 ♀; 13 ♂ in alcohol, det. Calvert.

A. agrioides was first seen by me at Clifton on a small stretch of hard, light-colored, barren, pavement-like ground, from which all the lighter soil particles had been washed. This ground had a slight slope towards a shallow dry gully which in turn led into the small stream mentioned in the itinerary under date of May 31. These bright blue dragonflies were resting on the ground, were restless, and, when flushed, were followed with difficulty because of a sharp wind. On subsequent days I found them along the bed of the small stream. This stream, near its mouth, has steep, washed sides and, at the date when we collected, long pools of water. Towards its source it dwindles rapidly, the channel is less deeply eroded and vegetation occurs on the banks and in the stream bed. Except for a few small marshy spots near its head it is a typical wet weather gully. In this insignificant gully, with its generally apparently unfavorable conditions, 8 of the 15 species and subspecies of *Argia* known north of Mexico were taken in one day, June 1. Only 10 species of *Argia* were taken on the collecting trip. Of the 2 species not taken June 1, one (*tibialis*) was taken on both sides of Clifton and I believe will be found there, possibly a little later in the season. The other (*intruda*) was taken only at Wister, Okla. Of the 8 species taken on June 1, 4 (*translata*, *vivida*, *immunda* and *agrioides*) were not taken elsewhere than at Clifton; 1 (*violacea*) was taken also at Wister, Oklahoma; and 3 (*moesta*, *sedula* and *apicalis*) were taken on both sides of Clifton. Of the 4 not taken elsewhere, *translata* is of very wide distribution; *vivida* is of wide distribution in the western States and into Mexico; *immunda* and *agrioides* are southwestern and Mexican. *Violacea* is of wide distribution; and of the 3 species

taken on both sides of Clifton, *moesta* and *scdula* are of wide distribution, while *apicalis* is of more restricted and northerly distribution. The truly remarkable Clifton list thus results from the meeting here of species of wide distribution with western and southwestern species. The distribution generally of dragonflies seems to be, within certain limits, determined by temperature and impassable barriers, subject only to the formation, age and extinction of suitable water habitats. Consider, for example, the distribution of *Ischnura kellicotti* known only from a few points in the extreme east, Indiana and Oklahoma.

In 1905 I collected 14 species of *Argia* in Guatemala. Nine species were taken at one point, Gualan, which, as in the case of Clifton, seemed favorably located to receive elements from two directions. Of the 9 species, 1 was taken at Gualan only; 1 was taken only in one direction; 4 were taken only in the other direction, and 3 were taken in both directions.

17. **Enallagma durum.**

Texas: Bay City, May 24, 1 ♂; Williams Lake, May 26, 1 ♀; Matagorda, May 25, 1 ♀.

18. **Enallagma civile.**

Texas: Brownsville, May 13 and 15, 5 ♂, 2 ♀; 1 ♀ in alcohol, det. Calvert. Nov. 25, 1910 (C. A. Hart), 3 ♂, one of them teneral; Black Bayou, May 18, 19, 20, 21 and 23, 32 ♂, 1 ♀; 11 ♂, 1 ♀ in alcohol, det. Calvert; Clifton, May 30 and 31, 5 ♂, 1 ♀; 1 ♂ in alcohol, det. Calvert.

Oklahoma: Wister, June 3, 1 ♂, 1 ♀; Henryetta, Aug. 7 and 30, and Sept. 22 (Collins), 7 ♂, 1 ♀.

19. **Enallagma traviatum.**

Oklahoma: Wister, June 3 and 4, 40 ♂, 4 ♀; 2 ♂ in alcohol, det. Calvert. Flying over the water at source of outlet of artificial lake in numbers, pairing.

20. **Enallagma geminatum.**

Texas: Williams Lake, May 26, 3 ♂, 1 ♀.

Oklahoma: Wister, June 3, 2 ♂, 1 ♀, 1 pair; 1 ♂ in alcohol, det. Calvert.

21. **Enallagma divagans.**

Oklahoma: Wister, June 3, 7 ♂, 1 ♀; 1 ♀ in alcohol, det. Calvert.

22. **Enallagma basidens.**

Texas: Clifton, May 30 and 31, and June 1, 12 ♂, 1 pair; 2 ♂ in alcohol, det. Calvert.

23. *Enallagma exsulans*.

Texas: Clifton, May 29, 30 and 31, 12 ♂, 1 ♀; 2 ♂, 1 ♀ in alcohol, det. Calvert.

Oklahoma: Wister, June 3 and 4, 3 ♂; 2 ♂ in alcohol, det. Calvert.

24. *Enallagma signatum*.

Texas: Black Bayou, May 20, 2 ♂; Bay City, May 24, 1 teneral ♂.

Oklahoma: Wister, June 3 and 4, 5 ♂, 2 ♂ in alcohol, det. Calvert.

25. *Enallagma pollutum*.

Oklahoma: Wister, June 3, 1 ♂.

26. *Telebasis salva*.

Texas: Black Bayou, May 17, 1 ♂ in alcohol, det. Calvert; Clifton, May 30 and 31, and June 1, 7 ♂, 2 ♀; 3 ♂ in alcohol, det. Calvert.

27. *Ischnura ramburii*.

Texas: Brownsville, May 13, 3 ♂, 1 hom. ♀, 2 het. ♀, and var. *credula* 1 ♂, all in alcohol, det. Calvert; Black Bayou, May 16, 21, 22 and 23, 10 ♂, 3 hom. ♀, 3 het. ♀; 1 ♂ and 1 het. ♀ in alcohol, det. Calvert; Bay City, May 24 and 27, 17 ♂, 1 hom. ♀, 6 het. ♀; Matagorda, May 25, 10 ♂, 3 hom. ♀, 6 het. ♀; Williams Lake, May 26, 5 ♂, 2 hom. ♀, 1 het. ♀.

28. *Ischnura kellicotti*.

Oklahoma: Wister, June 3 and 4, 14 ♂, 8 het. ♀; 1 ♂, 1 het. ♀ in alcohol, det. Calvert. On white water-lily leaves, identically as observed and described from Indiana.

29. *Ischnura posita*.

Texas: Black Bayou, May 22, 3 ♂, 3 ♀; Clifton, June 1, 1 ♂.

Oklahoma: Wister, June 3, 12 ♂; 2 ♂, 1 ♀ in alcohol, det. Calvert; Henryetta, Aug. 7 (Collins), 1 ♀.

30. *Anomalagrion hastatum*.

Texas: Sealy, May 10, 2 ♂, 1 ♀ caught near the railroad station; Brownsville, May 13, 1 ♀ in alcohol, det. Calvert; Black Bayou, May 23, 3 ♂ in alcohol, det. Calvert; Bay City, May 27, 2 ♂, 1 ♀; Williams Lake, May 26, 2 ♀; Clifton, May 31, 3 ♀.

Oklahoma: Wister, June 3 and 4, 3 ♂, 3 ♀; 1 ♀ in alcohol, det. Calvert; Henryetta, Aug. 7 and Sept. 22 (Collins), 10 ♀.

31. *Neoneura aaroni*.

Texas: Black Bayou, May 17, 1 ♂; 1 ♂ in alcohol, det. Calvert.

Several were seen but not taken on the same date and at the same place,—a small lot of drift debris on one side of a relatively deep pool in a small stream on the right bank of the Guadalupe River. From the drift the *Neoneuræ* flew out to hover motionless above the deep water of the pool. As the collector approached they would disappear, leaving him to guess at the direction of their flight. I have collected several species

of *Neoneura* and the flight and actions of all have been similar. Their agility must be seen to be appreciated. And almost invariably they have been found about deep pools in small streams with drift or overhanging bushes near at hand.

32. **Hagenius brevistylus.**

Oklahoma: Wister, Aug. 3 and 5 (Collins), 10 ♂.

33. **Erpetogomphus designatus.**

Texas: Bay City, May 27, along Colorado River, 1 teneral ♀; Clifton, May 29 and 31, 4 ♂, 1 ♀, all very teneral.

34. **Gomphus submedianus.**

Texas: Bay City, May 24, 1 ♂, 1 ♀; Williams Lake, May 26, 1 ♂.

Oklahoma: Wister, June 3 and 4, 3 ♂, 2 ♀.

35. **Gomphus subapicalis.**

Texas: Bay City, May 24 and 27, 1 ♂, 1 ♀; Williams Lake, May 26, 1 ♂.

36. **Gomphus militaris.**

Texas: Black Bayou, May 18, 21, 22 and 23, 6 ♂, 10 ♀, most of them teneral or very teneral; Clifton, May 29 and 31, and June 1, 1 ♂, 5 ♀, most of them teneral.

37. **Gomphus graslinellus.**

Oklahoma: Wister, June 5, 1 ♀.

This specimen has been studied by Dr. Calvert and myself, and it seems safe to refer it to this species. *Graslinellus* about Bluffton, Indiana, has been very numerous during its season in past years, and, in the large number of specimens I have examined, considerable variation in markings is shown. For example, the black mid-dorsal thoracic stripe may be of uniform width, in which case the pale stripe on either side is wider below; or the mid-dorsal stripe may be cuneiform, in which case the pale stripe on either side is of uniform width. The dark antehumeral and humeral stripes may be entirely separated by a narrow pale stripe, or they may be partly joined or entirely coalesced to form a wide dark band of nearly uniform width. There is some variation, but less in the development of the 2 lateral dark stripes.

38. **Gomphus externus.**

Texas: Clifton, May 29, 1 ♂.

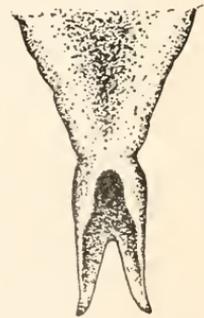
39. **Gomphus consanguis.**

Texas: Black Bayou, May 17 and 19, 1 ♂, 1 ♀; Bay City, May 24 and 27, 1 ♂, 1 ♀.

The specimens I have referred to this species, of which only the type ♂ is known, were examined by Dr. Calvert, who suggested they might be immaturesly colored *vastus*. Their close relationship to *vastus* is certain, the color pattern of the head and thorax being almost identical, though the dark color is much paler and more obscured in the Texas material. In the male of *vastus* the genitalia of the second segment are black, brown in the Texas specimens; and the anterior median angle on the second hamule, seen in profile, is much stronger in *vastus*. In color of abdomen the Texas specimens are much paler than *vastus*, 7-10 being largely brownish yellow and yellow, with obscure pattern, instead of the largely black with sharply restricted yellow markings of *vastus*. Moreover, in profile, the superior appendages of *vastus* are slenderer than those of the Texas specimens.

The occiput of the female from Texas is low, nearly straight, sloping gently from either side to a slightly lower center. In *vastus* the vulvar lamina is relatively narrower than in the Texas specimens, figured here, with the sides more nearly subparallel and the 2 points of the apex contiguous.

De Selys compared *consanguis* with *fraternus* and *adelphus*. The latter species is known to me only from descriptions. It is smaller than *consanguis*. From *fraternus*, *consanguis* is separated at once by the



Gomphus consanguis ♀,
vulvar lamina. Black
Bayou, Texas, May
19, 1907.

colored face and the thoracic markings (the more developed and cuneiform mid-dorsal stripe, and the complete, not interrupted, first lateral stripe), as well as the abdominal colors mentioned above in the comparison with *vastus*.

There is a fair degree of probability that the species here identified is not really *consanguis*, but, until the latter species has been positively determined and comparisons made directly with the Texas species, there is no justification, though the localities (North Carolina and Texas) are widely separated, for describing the latter species as new. The 2 males and 2

females from Texas in my collection are all teneral, and, in the course of study, all the male superior appendages but one have been lost. I am able to account for this only as a result of their teneral condition which seems to make the appendages extremely fragile.

40. **Gomphus plagiatus.**

Texas: Bay City, May 27, very teneral ♂.

Oklahoma: Wister, Aug. 2, 4 and 6 (Collins), 2 ♂, 2 ♀.

41. **Dromogomphus spinosus.**

Oklahoma: Wister, June 3 and 4, and Aug. 2, 4 and 5 (Collins), 9 ♂, 1 ♀; the ♂ and ♀ taken in June both teneral.

42. **Anax junius.**

Texas: Kingsville, May 11, 1 ♂ caught during a stop of the train; Black Bayou, May 18, 1 ♂; Williams Lake, May 26, 1 pair.

Oklahoma: Henryetta, Aug. 30 and Sept. (Collins), 2 ♂, 8 ♀.

43. **Epiaeschna heros.**

Oklahoma: Wister (Collins), 1 ♀.

44. **Macromia australensis.**

Oklahoma: Wister, Aug. 3, 5 and 6 (Collins), 7 ♂, 2 ♀.

45. **Macromia annulata.**

Texas: Clifton, May 30, 1 ♀.

Another individual, presumably of the same species, was seen but not taken. The flight was very swift, and, though I waited some time, the dragonfly did not return, nor were others seen. In the brief glance I got of it, and, of the one captured, the effect was of a brownish or grayish insect, not at all suggesting the *Macromias* I am better acquainted with in Indiana.

46. **Epicordulia princeps.**

Texas: Black Bayou, May 21, 1 teneral ♂.

47. **Platycordulia xanthosoma.**

Oklahoma: Wister, June 4 and Aug. 2 (Collins), 2 ♂.

48. **Tetragoneuria williamsoni.**

Oklahoma: Wister, June 3 and 4, 2 ♂, 1 ♀.

49. **Libellula cyanea.**

Oklahoma: Wister, June 3 and 4, 46 ♂, 4 ♀.

50. **Libellula luctuosa.**

Texas: Williams Lake, May 26, 2 ♂.

Oklahoma: Wister, Aug. 2 and 4 (Collins), 2 ♂, 1 ♀.

51. **Libellula pulchella.**

Oklahoma: Wister, June 3 and Aug. 2, 4 and 5 (Collins), 4 ♂, 2 ♀; the single specimen taken June 3 is a teneral ♀; Henryetta, Aug. 30, 1 ♂.

52. *Libellula incesta*.

Oklahoma: Wister, Aug. 2 (Collins), 46 ♂, 69 ♀. All the males have the extreme apex of wings dark, and 2 have a trace of color about the nodus in the front wings; otherwise the wings of all are unmarked. In the females the basal streaks are best developed in the front wings, sometimes being present in the front wings and wanting in the hind wings; the nodal spot similarly is best developed in the front wings. While in the females there is considerable variation in any one of the wing markings, there is also variation in the combination of these markings, as shown by the following tabulation, which is for the 69 females:

1. No basal streaks, no nodal spot, apex dark; 11 specimens.
2. No basal streaks, more or less distinct nodal spot, apex dark; 4 specimens.
3. No basal streaks, nodal spot, area between nodus and stigma, and apex dark; 5 specimens.
4. Basal streaks, no nodal spot, apex dark; 11 specimens.
5. Basal streaks, nodal spot, apex dark; 23 specimens.
6. Basal streaks, nodal spot, area between nodus and stigma, and apex dark; 12 specimens.
7. Basal streaks carried in antenodals of second series to nodus; nodus, area between nodus and stigma, and apex dark; 3 specimens.

53. *Libellula vibrans*.

Texas: Williams Lake, May 26, 1 teneral ♂.

Oklahoma: Wister, Aug. 2 (Collins), 17 ♂, 8 ♀. Of the 17 Wister males all have basal streaks, nodal spots and apex dark on all wings, except that in one specimen the nodal spot is scarcely evident in the hind wings. One specimen has the postnodals of all 4 wings edged with color. In the females the apical brown is more extensive than in the males. In one female the nodal spots are almost or quite wanting, and in 2 females there is some color on the postnodals.

54. *Libellula auripennis*.

Texas: Matagorda, May 25, 1 ♀; Williams Lake, May 26, 1 teneral ♀.

55. *Plathemis lydia*.

Texas: Williams Lake, May 26, 3 ♂, 1 ♀; Clifton, May 31 and June 1, 1 ♂, 1 ♀.

Oklahoma: Wister, Aug. 2, 5 and 6 (Collins), 9 ♂, 11 ♀; Henryetta (Collins), 1 ♂, 2 ♀.

56. *Orthemis ferruginea*.

Texas: Brownsville, May 15, 1 ♂, and Nov. 25, 1910 (C. A. Hart), 3 ♂, 4 ♀; Black Bayou, May 17, 18, 21 and 22, 11 ♂, 5 ♀.

57. *Perithemis tenera*.

Texas: Brownsville, May 13 and 15, 1 ♂, 1 ♀; Black Bayou, May

17, 18, 22 and 23, 4 ♂, 1 ♀; Bay City, May 27, 4 ♂, 2 ♀; Williams Lake, May 26, 15 ♂, 2 ♀.

Oklahoma: Wister, June 3 and 4, 9 ♂, 3 ♀; Henryetta, Aug. 20 and Sept. (Collins), 2 ♂.

The wing markings of the females from different localities vary but little, and probably the variation is not associated with locality. The female taken at Brownsville has the most yellowish of any, this color surrounding the customary darker markings. The Oklahoma females have the wing markings slightly less extensive than the others.

58. *Erythrodiplax berenice*.

Texas: Matagorda, May 25, 10 ♂, 12 ♀. Of the 12 females only 1 shows distinctly the clouded area near the nodus; another shows it very indistinctly and the rest not at all. Of the 12, 9 are heterochromatic. In these 9 there is more or less yellow at the wing bases; in one only does this reach the first antenodal, and this is in the single specimen having the colored area near the nodus. In the 3 homoeochromatic females the brown at the base of the hind wings is the merest trace and is entirely wanting on the front wings. In some apparently older heterochromatic females the thoracic dark markings are more extensive than in others and the abdomen is as dark as in the homoeochromatic females. In the youngest homoeochromatic female the thorax is shining black (dull in the others), and the abdomen is colored about as in the usual heterochromatic form. To summarize—the constant differences between the two forms in this material are confined to the head markings (as described by Calvert, B. C. A. Neur., p. 269), the thorax and the wing bases.

Four females selected at random had the following characters of the left wings tabulated (see Calvert, B. C. A. Neur., p. 268):

Number of marginal cells between		
Stigma and M ₂	R ₅ and M ₃	M ₄ and Cu ₁
f. w. 31, 33, 34, 36.	f. w. 23, 23, 22, 23.	f. w. 6, 10, 7, 7.
h. w. 27, 33, 35, 40.	h. w. 24, 28, 26, 28.	h. w. 13, 16, 13, 14.

In the above tabulation the first figure in each case is that of one individual, the second figure of another, and so on.

59. *Erythrodiplax umbrata*.

Texas: Brownsville, May 13 and 15, 4 ♂, 1 ♀; Black Bayou, May 17 and 23, 1 ♂, 1 ♀.

60. *Erythemis simplicicollis*.

Texas: Black Bayou, May 16, 18, 21 and 22, 2 ♂, 4 ♀; Bay City, May 24, 1 ♂; Matagorda, May 25, 1 ♂; Williams Lake, May 26, 3 ♂.

Oklahoma: Wister, June 3 and Aug. 2, 4, 5 and 6 (Collins), 2 ♂, 23 ♀.

61. *Erythemis verbenata*.

Texas: Black Bayou, May 21, 1 ♀.

62. *Leptthemis vesiculosa*.

Texas: Brownsville, May 13, 1 ♀, and Nov. 25, 1910 (C. A. Hart), 1 ♂; Black Bayou, May 17, 18 and 21, 30 ♂, 7 ♀.

This species was very abundant and very wary at the lake or pond where it was taken May 21. During the afternoon a short but heavy rainstorm came up and the *Leptthemis* at once took shelter in the alders, where they hung, often with the water pouring in a miniature stream from the apex of the abdomen. So drenched they were easily caught in the hand, but with cessation of the rain and the immediate appearance of the sun, they all took to the wing with unabated if not increased vigor.

Frequently they were observed feeding on a common fly, which has kindly been identified for me by Professor Hine as *Anthrax fulvohirta*. *Leptthemis vesiculosa* and *Erythemis simplicicollis* are the most voracious feeders known to me among the dragonflies. Both are grass green, both hunt in vegetation, especially *simplicicollis*, and I have seen *vesiculosa* strike like a falcon and kill dragonflies as large as itself.

63. *Sympetrum corruptum*.

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 5 ♂, 3 ♀, one of the males teneral; Bay City, May 24, 1 ♂.

Oklahoma: Henryetta, Sept. (Collins), 5 ♂.

64. *Pachydiplax longipennis*.

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 2 ♀, one of them teneral; Black Bayou, May 16, 17 and 18, 4 ♂, 2 ♀; Bay City, May 24 and 27, 4 ♂, 1 ♀; Williams Lake, May 26, 1 ♂.

Oklahoma: Wister, June 3 and Aug. 5 and 6 (Collins), 1 ♂, 17 ♀.

65. *Celithemis eponina*.

Texas: Williams Lake, May 26, 5 ♂, 1 ♀.

66. *Brachymesia furcata*.

Texas: Brownsville, May 13, 1 ♂; Black Bayou, May 21, 1 ♂. The one taken at Black Bayou rested in grass and low vegetation and was very wary and active.

67. *Brachymesia batesii*.

Texas: Black Bayou, May 18, 1 ♂, the only one seen.

68. *Brachymesia gravida*.

Texas: Brownsville, May 13 and 15, 2 ♂, 1 ♀; the latter has one stigma with a cross vein; Black Bayou, May 18, 20, 21 and 22, 12 ♂, 7 ♀, most of them teneral; Williams Lake, May 26, 9 ♂.

On May 20, at the lake where we collected, this species greatly exceeded in numbers all other species. They were all recently emerged and many were scarcely able to fly. These teneral, as might be expected, kept themselves closely to the vegetation, only a few of the more mature resting on the tips of the bulrushes. With maturity this species commonly selects more lofty resting places, and at Brownsville and also at the lake at Black Bayou, visited on May 18 and 21, individuals were seen resting on the tips of bushes out of reach of the insect net. In fact, one was shot from such a lofty perch within a few yards of the spot where *B. furcata* was taken resting in the grass.

69. *Dythemis fugax*.

Texas: Black Bayou, May 22, 1 fine ♂, taken near the section house, resting on the tip of a twig of a low bush in late afternoon; the only one seen.

70. *Dythemis velox*.

Texas: Clifton, May 29, 1 teneral ♀, the only one seen.

71. *Pantala hymenaea*.

Texas: Brownsville, May 15, 1 ♀; Black Bayou, May 17 and 22, 2 ♀; Williams Lake, May 26, 1 ♂.

Oklahoma: Henryetta, Sept. 29 (Collins), 1 ♀.

72. *Pantala flavescens*.

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 1 ♂; Black Bayou, May 18, 1 ♂; Matagorda, May 25, 1 teneral ♀.

Oklahoma: Henryetta, Sept. (Collins), 2 ♂.

73. *Tramea cophysa*.

Texas: Black Bayou, May 17, 18 and 21, 12 ♂, 3 ♀; Matagorda, May 25, 1 ♂.

In all the males the frons above is metallic violet, though the area is reduced in one individual. The lateral thoracic stripes are evident in 10 males; in 3 males these stripes, especially the second, are scarcely evident. In 3 males the basal hind wing color reaches A₂ and posteriorly it is on a level with the arculus; in 10 males the color reaches A₃ and posteriorly it scarcely attains the level of the arculus.

In the 3 females the lateral thoracic stripes are evident; the frons above at base is rich reddish brown, in front bright yellow; the basal color on hind wing reaching A₂ in 1 individual, and A₃ in 2 individuals.

In ENT. NEWS, September, 1903, p. 228, No. 46, I have recorded *Tramea abdominalis* from Nashville, Tenn. This speci-

men belongs to the same species as the Texas specimens here determined as *cophysa*.

74. *Tramea onusta*.

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 1 teneral ♀; Black Bayou, May 17, 18, 19 and 21, 21 ♂, 4 ♀; Bay City, May 24, 2 ♀.

Of 23 specimens examined for mites, 9 were infected.

In 1 male the basal color on the hind wings reaches only mid-way between the first and second antenodals, the supertriangle is scarcely colored, and the enclosed pale basal area reaches A₃, at which point the colored area is only 1 cell wide. In 10 males the basal color reaches the second antenodal; in 9 males it reaches the third. In 11 males the color extends to the distal angle of the triangle; in 8 it extends 1 cell beyond. In 1 male the median space and the area beyond the upper limb of the arculus are colored; in all other males these areas are hyaline.

In the females the basal color reaches the second antenodal in 5 individuals; the third in 2 others. Color extends to the distal angle of the triangle in 5 females; a short distance beyond in 1. The median space and the area beyond the upper limb of the arculus are colored in only 1 female, hyaline in the others.

75. *Tramea lacerata*.

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 2 ♂; Black Bayou, May 18, 2 ♂.

[Notes on a Gomphine Exuvia from Williams Lake, Matagorda Co., Texas.

The exuvia was collected on vegetation in the water May 26, 1907, by E. B. Williamson. No adults collected the same day throw any light on its identification. It comes close to the two exuviae described by Hagen (Trans. Amer. Ent. Soc. XII, p. 277, 1885) as "*Aphylla producta* (supposition)." The Academy of Natural Sciences of Philadelphia has a dried larva from Kissimee River, Florida, which agrees with this description. From the description quoted and the Kissimee River larva, the Texas exuvia differs as follows:

Smaller size, 43 mm. long; 6 mm. broad (in front of bases of wing pads).

"Palpus" of the "mask" with three teeth instead of four before the end hook; teeth shorter, less equally stout, the first and second proximal to the end hook being more slender than the third proximal to the end hook (*i. e.*, the most proximal tooth of all.)

Abdomen shorter (30.5 mm.), 10th segment shorter (11 mm.). (The Kissimee larva has the 10th 20 mm. long.)

The exuviae of Hagen's description and the Kissimee River larva may just as well be the early stages of the *Gomphoides* recorded by Pollard* from North Carolina as they may be of *producta*. The Texas exuvia is somewhere near these, but it is impossible to say what the species may be.—PHILIP P. CALVERT.]

A new *Platygasterid* Genus with Remarkable Antennae (Hym.).

By ALAN P. DODD, Nelson, via Cairns, Queensland.

MIRAMBLYASPIS nov. gen.

♂.—Head transverse, a little wider than the thorax; eyes large; ocelli rather wide apart, the lateral ones distant from the eye margins by no more than their own diameter; mandibles bidentate.

Thorax twice as long as wide, narrowed anteriorly; pronotum distinctly visible from above, especially on the sides; mesonotum longer than wide, parapsidal furrows wanting; scutellum lengthened, projecting over the metathorax and terminating in a straight, sharp spine.

Abdomen broadly rounded behind; a little longer and distinctly wider than the thorax; petiolate; first segment twice as long as wide, with two carinae; second segment occupying two-thirds the abdominal length, scarcely longer than wide.

Legs extremely long; all trochanters lengthened; anterior tibiae not much lengthened, anterior tarsi fully three times as long as their tibiae; middle tibiae lengthened, middle tarsi about twice as long as their tibiae; posterior legs nearly twice as long as the whole body, posterior tibiae very long, their tarsi scarcely longer than the tibiae; tarsi 5-jointed.

Forewings very long, extending well beyond apex of abdomen; without venation.

Antennae 13-jointed, very long, as long as the posterior legs; filiform; scape, pedicel, eight funicle joints, and between each of the four apical funicle joints there is a small joint, resembling a ring joint, quite distinct, small but a little longer than

*Ent. News, xxii, p. 79. 1911.

wide; scape extremely long, about ten times as long as wide, as long as the next four joints combined; pedicel only twice as long as wide; funicle joints very slender, giving off long hairs, the hairs being several times as long as the width of the joints; the three small joints between the apical funicle joints without hairs; first funicle joint one-half longer than the pedicel; second one-half longer than the first; third shorter than the second, as long as the first; fourth extremely long, five times as long as the third, as long as the scape, but much narrower, about twenty times as long as wide; fifth about three-fifths as long as the fourth; sixth three-fourths as long as the fifth; seventh almost as long as the sixth; eighth longer, as long as the fifth. The antennae are remarkable on account of the small joints between the apical four funicle joints.

Type.—*Miramiblyaspis mirabilis* sp. nov.

Miramiblyaspis mirabilis sp. nov.

♀. Length, 2.00 mm.

Shining black; neck of pronotum, posterior edge of mesonotum, apical two-thirds of scutellum, and base of abdomen ferruginous. Legs (including coxae), mandibles, and first five antennal joints golden yellow; apex of posterior femora, and apical third of posterior tibiae, black. Thorax rather densely pilose; first abdominal segment pilose, the rest smooth. Forewings long and broad; a little infuscated; marginal cilia rather long; discal cilia moderately fine and dense.

(From 1 specimen, 2-3-inch objective, 1 inch optic, Bausch and Lomb.)

Habitat.—North Queensland (Nelson, near Cairns). Described from one ♂ caught by sweeping on edge of jungle, July 15, 1913 (A. P. Dodd).

Type.—In the South Australian Museum, a ♂ on a tag, plus a slide bearing head, antennae, and forewings.

—♦—♦—♦—

Sympetrum obtusum and costiferum (Odonata) in Maine.

In the Catalogue and Bibliography of the Odonata of Maine (The Univ. of Maine Studies, No. 4, August, 1902), *obtusum* is recorded from York Harbor and Fryeburg. The capture establishing the Fryeburg locality is recorded on p. 276, ENT. NEWS, Nov., 1901, "a single specimen taken at Fryeburg, Me., August 10, 1899 (Harvey)." In the Harvey collection is a male *costiferum*, labeled, in Harvey's hand, "*Sympetrum obtusa*, Fryeburg, Me., Aug. 14, 1899, F. L. Harvey." This is doubtless the specimen, erroneously determined as *obtusum*, upon which the Fryeburg record is based. Ris, Coll. Selys, Libellulinen, p. 686, records as in his collection 1 ♂, 2 ♀ *obtusum*, Manchester, Maine, Miss Wadsworth, collector.—E. B. WILLIAMSON.

Descriptions of new North American Acalyprate Diptera—I.

By E. T. CRESSON, JR., Academy of Natural Sciences of
Philadelphia.

These descriptions are published now and in this form mainly to establish priority and to eliminate the necessity of circulating manuscript names. The types are in the collection here unless otherwise noted.

Sepedon pacifica n. sp.

Cinnamon-brown to tawny. Opake with head and abdomen shining. Two spots above foramen, spot at base of frontal bristles silvery, tinged with yellow. Head higher than long. Front broader than long, orbits slightly divergent; the para- and meso-frontal areas separated by sharp and well-defined ridges running laterad from the ocellar tubercle and evanescent at lunular margin; thus the frontal bristle is situated in the depressed parafrontal. The spot laterad of antennae round and velvety black. Otherwise similar to *fuscipennis* Loew, but larger and wholly darker in color. Wings deeply tawny, and the spines on femora beneath more developed and series more extended basally. Length 9 mm.

Holotype.—♂, Redwood Canyon, Marin Co., California, May 17, 1908 (Cresson). Type No. 6076.

Distinct from *fuscipennis* Lw., to which it is closely allied, by the broad front having the deeply sunken orbital and middle areas separated by distinct longitudinal ridges, the latter area being much more than one-third the width of the front.

Coelopa vanduzeei n. sp.

Black, opake to subopake; lunule, first and base of second joints of antennae, proboscis, trochanters and articulations of legs, yellowish-brown. Halteres yellow. Wings gray with costa, veins 1 and 2 yellow. Squamae white with yellow cilia. Legs of female brown with tarsi decidedly more yellowish. All surfaces, especially of body, covered with ochreous dust with mesonotal impressed lines black. Front, except at vertex, velvety black in certain aspects; ocellar tubercle, orbits and apices of fore and hind femora somewhat shining. Checks with short bristles, but those at anterior margin longer.

The three impressed mesonotal lines distinct in male. Second notopleural and postalar bristles strong; humeral, first notopleural, anterior postalar and sternopleural bristles very short. In the female all

these are equally strong and the scutellum has lateral bristles besides the erect apical pair.

Femora and tibiae of male, especially of fore and hind legs, stout and very strongly spinose, each spine emitted from a conical tubercle at its base; outer surfaces of middle femora with short spines; middle tibiae and tarsi, especially on flexor surfaces, thickly pilose with long curved pile. Female with legs more slender, the spines limited to the flexor and extensor angles and more bristle-like; no pile on middle legs. Only apical margin of fifth abdominal segment with long bristles. Length 5-7 mm.

Holotype.—♂, La Jolla, California, March 7, 1914. (E. P. Van Duzee). Type No. 6077.

Paratypes.—2 ♂, 1 ♀, with same data.

Differs from all the other species recorded from North America by the strongly spinose legs and the long pile on the middle pair. These spines are strong and straight, not curved bristles as in *frigida*. It seems allied to *parvula* Hal. in coloration.

Tetanops carbona n. sp.

Black, more or less shining, front as broad as, or broader than, eye, opaque except at vertical angles, not punctate or wrinkled; the broad median yellow stripe limited laterally by narrow lines of brown which end just laterad of the antennae. Orbits broadly white, which color extends down to the cheeks, the broad median carina of face of same color; foveae shining and darker, translucent. Cheeks and lower occiput yellower, rather shining; occiput above nearly shining brown. Palpi yellow, proboscis brown. Antennae tawny to brown with apex darker; third joint twice length of second.

Thorax, abdomen and legs excepting knees and articulations shining black, but mesonotum more or less white pruinose. Squamae whitish; halteres tawny. Scutellum triangular, convex, with four bristles. 3 pair prescutellars, 1 postalar, 2 supraalar, 2 notopleurals, 1 propleural, humeral, mesopleural and sternopleural each.

Wings yellow-hyaline; marked with brown spots as follows: a spot in apex of costal cell extending faintly to vein 4, a small spot at apex of vein 1; a larger spot in apex of marginal cell extending nearly to vein 3 and along costa to apex of 4, its proximal margin about opposite post c. v.; stigma yellow; vein 1 setulose. Fore femora only setulose beneath. Length 6 mm.

Holotype.—♂, Carbon County, Wyoming. In collection American Museum of Natural History.

Paratype.—1 ♂, with same data.

Differs from all the other species in having the front and thorax smooth, without any wrinkles or punctures or punctiform dots.

Calobata nasoni n. sp.

Shining black with front, face, cheeks, mouth-parts, antennae, humeri, halteres, venter of abdomen, claspers and legs, whitish yellow to tawny. Head slightly longer than high, eyes round; occiput swollen, one-half diameter of eye. Front one-third of width of head, opaque, yellow becoming tawny medianly toward ocelli; orbits silvery white continuing as stripes to a spot behind ocelli; ocellar tubercle on line with posterior orbits; orbital bristles not discernible. Face, lower occiput and palpi opaque white. Antennae with third joint slightly longer than broad; arista black, short plumose basally.

Thorax narrower than head and twice as long; mesonotum polished, with a broad median stripe divided anteriorly and passing over humeri, notopleural stripe and pleurae, white pruinose, as is also the scutellum and metanotum.

Abdomen of male one and one-half times as long as thorax, broadest at segments 3 and 4; genital segments subglobose; claspers separated, broad at base, abruptly attenuate and bent forward into a long filiform apex, sparsely hairy. Between hind coxae of male posteriorly is an elongate pointed process. Genital segment of female one-half length of abdomen, subcylindrical, with cavity at base beneath, flattened laterally toward apex.

Legs very slender; posterior femora three-quarters of length of wing, with brown subapical rings, their tibiae nearly as long; other tibiae equalling their femora.

Wings hyaline, yellowish, longer than abdomen; vein 2 entering costa in a straight line midway between post. c. v. and apex; veins 3 and 4 separated apically half length of post. c. v. Length 4-6 mm.

Holotype.—♂, Algonquin, Illinois, June 11, 1909 (W. A. Nason, No. 171.) Type No. 6078.

Paratypes.—3 ♂, 2 ♀, with same data.

This species averages smaller than *pallipes* Say, which it closely resembles. It cannot be Say's species, as the vertex is tawny and the mesonotum has a broad median whitish pruinose line, while the lateral margin is only narrowly so. The differences in the genitalia will readily separate the two species.

Taeniaptera divaricata n. sp.

Black with metallic blue and black reflections. In form and size similar to *antennaeipes* Say but more robust, especially as to head and

thorax, also not so highly polished. Front subopake, dark brown, the opake mesofrontal much narrower than parafrontal, scarcely attaining lunule or narrowly so. Face opake, tawny to brown with faint spots laterad of antennae and narrow oral margin black; orbits and cheeks not noticeably silvery. Antennae with second and base of third joints tawny to brown, latter two-and-one-half times longer than broad.

Thorax opake above, entirely subcinereous; prothorax, humeri, postalar region and scutellum tawny to brown. Sternopleural comb dense.

Abdomen metallic blue to black, subcinereous with third and fourth segments subopake, brown; broad apical band on first densely cinereous.

Fore coxae and femora, middle and hind femora translucent tawny to brown with yellow subapical and basal bands; fore tibiae and base of their tarsi black leaving the remaining apical joints snow white; middle and hind tibiae black, towards their apices and tarsi yellow to tawny.

Wings fuscus becoming diluted posteriorly, from base to apex of auxiliary vein, narrow band over anterior c. v., another narrow band beyond apex of first vein, hyaline. First vein ending slightly beyond the more or less oblique posterior c. v. First posterior cell closed in margin; anal cell long, ending less than length of post. c. v. before margin. Length 8-10 mm.

Male claspers short with anterior appendages as figured for *angulata* Lw. (Trans. Amer. Entomol. Soc., XXXIV, pl. ii, Fig. 12, 1908.)

Female with base of ovipositor three times as long as broad.

Holotype.—♂, Billy's Island, Okefenokee Swamp, Georgia, June, 1912. In the Cornell University Collection.

Paratypes.—4 ♂, 7 ♀, with same data.

Differs from *antennaeipes* Say in having the base of fore tarsi black, longer anal cell, longer antennae and in the form of the male claspers, as well as by other characters mentioned. It should not be confused with *lasciva* Fab., a neotropical and apparently very closely related species, but which has a much longer anal cell and simple claspers.

Additions to the Entomological Collections, Carnegie Museum, Pittsburgh.

The 17th Annual Report of the Director, Dr. W. J. Holland, for the year ending March 31, 1914, states that during the year there have been added about 53,000 specimens of insects, the largest addition for any year since the purchase of the Ulke collection of Coleoptera.

A New Species of the Remarkable Hymenopterous Genus *Smicromorpha* with Correction of the Generic Description.

By A. A. GIRAULT, Nelson (Cairns), Queensland, Australia.

The genus *Smicromorpha* Girault is the type of a new tribe in the family Chalcididae and was described from two broken specimens. Lately, a pair of a second species were captured from jungle in North Queensland, and these allowed the recognition of the sexes which formerly had been identified by analogical likenesses of the eyes to those of many male and female Diptera. It turns out, however, that the analogical likeness does not hold as may have been expected, since it is the female with the large eyes and the male with normal ones. The original description then should be corrected, the terms male and female turned about. The two sexes are alike except that the male has only 7-jointed antennae, the club solid, the funicle 4-jointed, no ring-joint, the antennae setiform as in the female. But also, besides the much larger eyes in the female (resembling those of many male Diptera), the abdomen is stouter distad, the ovipositor distinct but not exerted. The mandibles are alike in both sexes but very peculiar in shape, having two teeth, the first long, acute, subfalcate, the second a half shorter, rather broad, obtusely rounded at apex and separated from the first by a long, narrow sinus.

The second species of the genus is described herewith.

Smicromorpha cadaverosa new species.

♀. Length 5.00 mm. Like the type species, but with a more distinct pattern on the thorax (no pattern or practically none in the female type species): all of each parapside except margins, cephalic portion of each axilla, cephalic half of scutum except along margins and meson, caudal third of scutum except along meson and margins, forming two elongated oblique spots, one on each side, and a minute dot in the center of propodeum, dorso-laterad, dusky black; the spot on the fore wing is more distinct than in the type species. Otherwise, the same. First funicle joint tapering from apex to base.

♂. The same, but the hind coxae shorter and stouter, dusky black, the dot on propodeum absent. (The dark reddish scutum described for the male of the type species is no doubt due to fading and there is no real pattern.)

Described from a single pair captured a quarter of a mile apart by sweeping in a jungle pocket, July 28, 1913 (A. P. Dodd). The species is most probably, like its congener, parasitic upon ants.

Habitat.—Nelson (Cairns), Queensland.

Types.—In the Queensland Museum, Brisbane, the above specimens together on a tag, the two heads on a slide.

Note: The female of the above species had asymmetrical antennae, one of these latter bearing but eight joints, the other nine; the missing joint appeared to be the sixth funicle. I have reexamined the antennae of the female type species and both were 9-jointed and alike.

An Individual Variation of Lorquin's Admiral, *Limenitis lorquini* Boisduval (Lepid.).

By FORDYCE GRINNELL, JR., LOS ANGELES, CALIFORNIA.

Limenitis lorquini (Boisduval).

Individual Variant. ♀. Expands 72 mm. Upper side, forewings: Velvety blackish-brown, with the usual red apex, extending over about the same area, but there is considerable variation in this in specimens from the same locality. There are two white apical spots, next to the red, the upper longer and quadrangular, the lower oval; above the upper spot is a faint indication of the white continuation of the red. The band of white spots across the wings is much the same as in the typical form, but the spots are reduced in size and elongated and sprinkled with black scales. Only a faint indication of the white discal spot. Hind wings: velvety brownish-black, with only faint indications of the last three spots of the white band; and a comparatively large red anal spot clove-shaped.

Under side, forewings: The apex entirely red with no usual row of white crescents; a semi-circular area extending from the base to the inner angle and to the cell, blackish-brown; with the usual white and red spots, but much obscured with black scales.

Hindwings: *Entirely* red, with the row of median white spots and the two basal white spots very faintly indicated.

Habitat.—Arroyo Seco Canyon, San Gabriel Mts., near Pasadena, California, 1700 feet altitude, July 23, 1913; collected by Rutherford Moore, vice-president of the Lorquin Natural History Club for boys, in whose collection is this interesting specimen.

Locust Stridulations* (Orth.).

By H. A. ALLARD, U. S. Dep't. of Agriculture, Washington, D. C.

In August, 1913, while living at Clarendon, Virginia, just west of Washington, the writer studied the stridulating habits of *Conocephalus robustus* Scudd. This species is very common in the grass and herbage everywhere along the roadsides in this vicinity. Its note is a strong, humming z-z-z-z-z-z, which may continue several minutes without pause. It is considerably louder, more penetrating and droning in quality than the prolonged dry, snappy z-z-z-z-z of *Conocephalus triops* L., although probably not as strong and penetrating as the z-z-z-z-z-z of *C. fusco-striatus* Redt. *C. robustus* is scattered everywhere along the roadsides, rather than in well defined colonies, and stridulates most freely during the dusk of evening and early in the night.

At Clarendon, Virginia, the writer also located a small colony of *Conocephalus exiliscanornus* Davis, in a dense thicket of reeds and shrubs near a small meadow. Early in the evening the males advertised their presence by their brisk, vehement lispsings, for the notes of this *Conocephalus* are brief, intermittent and rather soft. This cone-headed grasshopper appears to be strongly gregarious in its habits, as the writer has found it only in small, widely separated colonies around Washington, D. C. Wherever these colonies occur a very striking similarity in the conditions obtains. A thicket of shrubs in low grounds with an undergrowth of grasses seems to be quite indispensable to these interesting locusts.

In 1911 (1) the writer described the stridulations of *Xiphidion strictum* Scudd., from a single individual heard late in the fall. More recently the writer has again studied the stridulations of this locust at Arlington, Virginia, and finds, as previ-

(*Identifications were made by Mr. A. N. Caudell, of the U. S. National Museum.)

(1) Xiphidion Stridulations. Proc. Ent. Soc. of Washington, Vol. XIII, 1911.

ously reported, that no staccato lisps precede the long, lisping monotone s-s-s-s-s-s-s-s, which may continue several minutes without pause.

The notes of this *Xiphidion* are much louder than those of any *Xiphidion* the writer has yet become acquainted with. The long persistent monotone without the preceding staccato lisps makes the habit of stridulation of this *Xiphidion* similar to that of the species of *Conocephalus* which have acquired the habit of prolonged stridulation. Although the Xiphidions usually keep well within the grass and low herbage of fields and meadows, the writer has observed *Xiphidion strictum* resting several feet from the ground in shrubs during stridulation.

Very noticeable differences in the manner of stridulation characterize many of the species of *Xiphidion*. According to the character of the notes these insects may be grouped into three classes.

Xiphidions in the first class always produce a few, brief staccato lisps followed by a more or less prolonged lisping, monotone, or in the case of *X. nemorale*, the staccato lisps precede from two to thirty-two brief phrases rapidly repeated. A number of Xiphidions in this class stridulate in quite the same manner as the more common species of *Orchelimum*. Although barely audible, the stridulations of *X. fasciatum* in delivery and duration are an almost perfect reproduction of the staccato lisps and succeeding monotone characteristic of *Orchelimum vulgare* or *O. molossum*.

The notes of Xiphidions in the second class consist of weak, lisping phrases alone, as staccato lisps are quite wanting. The stridulations of *X. allardi* are of this character. Among the *Orchelimums* this is also the habit of stridulation of *O. minor*.

In the stridulations of Xiphidions of the third class, staccato lisps are also wanting, but the note is a long-continued, lisping monotone similar to that of some of the cone-headed grasshoppers, although not nearly as loud and penetrating. *X. strictum* stridulates in this manner. This habit of stridulation

among the Xiphidions is a close approach to that of the cone-headed grasshoppers *Conocephalus triops* and *C. robustus*.

From the preceding remarks concerning the musical habits of the Xiphidions, it is evident that the stridulations of these little locusts are similar to the stridulations of the *Orchelimums* on the one hand and to those of the cone-headed grasshoppers *Conocephalus* on the other.

Stridulation unquestionably plays a very important role in the mating activities of the musical Orthoptera. It is a part of the active courtship behavior of the males. In the immediate presence of the females, the males, under the influence of strong sexual excitement, sometimes become very energetic in their stridulatory activities. At such times, however, the notes are often interrupted and irregular, and may not represent the characteristic mode of stridulation of the species. From a study of various katydids in confinement, it is evident that something akin to a keen sense of rivalry exists between the males of a species.

A single male katydid or locust of almost any species when confined in a room will stridulate very vigorously in response to other males out-of-doors, and sooner or later will make its way to the screened window in an attempt to escape and seek its noisy rivals. Among the musical Orthoptera this sense of rivalry in a great measure appears to be one of the strongest impulses leading to the act of stridulation. The writer has spent much time among colonies of different species of musical locusts and katydids, closely observing the various movements of the individuals. In general, the females are not prone to move about as actively as the males. The males, however, as soon as the time for stridulation has arrived, become alert, restless and climb or fly more or less actively from point to point, stridulating more or less persistently in the meantime. Observation has shown that many of these movements have been made in order to approach rival males in the vicinity. The writer has repeatedly noted these movements in colonies of *Microcentrum rhombifolium*, *Amblycorypha oblongifolia*,

rotundifolia and *uhleri*; and in colonies of *Oecanthus* and *Conocephalus* species.

From a study of the stridulatory habits of various musical Orthoptera it has been learned that some species voluntarily change their notes from time to time. This is true for *Scudderia texensis*, *Scudderia furcata*, *Amblycorypha rotundifolia* and *A. uhleri*, so far as the writer has observed. An abrupt change by one male is very likely to call forth similar responses from other males within hearing. Just what these volitional modifications signify in the social relationships of the species is not clear.

It is quite plain, however, that stridulation in one way or another has become intimately associated with the mating activities of the musical Orthoptera. Throughout the lives of the males the greater part of all attention and interest is concerned with courtship and stridulation. Although the noisy performances of one male may excite and attract another, as it would seem in many instances, this simply means that the courtship of the female is the ultimate aim in the life of every male. Stridulation thus serves to bring more than one male within the immediate society of the female, and at the same time tends more or less toward community aggregation for many species.

A Mite Gall on *Clementsia* (Acarina).

The Red Orpine, *Clementsia rhodantha* (Gray), is a Crassulaceous plant which abounds at high altitudes in the Rocky Mountains. On July 7, 1914, I found it at timber line (about 11,200 feet alt.) on the side of Mt. Martha Washington, Colorado, and observed that most of the heads, instead of producing the normal pink flowers, were aborted to a dense round mass of a dark crimson-lake color, consisting of excessively tuberculated floral parts, inhabited by an Eriophyid mite. In Central Europe and Italy a similar deformation of *Rhodiola rosea* is produced by *Eriophyes rhodiolae* (Canestrini); and judging from the brief accounts given by Nalepa and Houard, it seems very probable that we have to do with the same species of mite. The number of cross-lines is about the same, and the only apparent discrepancy I note is in the great length (about 65 microns) of the first ventral setae (Nalepa says they are "mittellang"). I have not access to Canestrini's figures.—T. D. A. COCKERELL.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., DECEMBER, 1914.

The Annual Entomological Meetings.

Again the Christmas holidays approach, bringing the annual meetings of the Entomological Society of America and the American Association of Economic Entomologists, in affiliation with the American Association for the Advancement of Science, and in conjunction with many other Societies of kindred interest such as the Botanical and Zoological. We print announcements of the two entomological societies on other pages of this issue. Philadelphia has the honor and pleasure of acting as host this year and the University of Pennsylvania will offer more ample and convenient facilities for the occasion than were hers on the last previous occasion in 1904. The meetings of a decade ago led to the formation of the Entomological Society of America and the birthplace will gladly welcome the sturdy child of ten years and her older sister.

The First Quarter-Century of The "News."

This present December number completes the twenty-fifth volume and the twenty-fifth year of ENTOMOLOGICAL NEWS. We, who have done the work of editing and proof-reading, of caring for subscriptions and the other financial interests of the journal, find a difficulty in realizing the length of the period which has elapsed since the first slim, pink-covered number, of sixteen pages, appeared on January 14, 1890. But on the other hand, as in many similar retrospections, we have become so used to the monthly toil and the monthly appearance that we find it equally difficult to realize the time when the NEWS was not. Without boasting, we feel that this journal has aided in the development of Entomology in America. We hope that it may continue to play this rôle for many years to come.

Of the six names of editors and advisory committee borne on the covers of the first three numbers, three are still to be found there, and among our subscribers and contributors we have the pleasure of counting some who have been with us continuously from the very beginning. All thanks to our friends, near and far, whose support has enabled the veterans and their later associates to increase and to carry on the NEWS unto this present. May their aid and that of their successors continue to us and to those who shall take our places!

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

A Method of Injecting the Tracheae of Insects.

In working on the internal anatomy of various insects, I stumbled upon a plan for injecting the tracheal system, which renders it comparatively easy for the dissector to follow this system to its smallest branches.

Place the insects in a flask and pour in just enough India ink to cover them. In the case of Coleoptera and Hemiptera it would be better to first remove the wings. Connect up the flask with an aspirator which is attached to a common water faucet. On turning on the water, the air is withdrawn from the flask by the aspirator, creating a vacuum. At the same time the air is withdrawn from the tracheae of the insects, and is replaced by the India ink. On opening up the insect, the tracheae will stand out clear and black, and can readily be followed.—E. H. DUSHAM, Instructor in Entomology, Pennsylvania State College, State College, Pa.

Callosamia promethea and *angulifera* (Lepid.).

During the spring I collected some cocoons of *promethea* hanging on spice-bush in my garden. They were placed in a hat box and the box covered with mosquito netting. The box was kept in a corner of a room on the third floor of my home at Ardmore, Pennsylvania. On June 27th a male and female of *promethea* emerged, and in the evening between eight and nine o'clock moths were noticed flying against the wire screen of the window of the room where the *promethea* were kept. The screens were raised and fifteen male *angulifera* came into the room and were captured. The windows were then closed. How many more would have entered had they been left open, it is not possible to say. The exact relationship between these two

has always interested me and many experiments could be carried on in relation to them. Were the male *angulifera* deceived by the female *promethca*? If the attraction is so great, what happens to the hundreds and perhaps thousands of specimens of these two in nature? Are the males of *promethca* attracted in the same way by the female *angulifera*? What are hybrids between the two like? Are such hybrids fertile? It is sometimes difficult to differentiate the females of the two. Perhaps it is foolish to speculate in regard to such matters when it is possible to ascertain the truth by direct experiment and observation. My only excuse is that this note may stimulate an interest in the subject and when opportunity affords, breeding experiments may be carried on.—HENRY SKINNER.

Annual Meeting, Entomological Society of America.

The ninth annual meeting of the Entomological Society of America will be held in Philadelphia, Pennsylvania, Thursday and Friday, December 31st, 1914, and January 1st, 1915, in affiliation with the meetings of the American Association for the Advancement of Science and other Societies. Meetings will begin at 10 A. M. on Thursday.

Blanks for abstracts of papers will be sent by the Secretary to the members, and should be returned to him not later than December 15th, in order that the program may be included in the general program of the A. A. A. S. Papers will be limited to 15 minutes in delivery.

The by-laws provide that there shall be held at the annual meeting a technical exhibit of entomological materials and methods. Photographs, drawings, specimens, novelties, apparatus, or other matter of interest to entomologists will be heartily welcomed. This exhibit will be open from December 28th to January 1st, under the charge of Dr. Philip P. Calvert, Zoological Hall, University of Pennsylvania, Philadelphia, Pa.

The business meeting will be held Friday morning, January 1st,* for the reports of the executive committee, treasurer and auditing committee, the election of new members and of officers and the transaction of all other business.

The annual public address will be given on Wednesday evening, December 30th, at 8 P. M., by Professor Stephen A. Forbes, of the University of Illinois, State Entomologist of Illinois. His subject will be, "The Ecological Foundations of Applied Entomology." Following this address, Dr. Henry Skinner, at the request of the Executive Committee, will present a history of the Society. At the conclusion, the entomologists of Philadelphia will tender a smoker to all visiting entomologists. The addresses by Professor Forbes and Dr.

*The Secretary-Treasurer writes that the date announced for the business meeting on the notices which he sent out is incorrect; it should be as given above. P. P. C.

Skinner and the smoker will be held at the Academy of Natural Sciences, Nineteenth and Race Streets.

The other meetings will be held at the University of Pennsylvania (see below).

ALEX. D. MACGILLIVRAY, Secretary-Treasurer, University of Illinois, Urbana, Illinois.

PHILIP P. CALVERT, President, University of Pennsylvania, Philadelphia, Pa.

Annual Meeting, American Association of Economic Entomologists.

The twenty-seventh annual meeting of the American Association of Economic Entomologists will be held at the University of Pennsylvania, Philadelphia, Pa., December 28th to 30, inclusive. The program will be arranged as follows:

Monday, December 28th, at 1.30 P. M. Opening session, at which will be delivered the address of the President, Dr. H. T. Fernald, which will be preceded by the transaction of the regular business of the meeting. At 8 P. M. of the same day, the meeting of the section on Apiary inspection will be held.

Tuesday, December 29th, at 10 A. M. and 1 P. M., the regular session of the Association will be continued. At 8 P. M. the opening session of the section on Horticultural Inspection will convene and another session of this section will be held at 10 A. M. on the following day.

Wednesday at 1 P. M. the closing session of the Association will be held. Thursday evening, December 31st, is left open temporarily, in case the program is too long to be disposed of at the sessions already arranged, in which case papers will be presented at a session to be held on that evening.

The meeting of the section on Horticultural Inspection will be in charge of Dr. W. E. Britton, chairman of this section, and communications in regard to program and other matters relating to the sectional meeting should be addressed to Prof. J. G. Sanders, Madison, Wis., who is Secretary of this section.

The section on Apiary Inspection will be in charge of Prof. Wilmon Newell, College Station, Texas, and communications in regard to the sectional meeting should be addressed to Mr. N. E. Shaw, Columbus, Ohio, Secretary of this section.

In accordance with our usual custom, the time allowed for presenting a paper should not exceed 15 minutes.

A. F. BURGESS, Secretary, Melrose Highlands, Mass.

DOCTOR H. T. FERNALD, President, Amherst, Mass.

Local Arrangements for the Annual Meetings.

The meetings of the Entomological Society of America (except that of Wednesday evening, December 30th, as announced above)

and all the meetings of the American Association of Economic Entomologists will be held in Class Room D, Veterinary Building, University of Pennsylvania, Thirty-ninth Street and Woodland Avenue, Philadelphia.

Hotel headquarters for both the entomological societies have been taken at the Hotel Walton, Broad and Locust Streets. The rates, for rooms only, are as follows: Single rooms, without bath, one person, \$1.50 and up per day, or with bath \$2.00 and up per day. Double rooms without bath, two persons, \$3.00 and up per day, or with bath, \$3.50 and up per day. All rooms have hot and cold running water. The Walton is three blocks from the Pennsylvania Railroad (Broad Street) Station, five blocks from the Philadelphia & Reading Railway (Market Street) station, eleven blocks from the Baltimore & Ohio Railroad (Twenty-third and Chestnut Streets) station. It is advisable to engage rooms early.

A list of other hotels, with their rates, will be found in the Preliminary Program of the American Association for the Advancement of Science.

The Veterinary Building, the meeting place for both societies, is reached, without change, by the electric cars, Route 13, on Walnut Street (one block north of the Walton), or by those of the Market Street Subway (three blocks north of the Walton), westbound, Routes 11 and 37, to Thirty-ninth Street and Woodland Avenue.

The University of Pennsylvania extends a cordial invitation to members of the A. A. A. S. and of all affiliated societies to take lunch during the meetings at the Gymnasium, Thirty-third and Spruce Streets, as its guests. The Gymnasium may be reached from the Veterinary Building direct by electric cars of Route 40, eastbound, on Spruce Street, one block north.

While it has not been possible to arrange for the entomological meetings without conflicting with meetings of allied interests, by grouping such societies in nearby buildings, attendance at different meetings will be possible with very little loss of time. The American Society of Zoologists (December 29-31), Section F, Zoology, of the A. A. A. S. (December 29-31) and the American Society of Naturalists (December 31st) will meet in the Zoological Laboratory, on the opposite side of Woodland Avenue, from the Veterinary Building. The Botanical Society of America (December 29-31), The American Phyto-pathological Society (December 30-January 1) and Section G, Botany, A. A. A. S. (December 29) will meet in the Medical Laboratory on Hamilton Walk, two blocks from the Veterinary Building. The annual dinner of the Naturalists will take place on Thursday evening, December 31st.

PHILIP P. CALVERT, University of Pennsylvania, Philadelphia, Pa.
(Member of the Local Committee on Meeting Places.)

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings of the Academy of Natural Sciences of Philadelphia. 2—Transactions, American Entomological Society, Philadelphia. 3—The American Naturalist. 4—The Canadian Entomologist. 5—Psyche. 6—Journal of the New York Entomological Society. 8—The Entomologist's Monthly Magazine, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 14—Proceedings of the Zoological Society of London. 18—Ottawa Naturalist. 21—The Entomologist's Record, London. 36—Transactions of the Entomological Society of London. 40—Societas Entomologica, Zurich. 50—Proceedings of the U. S. National Museum. 92—Zeitschrift für wissenschaftliche Insektenbiologie. 97—Zeitschrift für wissenschaftliche Zoologie, Leipzig. 102—Proceedings of the Entomological Society of Washington. 119—Archiv für Naturgeschichte, Berlin. 166—Internationale Entomologische Zeitschrift, Guben. 177—Quarterly Journal of Microscopical Science, London. 179—Journal of Economic Entomology. 180—Annals of the Entomological Society of America. 184—Journal of Experimental Zoology, Philadelphia. 189—Journal of Entomology and Zoology, Claremont, Calif. 198—Biological Bulletin of the Marine Biological Laboratory, Woods Hole. 230—Revista, Museo de la Plata, Buenos Aires. 263—Proceedings, Hawaiian Entomological Society, Honolulu. 273—Proceedings, Royal Physical Society, Edinburgh. 274—Archiv für Zellforschung, herausgegeben von Dr. R. Goldschmidt, Leipzig. 313—Bulletin of Entomological Research, London. 369—Entomologische Mitteilungen, Berlin-Dahlem. 420—Insector Inscitiae Mensurus: A monthly journal of entomology, Washington. 489—Ohio Agricultural Experiment Station, Wooster.

GENERAL SUBJECT. Crampton, G. C.—On the misuse of the terms parapteron, hypopteron, tegula, squamula, patagium and scapula, **6**, xxii, 248-61. Felt, E. P.—Notes on forest insects, **179**, vii, 373-75. Fernald, H. T.—Notes on some old European collections, **180**, vii, 89-93. Howard, L. O.—An incident in the search for foreign gipsy moth parasites, **179**, vii, 378-82. Report on parasites, **180**, vii, 86-8. McDermott, F. A.—The ecologic relations of the photogenic function among insects, **92**, xviii, 303-7. Morgan, T. H.—Sex-limited and sex-linked inheritance, **3**, xlvi, 577-83. Muir, F.—The effect of parasitism on the struggle for existence and natural selection, **263**, iii, 30-42. Perkins, R. C. L.—Abnormal coupling in insects, **8**, 1914, 250-1. Townsend, C. H. T.—Note on a classification of sexual characters, **102**, xvi, 138-9. Saunders, W.—Obituary by C. J. S. Bethune, **4**, 1914, 333-6.

ARACHNIDA, ETC. Banks, N.—Acarians from Brazil, **5**, xxi, 160-2. Emerton, J. H.—New spiders from the neighborhood of Ithaca, N. Y., **6**, xxii, 262-4. Ewing, H. E.—The geographical distribution of our common red spider, *Tetranychus telarius*, **189**, vi, 121-32. Merian, P.—Les Araignees de la Terre de Fue et de la Patagonie, **230**, xx, 7-100.

Bacon, G. A.—The distribution of *Collembola* in the Claremont-Laguna region of California, **189**, vi, 137-180.

APTERA AND NEUROPTERA. Butler, H.—Three n. sps. of Odonata, **4**, 1914, 346-8. Houser, J. S.—*Conwentzia hageni*. Life history notes and variations in wing venation, **180**, vii, 73-6. Jorschke, H.—(See under Orthoptera.) Ris, F.—Zwei neue neotropische Calopterygiden, **369**, iii, 282-5.

Walker, E. M.—New and little-known nymphs of Canadian Odonata, **4**, 1914, 349-57 (cont.).

ORTHOPTERA. Glaser, R. W.—*Forficula auricularia* in Rhode Island, **5**, xxi, 157-8. Jorschke, H.—Die facettengaugen der Orthopteren und Termiten, **97**, cxi, 154-280. Tumpel, R.—Bau und wirkungsweise der punktaugen bei *Acridium aegypticum*, **92**, xviii, 275-82.

Caudell, A. N.—O. of the Yale-Dominican Expedition of 1913, **50**, xlvii, 491-5. Davis, W. T.—Notes on O. from the east coast of Florida, with descriptions of two n. sps. of *Belocephalus*. Additions to the O. known to occur in North Carolina, **6**, xxii, 191-205, 265-6. Fox, H.—Data on the Orthopteran faunistics of Eastern Pennsylvania and Southern New Jersey, **1**, 1914, 441-534.

HEMIPTERA. Awati, P. R.—The mechanism of suction in the potato Capsid bug (*Lygus pabulinus*), **14**, 1914, 685-733. Bacot,

A. W.—The influence of temperature, submersion and burial on the survival of eggs and larvae of *Cimex lectularis*, **313**, v, 111-18. **Browne, E. N.**—The effects of centrifuging the spermatocyte cells of *Notonecta*, with special reference to the mitochondria, **184**, xvii, 337-42. **Childs, L.**—The anatomy of the diaspinine scale insect *Epidiaspis piricola*, **180**, vii, 47-60. **Foot & Strobell**—Preliminary report on crossing two hemipterous species, with reference to the inheritance of a second exclusively male character, **198**, xxvii, 217-34. **Moore, W.**—A comparison of natural control of *Toxoptera graminum* in South Africa and the United States, **180**, vii, 77-85. **Parshley, H. M.**—List of the Hemiptera-Heteroptera of Maine, **5**, xxi, 139-49. **Van Duzee, E. P.**—Mr. Crawford's recent work on the Delphacinae, **5**, xxi, 163-6. **Webster & Stoner**—The eggs and nymphal stages of the dusky leaf bug *Calocoris rapidus*, **6**, xxii, 229-34.

Funkhouser, W. D.—New So. American Membracidae, **4**, 1914, 357-63 (cont.). **Heidemann, O.**—A n. sp. of No. Am. Tingitidae, **102**, xvi, 136-7. **King, G. B.**—The eleventh kermes from California, **189**, vi, 133.

LEPIDOPTERA. **Bryk, F.**—Ueber das abandern von *Par-nassius apollo*, **119**, 1914, A, 5, 129-60. **Chapman, T. A.**—A contribution to the life-history of *Agriades thersites*. On a new form of seasonal (and heterogonetic) dimorphism in *A. thersites*, **36**, 1914, 285-308, 309-13. **Dyar, H. G.**—The life histories of the N. Y. slug-caterpillars—XX, **6**, xxii, 223-9. **Fassl, A. H.**—Biologisches Bolivianischer tagfalter, **40**, xxix, 75-6. **Gibson, A.**—The burdock gelechid. An insect seed-destroyer, **18**, xxviii, 96. **King, J. L.**—Contribution to the life history of the lesser peach borer in Ohio, **179**, vii, 401-3. **Mosher & Webber**—The relation of variation in the number of larval stages to sex development in the gipsy moth, **179**, vii, 368-73. **Pierce, F. N.**—The genitalia of the group Geometridae of the L. of the British Islands, 88 pp. (Liverpool, 1914). **Seiler, J.**—Das verhalten der geschlechts-chromosomen bei *L.*, **274**, xiii, 159-269.

Bethune-Baker, G. T.—Notes on the taxonomic value of genital armature in *L.*, **36**, 1914, 314-38. **Dyar, H. G.**—Descriptions of n. sps. and gen. of *L.* from Mexico. *L.* of the Yale-Dominican expedition of 1913, **50**, xlvii, 365-409, 423-6. *Utetheisa* in Porto Rico. Note on *Hemihyalea* and some species of *Amastus*, **420**, ii, 129-31, 146-51. **McDunnough, J.**—Notes on the synonymy of Boisduval's North American species of *Lycaenidae*, **21**, 1914, 194-203. **Meyrick, E.**—Descriptions of South American Micro-*L.*, **36**, 1914, 229-84.

DIPTERA. **Alexander, C. P.**—Biology of the No. American crane flies, **189**, vi, 105-120. **Hyde, R. R.**—Fertility and sterility in *Drosophila ampelophila*, **184**, xvii, 343-72. **Illingworth, J. F.**—Further notes on the breeding of the tachinid fly, parasitic on the cane beetle borer, **179**, vii, 390-98. **Knab, F.**—Ceratopogoninae sucking the blood of other insects, **102**, xvi, 139-41. **Metz, C. W.**—An apterous *Drosophila* and its genetic behavior, **3**, xliii, 675-692. **Morgan, T. H.**—A third sex-linked lethal factor in *Drosophila*, **184**, xvii, 315-324. **Muller, H. J.**—A gene for the fourth chromosome of *Drosophila*, **184**, xvii, 325-36. **Severin & Severin**—Relative attractiveness of vegetable, animal and petroleum oils for the Mediterranean fruit fly, **6**, xxii, 240-8. **Taylor, M.**—The chromosome complex of *Culex pipiens*, **177**, lx, 377-98. **Townsend, C. H. T.**—Progress of verruga work with *Phlebotomus verrucarum*, **179**, vii, 357-67. **Woodcock, H. M.**—Studies on avian haemoprotozoa: No. III.—Observations on the development of *Trypanosoma noctuae* (of the little owl) in *Culex pipiens*, **177**, lx, 399-434. **Woods, W. C.**—A note on *Rhagoletis pomonella* in blueberries, **179**, vii, 398-400. **Zetek, J.**—Dispersal of *Musca domestica*, **180**, vii, 70-2.

Aldrich, J. M.—A new *Leucopis* with yellow antennae, **179**, vii, 404-5. **Alexander, C. P.**—A revision of the American species of *Tanyremna* and *Megistocera*, **6**, xxii, 205-18. **Banks, N.**—A new ortalid fly, **102**, xvi, 138. **Johnson, C. W.**—A new Stratiomyid, **5**, xxi, 158-9. **Knab, F.**—Two No. American Syrphidae, **420**, ii, 151-3. **Malloch, J. R.**—The early stages of *Metriocnemis lundbecki*. *Forcipomyia propinquus*, a correction, **102**, xvi, 132-6, 137-8. **Walton, W. R.**—A new tachinid parasite of *Diapheromera femorata*. *Neocelatoria ferox* a synonym of *Chaetophleps setosa*, **102**, xvi, 129-32, 138. **Whitney, C. P.**—Descriptions of four new Tabanidae, with remarks upon *Chrysops cursim*, **4**, 1914, 343-6. **Willard, F.**—Two n. sps. of *Platypeza* found at Stanford University, **5**, xxi, 166-8.

COLEOPTERA. **Dow, R. P.**—The greatest coleopterist, **6**, xxii, 185-91. **Gossard, H. A.**—Orchard bark beetles and pin hole borers, **489**, Bul. 264. **Grieve, S.**—The occurrence and distribution of the beetle, *Passalus unicornis*, in the Antilles and the northern portion of South America, **273**, xix, 159-60. **Matheson, R.**—Notes on *Hydrophilus triangularis*, **4**, 1914, 337-43. **Molz & Schroeder**—Beitrag zur kenntnis der biologie des blattrankaefers (*Sitona lineata*), **92**, xviii, 273. **Munro, J. W.**—Notes on the reproductive organs of the pine weevil (*Hylobius abietis*), **273**, xix, 161-69. **Smith & Hamm**—Studies in the experimental analysis of sex.—On *Stylops* and stylopisation, **177**, lx, 435-61. **Wolcott, G. N.**—The cotton boll weevil in Cuba, **102**, xvi, 120-22.

Clavareau, H.—Coleopterorum catalogus, Pars 59: Chrysomelidae: Eumolpinae, 215 pp. **Fisher, W. S.**—A n. sp. of *Callichroma*

from Texas, **102**, xvi, 97-8. **Heinrich, C.**—A new Californian *C.* on plum, **420**, ii, 145. **Lewis, G.**—On new species of Histeridae and notices of others, **11**, xiv, 283-89. **Mequignon, A.**—Coleopterorum catalogus, Pars 61: Rhizophagidae, 16 pp. **Pierce, W. D.**—Descriptions of two n. sps. of Strepsiptera parasitic on sugar cane insects, **102**, xvi, 126-9. **Wickham, H. F.**—Twenty new Col. from the Florissant shales, **2**, xl, 257-270.

HYMENOPTERA. **Doncaster, L.**—The determination of sex in the gall fly "*Neuroterus lenticularis*," **10**, xciv, 115-16. **Natzmer, G. V.**—Das kokonspinnen der Ameisenlarven, **166**, viii, 130. **Triggerson, C. J.**—A study of *Dryophanta erinacei* and its gall, **180**, vii, 1-46. **Webster, F. M.**—An unrecorded parasite of Toxoptera graminum, **179**, vii, 403-4. **Wolcott, G. N.**—Notes on the life history and ecology of *Tiphia inornata*, **179**, vii, 382-89.

Crawford, J. C.—Notes on the chalcidoid family Callimomidae, **102**, xvi, 122-6. **Cushman, R. A.**—A revision of the N. Am. species of the braconid genus *Habrobracon*, **102**, xvi, 99-108. **Ellis, M. D.**—New bees of the genus *Halictus* from United States, Guatemala and Ecuador, **6**, xxii, 218-23. **Girault, A. A.**—Descriptions of new chalcid-flies, **102**, xvi, 109-19. **MacGillivray, A. D.**—New genera and species of sawflies, **4**, 1914, 363-7. **Myers, P. R.**—Results of the Yale-Peruvian expedition of 1911.—Addendum to the H. Ichneumonidea, **50**, xlvii, 361-2. **Rohwer, S. A.**—Vespoïd and Sphecoïd H. collected in Guatemala by W. P. Cockerell, **50**, xlvii, 513-23. Descriptions of two parasitic H., **102**, xvi, 141-2. **Wheeler, W. M.**—New and little known harvesting ants of the genus *Pogonomyrmex*, **5**, xxi, 149-57.

THE GENITALIA OF THE GROUP GEOMETRIDÆ OF THE LEPIDOPTERA OF THE BRITISH ISLANDS. An Account of the Morphology of the Male Clasping Organs and the Corresponding Organs of the Female. By F. N. PIERCE. Liverpool, F. N. Pierce, The Elms, Dingle, 1914.

Mr. Pierce is the author of a similar work on the Genitalia of the British Noctuidæ, published in 1909. The present volume consists of 88 pages and 48 plates. There is an introduction of 12 pages, describing the genitalic anatomy and the nomenclature of the parts. Then follows the classification of the British Geometridæ based on the structure of the male and female genitalia. The genitalia of the species are described as well as accurately figured. The whole work is largely original and shows careful study. There can be no question in regard to the wonderful aid afforded by the genitalia in systematic work. This fact is now well established by the work of careful students of the Lepidoptera both in Europe and America. One of its great values is to establish maculation and other characters between species not readily separated, but now readily differentiated by an examination of the sexual appendages. So far as we are aware, the first studies in this line in America were made by Scudder and Burgess in 1870, but they attracted little attention. In the future it will be impossible for students to neglect this fertile field of study.—H. S.

WATER REPTILES OF THE PAST AND PRESENT. By SAMUEL WENDELL WILLISTON, Professor of Paleontology in the University of Chicago. The University of Chicago Press, Chicago, Illinois. Published October, 1914. 8vo, pp. viii, 251. 131 figures. \$3.00 net, postage extra, weight 2 lbs., 5 oz.

Although this volume has been sent "to the literary editor for editorial use," we confess that we would find it impossible to notice it in an entomological journal were it not that its author is a famous dipterologist. Perhaps the word "insects" may occur in it elsewhere than on page 141, but if it does it is hardly likely to be more than the incidental mention of the class to be found there. It is not given to many men in our day to achieve distinction in two groups so distinct as the Diptera and the Reptilia, and we regret that Prof. Williston has more or less abandoned the former for the latter. Certainly the extinct reptiles, of which this work chiefly treats, appeal more strongly to the imagination, by reason of their size and often grotesque shape, than do the flies, even though the influence of the latter on human existence has been, and is, a thousand fold greater. Prof. Williston's non-entomological book is very interesting both to the entomologist and the non-entomologist, and the most general chapter in it—Chapter V, on the "Adaptation of Land Reptiles to Life in the Water"—has suggestions of value even for the first kind of readers.

There is one feature of the book which we must criticise unfavorably, just as we did in speaking of another production of the same University Press in the NEWS for February last. This is its great weight *avoirdupois*. We urged then, and we repeat now, that books intended to be read should have light weight paper for the text, the heavy sort to be used only as plates for half-tones, if necessary at all.—P. P. C. (*Advertisement*.)

Doings of Societies.

ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Meeting of March 26, 1914. Mr. Philip Laurent, Director, presided. Eight persons were present.

Dr. Skinner exhibited a race of *Ambulyx strigilis* (Lepid.) from Florida, taken at Miami, by Mr. Morgan Hebard. This is the form called *carteri* by Rothschild and Jordan.

Mr. R. C. Williams exhibited specimens of *Argynnis laurenti* from Park County, Montana, taken July 5 to 7, 1913. Also *Coenonympha haydeni* and *Erebia ephiosodea* from the same locality.

Mr. Rehn said he and Mr. Hebard had lately been studying the genus *Melanoplus*. The last monograph was by Scudder in 1897, while Morse has done considerable work on the genus.

The genitalia are of great importance in differentiating species. These were largely used by Scudder in his work. In certain forms the genitalia are moderately variable.

Meeting of May 28, 1914. Mr. Philip Laurent, Director, presided. Ten persons were present.

Dr. Calvert exhibited some colored drawings which he had made from living males of *Anisagrion allopteron* Selys (Odonata) in Costa Rica, which illustrate what he believes to be changes in color accompanying advancing age of the imago. The recently transformed individuals with softer chitin and no pruinosity are predominantly pale cinnamon brown. Those with firm chitin and some pruinosity are chiefly black. Both these extremes, as well as many intermediates, were obtained in the vicinity of Cartago. The pale brown forms were described by Selys as variety *rubicundum*. The speaker had suggested in the *Biologia Centrali-Americana* that such color changes as above indicated probably occurred in this species, but he did not then have the evidence in support of this view which he now possesses. If this be correct, *Anisagrion allopteron* furnishes a parallel to other species of that genus and to *Hesperagrion heterodoxum* whose color changes have been described in the *Biologia*.

Dr. Calvert also exhibited a few Costa Rican Dynastine Scarabaeidae (Coleop.) showing marked development of the cephalic or prothoracic horns and, after remarking on the very scanty information which exists as to the functions of these horns, read the verbatim statements of such observations which have been recorded for this group in different parts of the world. These indicate that in different species the horns are used as weapons, as instruments for scraping through bark, for anchoring the beetle, or for carrying the female. Photographs from a living male of *Dynastes perseus* which had been kept in a room in Cartago, Costa Rica, for a month, feeding on sugar cane, were also shown.

Mr. Laurent showed some cocoons of *Callosomia angulifera* that had holes in them that he thought were made by wood mice.

Meeting of September 27, 1914. In the absence of the Director and Vice-Director, Dr. Philip P. Calvert presided. Six persons were present.

Mr. G. M. Greene made some remarks on *Sandalus petrophya* (Col.). Mr. Liebeck said he supposed the species was always found on beech.

Mr. Rehn explained a method of collecting Orthoptera by trapping, recommended by Mr. W. T. Davis, by means of setting a Mason fruit jar into the ground with the opening level with the surface. A small quantity of New Orleans molasses, with a few drops of fusel oil, is placed in the jar. He said many little known species are collected by this method, specially mentioned the genus *Ischnoptera* and made some remarks relating to it.

Mr. Cresson reported on the progress of arrangement of the local collection.

Dr. Calvert exhibited specimens of the Odonata *Gynacantha gracilis*, *G. trifida*, *Philogenia carrillica* and *Protonicura remissa*, all of which he had taken in the same piece of dark forest on the Banana River, Costa Rica, November 9, 1909. The actual body lengths of these four individuals is 88, 63, 57 and 37 mm. The sizes of their eyes may be appreciated by giving their heights, viz.: 7.44, 5.76, 2.88, 1.11 mm. The eyes of the two *Gynacanthas* meet on the top of the head, those of *Protonicura* and of *Philogenia* are separated by a distance equal to the width of one eye. In spite of the smaller size of the lenses (facets) in *Protonicura*, he calculated that roughly the *Protonicura* eye has only half, or less than half, the number of facets of *G. trifida* and between three-sevenths and one-third as many facets as *G. gracilis*. Taking various factors into consideration, he concluded that the eyes of the *Gynacanthas* are more efficient organs than those of the other two genera. Since other dragonflies (*Anax*, *Aeshna*) with eyes almost as large as those of *Gynacantha*, are found in well-lighted places, we cannot suppose that the large eyes of *Gynacantha* are a result of shadow-haunting habits. Rather must we look on

their large eyes as giving them an advantage over insects with less efficient visual apparatus when they took to living in darkness. He also exhibited Costa Rican specimens of Lepidoptera: *Callitaera menander* found only in dark woods, whose eyes are not as large as those of *Callidryas argante* and *Dapto-neura iliaire*, creatures of about the same total size, living in bright sunlight; shade-loving Ithomiine butterflies, like *Episcada apuleia*, whose eyes are not absolutely or relatively large; Sphinges and *Thysania agrippina* with the largest eyes of the order, so far as the speaker's collection was concerned, yet which are not as large as those of *Gynacantha gracilis* in spite of the heavier body and greater wing-spread of the moths.

Mr. J. W. Green, of Easton, Pa., was elected an Associate.—
HENRY SKINNER, *Secy.*, and E. T. CRESSON, JR., *Secy. pro tem.*

OBITUARY.

We learn from the *Canadian Entomologist* for October, 1914, of the death of DR. WILLIAM SAUNDERS at London, Ontario, on September 13, 1914, in the seventy-ninth year of his age. Beginning life as a retail druggist, he became also a fruit-grower, a Professor of Materia Medica, a public analyst, an organizer of the Entomological Society of Ontario, an editor of the *Canadian Entomologist* and Director of the Experimental Farms of the Dominion of Canada. His "Insects Injurious to Fruits" has been favorably known since its appearance in 1883. His bibliography comprises some hundreds of additional titles. The account of his active and useful career by Dr. C. J. S. Bethune, which is accompanied by a portrait, furnishes a striking example of the attainment of honorable success by one whose advantages at the beginning of life were very few, and is an incentive to all to make the best of our opportunities.

ERRATA.

Page 387, line 3 from bottom for "finely," read "densely."

Page 431, for line 7 substitute: the ants about 5-16 inch long; when disturbed the beetles grasp

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Graphiphora garmani, *Heliomata infulata*, *Plagodis keutzingi* and many other species of Lepidoptera (Heterocera) from this locality offered for exchange.—Fred Marloff, Box 104, Oak Station P. O., Allegheny Co., Penna.

Wanted—For cash, fertile eggs, blown larvae and imagines of *Catocala* of the U. S. Fertile eggs of *C. badia* and *C. muliercula* in particular.—Geo. J. Keller, 191 Avon Ave., Newark, N. J.

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✂ N. B. The original manuscripts and illustrations of the articles which appeared in the NEWS for 1911 and 1912, together with the galley proofs of the same, will be destroyed on February 1, 1914. Anyone wishing them will apply to the Editor, Dr. P. P. Calvert, 4515 Regent St., Philadelphia, Pa., before that date and must enclose postage.

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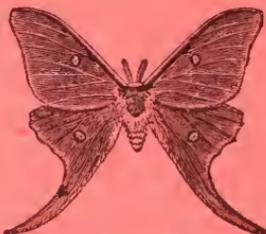
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