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## THE FIRST LARVAL OR POST-EMBRYONIC STAGE OF THE PEA AND BEAN WEEVILS

BY C. V. RILEY, WASHINGTON, D. C.

In No. 9-10, Vol. IV., of "Insect Life," an account was given of the post-embryonic larva of the Bean Weevil, attention being called to some most interesting characteristics of this larva, which is possessed of temporary thoracic legs and some other structures which admirably serve its locomotive needs until it has entered the bean, when, with a cast of the skin, they are lost and the larva assumes the ordinary apodous form of weevil larvæ. The Bean Weevil (*Bruchus fabae*, Fitch [Riley],) goes on breeding in stored beans, in which respect it differs from the Pea Weevil, as also in the fact that a number of individuals, owing to their smaller size, will develop in the same bean, as many as twenty-eight having been found in a single bean. The eggs are primarily laid upon the bean-pod in the field but chiefly, if not entirely on those which are already mature and ripening, and the larvæ enter the same very much as does the Pea Weevil. But whether laid upon the pods in the field or laid upon the stored beans, the newly hatched larva has to eat its way into the bean and it is able to move about quite briskly by the aid of these temporary legs. Four rather stout but short spines or spurs on the prothoracic shield and four smaller spurs on the anal plate facilitate the penetration of the smooth and rather thin skin of our ordinary beans. The temporary legs are curious in appearance, consisting of three joints, the second long and slender and doubtless corresponding to the fused femur and tibia. The third, which corresponds to the tarsus, is slender and broadened at the tip into a flat pulvillus bearing at the heel a single delicate spur.

Having recently ascertained these facts upon more careful study of the habits of the Bean Weevil, I was curious to learn whether or not the Pea Weevil (*Bruchus pisi*, Linn.,) had similar structures in its newly-hatched larval condition. It has long been known that the egg of the Pea Weevil is laid on the outside of the pod, being fastened thereto, and the

newly hatched larvæ recently studied show that in this species also we have the same characteristics that I have referred to in the case of the Bean Weevil. The temporary legs are much shorter and stouter, but similarly constructed, the tarsus proper being merely a spatulate pad. The spurs on the prothoracic segment are more elaborate and more conspicuous. They consist of about six strong retrorse spines anteriorly, succeeded by two more prominent plates, also pointing posteriorly and strongly toothed along their exterior border. There are no anal spurs or spines. An interesting fact connected with this larva is that while ordinarily entering the pea direct from the amber-coloured egg, as previously recorded, it sometimes enters the pod in the neighborhood of the egg and then mines along the inside of the pod for some distance, being quite active and moving rapidly and with ease. This doubtless occurs wherever the egg hatches before the peas are sufficiently developed, the larva living as a miner until the pea is nearly full grown. The entrance of the larva into a pea in such case would seem to be rather by chance than design. As in the case of the Bean Weevil, however, the larva molts and loses its legs and other post-embryonic characters as soon as it has penetrated the pea.

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### SOME NOTES ON THE MARGINED SOLDIER-BEETLE (CHAULIOGNATHUS MARGINATUS).

BY C. V. RILEY, WASHINGTON, D. C.

Since the larval history of this beetle was published by Walsh in 1868 it has been generally known that the larva is carnivorous, feeding, as Walsh showed, upon the Plum Curculio, and, as I showed, on the Apple Worm among other insects, so that it must be included among our beneficial species. The larva is also one of those which is quite often found during the winter months upon the surface of snow. The beetle is one of the most common species during the summer months upon many kinds of flowers, but particularly upon those of *Yucca*, feeding principally on pollen, but also sipping the slight amount of nectar which is found at the base of the pistil, or the sweetened exudation which is also quite frequent upon the tip of the petiole of the flower after this has dropped. It is quite frequently found in pairs, and there is no difficulty in getting the female to lay her eggs, but so far as I know the eggs have hitherto

been unknown, and no record of them made. It occurred to me, therefore, that a brief statement might be interesting.

The eggs are laid, not in the ground, but on the surface of the ground, and preferably under some shelter, as a stone or a piece of wood. In the vivarium pieces of crockeryware have been made use of. In nature the shade afforded by the dense, more or less recumbent foliage of *Yucca filamentosa* doubtless furnishes a desirable situation. The eggs are laid in clusters, some of them as large as an ordinary pea. They are very pale yellowish, almost white, highly polished and faintly rugose. They are nearly globular, or but very slightly ovoid. I have counted over 300 eggs in a single mass, and each egg measures 0.25 mm. in length and 0.27 in diameter. The newly hatched larva is pure white but otherwise has the same form and general appearance as when full grown.

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### THE SPECIES OF MAMESTRA.

BY A. R. GROTE, A. M.

By favour of the Secretary of the Smithsonian Institution, I have received a copy of the "Revision of the species of *Mamestra* by John B. Smith, Professor of Entomology, Rutgers College, Washington, 1891". There are one or two points only upon which I desire here to comment. As a whole the determinations agree with my own. The genus *Dianthoecia* is merged with *Mamestra*, as I at one time proposed from the variability in the same species of the ovipositor. But, as I pointed out in my last Check List, p. 13, the characters of *Dianthoecia*, Bdv., are taken from the habit of the larva, the button-like termination of the wing cases in the chrysalis and the extended ovipositor in the moth. The American forms have been only incompletely studied for these characters. The genus is universally adopted in Europe, and our "cabinet opinions" will doubtless be modified when we come to know the preparatory stages of our species.

So far as the Revision is concerned, I may discuss the following synonymical points. And first, on page 218, my *M. vittula* is very fully described from my type, shown to the author of the Revision by Prof. Snow. Yet, on page 268, this same species is stated to be "unknown", and is further unfavourably commented on as too near to *q-lineata*, while on page 219 the type is said to be "much more nearly allied to *capsularis*

than to *4-lineata*". With reference to *subjuncta*, G. & R., I repeat that Guenée himself determined our type as belonging to an undescribed species, received also by him since the issue of the Species Général, and for which he had a collection name which we adopted. It seems thus not likely that the *W-latinum* of the Species Général could be our species; but much more likely that it is my *atlantica*. On page 233 *crisifera*, Walk., is preferred for *lubens*, on the faith of Mr. Butler's reference. I have seen none of Mr. Butler's papers. My collection has been distributed without my consent or knowledge, nor have I ever been consulted in the slightest way by the British Museum authorities. I saw the type of *crisifera*, Walk., and it was not *lubens*. As stated by me, and cited in the present Revision, the type of *Acronycta crisifera* is not an *Acronycta*, but a stone-gray Hadenoid form unknown to me. I did not examine the eyes, but I should have suspected them to be naked, not hairy, and the type wanted all the brighter shades of *lubens*, while the markings did not suggest to me *lubens* at all. It seems to me that Mr. Butler is in error. According to the Revision, "the type of *cornis* is a very bright, strongly-marked specimen, like (?) typical *olivacea*, but so spread that the insect appears more plump, shorter winged, and differently marked". As the type was one of the specimens marked to be returned to Mr. Hy. Edwards, and was, with all others, so marked so returned, it is possible that I have been momentarily deceived by the brighter tints and peculiar setting. But I knew *olivacea* well, having originally determined the species for Mr. Morrison as then undescribed. It appears that Prof. Smith had re-described *purpurissata* as a *Hadena*, and that the fusion of the stigmata entitles the retention of this name as varietal.

On page 262 I am credited with a species, *M. dodgei*, which I never described, and which is one of Mr. Morrison's synonyms that I did not refer in my lists, but of which I remember to have had a note. I did not know Mr. Morrison's *ectypa*, nor, from the description, could I have suspected it to be my *bella*, which has a close ally, as I pointed out, in the European *Dianthoecia magnolii*. The author of the Revision has compared the types, and the reference is to be accepted. With the exception of *egens*, I believe I am responsible for the use of Mr. Walker's names in this genus adopted in the Revision. The condition of the specimens representing Mr. Walker's types of *Celaena* was so indifferent that it appeared to me they could not be determined, while the descriptions are quite useless. In the list of species of *Mamestra*, p. 274, the

errors as to *vittula* and *dodgei* are repeated. I do not find in the list my *M. mimula* (also omitted in my late Check List) nor Dr. Harvey's *D. pallilis*. Hübner's *confusa* and *mucens* are much like *Hylomiges*, and I so referred them in my Check List, 1875-6. Otherwise the species of North American *Mamestra* and *Dianthoecia* known to me seem to be all included in the Revision, which credits me with thirty-three species and two varieties. I would correct this so far that *lubens* should be restored and that *oregonica* should be added as a variety of *trifolii*. Three well-marked species, *sutrina*, *ferrealis* and *Dimmocki*, are unknown to the author of the Revision. The latter should be recognizable since it is a peculiar form, and the type was in my collection, which latter ought rather to have been preserved as I left it, intact, in the true interests of science. What I must have suffered at having my Noctuidæ overhauled by Mr. Butler may be imagined.

#### MR. WALKER'S TYPES.

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

In the CAN. ENT., p. 136, Prof. Smith says that our reference of *Edema? transversata*, Walk., in 1868, to *lignicolor* is an error. In other cases e. g. *Apantesis radians*, etc., our testimony is borne out, and now comes up the question of a changing in specimens since 1868. Mr. Walker's specimens are not marked type, but placed merely above the label. They can have been changed, and the question is, whether a name of Walker's can be employed which in any way contradicts in its description the supposed species. In my Revised Check List 4, I say: "Clearly there is room for misapprehension of what specimens are really types had we not a check for the reference. This is the criterion for types, that they do not contradict the original description," CAN. ENT., XX., 75. If the description of *Edema? transversata* contradicts *Ellida gelida* in any particular it should not be accepted. If it agrees well with *lignicolor*, our original reference is probably correct. I do not now recall this particular reference, and a possible error in our notes, or their transcriptions, might have occurred. But we knew *lignicolor* very well, and I am the first to restore and interpret this name, reducing *virgata* to a synonym and giving the correct synonymy of the species. I do not object to as rigorous a use of Mr. Walker's names as is consistent with the law of priority. But I object to the putting forward of this or that supposed type of Mr. Walker's without reference to the description. The proposal by Stal and others to

ignore the British Museum Lists from their defective composition has been answered by us, with subsequent American lepidopterists, in the negative. I may say that American lepidopterists have made visits at a considerable sacrifice to London for the main purpose of finding out what Mr. Walker described, and they have always accepted cheerfully the result of these visits. It was necessary to build up in America a stable, specific nomenclature. As to the generic, it will always be unstable, partly from the difference in opinion as to what constitutes a genus, partly that here tradition has been stronger than priority. In vain I have shown that *Jaspidea* is older than *Bryophila*, *Heliophila* than *Leucania*, *Graphiphora* than *Taeniocampa*. At least the acceptance of these names is but partial, and I myself have hesitated to use two of them. The necessity for a stable basis for our specific nomenclature is clearly greater than necessity for ideal justice towards this or that American describer, and he must bear his synonym, as he has to bear other injustice in this world. One word as to the employment of double names in the Noctuidæ, and I have done. It is extremely desirable that no two Noctuids should bear the same specific title. The value of a Check List is largely dependent on the carrying out of this rule. Guenée went so far as to change all double names. In the more than seven hundred species of N. Am. Noctuidæ I have described, I have never used a name twice except by accident. Of late there has been an unnecessary duplication of such names. The coat of ice, which the works of European writers on North American Lepidoptera laid upon our knowledge of the scientific titles of our insects has been broken, and to this freeing of our literature I have assisted to the extent of my ability. A responsibility now rests with future American students that they keep the current clear and take large and philosophical views in their classifications.

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### OVIPOSITING OF MELITÆA CHALCEDON IN PAPER ENVELOPES.

BY RICHARD E. KUNZE, M. D., NEW YORK, N. Y.

In March number, Vol. XXIV, of CANADIAN ENTOMOLOGIST, Mr. W. G. Wright, of California, mentions a number of genera of diurnals not requiring plants for ovipositing thereon. Those enumerated belong to *Parnassius*, *Argynnis*, *Euptoieta*, *Neonympha*, *Cœnonympha*, *Hipparchia*,

Satyrus, Chionobas, and, in part, Chrysophanus. I can add *Melitaa* to his list, which oviposited on two different occasions under circumstances extraordinary but exactly the same. Two years ago I received from a friend, who collects for me in California, but is not a practical entomologist, a lot of *M. chalcedon* papered up. My instructions to kill specimens with chloroform by brushing a little of it over head of each, and at once paper the same after capture, were carried out to the letter. How much or how little each received I do not know. I received the specimens after being in the mail bag six or seven days on their journey from Oakland to New York. On opening paper box I found a lot of little, hairy, black larvæ crawling over contents of box, and soon traced them to an envelope containing a ♀ *M. chalcedon*, with quite a number which had not yet escaped therefrom. There must have been more than fifty living larvæ, which, not knowing their food-plant, I placed in my garden or back yard, so to speak, scattering the lot over cultivated and wild plants, including a White Birch, in the hope that some might find suitable food, and then watch their progress. But all soon died.

In another envelope I found a second ♀ of *M. chalcedon*, which had laid quite a number of eggs, and which I kept a few days pending development of those living larvæ. When those perished I threw away the ova of *chalcedon*. Both females were found dead in their envelopes. But out of some half a dozen females received I found one alive which had to be put into the cyanide bottle.

Another instance of similar ovipositing was that of a Dioptid, *Phryganidia californica*, received in the same way from the same party two years ago. This was not discovered until I took the specimen in original envelope with a lot of other California specimens to my friend, Mr. Charles Palm, of this city, for identification. Most of the larvæ of *P. californica* appeared to have died during period of hatching or shortly afterward, inasmuch as many were not freed from shell of ovum. A number of ova, but very few out of a total number of fifty-three counted, were not hatched or possibly sterile. I did not discover the dead larvæ of this Californian Bombycid until a few months ago while trying to get it determined.

I should also state that the females of *M. chalcedon*, which oviposited in envelopes, were taken a week apart during a period covering two weeks, and would allow about twenty-one days or less for hatching of ova.



## LEPIDOPTERA FROM MARSHALL PASS, COLORADO.

The late Mr. W. S. Foster sent me some years ago a list of Lepidoptera taken by himself in 1888 at Marshall Pass, Colorado, which deserves to be put on record as a contribution to the knowledge of alpine entomology. The collecting was done at altitudes from 10,000 to 13,000 feet, on the slopes of the Continental Divide and Mt. Ouray, on the north side of the railroad track. This is in Saguache county, and about forty miles from the district in Custer county, of which the alpine insects are recorded in CAN. ENTOM., 1890. The list is as follows:—

<i>Papilio zolicaon</i> , Bdv.	<i>Pyrameis huntera</i> , Fb.
“ <i>asterias</i> , Fabr.	<i>Cænonympha ochracea</i> , Edw.
<i>Parnassius smintheus</i> , D. & H.	<i>Erebia magdalena</i> , Strk.
<i>Picris sisymbri</i> , Bdv.	<i>Chionobas chryxus</i> , Westw.
“ <i>protodice</i> , B. & L.	“ <i>taygete</i> , Hbn.?
“ <i>oleracea</i> , Bdv.	<i>Lycæna shasta</i> , Edw.
<i>Colias meadii</i> , Edw.	<i>Chrysophanus snowi</i> , Edw.
“ <i>alexandra</i> , Edw.	<i>Lycæna melissa</i> , Edw.
“ <i>scudderii</i> , Reak.	<i>Pyrgus centaureæ</i> , Ramb.
“ <i>eurytheme</i> , Bdv.	<i>Deilephila lineata</i> , Fb.
<i>Argynnis freya</i> , Thunb.	<i>Alypia lorquinii</i> , G. & R.
“ <i>eurynome</i> , Edw.	<i>Gnophaela vermiculata</i> , G. & R.
“ <i>helena</i> , Edw.	<i>Nemeophila plantaginis</i> , Auctt.
<i>Euptoieta claudia</i> , Cram.	<i>Plusia hohenwarthi</i> , Hoch.
<i>Melitæa brucei</i> , Edw.	<i>Drasteria crechtea</i> , Cram.
“ <i>anicia</i> , Auctt. Amer.	<i>Botis turmalis</i> , Grt.
“ <i>palla</i> , Bdv.	

*Mel. brucei* is the real *anicia*, and *anicia*, Auctt. Amer., should apparently be called *meglashanii*, concerning which see 12th Rept. Colo. Biol. Assoc. *Nem. plantaginis* of the Colorado Mountains would now, I suppose, be referred to *petrosa*, Walk.

In Prof. J. B. Smith's list of Lepidoptera, while *petrosa* is accepted as distinct, “*hospita*, Schiff.” is referred to it as a variety. This latter is, however, a variety of the European *N. plantaginis*, L., and consequently the American *hospita*-like aberration apparently requires a new name. *Botis turmalis* is now referred to *itysalis*, Walk. The doubtful *Chion. taygete* is very possibly the species lately named *C. brucei* by Mr. W. H. Edwards.

Of the thirty-three species enumerated, about half may be regarded as specially alpine; the others occur also at much lower elevations.

T. D. A. COCKERELL.

Institute of Jamaica; Kingston, Jamaica. April 18, 1892.

## BIOLOGIC NOTES ON NEW MEXICO INSECTS.

BY C. H. TYLER TOWNSEND, LAS CRUCES, N. M.

## HEMIPTERA-HETEROPTERA.

All of the following species were determined by Dr. P. L. R. Uhler :—  
*Lioderma ligata*, Stal.

*In coitu* on mesquite (*P. juliflora*), July 14. It was found numerous on Chinese cabbage on college farm July 16.

*Mozena obtusa*, Uhler MS.

Taken in July on *Prosopis juliflora*. *In coitu* July 8.

*Chelinidea vittigera*, Uhl.

Taken *in coitu* May 24 on a small fruit of *Opuntia*, Soledad Canon.

*Hadronema militaris*, Uhl.

Swept from alfalfa May 12.

*Neurocolpus nubilus*, Say.

This capsid was beaten extensively from flowers and foliage of mesquite (*P. juliflora*) May 10. May 12 to 16 both adults and larvæ were beaten. The adults vary from a light yellowish or greenish to brown and almost black, usually more or less mottled. They doubtless grow darker with age. The larvæ are of a clear, light green colour.

*Calocoris superbus*, Uhler.

This capsid is numerous on alfalfa, both adults and larvæ, and doubtless causes considerable injury to the plant. May 8 to 12 both stages were found in abundance. May 28 the adults were numerous, and a few nymphs were found. The adult is blackish, with orange or yellow on the sides. The larvæ and nymphs are green, with the extremity of the body brown. Predaceous heteroptera and lady-birds were also swept, which doubtless prey upon the capsid.

*Calocoris* sp.?

Beaten from scrub oak (*Quercus undulatus* var. *Wrightii*) in Soledad Canon May 24. It is very pale yellowish, with faint brownish markings. Oak determined by Mr. W. H. Evans.

*Lygus pratensis*, Lin. var.

Adults and larvæ swept from alfalfa May 12. Only adults swept May 28. The adults vary from light green or glassy to a uniform light and dark brown, and one specimen has only the posterior portions brown. The larvæ are green with black dots on the thorax, and one black dot in the middle of the first abdominal segment. This species is also, I believe, injurious to the alfalfa.

*Rhinacloa forticornis*, Reut.

Beaten from scrub oak (*Q. undulatus*, var. *Wrightii*), May 24, in Soledad Canon. It is blackish or brownish, variegated with pale yellowish or silvery. Also beaten, May 28, from alfalfa.

*Malticotoma valida*, Uhler.

This is a stout looking, short capsid, bluish-black in colour, with the head and thorax reddish-brown. It was found very numerous from May 15 to June 2, on leaves of both *Yucca angustifolia* and *Y. macrocarpa* (?). They do not fly readily, but run down to the base of the leaves and are thus hard to catch. Both adults and young were found, May 15, puncturing the leaves. The larvæ are also bluish-black in colour.

*Macrotylus desiccatus*, Uhler MS.

Both adults and larvæ of this capsid were found on mesa April 4 infesting plants of *Senecio douglasii*, which they puncture. Both larvæ and adults are greenish. Plant determined by Prof. Wooton.

*Tuponia herbacca*, Uhler MS.

This small, light green capsid was beaten from mesquite (*P. juliflora*), May 12 to 16. No larvæ were found. On May 28 specimens were swept from alfalfa, which I cannot distinguish from this species.

*Tuponia*, n. sp.

A single specimen of a bright green capsid with the tips of the hemelytra brown, was beaten from *Larrea mexicana* May 15. It is about 5 mm. long.

*Triphleps insidiosus*, Say.

Swept in numbers from alfalfa May 12 to 28.

## HEMIPTERA-HOMOPTERA.

The following named species, when not otherwise stated, were also determined by Dr. Uhler:—

For notes on several new species, and one new genus of *Coccidae* see Bulletin No. 7 of the New Mexico Agricultural Experiment Station, June, 1892.

*Pemphigus populi-ramulorum*, Riley.

This twig gall is found on our cottonwoods (*Populus fremontii*). Green galls were found, June 29, which contained inside small lice with cottony coverings. Winged specimens issued from the gall July 5. Determined by Dr. Riley from galls.

*Pachypsylla venusta*, O.-S.?

Petiole galls were found at bases of leaves of *Celtis occidentalis*

(hackberry) at Riley's ranch in the Organ Mts., May 14, which exactly resemble those of this species so far as I can determine. The galls were at that date, from one-third to one-half of an inch in diameter; and the eggs were apparently just hatching, or about to hatch. The tree was determined by Mr. W. H. Evans.

*Psylla*, n. sp. (?)

Adults and larvæ of a psyllid were beaten from mesquite (*P. juliflora*) May 14 to 16. The adults are greenish or yellowish, with brown at the extremity of the wings. The larvæ are entirely green.

*Cicada montezuma*, Dist.

This cicada was noticed to be very numerous on the mesas and plains from May 23 to 31. They seem to frequent especially the plants of *Yucca angustifolia*. On May 24, while riding on horseback, I was quite sure I observed one specimen with its proboscis thrust into a leaf of this *yucca*. It is very probable that this cicada oviposits in the leaves of this plant, since it seemed to have such a decided preference for it. I am quite sure it also pierces the leaves and stalk for food. The specimen referred to above was motionless, and evidently feeding. A cicada was heard on the mesa May 17. It was either this species or the next, but was not captured.

*Cicada ochreoptera*, Uhler.

This species was found May 27 on mesa near the college. A pupa skin was also found there. On June 9 it was found very numerous on pear trees, and I was told that in former years it had damaged many of the trees by ovipositing in the twigs quite extensively. I have also found its work on twigs of young plum trees, which had been damaged by it, causing the terminal half of the twigs to die. On Feb. 4 a cicada larva, probably this species, was dug up about the roots of a young apple tree in Mesilla. It was about half an inch long, and was found at a depth of about eight inches. This cicada seems rather confined to the valleys, while the preceding and larger species is only found on the mesas and plains.

*Stictopelta marmorata*, Goding MS.

This tree-hopper was noticed July 8 on mesquite (*P. juliflora*), in some numbers. It was also previously noticed on weeds. Determined by Dr. F. W. Goding.

*Publilia modesta*, Uhler.

Adults beaten in some numbers from flowers and foliage of mesquite

(*P. juliflora*), May 10 to 12. The hemelytra are yellow, mottled with brown. A specimen swept from alfalfa May 9 is determined by Dr. Uhler, with a query, as this species.

*Cyrtolobus annexus*, Uhler.

Quite a number of this small brown tree-hopper were beaten from flowers and foliage of *P. juliflora* May 10 to 12. Two larvæ, apparently belonging to this species, were beaten May 10. The larvæ are also brownish.

*Stictocephala inermis*, Fab.

Quite numerous swept from alfalfa May 9 to 28. The adults vary from wholly green to largely reddish on upper portions. No larvæ found.

*Gorgora atlas*, Goding.

Adults beaten, May 13 to 15, from twigs and leaves of *Larrea mexicana*. Larvæ were beaten May 15. The adults are of a rich dark brown colour, and peculiar form. The larvæ are greenish. Both adults and larvæ are not readily dislodged from the *Larrea* twigs or leaves, and the adults rarely take wing. This was formerly determined by Dr. Uhler as *Centrodontus biundulatus*, Uhl. (prob. MS.). A specimen was sent to Dr. Goding for insertion of the species in his catalogue, and he wrote me that he had already described it as above, under a new genus.

*Typhlocyba vitifex*, Fitch.

I notice in Bulletin 19 of the Colorado Station that specimens of the vine leaf-hopper, as it exists in Colorado, have been sent by Professor Gillette to Professor Osborn and Mr. E. P. Van Duzee, who have determined it as *T. vitifex*, Fitch. Our species in New Mexico is apparently the same. I had always noticed the marked difference between this and *T. vitis* in the markings of the hemelytra, but from the fact that many authors accepted these as varieties of one species, I had preferred to consider our form as a variety of the eastern one. Our form does not possess the black spots at base of scutellum, as in var. *coloradocensis*, Gillette. The larva is pale yellowish, with four black spots on the thorax.

*Agallia 4-punctata*, Prov.

This small, short, grayish leaf-hopper was swept in large numbers from alfalfa May 9 to 28. Larvæ were swept May 12 to 28. *In coitu*, May 28. The larvæ are also grayish.

*Gypona angulata*, Spang.

Several of this species were swept from alfalfa May 12 to 28. It is

light green in colour, and about 8 mm. long. It probably punctures the alfalfa.

*Platymetopius acutus*, Say.

Swept from alfalfa May 12. It is small, brownish or grayish in colour, with pointed head.

*Oecleus decens*, Stal.

Found, May 15 to June 2, on leaves of both *Yucca angustifolia* and *Y. macrocarpa* (?), in which its egg-punctures were very numerous.

#### THYSANOPTERA.

The following species were determined by Professor H. Osborn:—

*Thrips tritici*, Fitch.

Swept in great numbers from alfalfa May 12 to 28. It undoubtedly does much harm to the plant. The same species was also beaten in countless numbers from mesquite (*P. juliflora*), May 16.

*Thrips*, sp. (?)

On May 5, 1891, some curious cluster-like galls were noticed on our cottonwoods (*Populus fremontii*). At first they were noticed only on staminate trees, and consisted of clusters of staminate flowers reverting towards a leaf-development. More staminate galls were found on May 7, and also two or three pistillate clusters. On all of these gall-clusters there were present large numbers of an immature thripid, which Professor Osborn says appear to be different from *Thrips tritici*, and possibly belong to a different genus. Whether this thripid has anything to do with these abnormalities must be proved by future investigation. It did not seem to be found on the foliage, but was perhaps found on all the flowers.

*Colcothrips trifasciata*, Fitch.

Swept from alfalfa May 28. Doubtless causes more or less injury, though it was by no means so numerous as *Thrips tritici*.

#### ORTHOPTERA.

*Homcogamia*, n. sp.?

This is a whitish roach which is sometimes attracted to light in the evening, if I remember rightly. It is quite different in appearance from its eastern allies. Determined by Prof. Bruner.

*Ceuthophilus pallidus*, Thos. (?)

This is a white cricket which was found, June 10 to 27, in houses eating holes in lace curtains and other fabrics. It is reported to cause

much damage in this way. Prof. Bruner writes that it does not quite agree with Thomas's description.

*Acridium shoshone*, Thos.

For a week or two during the first part of July, I noticed the mesquite (*P. juliflora*) to be greatly infested with this large greenish locust, which was so numerous as to almost defoliate some bushes. On July 14 many nearly leafless bushes were seen, from which, on one's approach, would fly swarms of these locusts.

*Melanoplus*, sp.

A number of specimens of our ordinary species of *Melanoplus* were put in a breeding cage with earth June 28 and 29. On July 24 the cage was full of young locusts. The old ones had been transferred to another cage a couple of weeks before. No eggs were taken up with the earth put in the cage, since this was dry sand which had been carefully looked over.

*Boëtettix argentatus*, Bruner.

This locust was found in large numbers on *Larrea mexicana* July 17, 1891, and on no other plant. It is of a beautiful rich green, variegated with velvet-brown, black and silvery-white, and apparently lives only on the *Larrea* on the mesas. Its colour assimilates well with the peculiar green of the *Larrea* leaves. On May 13, 1892, I found on *Larrea* some very small locusts of a general greenish colour, which I am quite sure are the larvæ of this species. The creosote bush is in all probability the food-plant of this locust. Determined by Professor Bruner.

#### LEPIDOPTERA.

*Synchlœ crocale*, Edw.

The red and black, more or less spiny caterpillars of this butterfly were found, about June 5, on *Helianthus*, sp. They live in colonies. The last of June they were not to be found. Again, on July 28, a good number were found and transferred to a breeding-cage, in which they pupated July 30, suspending themselves from the top of the cage inside as chrysalides. A half dozen imagoes issued August 3. This butterfly is, therefore, two-brooded, and very likely three-brooded. Determined by Mr. W. H. Edwards.

*Triptogon modesta*, var. *occidentalis*, H. Edw.

A large, light green sphingid larva was found, August 29, on the cottonwood (*Populus fremontii*). On being placed in jar it immediately went into the earth. The imago of this species issued March 25 following. Determined by Dr. J. B. Smith.

*Sannina*, sp. (?)

On July 7 a great number of pupa skins of what seemed to be an Egerian were found sticking out of the ground near roots of mesquite (*P. juliflora*), on the mesa near college. The perfect insects had all emerged. Digging in the ground failed to disclose any pupæ. I believe this is a scsiid which bores the mesquite roots.

*Thyridopteryx*, sp.

Our native bag-worm is found here principally on small trees of black locust (*Robinia pseudacacia*), which have been brought in. It is also found on apple, and I have found its bags on tornillo (*Prosopis pubescens*). The bags of those on locust are woven on the outside with the leaf-stems of the locust; those on tornillo have the thorns of the tornillo beautifully woven in. A large number of bags cut open, March 15, 1891, revealed only larvæ, which are thick-bodied, brown or black, and an inch or more in length. Through September it was noticed that many of these larvæ, with their cases attached, were crawling on the ground in the vicinity of locust trees. October 5 a large number of these were placed in a breeding cage. They crawled to the top of the cage, and there fastened their bags by spinning a small quantity of silk. In this suspended condition they passed the winter. Nine male moths issued from May 24 to June 1, 1892. The males are of a soft, light, brownish colour, and possess remarkable genitalia. The pupa skins were usually almost entirely extruded from the bag, showing that the pupa works itself nearly out, only retaining its hold by fastening its extremity into the silken lining of the bag near the lower orifice. The adult females may or may not be fertilized in their bags. All the females I have observed were found to have dropped from the bags to the earth of the cage. Some were simply a skin stretched over a mass of eggs, indicating that fertilization had been accomplished, while others showed no such indication. Four females issued from their bags, as well as their pupa skins, May 27 to 31, and were found upon the earth. The female is almost entirely whitish, and grub-like in appearance except the head and genitalia. There are some rings of brownish hair near the posterior extremity of the body. June 9, on cutting open the remaining bags, a live male pupa was found, several larvæ, and an adult female. The latter was dead and contained eggs apparently half formed, as though developed to a certain stage but not fertilized. In one bag, with a dead larva, there was found the puparium of a tachinid parasite with the contents dead and more or less decomposed.

*Hemiteuca juno*, Pack.

On June 15, 1891, a number of large, spiny, warted bombycid larvæ were found on willow (*Salix*, sp.). They were nearly full grown. June 24 to 30, the same larva was found on cottonwood (*Populus fremontii*).



One changed to a pupa in ground July 6, and another was at that date burrowing in the earth. The two pupæ were sent to Dr. Packard, who wrote me under date of April 20, 1892, that one pupa had disclosed a female moth, which proves to be probably this species. The other pupa was a male and had not yet burst. May 22, 1892, half-grown larvæ, apparently this species, were found on willow. May 31 larger specimens were found on cottonwood (*P. fremontii*).

*Eucaterpa variaria*, Grote.

This moth was bred from thin net-like cocoons found on terminal shoots of *Chilopsis saligna*, August 25, the moths issuing Aug. 28. The cocoon is very thin, formed of silk, with the nearest leaves fastened to it on the outside. (See *Psyche*, April, 1892.) The moth is silvery, speckled with blackish. I have noticed the *Chilopsis*, through September and October, both near Mt. Picacho and about the entrance to Soledad Canon, to be full of the empty cocoons of this moth. A tachinid was bred from the cocoons about Sept. 5. (See *Psyche*, l. c.) Determined by Dr. Skinner.

#### HYMENOPTERA.

*Andricus*, sp. (?).

While looking over, in March, specimens of plants collected the previous summer, Prof. Wooton handed me some scrub oak leaves, one of which possessed on the underside a reddish, woolly, hymenopterous gall. Each section of the gall contained a perfect gall-fly, which had transformed within, but had been unable to escape while the plant was in press. Determined by Dr. Riley. The oak is *Q. undulatus* var. *wrightii*; determined by Mr. W. H. Evans.

*Synergus*, sp. (?).

Scrub oaks (*Q. undulatus* var. *wrightii*) near Riley's water in the Organ Mts. were found hung full of a large and very hard twig-gall about the size of an apple. From a large gall which was brought home to breed the flies, there issued, from April 6 to 20, about two dozen gall-flies. The gall was 2½ inches in longest diameter, and 2 inches in shortest. It contained twenty-three exit holes April 20. The flies are brown or blackish, with hyaline wings. Determined by Dr. Riley.

*Decatoma*, sp. (?).

From the last mentioned gall there also issued, on April 20 and May 19, two apparent inquiline of this genus. They are of a brownish flavous colour, and the eyes are of a beautiful light carmine in life. Determined by Dr. Riley.

*Chalcididæ* (?).

Prof. Wooton handed me in April a pod of a native species of *Lotus*, with some chalcid (?) flies which had issued therefrom in his herbarium. The pod is very small, and the plant was collected the preceding June. The flies are black, and several holes in the pod show where they had issued.

A LIST OF THE BUTTERFLIES FOUND AT MARSHALL,  
MISSOURI, AND VICINITY.

BY OLIVER J. STALEY.

Marshall is the county seat of Saline county, about twenty miles south of the Missouri River and eighty-nine miles east of Kansas City, and situated among woods and fields; on the west and south open farming country, and on the east and north for three or four miles woods.

I have been collecting here for three years, and believing that a list of butterflies which are found here may be interesting to others I present this list.

By vicinity I mean five miles from town in any direction.

*Danaïs archippus*, Fab.

This is about the most common butterfly. I have taken it from April to November. *D. berenice* I have never found here.

*Euptoieta claudia*, Cram.

Rare; have taken but four or five specimens. Found chiefly in July.

*Argynnis cybele*, Fabr.

This is the only species of *Argynnis* which I have found here, and usually it is common, but last year (1891) I only saw one specimen. It is here from April to the middle of October.

*Phyciodes nycteis*, Db.-Hew.

I have taken a number of specimens, but it cannot be said to be common. They are found here during the summer months.

*Phyciodes tharos*, Dru.

This species is common from the middle of April to October, and may be taken in almost any numbers.

*Grapta interrogationis*, Fabr.

Both varieties are very common, but *Umbrosa*, Lint., most so. I have never seen any later in the fall than the last of October, which is the month in which most of our butterflies disappear.

*Grapta comma*, Harr., var. *Harrisii*, Edw.

One specimen taken in September near Shackelford, about five miles west of here.

*Grapta progne*, Cram.

This is found all through the summer, but is most common during September.

*Vanessa antiopa*, Linn.

Very rare ; have seen but three specimens, one in March, one in July and one in November.

*Pyrameis atalanta*, Linn.

Very common from April to October.

*Pyrameis huntera*, Fabr.

The least common of its genus but not uncommon, and is found from May to October.

*Pyrameis cardui*, Linn.

Very common during the same months.

*Junonia cœnia*, Hbn.

Uncommon, but a few specimens seen every year from July to October.

*Limenitis ursula*, Fabr.

Not uncommon from May to October.

*Limenitis dissippus*, Gdt.

Found mostly in August around maple trees ; not uncommon.

*Apatura celtis*, Bd.-Lec.

Not common and is found in numbers only in a yard in town which has a hackberry tree. August is when most are seen.

*Debis portlandia*, Fabr.

Common all through the summer months.

*Neonympha eurýtris*, Fabr.

. Common from May to September, and is found chiefly near the bottom of gullies which have grassy sides.

*Satyrus alope*, Fabr., var. *Olympus*, Edw.

Very rare ; have seen but two specimens.

*Libythea bachmani*, Kirtl.

Usually not uncommon through the summer months.

*Thecla melinus*, Hbn., var. *Humuli*, Harr.

Very rare ; have taken but one specimen.

*Feniseca tarquinius*, Fabr.

Very rare ; took one specimen, somewhat broken, in an opening in the woods in September.

*Chrysophanus thoe*, Bd.-Lec.

Rare ; a few specimens were captured by a friend west of Marshall in September.

*Lycaena pseudargiolus*, Bd.-Lec.

The form *Pseudargiolus* is very rare; found mostly in July and August.

Var. *Violacea*, Edw.

This form is common and seems to be found at all times through the spring and summer.

Var. *Neglecta*, Edw.

This also is common and most so during the summer months.

*Lycaena comyntas*, Gdt.

Common, and is found as late as October.

*Lycaena isola*, Reak. or *Alce.*, Edw.

I have taken a few specimens but only in October; have not seen anything of them at any other time.

*Pieris protodice*, Bd.-Lec.

Common through the summer.

*Pieris rapae*, Linn.

Too common from April to October.

*Nathalis iole*, Bdv.

Rare; found only in September.

*Colias eurhytheme*, Bdv.

Very common, from April to November; have taken a few Albinos of this species in October.

Var. *Keewaydin*, Edw.

Not uncommon; a few taken in August, but most in latter part of September and October.

*Colias philodice*, Gdt.

This is our most common butterfly, and is found from early in April to middle of November. It is more common than *C. eurhytheme*.

*Colias caesonina*, Stoll.

Common through summer months.

*Terias nicippe*, Cram.

Rare; have taken but one specimen, but that was perfectly fresh; October.

*Terias lisa*, Bd.-Lec.

Common, but most so in September and October. Have taken white females of this species.

*Papilio ajax*, Linn.

Not uncommon in variety *marcellus*, Bdv., but *telamonides* is rare. This species I found very hard to capture on account of the colour and the skill they have in dodging the stroke of the net.

*Papilio turnus*, Linn.

Common all through the summer.

*Papilio cresphontes*, Cram.

Common from April to September.

*Papilio asterias*, Fabr.

Common through the summer.

*Papilio troilus*, Linn.

From April to October may be seen; not very common at any time.

*Papilio philenor*, Linn.

Common; found from April to middle of October.

*Ancyloxypha numitor*, Fabr.

Not uncommon in the fall.

*Pamphila zabulon*, Bd.-Lec.

Common.

*Pamphila huron*, Edw.

Have taken a few specimens in October.

*Pamphila peckius*, Kirby.

Common in latter part of summer.

*Pamphila cernes*, Edw.

Common; most so of its genus; found all through summer and fall.

*Pamphila verna*, Edw.

Nearly as common as "*cernes*", and found with that species.

*Pyrgus tessellata*, Scud.

Common in October—not very much before.

*Nisoniades juvenalis*, Fabr.

Common on flowers in September; seen occasionally during the summer.

*Pholisora catullus*, Fabr.

Not uncommon; found principally on flowers.

*Eudamus bathyllus*, S. & A.

Rare. I have only found this east of Marshall, along the C. & A. R. R., and only in October.

*Eudamus tityrus*, Fabr.

Common all through summer.

*Paphia troglodgta*, Fabr.

Not uncommon; mostly seen in September, and delights in resting on dead brush, where it may be easily taken.

*Callidryas sennæ*, Linn.

Rare through summer, and very hard to capture; but in latter part of September is common, and while resting on flowers may be taken with the thumb and finger.