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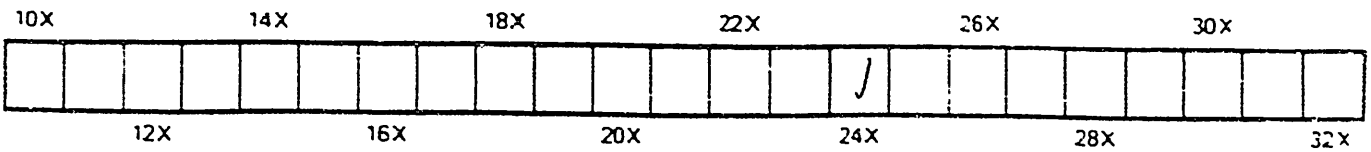

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A CONTRIBUTION TO THE KNOWLEDGE OF NORTH AMERICAN SYRPHIDÆ.

BY W. D. HUNTER, ASS'T IN ENTOMOLOGY, UNIV. OF NEBRASKA.

[The material mentioned in this paper (with the exception of the type of *Chilosia Townsendi*, n. sp., from the collection of the Cal. Acad. of Sciences) is in either the collection of the University of Nebraska or of Prof. C. W. Johnson, of Philadelphia. In each case I have taken care to mention in which one of these the specimens may be found.]

Callicera Johnsoni, n. sp.

Male.—Eyes contiguous for about two-thirds their width above, densely long, white pilose, with a sharply defined vertical black band about one-fifth their width; above, the two bands are confluent. Occiput shining olivaceous, white pilose. Ocellar area with a tuft of ferrugineous pile. Spot above the antennæ bare, shining black. Face shining black, except the tip of the indistinct tubercle, which is opaque; covered, except an indistinct median stripe, and more densely below, with abundant long light yellowish pile; very indistinctly concave below the antennæ. Cheeks shining olivaceous, except an anterior velvety cross-band and an indistinct spot below the lowest margin of the eyes; long yellow pilose. Palpi clavate, testaceous at base, apical half black. Antennæ entirely black, with short stiff black hairs on the first and second joints; first joint cylindrical; second expanded at apex, less than half as long as the first; third joint bare, over twice as long as the first and second together, expanded on basal half, flattened, bent outwardly at middle. Style short, obtuse. Thorax: dorsum shining olivaceous, with five opaque, very indistinct, longitudinal bands; pile obscure yellowish, abundant. Pleura shining, with more distinctly yellow pile. Wings a trifle tinged with yellow anteriorly, veins testaceous. Anterior cross-vein distinctly before the middle of the discal cell. Last section of the fourth vein with the first third straight, distinctly sinuate inwardly. Tegulæ white, ciliate. Abdomen entirely covered with moderately long yellowish-white pile; first segment entirely opaque; second, except a broad cross-band, expanded medially into a large triangle, the apex of which reaches

the anterior margin, shining olivaceous; third segment entirely shining. Legs: femora, except the extreme tips, black; long white pilose; tibiæ testaceous at base, at apex ferrugineous. Tarsi ferrugineous, darker at tips. L., 10½ mm.

One specimen [Fairmont Park, Philadelphia, Pa.], collected by Mr. Chas. I. Greene and kindly transmitted to me by Prof. C. W. Johnson, of the Wagner Institute of that city, to whom I most respectfully dedicate it.

This species differs from the European *C. ænia*, Fabr., to which it is allied, in the markings of the abdomen, the absence of the "snow-white style," the general dull colour, and in several other respects; from the only other described North American species, *C. montensis*, Snow, in not having the face and front black pilose nor the thorax and abdomen golden pilose. Mr. Snow writes me that he has never observed any variation in the colour of the pile in *montensis* at all. There are other differences in the coloration of the antennæ and legs and in the form of the fourth vein.

The capture of this insect is deemed worthy of more than passing notice. The species of *Callicera* are found almost exclusively near the tops of mountains. The only species up to the present time found outside of Europe was *C. montensis*, Snow. The three type specimens were taken on the top of Mt. Deception, in Colorado, at an altitude of 9,000 feet. Later, two more specimens were taken on one of the peaks of the Magdalena Mountains, in New Mexico, at an altitude of 9,500 feet, also by Snow. The species was described by Snow, in Kansas Uni. Quart. Vol. I., p. 33; July, 1892.

In Europe, as far as I have been able to ascertain, there is only one record of the capture of a *Callicera* except on a mountain top. Prof. Stein has this note in the Berlin Ent. Zeitschr., 1860, 325 [translating]: "*Callicera fulva*, Schaum.—I captured a female of this species on the first of June, in the vicinity of Frankfurt-a.-d.-O. It was resting on flowering *Spartium scoparium*, which was, perhaps, only accidental. A thorough search of the same place eight days later yielded no result."

The present is, therefore, the second record of the capture of a species of this genus at a remarkably low altitude, the altitude in this case being considerably lower than that of Frankfort-on-the-Oder, which is about 125 feet. Fairmont Park lies on both sides of the Schuylkill River, adjoining Philadelphia on the Northwest, and probably in no place exceeds an altitude of sixty feet.

The occurrence of the first discovered specimen of this European genus in the western part of North America was another verification of the well-known biological law that European forms are more likely to occur in the western than in the eastern part of this Continent, as pointed out by Snow. It is clear now, however, that since two species have been discovered, one eastern and the other western, and the eastern as closely related to the typical European forms as the western, that any such conclusion in regard to this genus is no longer valid.

Microdon fulgens, Wied.

This species was included in Williston's Synopsis of N. A. Syrphidæ, on the authority of Wiedemann, who described the species, Aussereuropæischen Zweifl., Insecten 82 (I.), from a specimen "In Berliner Museum, aus Neugeorgian," and on Macquart's statement, Dipt. Exot. Ier. Suppl., 122, of habitat as Florida and Guiana. Wiedemann's short, terse description is abundantly sufficient to separate it from its congeners. It is as follows :—

"Antennæ black. Face steel-blue, thinly yellowish-white pilose. Thorax golden-green ; in certain reflections there appear copper-coloured stripes. Ante-alar callosities (Vorflügeldreieck) steel-blue ; front between green and blue-metallic. Wings nearly pure brown, on the thin veins only brownish ; tegulæ white with a black ciliate border. Legs green or blue" [translation by Williston].

The front is mixed white and black pilose, front and middle tarsi opaque black, pulvilli light yellow. Scutellum very broad, the posterior margin almost parallel with the anterior; the spines distinct. The outer cross-veins are distinctly sinuate.

One specimen, a female [St. Augustine, Florida; Prof. C. W. Johnson], now in the collection of the University.

The robust form, entirely metallic colour, black antennæ, and large size are such as to make the species unmistakable.

Chrysotoxum derivatum, Walker.

This genus is a very difficult one, and much confusion prevails even in Europe as to the limitation of the species. Even such structural characters as the comparative length of the antennal joints are of very little value, although such an authority as Schiner has used them. They all show a very great resemblance in coloration, and the species are very variable. In Europe there are about fifteen described species, and in this country ten, one of which must be dropped on account of the imperfect description.

The material in the University collection contains numerous specimens that must be *C. derivatum*, but it is only by a process of elimination that this conclusion can be reached. As Mr. Snow states of other specimens: "They seem to belong here, however, better than elsewhere." These specimens were taken in extreme North-western Nebraska, and in the Big Horn Mountains, in Wyoming. They exhibit all the variations in the markings of the abdomen that Snow has mentioned (Kans. Uni. Quart. Vol. I., 35). Besides these, there are three specimens of both sexes—two taken at Lincoln and one at Harvard, Nebraska—that differ as follows: The anterior margin of the wings is only very lightly tinged with yellow, whereas in the others they are always very distinctly so; the abdomen is covered with erect, light-coloured pile, while in the mountain specimens it is provided with only very short black hairs; the median stripes of the thorax are very distinct, while in the others they are obsolete or entirely wanting; the four anterior femora are entirely yellow, while in the others there is a distinct black spot near the base. From this I conclude that these specimens are of a different species, which I am quite certain is *pubescens*, Loew, although the only differences in the descriptions of these two species are that in one there are distinct dorsal vittæ and the wings are tinged with brown anteriorly, while in the other these points are not mentioned, and hence, may or may not be present. But from a study of this material, part of which must be *derivatum*, I am certain that *pubescens* and *derivatum* are both good species, and should stand, no matter how many of the other species of this genus must fall. I am thus enabled to give the following amended descriptions of the two species.

C. derivatum, Walker.

Second joint of antennæ one-fourth to one-half as long as third, sometimes shorter than the first; arista yellowish. Thorax with the median vittæ at all discernable only in the female. Abdomen everywhere covered with short sparse black hairs. First segment black, second lateral margin black, except sometimes the posterior corners, the yellow band is very distinctly interrupted, the two parts arcuate and often expanded medially, posterior margin black. Band of third segment more equal in width than first, interrupted or entire, not always reaching the lateral borders, which are mostly black; entire posterior margin expanded in the middle, yellow. The black markings of the fourth segment vary from an anterior uninterrupted band, expanded to include most of the

lateral borders, and a complete arched band in the middle of the segment to a very narrow anterior band, sometimes interrupted in the middle, and not including all of the lateral margins, and an indistinct middle spot with a very slender, elongate spot at each side of it. On this segment the yellow posterior margin may be entirely separated from the anterior band, but usually they are confluent at the corners. Fifth segment with an anterior black band, expanded to include more or less of the lateral margins, and a black spot like an inverted V or Y. Often this spot is obsolete, leaving only three small spots to form the outline of a V. Legs yellow. All the coxæ, and trochanters, and a distinct shining spot at the base of each of the four anterior femora, black. Posterior tarsi tinged with reddish. Wings very distinctly brownish (less so in the female) on anterior third.

C. pubescens, Loew.

Very much like *derivatum*, but differing in having the legs entirely yellow, the abdomen everywhere covered with erect yellowish pile, and the median thoracic stripes distinct. The wings are much less distinctly marked with yellow. Second joint of antennæ longer than first; third joint in female about equal to the first two; in the male it is slightly longer. Abdomen marked like that of *derivatum*, except that the posterior margin of the second is always yellow, and the anterior corners of segments three and four are reddish. The black mark on the fifth segment is like an inverted V or Y; or the branches may be arcuate.

Psilota buccata, Macquart [Dipt. Exot. II., 2, 107, pl. xviii, fig. 2].

The history of this species and its attribution to the United States is as follows: It was described by Macquart, in the Memoirs of the Society of Arts and Sciences of Lille in 1841, and the locality given as "Carolina." It was here placed in the genus *Pipiza*. In the fifth supplement to the Dipt. Exot., which was published in 1855, Macquart describes a species, *flavidipennis*, for the first time under the genus *Psilota*, which was founded by Meigen, in his Syst. Beschr. III, 256, in 1822, several years before the other species, *buccata*, was described under the genus *Pipiza*.

In 1862 Dr. Loew, in the Monographs of the Dipt. of N. A., I, 27, in mentioning the various genera of *Syrphidæ* that have been recorded from North America, states that Macquart has recorded a *Psilota* from North America, but that, as that genus had been misunderstood by most authors, he would not venture to mention it among those truly represented in N. A. The reference mentioned above was undoubtedly his authority for this statement.

The next step comes in 1878, with the appearance of Osten Sacken's second edition of his Catalogue of N. A. Diptera. In that he includes *Psilota flavidipennis*, Macq., giving the author's habitat, Philadelphia, and calling attention to the note by Loew just referred to. It is very certain that if he had found the species in nature, he would have mentioned the fact. We must hence conclude that he had not, and included it simply on the authority of Macquart, which makes it very uncertain that the species is North American at all up to this date.

Between this time and the time of the publication of Williston's Synopsis it is evident that some specimens were captured in this country. For Williston states that he found two specimens in the Loew type collection which were labelled *Psilota flavidipennis* at Cambridge. Hence it is certain from this time on that this species is a North American one, and that Macquart's locality was probably correct, as was his determination.

Now, Williston states that he has no doubt that these specimens so labelled are *buccata*, but that they are *flavidipennis* is doubtful. In other words, he thinks that the correct determination of the specimens is as *buccata*, and that Macquart's other species, *flavidipennis*, may or may not be the same as that species. Hence, in his Synopsis he places Macquart's description of *flavidipennis* along with that of *buccata*, as revised after an examination of the specimens at Cambridge.

Without assuming that my opinion will settle the matter at all, I may say that it seems that they are two distinct species. The colour of the legs and of the abdomen is quite different. The two specimens from Georgia that Williston mentions [Syn. App., 292] may and may not be the true *flavidipennis* of Macquart. It is very doubtful. The less shining abdomen would seem to favor the conclusion that they are, while the more concave face would point to an opposite conclusion.

There are known in collections specimens of this species as follows: In the Loew type collection, at Cambridge, two specimens; in the U. S. National Museum, eight specimens, six from Texas and two from Georgia; in Mr. C. W. Johnson's collection, at Philadelphia, several specimens from Texas; and in the collection of the University here, one specimen from Blanco County, Texas;—this specimen has the pile everywhere pure white.

Chilosia prima, n. sp.

Female.—*Eyes and arista bare (when magnified twenty diameters the arista shows distinct hairs). Face not pilose, scutellum without distinct marginal bristles; legs almost entirely yellow.*

Front distinctly trisulcate, sparsely punctured, shining black, with moderately long whitish pile more abundant between the lateral sutures and the eye margin. Occiput opaque, white pubescent, except near the eye margin, where it is shining olivaceous and pilose. Face shining black; viewed from in front, covered, except broadly on the tubercle, with very fine pubescence (viewed from the side it appears bare); very deeply concave below the antennæ and indistinctly so below the tubercle, with a few short hairs between the facial sutures and the eyes. Tubercle round, subacute, shining, much more prominent than the antennal elevation, situated below the middle of the face. Epistoma not projecting, in profile obliquely truncate at apex, lower margin straight and horizontal. Cheeks narrow, coloured and provided with pile like the face. Proboscis large, flabellate, dark ferrugineous; palpi cylindrical. Antennæ and narrow margin of the orifices bright reddish-fulvous, first joint slightly darker, second with a few short dark bristles, third joint somewhat longer than broad and a little flattened above and below, large and nearly oval. Arista basal, black, micro-pubescent, not incrassate. Humeral callosities ferrugineous, inwardly silvery pollinose. Dorsum slightly metallic, sparsely punctured, more coarsely so posteriorly, with sparse erect light yellow pile. Pleura shining olivaceous, with very sparse whitish pile. Scutellum coarsely punctured, black, rather long pilose and with slightly stronger hairs on the border. Abdomen robust, distinctly expanded on segments two and three, sparsely but distinctly punctured, with short sparse yellowish pile, everywhere shining except a broad median stripe on the second segment. This stripe has a small shining area in its middle anteriorly. There is a general, almost indiscernable, purplish cast to the abdomen. Venter shining, polished anteriorly, light yellowish pilose, the apical margins of the segments reddish. Legs light fulvous, with moderately long whitish-yellow pile; middle and posterior coxæ black; the apical joint of all the tarsi, and a large spot on the outside of the posterior tibiæ, brownish. Claws black, pulvilli whitish. Wings hyaline, veins testaceous, apical cross-vein parallel to the margin of wing, meeting the third vein at an acute angle. Tegulæ and narrow base of the wing distinctly yellowish. Long. corp., 11 mm.; L. alae., 8.5 mm.

One specimen [Philadelphia, Pa., 9-4-91], collected by Prof. C. W. Johnson. The type is now in his collection.

This species falls in the group with bare eyes and arista, which includes as North American species, *capillata*, Loew; *comosa*, Loew;

nigripennis, Will.; *versipellis*, Will.; *parva*, Will.; *leucoparea*, Loew *tarda*, Snow; and *lucta*, Snow. From all these, except *parva*, Will., it is easily separable by the colour of the legs, which are almost entirely yellow From *parva* it is separable by the abdominal markings as well as by the much larger size.

Chilosia Townsendi, n. sp. [To Prof. C. H. Tyler Townsend.]

Male.—Eyes bare, arista very long plumose, face not pilose, scutellum with very distinct bristles, third joint of antennæ quadrangular, one and one-fourth times as long as broad, slightly concave above, the angles scarcely rounded.

Pile of vertex long, black. Front unisulcate, very slightly shining, black pilose. Eyes contiguous for one-half their width. Antennæ small, ferruginous, apical third of third joint darker. Arista situated at extreme base of the joint, obscurely reddish, long plumose except at the extreme apex. Face covered, except broadly on the tubercle, with short appressed whitish pubescence, everywhere slightly shining, in profile distinctly concave below the antennæ. Tubercle below the middle, very obtuse, more projecting than the antennal prominence. From tubercle to epistoma, which is projecting, deeply concave. Epistoma beneath almost horizontal, in front obliquely truncate. Cheeks coloured and pubescent like the face, narrow with a transverse sulcus in the middle. Occiput olivaceous dull silvery pollinose. Proboscis very small. Humeri obscurely reddish-white pubescent. Dorsum subopaque on the side, shining, with erect black pile which grows into bristles posteriorly and laterally. Pleura shining olivaceous with erect yellowish pile Scutellum shining, finely punctured, with very long distinct bristles on the margin and a fringe of white pile below, elsewhere it is black. Abdomen with sides nearly parallel, laterally with dense, bushy pile, which is white, except at the posterior corners of segments three and four. On the top the pile is sparse, black in the middle and yellowish at the sides. First segment entirely, narrow anterior margin of the second and third, shining metallic fourth segment everywhere shining, but less metallic. Hypopygium shining, white pilose. Venter distinctly punctate, obscurely reddish laterally first segment shining white pilose and pubescent, second opaque with mixed black and white pubescence, third shining, black pubescent, and with very narrow posterior margin reddish. Legs black, mixed black and white pilose, all the trochanters, coxæ and narrow base and apex of the femora, posterior tibiæ except a wide median annulus and their tars

except the first and last joints, reddish; anterior and middle tibiæ except wide median annulus and their tarsi except the apical joint, yellowish. All the femora have a fringe of strong black hairs on the apical portion of the posterior side. Claws, except their apical half, reddish. Wings long, everywhere tinged with brownish; veins all brownish. Long. corp., 10 mm; al., 9 mm.

This species is very closely allied to *C. tristis*, Loew, but is easily separable from that species by the colour of the antennæ and the form of the third joint, which is not at all "subrotundo," as well as by several other characters.

One specimen [Marin County, California; Haines], in the collection of Cal. Acad. of Science. It was kindly transmitted to me for examination by Mr. Chas. Fuchs, through the courtesy of Mr. H. H. Baer, of the Academy.

This specimen is the identical one referred to by Mr. C. H. Tyler Townsend, in the Proc. Cal. Acad. Sci., Ser. 2, Vol. IV., 611, under the head of *Chilosia*, n. sp.?

Allograpta fracta, O. S. Western Diptera, 331, 1877.

The type of this species a single male, was captured by Baron Osten Sacken, at Santa Monica, California, February 20, 1876. Since then no record has been made of its capture. In the collection of the University of Nebraska is a single female specimen captured at Los Angeles, California, November, 1887, by Prof. Bruner. It differs in no respect from Osten Sacken's description of the male. The front is yellow laterally and the first segment of the abdomen has the sides as well as the anterior margin yellow.

It is quite a remarkable fact that of the two specimens of this species known in collections, the latter one was captured in exactly the same locality as the type, though eleven years later.

Mesogramma parvula, Loew.

This species has been recorded from Florida and Georgia only. There is a male specimen in the collection of the University, labelled Orizabo, Mex., Jan., '92; Prof. Bruner. It agrees exactly with the description, except that the black of the second segment of the abdomen is entirely shining and that the third and fourth segments have the black markings very obscure, but like the typical ones in outline. Two other specimens from St. Augustine, Florida, collected by Mr. C. W. Johnson, of Philadelphia.

A careful study of this material seems to make it clear that *M. Boscii*, Macq., and *M. parvula*, Loew, are one and the same species. Absolutely the only differences in the descriptions of these two species are in the markings of the abdomen, and they are notoriously variable in the species of this genus. In *Boscii* the first segment is black and the anterior half of the second is yellow; in *parvula* the anterior margin of the first segment is yellow and the anterior margin of the second is black. Now, one of these specimens shows a very narrow yellow anterior margin on the first segment, and the other specimen has it entirely black, but in both the second segment is black on the anterior margin. Such a combination of the only characters that separate these species in individual specimens seems to make their identity certain.

Mesogramma marginata, Say.

One specimen from Orizabo, Mexico; Jan. This species has been recorded from all parts of the United States and from several points in Mexico.

Baccha Tarchetius, Walker.

There has been recorded only one specimen of this species besides the type in the British Museum; this one was from New Jersey [Mr. Keen] and is now in the National Museum. In the collection of the University are two specimens—one from Philadelphia, Penn., and the other from Mobile, Ala.—both taken by Mr. C. W. Johnson, and from his collection. They are both females and differ from the description of the male in having two yellow spots similar to those on the third segment on the fifth. In all other respects the description applies exactly.

Baccha clavata, Fabr.

This species is a common one in the Southern States. It has been recorded from Georgia, Florida, Arizona, and two localities in New Mexico; Schiner mentions it "aus Süd-America." The capture of a specimen at Lincoln is therefore quite remarkable and gives the species a very much enlarged range. This specimen, a male, was taken near the flowers of a species of aster growing near the water, in September, by the writer. The larva of this species is a very beneficial one in districts where oranges are grown, as it feeds on the aphids that often infest the trees.

Baccha notuta, Loew, *Diptera Americæ septentrionalis, Cent. VII., 65, 1861.*

MALE.—"OCHRACEOUS; VERTICAL TRIANGLE AND SPOT ON THE FRONT, BLACK; DORSUM OF THORAX, EXCEPT LATERAL BORDER, DARK OCHRACEOUS, MARKED MEDIALLY WITH A GREENISH-BLACK STRIPE; ABDOMEN WITH DARK LINES; WINGS INFUSCATE, TOWARDS COSTA LUTESCENT.

"Head luteous; occiput cinereous; vertical triangle black: front opaque, black pilose, and with a minute black spot: frontal lunule naked, near the antennæ black. Antennæ ochraceous. Face light ochraceous, semi-transparent, entirely shining. Thorax ochraceous; dorsum, except the wide lateral margins, dark fuscous, with two median lines abbreviated posteriorly and double lateral marks shining virescent. Scutellum ochraceous; metanotum bronzy-black; pectus marked with black. Abdomen ochraceous, with fuscous longitudinal lines; hypopygium bronzy-black. Legs ochraceous; apical third of posterior femora and posterior tibiæ, except a wide subbasal annulus, subfuscous. Wings infuscate, towards costa yellowish; marginal and apex of the submarginal cells distinctly coloured with fuscous." [Translation.]

One specimen, a male, agrees in almost all respects with Loew's description. The coloration of the wings is much less marked, however. They are subhyaline, iridescent, costa tinged with testaceous. The posterior femora are testaceous except a dark annulus on apical third; the posterior tibiæ except basal third are dark. The abdomen is furnished with moderately long light pile, especially on the first and second segments. First segment, except a broad, uninterrupted band on posterior margin, yellow; second segment fuscous subtranslucent with a distinct light band just beyond the middle; remaining segments yellow, except the lateral margin and four slender black bands slightly expanded at the apex. Third joint of antennæ very short; oval.

One specimen [Charlotte Harbour, Florida; Mrs. Slosson]. This species was described by Loew, in 1861, from a specimen collected by Gundlach, in Cuba. The present is the first record of its capture since that time and the only record of its occurrence in the United States.

My thanks are due to Prof. Williston for aid in determining this specimen.

Eristalis latifrons, Loew.

This is a very widely-distributed and common species in the West.

Snow has recorded it from five different localities in Colorado and from four in New Mexico. Besides this, it has been recorded by Williston, from California, Kansas, Arizona, Texas, and Mexico, and from the latter locality also by E. Giglio-Tos. In the collection of the University there are numerous specimens from Lincoln and West Point, Neb., Custer, S. D., Los Angeles, Cal., and Lerdo, Mexico. The three female specimens from the latter locality are not in the least different from the others.

Several female specimens that are not otherwise different have a very large spot of brownish in the middle of the wing. One female specimen from Lincoln, Neb., lacks the opaque spots on the third segment of the abdomen, as did several male specimens from California that Prof. Williston mentions.

Eristalis Brousi, Will.

There are specimens in the collection of the University from Hot Springs, and Custer, S. D., Soda Springs, Idaho, and Laramie, Wyoming. One female specimen has the spots on the second segment of the abdomen yellow and distinct, as Snow has observed in other specimens. This species has been recorded from Alaska to Colorado and to New England.

Eristalis montanus, Will.

A male specimen collected at Soda Springs, Idaho, by Prof. Bruner, agrees exactly with Williston's description, except that the eyes are distinctly contiguous, and that the black of the third segment of the abdomen is not contiguous with that of the second; the margin of the second segment posteriorly is yellow slightly tinged with reddish. The type specimen of this species, a single male, was captured at Como, Wyoming, at an altitude of 7,000 feet. The present is the only record of its capture since that time. A female specimen taken also at Soda Springs, at an altitude of 5,000 feet, on flowers near the water, in August, shows the following differences from the male, which have never been described: The second segment of the abdomen has the black as wide on the posterior margin as on the anterior; the posterior margin black, third segment mostly shining black, with sides broadly yellow, with an anterior spot and narrow posterior margin opaque; fourth like third, except no opaque spots; fifth entirely shining black. The front is black with yellow pile, and the vertex is black pilose. Otherwise it is exactly like the male.

Eristalis hirtus, Loew.

This is a very widely-distributed and common species all over the West. It has been taken at four different localities in Colorado, as well as New Mexico. The collection here contains numerous specimens taken at Custer, South Dakota.

Eristalis flavipes, Walker.

There are two specimens of this species in the collection of the University. One of them, a male, captured at Lincoln, Nebr., is a typical form; another, a male, captured near Lake Winnipeg, on the Saskatchewan River, in Canada, by Prof Bruner, in September, is Loew's *E. melanostomus*, or, as it is now considered, *Eristalis flavipes*, var. *melanostomus*, Loew.

It is worthy of note that this species is predaceous, quite anomalously among the *Syrphidæ*. The latter of the two specimens just mentioned was captured sucking the substance of a small grasshopper, *Chloealtis curtipennis*, which it held in its grasp after the manner of many of the *Asilidæ*.

Pteroptila cincta, Drury.

Two males and one female from Jamaica, W. I., have the abdomen and scutellum entirely of a strong reddish colour. The hypopygium is large and shining red. Collected at Portland, Jamaica, by C. W. Johnson, of Philadelphia.

Mallota cimbiciformis, Fall.

There is a specimen in the collection of the University taken at Milford, Nebr., in June.

There is another specimen that is very difficult to place. It was taken in War Bonnet Canyon, Sioux County, Nebr. Williston has described a species, *M. Sackeni*, that differs from *cimbiciformis* only in having the eyes separated in the male, and the wings marked with a distinct brown spot. There is perhaps also this difference, viz., that in *Sackeni* the marginal cell is closed in the margin, while in *cimbiciformis* it is distinctly open. Williston states, in litt., in reply to a letter in which I expressed some doubt as to the right of *M. Sackeni* to stand as a species: "The question of the 'art recht' of *M. Sackeni* is doubtful. I found specimens, however, from Mexico agreeing perfectly with the type specimen (a note of which I made in the Biol. Central Amer.), and thus continued the name. It is not at all improbable that the species runs into the older species, and that the name can only be used with a varietal meaning."

The specimen above mentioned has the eyes distinctly separated, and would hence fall into *M. Sackeni*. But the wings are not more distinctly marked than in *M. cimbiciformis*, the marginal cell is distinctly open, and the last segment of the abdomen is covered with long erect yellow pile, while in *Sackeni* the abdomen is entirely black pilose. These points together would seem to make it distinct from that species, although the very strong character of the eyes being separated would make it that. It differs from all the forms of *M. cimbiciformis* in the above-mentioned pilosity of the abdomen, and in the separation of the eyes. I have consulted almost a dozen different descriptions of *M. cimbiciformis*, which it is more than probable represent all of the different variations, and invariably the abdomen is described as entirely black pilose, except the first segment. There is a further difference in the form of the face below. After thus stating the case, and exercising all the care that should be exercised in erecting a new species in a genus where the synonymy is already immensely complex, I feel justified in describing the specimen as new.

Mallota facialis, n. sp.

Male.—Antennæ obscurely reddish, shining except the third joint, arista yellow. Wide facial stripe and cheeks shining. Face white pubescent and pilose, strongly projecting below, so that a line from the tip of the tubercle to the tip of the epistoma would have a distinct outward slant; the epistoma projects distinctly further than the antennæ [the outline of the face is quite different in the other species of this genus]. Eyes bare, very narrowly separated. Pile of thorax and scutellum bright yellow. Thorax black, scutellum translucent. First segment of the abdomen but little shining, whitish pilose; second and third segments shining, and everywhere covered with short, stiff black hairs; fourth shining bronzy, everywhere covered with abundant long, bright yellow pile. Legs black, all the tarsi, and tips of femora strongly and fore and middle tibiæ entirely and basal half of posterior tibiæ weakly reddish. Posterior tibiæ without spur. Wings very slightly marked with brown at the separation of the second and third veins.

One specimen [War Bonnet Canyon, in extreme North-western Nebraska].

Xylota analis, Will.

There are known specimens of this species as follows: In the U. S. National Museum, one male from Cala. [Baron], and two females from

New Mexico [Gaumer]. which form the types of the species; in the collection of the Kansas University, two males from the Magdalena Mountains, in New Mexico [Snow]; and in the collection of the University of Nebraska, one male, taken in War Bonnet Canyon in the extreme north-western part of Nebraska. This last specimen agrees exactly with Williston's description except that the antennæ are entirely red.

Xylota flavitibia, Bigot.

This species has been recorded from Colorado, by Williston, and from Colorado and New Mexico, by Snow. The collection of the University contains one male specimen taken in War Bonnet Canyon, Nebraska.

Xylota fraudulosa, Loew.

The collection of the University of Nebraska contains numerous specimens taken near Milford, Neb., in June, on the flowers of *Prunus americanus*. It has also been recorded from several localities in the East, and from Illinois, Wisconsin, and Washington, in the West.

Xylota augustiventris, Loew.

This species has been recorded from New York, Penn., and Ill., but not hitherto west of the Mississippi River. A single male specimen from War Bonnet Canyon, in extreme North-western Nebraska, has the wings hyaline, the third segment of the abdomen shining, except a very broad posterior band which projects almost to the anterior margin. The fourth segment is entirely shining.

Xylota obscura, Loew.

There is in the collection of the University of Nebraska, one female specimen taken in War Bonnet Canyon, Nebr. This species has been recorded from Oregon, California, and the Red River of the North. The description applies exactly.

Spilomyia quadrifasciata, Say.

One female specimen taken at Lincoln, Nebr., in September, by the writer. With the exception of the record of several specimens in Eastern Kansas, by Snow, this species has not been recorded outside of some of the extreme Eastern States. This specimen was taken on the flowers of *Aster multiflorus*.

Sphecomyia vittata, Wied.

In the University collection there are two specimens, one from Belmont, Nebr., and the other from War Bonnet, thirty miles distant. This species has been recorded from the Eastern and Southern States, and Minnesota and Colorado, in this country, as well as from localities in Northern Europe and Siberia.

PIERIS RAPÆ AND AGRAULIS VANILLÆ.

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

P. Rapæ, the introduced "European cabbage butterfly," on its westward march across this Continent, was first taken in Nebraska on August 3, 1881. (See CAN. ENT., 1882, 39.) In May, 1883, I took one male in Southern California. At that time I did not know its name, but I spread it and placed it in my cabinet as unknown. In a few years an Eastern Entomologist called on me, and at once identified it as P. Rapæ. It was yet other years before I saw another specimen in flight, though collecting diligently every season. About 1890 or '91 other specimens were observed, and thereafter every year brought them in rapidly increasing numbers, till now they are extremely abundant, flying early and late in the day, and early and late in the spring and fall, and at times, as in cold or cloudy weather, when only a very few of the native species can fly, indicating that it is more hardy than the native species, and that it will eventually dominate. As might be expected, the larvæ feed in good part on cabbage plants, but yet they are not at all dainty or particular as to food, and many other plants are used. Last year I raised some fine specimens from eggs laid on leaves of common nasturtiums, in the garden, and wholly fed upon those leaves.

The native Pierids, P. Protodice, P. Beckeri, and P. Sisymbri, do not oviposit on any cultivated plant so far as I know, preferring wild plants, while Rapæ apparently prefers cultivated ones. Evidently Rapæ will in a few years become a great pest. Already they fly in numbers everywhere, but especially about the Chinese vegetable gardens, and the flower gardens and dooryards of the towns.

Another introduced butterfly is that beauty from the Southern States, Agraulis Vanillæ. This species came into California over the Southern Pacific Railroad soon after trains ran through from Louisiana, or say in 1885. I well remember the first ones I ever saw. There were two of them in a front dooryard feeding on the flowers, and I was in a buggy driving along the street; but my net was handy, and I instantly went in pursuit of the red beauties, capturing them both as a first move, and explaining to the surprised people of the house afterward. Now Vanillæ is everywhere in evidence, and its larvæ are so abundant that large old passion vines are sometimes wholly denuded of leaves by them. Vanillæ is also extremely hardy and vigorous, flying, like Rapæ, at unfavourable times and seasons, as if bent on conquest. Still, it has not increased so rapidly during the last few years as has Rapæ.

These two species are the only ones as yet brought into the State from the East.

ON THE POSITION OF THE GENUS DEMAS.

BY HARRISON G. DYAR, PH. D., NEW YORK.

In the March number of the CAN. ENT., pp. 81–82, Mr. Tutt falls back upon the writings of Dr. Chapman to support his position for this genus as among the Liparidæ*. As Mr. Tutt has thus gracefully retired from the discussion without making a direct answer to my facts, I can only, in reply, briefly notice Dr. Chapman's position.

In the egg of Demas, Dr. Chapman, on a matter of detail, seems to imply an absence of relation with the Apatelidæ; but the fact remains that the egg is vertically ribbed as in the Noctuidæ, Apatelidæ, and Thyatiridæ, which I take to be the essential character. The Lymantriidæ, which belong to the Notodontian-Lasiocampid series have smooth, or obscurely reticulated eggs, the vertical lines having no tendency to become prominent.

In the young larva, Dr. Chapman has not discovered the peculiar arrangement of the warts, on which I lay special stress. He would ally Demas to Liparis on "the abundance of hairs and their length, the character of the tubercles, the anterior trapezoidal being more important than the posterior and the colouring." The hairs and colouring may be dismissed at once, as they are notoriously adaptive and variable characters. The statement about the tubercles is surprising. While it is correct of Demas as figured, the reverse is strikingly the case in many Lymantriids. The anterior trapezoidal (tubercle i.) in this group have a marked tendency to disappear, and I can only suppose that Dr. Chapman has made some mistake. His own figure of *Dasychira pudibunda* (pl. ix., fig. 8) shows the anterior trapezoidals clearly the smaller. The structure in Demas really tells in favour of my view.

In the second skin, Dr. Chapman describes a medio-dorsal depression on joints 5 to 11 and 12 "in the position of a peculiar organ in various Liparids." I see no good reason for the inference that these are the homologues of the dorsal eversible glands of the Lymantriidæ. In the first place they seem not to have any indication of the structure of such glands, and in the second place they are not homologous in position. In the Lymantriidæ, the glands occur on the 10th and 11th segments only; when others appear on the anterior abdominal segments, as in *Stilpnotia salicis* and *Lymantria dispar*, they are paired, not single.

*The name Lymantriidæ, as this family "appears to be called by American authors," was adopted by me from Mr. G. F. Hampson's Moths of India.

Dr. Chapman then remarks that in the further skin the larva has a more Liparid-like general appearance. The "appearance" is to me, however, not Liparid, but Arctian. When I first saw the larva, years ago, I took it for *Halisidota Harrisii*, till I noticed the different arrangement of the hair-pencils.

Next, he states that the habit of living between spun leaves is not that of an Acronycta. It is, however, decidedly so of our *Charadra deridens*, one of the Apatelidæ. But if Demas stood alone in this respect it would form no valid argument to remove it from the Apatelidæ, so slight and little specialized is the habit, evidently a recent adaptation.

As concerns the pupa, I do not pretend to be so conversant with the subject as Dr. Chapman is, and therefore his positive statement that "the pupa of *D. coryli* is not that of a Noctua" is entitled to consideration. However, I do not find the statement in "The genus Acronycta and its allies," a little book containing reprints of these articles, kindly sent me by Dr. Chapman, nor do I notice the positive characters which would lead to such a conclusion. Indeed, Dr. Chapman admits that "the character of the anal armature has some resemblance to various Noctua forms." But, indeed, suppose that the pupa be really "not that of a Noctua," the fact could only be applied to this discussion if it were shown that the pupæ of the other Apatelidæ were true Noctuæ pupæ, since it is equally true that the larva of Demas is "not that of a Noctua", but neither are those of any other Apatelidæ. Now, Dr. Chapman says, speaking of the pupæ of the genus Apatela: "The pupa is less characteristic [than the larva]; it serves rather to divide the genus . . . . than to define the group as a whole. The pupa of the *rumicis* group is very characteristic and rather bombyciform in its aspect. The others are more of an ordinary Noctua pattern, but present features that separate them from other families. This is a somewhat rash statement to make, since I must confess my knowledge of Noctuæ pupæ is of a rather superficial character."

These are all the points which I can gather from Dr. Chapman's account, and I do not think that they go far to refute my position drawn from positive structural characters in the larva. Indeed, I should not feel called upon to criticise Dr. Chapman's interesting and valuable papers, except to examine the grounds of Mr. Tutt's position.

SOME ARGYNNIDS OF PARK CITY, UTAH.

(Elevation, 7,000 feet.)

BY ARTHUR J. SNYDER, EVANSTON, ILL.

Any time before the middle of June, entomological studies in the mountains are apt to be interrupted by snowfalls; but from that time to September, one will seldom find a better or more interesting place for study. The climate is delightful, and though the common opinion is that no rain falls upon the great plateau, here as elsewhere, suppositions are not facts.

My brief experiences (covering portions of two summers) would indicate that Utah receives as much rain during July and August as the State of Illinois. During the latter month, in 1893, there were frequent showers, and at least two heavy rains. In July, 1895, we experienced a very rainy day, and several showers. Nevertheless, at times it becomes so dry on the mountains that one must seek the low, irrigated meadows to find butterflies abundant.

The genus Argynnis is well represented in the West and North-west. From low lands to an elevation of 9,000 feet one finds many representatives.

The most striking species, as to colour and size, which I have found there is *A. leto*. This insect must be seen alive to be fully appreciated. Whether seen on the wing, or resting on a thistle blossom, it is a prize well worth the collector's attention. It appears in Utah (Park City) early in July, and its numbers gradually increase, until in August it may be called almost common. As is so frequently the case, the males appear first, and were found in the ratio of ten to one as compared with the females.

Mr. Maynard says *Leto* is found in California, Nevada, Oregon, Washington, and Montana. It has been my good fortune to capture it in Utah, Idaho, and Wyoming. I do not know how far East it has been taken, but my friend, Mr. William S. Bates, took several specimens of a female Argynnis, which I am satisfied are *Leto*, in Michigan during the past summer, and I have heard that it has been taken in Minnesota. I have never read that the female of *Leto* is dimorphic, but would not be surprised to learn that it is, or that *Leto* and *Cybele* are, or were at some time not far distant, one and the same species.

It is not difficult to secure eggs of *Leto*, and were it not for the fact that the larvæ hibernate, there would be no difficulty in rearing the

species. I believe Mr. W. H. Edwards has done so. Females confined over fresh violets oviposited readily, and in 1893 a number of larvæ were brought to Illinois, and subjected to "the cold-storage process" for the winter. In the spring, however, they failed to awaken from their lethargic condition.

A. eurynome was very common on low lands near Park City. At least 600 were taken in 1893. In one open meadow covered with flowers there were thousands of this species. Two forms or varieties were found, the ordinary one with silvered spots below, and a variety with all the spots below yellow. The ratio was about one yellow form to twenty-five of the silvered. A remarkable fact was noted. A silvered ♀ and a yellow ♂ were taken in *coitu*; a yellow ♀ and a silvered ♂; a silvered ♀ and a silvered ♂, and also a yellow ♀ and a yellow ♂. I am *positive* of all the statements except the last concerning the yellow ♀ and yellow ♂.

We know that peculiar specimens are sometimes the result of hybridism. Melanism may result from cold, drought, etc., and almost everyone has seen "sports" in the insect world.

I await with interest the results of future study concerning these subjects. It is commonly asserted that hybrids are never fertile. Is this *known* to be true?

A. myrina was abundant in the meadow mentioned above, but I do not remember having seen it elsewhere in Utah.

A. epithore was found on low ground flitting among the leaves of a large canna-like plant. One specimen also was taken beside a small mountain stream.

A. kremhild was taken in the same locality.

A. egleis was taken on a hillside near town, in an open spot, where the sun's rays seemed to linger at eventide, but near the underbrush where it was easy to escape among the scrub oaks and sage bushes. In its habits it much resembles *A. coronis*.

A. coronis was rare at Park City, but more common in the mountains, near Salt Lake City and Ogden.

A. Nevadensis and *A. Meadii* were also rare at Park City, but more abundant near Salt Lake. In habits they were quite unlike *coronis* and *egleis*, always being found on the flowers or else crossing swiftly to some place where flowers were more numerous, never dropping to the ground and flitting below the sage bushes, but seeking escape in swift flight. They also seemed to prefer lower ground,—the valleys instead of the hillsides.

A. montivaga.—One specimen taken.

A. Edwardsii.—Only one specimen taken.

A. liliana.—Only one specimen taken. Mr. W. H. Edwards says that the *A. coronis* and *A. nevadensis* taken in Utah are larger than ordinary. To my mind the *A. coronis* taken in Utah are unlike those taken in Colorado, both as to size and colour, but I have seen very few of the Colorado specimens.

In my collection are a number of Argynnis which seem to be unnamed.

For identification of specimens I am indebted to Prof. G. H. French, Dr. Henry Skinner, and Mr. W. H. Edwards.

My studies of this group lead me to believe that it sadly needs revision; that when it is studied carefully by someone who has facilities for comparing all the species and varieties described, many so-called species will prove to be synonymous; that when all the species have been bred and the stages studied, some surprising truths will be unearthed.

With a collection containing thirty-five species (?) and several varieties (?), I am willing, for the present at least, to say "don't know" to many things concerning the genus. I am anxious to find out something and contribute my mite towards unravelling the remarkable tangle.

LUNA EGGS—A CORRECTION.

Mr. Dyar kindly points out that the eggs mentioned by me on page 79 of the March number are not those of *Actias Luna*, as stated, but are those of *Telea Polyphemus*. He adds that "Luna eggs are quite different, being almost entirely black, and laid in little clusters on the twig, not on the leaf." Not having bred these moths from the egg, I had to rely on such descriptions as were at hand. Rogers [CAN. ENT., VII., 199] describes the eggs of Luna as "dark brown or chocolate colour, flattened at the sides, smooth, and about .05 of an inch in length; the sides were of a lighter shade." Saunders [Sixth Ann. Report, 41] says of Polyphemus: "The egg is about one-tenth of an inch in diameter, convex above and below, with the convex portions whitish and the nearly cylindrical sides brown." Minot [CAN. ENT., II., 27] also describes Luna eggs as very dark sepia, although some were almost entirely white. My eggs appeared to me to answer better to the description of those of Luna, and as the difference in method of attachment to food-plant was not given, I came to the conclusion that they were those of Luna, as the moth is usually abundant in the grove of hickories where the eggs were obtained.

W. HAGUE HARRINGTON.

A CANADIAN TRIGONALYS.

BY W. H. HARRINGTON, F. R. S. C., OTTAWA.

Trigonalys Canadensis, n. sp.

Male.—Length, 10.5 mm. Black with yellowish markings. Head transverse, as wide as thorax, about twice as wide as long when viewed from above; face above the antennæ, and vertex, polished, impunctate, without apparent sutures and with sparse blackish pubescence; the cheeks and under surface with pubescence more dense; clypeus polished; palpi slender; antennæ as long as head and thorax, rather stout, eighteen-jointed, segments subequal; eyes small but prominent; ocelli small, in a triangle on a line with the posterior margins of the eyes. Thorax rugose with coarse, irregular punctures, those of the pleura and pectus smaller and more numerous; posterior angles of prothorax yellow; legs rather slender, coxa and femora black, remainder yellow, the tips of tibiæ and tarsi somewhat dusky; wings subhyaline, with dark stain covering marginal cell and extending slightly beyond each end of it, stigma and costal nervures black, remaining nervures reddish, second and third sub marginal cells subequal; scutellum abruptly rounded posteriorly, post-scutellum yellow, prominent, subpyramidal, notched at apex, in suture on each side several deep shining foveæ; metathorax very short and rounded at sides, without prominent angles, a small yellow spot on each side. Abdomen polished, impunctate, apparently with six segments; second segment as long as all the following and with a yellow central band, or elongated spot on each side; a yellowish spot at lateral base of segments 3 and 4, very faint on the latter; venter slightly pubescent, with double row of yellow spots on segments 1 to 5, largest on 2nd.

This is the first record of the occurrence of any member of the family Trigonalidæ in Canada, and I am indebted for the privilege of describing the specimen to Mr. Fletcher, who received it in Sept., 1893, from Mr. Wilkinson, of Victoria, B.C. It was taken from the cell of a wasp (probably *Vespa occidentalis*) which had built on his verandah, and he had observed that the wasps were rapidly decreasing in numbers, apparently from the presence of this parasite, and of a smaller species of hymenopteron, of which, unfortunately, no specimens appear to have been preserved.

ITHYCERUS NOVEBORACENSIS, FORST.

In former years I had found this beetle, the largest and most conspicuous weevil of our fauna, to occur only upon beeches, as noted in my sketch of the Rhyncophora, in Eleventh Annual Report. Such, also, was Mr. Chittenden's record [Ent. Am., Vol. VI., 168]. Its infestation of the twigs of oak had been recorded by Riley, who described the larva. Its occurrence upon hickory is noted by Mr. Beutenmuller [CAN. ENT., XXII., 201], and it is known as injurious to apple and other fruit trees. On June 9th, 1895, I observed a pair in *coitu* upon the trunk of a hickory *(Carya amara)*, where there were no beech trees near by, and on carefully examining other hickories in the immediate vicinity I found five more pairs. Two or three days later I examined the same trees and could not detect a single beetle, nor did I find any on subsequent examinations. This shows that missing the exact date for such an insect might lead to its escaping observation entirely, as those trees had been examined in former years.

W. HAGUE HARRINGTON.

A CORRECTION.

For the new genus of Megalopygidæ, *Brachycodion*, described in the last volume of CAN. ENT., read *Aidos*, Hubn. The genus is not in Kirby's Catalogue, and I thus came to overlook it. The following is the synonymy :—

Genus AIDOS, Hübner.

1818. Hübner, Verz. bek. Schmett., p. 191, No. 1962, *Brachycodion*, Dyar.

1895. Dyar, CAN. ENT., XXVII., 244.

Type *A. amanda*, Stoll.

I must apologize for this synonym by hastening to correct it.

HARRISON G. DYAR.

Through the kind consideration of Mr. A. R. Grote, the Society has been put in possession of his paper on the Apatelidæ, noticed by Dr. H. G. Dyar, in CAN. ENT., Vol. XXVIII., p. 86 ; also, the original photographs of the plates, beautifully executed, and greatly admired by all who see them. The form and ornamentation are displayed with remarkable life-like distinctness, even to the tubercles and rounded bodies of the larvæ, which are somewhat lost on the plates, but well defined in the photos, testifying to the great advance that has been made in this method of illustrating entomology since Mr. Grote first adopted it twenty years ago.

J. ALSTON MOFFAT.

NOTES ON NEW MEXICO AND ARIZONA HYMENOPTERA.

BY C. H. TYLER TOWNSEND, LAS CRUCES, NEW MEXICO.

With the exception of some undetermined gallflies and parasites, the following list of 86 species contains all the Hymenoptera collected (and bred) by the author, in the South-west, of which it has proved possible to get the names, except four mentioned in CAN. ENT., 1892, p. 200. The gallflies and parasites above referred to will be recorded in some papers to be published in the future. The cottonwood, *Blennocampa*, mentioned in CAN. ENT., 1893, p. 304, and in Zoe, iii., pp. 234–236, should also be included in the above exception.

As the list is not large, the species are arranged alphabetically. The fact that I have not been able to refer to Cresson's catalogue explains this, as it does the absence in most cases of the authorities for the species.

In the four cases where the query and asterisk occur, two species got mixed under one number in sending for identification to *Ent. News*, so that it is uncertain to which the locality and notes belong.

Agapostemon melliventris, Cr.—La Vega de San José, Valencia Co., N. Mex., August 4. One. A small, elongate species, with head and thorax entirely vivid Paris-green colour. Abdomen, legs, and antennæ yellow, the hind borders of segments brown. Det., Fox.

Allantus unicinctus, Nort.—Hart Little Spring, Arizona, July 14. Seven specimens. Det., Fox.

Andrena, sp.—Las Cruces, N. Mex. One ♂. A moderately small, elongate, entirely black species. Wings slightly fuscous. Det., Fox.

Andrena, sp.—Las Cruces, N. Mex. One ♂. Clypeus white. A small, elongate species. Black; thorax and head whitish pubescent. Wings slightly smoky. Det., Fox.

Anthidium, sp.—Las Cruces, N. Mex., May 17. One ♂. A moderately small species with clear wings. Thorax with yellow border, except in front, and two delicate yellow vittæ. Abdomen black, with yellow hind border to each segment. Det., Fox.

Anthidium, sp. near *mormonum*.—Las Cruces, N. Mex. One. A small form, with wings clear. Abdomen black, with irregular yellow hind borders to segments, interrupted in middle on six segments. Det., Fox.

Anthidium interruptum, Say.—Chaves, N. Mex., August 6. Three. Las Cruces, N. Mex. One. Det., Fox.

Anthophora, sp.—Hart Little Spring, Arizona, July 14. One specimen. A grayish pilose bee, larger than *Megachile relativa* ♀, and with the abdominal bands of pile gray. Det., Fox.

Anthophora, sp., probably n. sp.—Chaves, Valencia County (near Los Lunas), N. Mex., August 6. One ♂. A species of moderate size, fulvous pilose, including first abdominal segment, rest of abdomen black with white or yellow hind borders to segments. Wings clear. Det., Fox.

Anthophora, n. sp.—La Vega de San José, N. Mex., August 4. One ♂. Wholly yellowish, whitish pilose, with clear wings. A rather large species. Det., Fox. (?) *

Anthophora maculifrons?—Las Cruces, N. Mex. One ♂. Small species, grayish cinereous pilose all over, only front border of abdominal segments 1 to 3 showing black. Pile on abdomen very short. Wings clear. Det., Fox.

Anthophora montana, Cr.—La Vega de S. José, N. Mex., August 4. Two specimens. Det., Fox.

Anthophora occidentalis, Cr.,♂.—La Vega de S. José, N. Mex., Aug. 4. One ♂. Wholly yellowish, whitish pilose, with clear wings. A rather large species. Det., Fox. (?) *

Anthophora Walshii, Cr.,♂.—La Vega de San José, N. Mex., Aug. 4. One. Clypeus white. Six abdominal segments with white hind margins. Det., Fox.

Braconid.—Grand Canyon, Arizona; Hance trail, July 11th. One specimen. A bright red species, with wings fuscous or black. Det., Fox.

Calliopsis, sp.—Las Cruces, N. Mex. Two. Det., Fox.

Ceceris (sic *Cerceris?*) *venator*, Cr.—Chaves (near Los Lunas), N. Mex., August 6. One. Very like *Eucerceris*, sp., but basal abdominal segment smaller and black. Det., Riley.

Centris, sp. ♀ (♀ of *lanosa?*).—Las Cruces, N. Mex. One. Det., Fox.

Cerceris bicornuta, Say.—La Vega de San José, N. Mex, August 4. Two. Det., Riley.

Chalybion cæruleum, L.—La Vega de San José, N. Mex., August 4. One. A small bluish-black wasp, a common species in the Eastern U.S. Det., Riley.

Chelonus sericeus, Say.—Continental Divide, Tenaja, N. Mex., Aug. 2. One. A blackish saw-fly (?). Det., Riley.

Chlorion occultus.—La Vega de San José, N. Mex., Aug. 4. One specimen. El Rito, N. Mex., Aug. 5. One specimen. Det., Fox.

Crabro, sp.—Hart Little Spring, Arizona, July 14. One. A black, shining hornet, with abdomen banded with yellow, but no yellow on scutellum. Det., Fox.

Crabro, sp., near *Packardi*.—Hart Little Spring, Arizona, July 14. One. A black hornet, of narrowed form. Abdomen banded with yellow, legs yellow. Det., Fox.

Crabro delectus, Cr., ♂.—Continental Divide, Tenaja, N. Mex., Aug. 2. One. A small black and deep yellow hornet. It was infested with two dozen small rufous mites on dorsum of base of abdomen. Det., Riley.

Crabro minimus, Pk.—Las Cruces, N. Mex. Name com. by Prof. Cockerell. Det., Fox.

Cryptus, sp. aff. *americanus*.—Hart Little Spring, Arizona, July 14. One specimen. A good-sized black ichneumonid with red abdomen. Det., Fox. (?) *

Cryptus callipterus, Say, ♂ ♀.—Las Cruces, N. Mex. An ichneumonid. Two females and two males. One of the males is considerably smaller and more slender, and generally darker. Det., Riley.

Cryptus proximus, Cr.—Hart Little Spring, Arizona, July 4 and 14. Two specimens. Det., Fox.

[TO BE CONTINUED.]

BOOK NOTICES.

"Handbuch der paläarktischen Gross-Schmetterlinge für Forcher und Sammler," by Dr. M. Standfuss, Jena, 1896 (Verlag von Gustav Fisher).

This is a second edition of the "Handbuch für Sammler der europaischen Gross-Schmetterlinge" rearranged and enlarged by the addition of certain studies in the theory of descent; 392 pages, and eight coloured lithographic plates.

The author gives an extensive account of the methods of collecting, of breeding larvæ, pairing of imagoes, both of the same and of different species, etc., interspersed with interesting philosophical remarks. As the preface says, "this book unites in itself two objects: lepidopterological practice and scientific-zoological speculation." The special case of hybridization recounted in detail, on pages 66 to 107, represents a very neat piece of work. The author shows, by considerations of the

egg, larva, pupa, and imago, that the three Saturnias, *spini*, *pavonia* and *pyri*, differ in degree of specialization; that they are phylogenetically of different ages, *spini* being the oldest, or least specialized, and *pyri* the youngest form. The hybrid larvæ between the first two and last two are figured adjacent to the normal forms, and the greater resemblance of the hybrid to the more generalized form in each case is striking, thus neatly confirming the conclusions already reached, and all on the lines laid down by Weismann.

Our author also gives an account of experiments on the effects of different temperatures on hibernating larvæ and pupæ, with figures of some of the forms of imago produced. There is an account of variation, seasonal dimorphism, local forms, etc., discussed from the most recent scientific standpoint. The book contains much of interest which it is unfortunate that we are not able to enjoy more easily in an English edition.

HARRISON G. DYAR.

BRITISH MOTHS, by J. W. Tutt. London: George Routledge & Sons. Pp. 365.

The young collector in the British Isles will no doubt welcome this manual, which will not only help him to name any specimen that he may collect, but give him also much information regarding the habits of the moth in its preparatory as well as perfect stages. It is written in the author's well-known pleasant and readable style, and is not merely a dry handbook. There are twelve coloured plates and over sixty wood-cuts, illustrating the majority of the families. There are also a number of tables, giving the times of year when the species may be looked for in the egg, larval, pupal, and perfect states; the food-plant of the larva: the location of the pupa; and notes on the variety or abundance of the moth. It would have added much, we think, to the handiness of the book if it had contained comparative tables of genera and species as well.

RANDOM RECOLLECTIONS OF WOODLAND, FEN, AND HILL, by J. W. Tutt., F. E. S. London: George Gill & Sons. Pp. 256. [2s. 6d.]

We are glad to see that a second edition of this delightful little book on outdoor natural history has been called for. In this new issue the matter has been, to some extent, rearranged and revised, and its attractiveness has been much enhanced by a pretty cover and over a hundred excellent illustrations. Though it deals with "Old Country" scenes, and the insects, birds, and plants that frequent them, it can be read with great interest by any lover of nature in any part of the world.

REPORT OF OBSERVATIONS OF INJURIOUS INSECTS AND COMMON FARM PESTS DURING THE YEAR 1895, WITH METHODS OF PREVENTION AND REMEDY. Nineteenth Report, by Eleanor A. Ormerod, F. R. Met. Soc., etc.

This splendid report fully sustains the high standard of excellence which has characterized Miss Ormerod's previous publications. The preface shows that the unusual and prolonged low temperature of the winter of 1894-95 had apparently but little affected the insects which it might be supposed to destroy.

The following pests are treated of in separate chapters: Apple, *Smerinthus ocellatus*; bean, *Bruchus rufimanus* and *B. fabæ;* cabbage, *Ceutorhynchus sulcicollis;* corn and grass, *Charæas graminis*, *Cetonia aurata*, *Phyllopertha horticola*, *Melolontha vulgaris*, *Rhizotrogus solstitialis*, *Tipula maculosa* and *Oscinis frit;* gooseberry, *Bryobia prætiosa*, *B. ribis* and *Nematus ribesii;* mangolds, *Aphis rumicis*, *Silpha opaca* and *Atomaria linearis;* orchard caterpillars, *Cheimatobia brumata;* pine, *Astynomus ædilis* and *Retinia buoliana;* plum, *Scolytus rugulosus;* strawberry, *Harpalus ruficornis*, *Pterostichus madidus* and *P. vulgaris;* turnip, *Helophorus rugosus.*

The ravages of the bean weevil appear to have been serious, and those of the ground beetles, upon strawberry, have been more extensive than in previous years. Ninety-three pages are occupied with the discussion of the above mentioned insects, while fifty are allotted to "Flies injurious to horses, cattle," etc. These chapters are exceedingly interesting, and several species of Hippoboscidæ, Tabanidæ, and Œstridæ, which are very annoying and injurious to domestic animals, are fully and clearly discussed. In connection with the account of the attacks of the Forest Fly, *Hippobosca equina*, are given two magnificent plates showing upper and side views of the foot of this fly, the tarsi of which are so modified as to enable it to secure a most firm grip on the hairs of the animal upon which it alights. The report concludes with a chapter on Deer and Dog Ticks, very troublesome mites belonging to the Ixodidæ. W. H. H.

Mailed April 1st.