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NOTES ON WALKER'S TYPES OF SPILOSOMA CONGRUA, AND A FEW OTHER TYPES IN THE BRITISH MUSEUM.*

BY HENRY H. LYMAN, MONTREAL.

Having arranged for a two months trip to Europe during the past summer, I determined to visit the Natural History Branch of the British Museum, to endeavour to clear up the doubt surrounding Walker's *Spilosoma Congrua*, taking with me a number of specimens of *S. Antigone*, Strecker; a pair of the heavily-spotted Gomin form of *Spilosoma*, which Dr. Fyles calls *Cunea*, lent to me by Mr. Winn; a typical female specimen of *S. Prima*, kindly given to me by Mrs. Slosson; and a small series of *Hyphantria Cunea*, Drury. I reached London late on the 26th June, but on the morning of the 29th received a cablegram which necessitated my immediate return home. After making my arrangements to sail from Liverpool on the 30th, I found I had a few hours to spare, and so paid a very hurried visit to the Museum, and was shown what was supposed to be the three types of *Congrua* by Sir George Hampson, who kindly remained after the closing hour to accommodate me.

I had not sufficient time to make any attempt to verify these types by comparing them with Walker's original description, or that subsequently made by Grote & Robinson, or by looking up the register of acquisitions, and as Sir George Hampson seemed quite positive that there could be no mistake, I accepted his dictum. I would call attention to the note published by Mr. A. G. Butler in 1875, to the effect that the only specimens then representing *Congrua* in the British Museum collection were a presumably female specimen of *S. Virginica*, without abdomen, and what he believed to be a male variety of *Hyphantria Cunea*. The three specimens shown to me I found to be:

*Read at the annual meeting of the Entomological Society of Ontario, Nov., 1900.

(a) A male specimen of *S. Antigone*, Strecker, presumably of the type which Dr. Fyles described under the letter f.

(b) A female specimen of the heavily-spotted Gomin type of *Spilosoma*.

(c) The specimen of *S. Virginica* without abdomen, as described by Grote & Robinson.

On my return to Montreal, I looked up the description given by Grote & Robinson of the types *a-b*, to which they restricted the name *Congrua*, as quoted by me (CAN. ENT., XXXII., 123), and saw at once that there must be some mistake, as they described the type *b* as: "Primaries with but one or two dots, almost immaculate. Secondaries immaculate in either sex." I therefore wrote to Sir George Hampson, who admitted that the heavily-spotted specimen was probably not one of the types of *Congrua*, especially as he found that the locality label on the pin was New York, while the types were said to have come from Georgia. I only mention this to show how necessary it is to "prove all things," as we are exhorted to do by the apostle. Subsequently I was able to return to England for a brief visit, and shortly before my return home spent two or three hours at the Museum, and made an exhaustive examination of the specimens of *Spilosoma* and *Hyphantria*, and came to the conclusion that type *b* must have been destroyed, as I could find no specimen in the collection which would at all answer the description given by Grote & Robinson. The type specimen *a* is numbered 947, and is shown both by the date upon the label and by the Register to have been acquired on 19th June, 1839, at the sale of Mr. Milne's collection, at which a considerable number of specimens were obtained. It is entered in the Register merely as *Arctia*. It expands about 1⅞ inches, and answers fairly well to the description given by Messrs. G. & R.

Type specimen *c* is a rather large specimen of *S. Virginica*, expanding about 1⅞ inches, and is presumably a female, but the abdomen is missing. This specimen is very lightly marked, having only a black point on upper side of fore wing at lower angle of cell, and a black spot on the middle of the discocellular vein of hind wing below. The number on label is 937, and is entered as *Arctia* simply, and was received at the same time as the type *a*.

The question now arises as to the use or suppression of Walker's name, *Congrua*.

Sir George Hampson has informed me, both orally and by letter, that he regards the name *Congrua* as a synonym of *Virginica*, and intends to refer it in this way in his forthcoming work, and to retain Strecker's name, *Antigone*. In order to make this matter clear, it is necessary to have Walker's description before us, and I therefore reproduce it.

"White. Tarsi with black bands. Fore coxæ and fore femora luteous, with black spots on the inner side; fore tibiæ striped with black on the inner side. Male.—Head and fore part of the thorax with a slight testaceous tinge. Fore wings with four oblique, very imperfect and irregular bands, composed of pale brown dots. Length of the body 6–7 lines: of the wings 16–20 lines, *a–c* Georgia. From Mr. Milne's collection." Now, Sir George Hampson's contention is that the first part of the description down to the word "Male" applies only to the specimen of *Virginica*, and that therefore the latter, as there were at least two distinct species included under the name, should be regarded as the type of *Congrua*. With this contention, though sorry to differ from Sir George, I am unable to agree for the following reasons:

In the first place, I contend that an author's description must be taken as a whole, and not split up into parts, and that to give the first line of a description priority over the second is carrying the doctrine of priority much further than I, at least, am prepared to carry it.

In the second place, I contend that the first part of the description applies to both types. As both are white moths, neither is yellow, brown or any other colour, and probably to save himself a little trouble, or possibly merely to give variety to the form of his descriptions, Walker gave first the characters applying to both the supposed sexes, and then indicated the points in which one sex, in this case the male, went beyond the description so far given.

But there is a very important point in this connection which Sir George appears to have overlooked, and that is that type *b* has disappeared.

Now, as this was also a female, and, according to the description of Messrs. G. & R., must have been very close in appearance to the *Virginica* type *c*, though not that species, it seems highly probable that it answered as closely as the specimen of *Virginica* to the first section of the description, and, hence, even on Sir George's theory, would be equally entitled to rank as the primary type. Now, while it is impossible to be certain what type *b* was, still, from the fact that an entomologist of Mr. Grote's ability regarded it as of the same species as type *a* and different

from any species of *Spilosoma* known to him up to that time, it seems in the highest degree probable that it was a typical lightly-marked female of *Antigone*, in which case it seems to me that Sir George Hampson's contention would entirely fall to the ground. In the third place, Messrs. Grote & Robinson published their description of the species in 1868, retaining the name *Congrua* and referring type *c* correctly to *Virginica*, which should certainly be allowed weight, as all difficulty was thereby cleared up, the name *Congrua* being restricted to a single valid species. And, lastly, it is certain that the species described by Strecker in 1878, ten years after Grote & Robinson's description appeared, had been standing under the name *Congrua* in a great national museum since 1855, that is, for twenty-three years, before it was redescribed by Strecker.

Under these circumstances, I contend that the name *Congrua* should be used for this species, and the name *Antigone* be referred as a synonym. Before leaving this subject, I may mention that Sir George Hampson has informed me that as both this species and *Prima* have the claw on fore tibiæ, they belong to the genus *Estigmene*, Hübn., = *Leucarctia*, Pack., and not to *Spilosoma*.

In regard to the forms which Walker referred to *Cunea*, it is impossible to be certain, for while there are in the collection quite a number of specimens of this species, a good proportion of these have been received at later dates than those referred to by Walker. But of one thing we can be certain, and that is, that so far at least as the males go, he must have referred to *Punctatissima*, and it is a remarkable fact that in the collection there are no less than eight specimens of this species (7 ♂ and 1 ♀) having the hind wings more or less spotted, though in two males the spots are barely perceptible. But Walker's description of the female as "Hind wings with some brown submarginal spots," was probably based upon the one specimen of the heavily-spotted Gomin form of *Spilosoma*, or, I suppose, I should say *Estigmene*, which was entered in the Register, under number 950, as *Arctia Cunea*, and as received on 19th June, 1839, from Mr. Milne's collection. Another specimen, No. 951, was entered under the same name, but there is only the one specimen of the Gomin form in the collection.

Sir George Hampson called my attention to a specimen which he said agreed exactly with Walker's type of *Spilosoma Mutans*, which is in the museum at Oxford, and which specimen is only a very ordinary form of *Cunea* or *Punctatissima*. Sir George also showed me Walker's type of

Cynia Dubia from Hudson's Bay, and there would seem to be no doubt at all that it is a drab-coloured variety of *Leucarctia Acræa* ♀, and there are also in the museum three other very similar females from the U. S., the only noticeable difference being that in Walker's type the wings are a little shorter in proportion to width, and that the veins are light-coloured. Sir George Hampson also called my attention to the fact that American entomologists have also been in error in referring *Platarctia Parthenos*, Harris, as a synonym of *Hyperborea*, Curtis, as these species are distinct, the latter appearing to be the American representative of *Hyphoraia Lapponica*, Thunb., and Harris's name should, therefore, be restored. I cannot understand how *Parthenos* was ever placed as a synonym of *Hyperborea*, as Curtis's description does not at all fit any specimen of *Parthenos* which I have ever examined.

Postscript.—As this paper contained criticisms upon unpublished and privately-expressed opinions of Sir George Hampson, I did not feel that I could publish it without referring it to him. Sir George replied that I had not stated his views quite correctly, and wrote: "I maintain that Walker originally wrote his description from the ♀ *Virginica* only, and that, afterwards finding two other specimens before publication, he added to his description; otherwise, he would have described the male first, as was his custom. The ♀ *Virginica* is the only one of the three to which the first part of the description applies, and is, therefore, Walker's type (*a*)—not (*c*) as you make it. The missing type (*b*) will not fit in with this first part of description, *vide* Grote's description of it, nor does the other specimen (*c*) now in the collection. Therefore, the ♀ *Virginica* is the type of the species."

To this I reply that the two remaining types reached the museum from the same source and on the same day, viz., 19th June, 1839, as shown by the Register, and were apparently so near together in the box in which received, that in numbering them one was numbered 937 and the other 947. The number of the missing type cannot be determined, but it was received on the same day. These specimens were, therefore, in the museum for sixteen years before being described, and, as they were of the same genus and from the same country, must have been kept together, and so have been before Walker when he was working on the group.

Walker does not use the word female at all, which shows that he considered the first part of the description applicable, so far as it went, to both sexes. Sir George says that it only fits the specimen of *Virginica*,

but it does not even fit it decently, as it makes no mention of the black spots on the wings of that specimen.

I did not, as suggested, transpose the designating letters of the types or choose them to fit in with any theory. I accepted them as used by Grote & Robinson (Vide CAN. ENT., XXXII., 123), and it must be remembered that these gentlemen made their examination of the specimens in Walker's presence, and presumably in consultation with him and with his sanction, and it is hardly conceivable that Walker would have called the two female types (*a*) and (*b*) and the male one (*c*). The missing type *b*, a ♀, as described by G. & R., must have come about as near to the description as the *Virginica* does.

Under these circumstances, I think it will be generally conceded that the name *Congrua* should stand.

Perhaps I have devoted too much space to this question, but I think that the correct application of one specific name is quite as important as that of any other.

NOTES ON THE OCCURRENCE OF LEPIDOPTERA, ETC., IN SOUTHERN MANITOBA.

BY E. FIRMSTONE HEATH, CARTWRIGHT, MAN.

A greater contrast between the last two seasons—those of 1899 and 1900—could hardly have obtained. The spring of 1899 was unusually wet, and the consequence was that the Manitoban prairie flea took refuge in our houses out of the rain, and life became almost unendurable between the armies of fleas inside and the clouds of mosquitoes without. So bad were the latter that, seasoned as I am to their attacks, all my night collecting was done under difficulties, for after covering myself as far as possible (rather a nuisance on a hot, close night), I had to bathe every square inch of skin that had of necessity to be exposed, with a strong solution of alum. This last year, through the unusually dry spring and early summer, to be bitten by a mosquito was quite an event. The fleas too took advantage of the fine, dry weather, and resumed their usual prairie life, and left us in our houses in peace. It may not be generally known, but some parts of the country swarm with fleas, while in others they are hardly to be found. In the olden days, before the railways, when we had to fetch our supplies from the nearest towns—Emerson, in my case—by waggon, camping on the prairie as we went along, I was several times cautioned by old settlers on no account to camp on certain

spots, or in certain localities, if it could be avoided, by reason of the swarms of fleas that had taken up their habitation there. These places were invariably those that would be selected as resting places, being dry, sandy or gravelly spots. Still, Manitoba cannot by a long way equal Southern Europe for fleas.

To my surprise, I did not take last spring (1900) a single Tæniocampa, or any of the other early species which are usually to be seen about the catkins of the white poplar *(Aspen tremuloides)*, in some numbers, in the evening; but the bloom of the wild plum was visited during the daytime by *Hemaris thysbe* and *tenuis* in more than average numbers, and at night, *Deilephila gallii*, *Mamestra Farnhami*, *Cucullia intermedia*, *Plusia simplex* were in quantity about the wild currant bloom; but hardly anything came to sugar on the trees, the evenings shortly after sunset becoming very chilly.

In 1899 the genus Acronycta came out in great force, and I secured at sugar several species new to my collection. This last season hardly an Acronycta was to be seen, its place being taken by the genus Agrotis (with the many sub genera into which that old genus has been subdivided). Few as the Acronycta were, I secured a specimen of one new to me, *A. morula*, G. & R. Most of the most dangerous species, from an economic point of view, were strongly represented, and if a tithe of the produce survives the winter, cutworms of all descriptions will be rampant this spring.

Carneades tessellata, Harris, and *pleuritica*, Grt., which for a long time were only represented by one or two examples in my collection, were fairly numerous, and I secured a nice series of each. From among them I picked out one or two that looked decidedly different, and submitting one to Dr. J. B. Smith, he pronounced it to be his new species, *nordica*. *Leucania unipuncta*, Harv., has generally put in an appearance in small numbers about August, but this last season it appeared in June on my sugared trees, and continued in numbers until the autumn frosts set in. *Peridroma saucia*, Hbn., and *ypsilon*, Rott, and *Carneades messoria*, Harr., the larvæ of which are so destructive, were all more abundant than usual.

The Sphingidæ, on the whole, were sparingly represented, but *Cressonia juglandis*, of which I did not take in 1899 a single specimen, appeared again at light. Very few Hydrœcia were taken, but among the few were two or three *nelita*, Strecker. Owing to the dry weather in the

early summer, weeds were only an inch or two high, when in other years they would be as many feet, and I am afraid that the larvæ of some of the species of this genus must have been put to some inconvenience by lack of food. I have never seen so few Catocala come to sugar as last season, and of *grynæa*, of which, in 1899, I might have taken dozens of specimens, I did not see one. *Plusias* made a very poor show, and the autumn species, *Xylina* and *Calocampa*, were hardly represented.

Although, in point of numbers, both of species and genera, last year is not to be compared with the previous one, still I was so fortunate as to add a few new things to my collection, including a specimen of *Euthyatira pudens*, Grt.; *Platysenta atriciliata*, Grt.; *Cleoceris curvifascia*, Smith; *Tæniocampa peredia*, Grt., etc., and several Geometers which await identification.

The dry weather quickly began to tell upon the butterflies, though the earlier ones appeared in their usual numbers. I certainly noticed a good many *whites*, but thinking they were all *rapæ*, I did not net any, and I have no small-boy's catch to fall back upon like my friend, Mr. Hanham, so I cannot say whether or not *napi* was among them. The *blues* were not in anything like their usual numbers. I did not see a single *Thecla titus*, generally plentiful; only one *Thecla strigosa*, and one *T. calanus*. *Chionobas varuna*, on the other hand, was more plentiful than usual. I took *three*, and saw several more, *one* being usually the extent of my catch annually. *Pyrgus tessellata* was not seen, and the late-flying Pamphilas were hardly noticed.

Cutworms did great damage to garden stuff generally, but the Colorado beetle, which did a good deal of damage in 1899, was not to be seen; the potatoes not being up before July, owing to the drought, escaped its attacks. No injury to grain from Hessian fly, or wheat midge, came under my notice. In the damp spring and summer of 1899 I had a good deal of damage done by the larva of *Dermestes talpinus*, Mann. (?), attacking moths while on the setting-boards. I need not say that if there happened to be on a board a moth much rarer than the others, that was the one selected for its attacks. Last year I only caught one, though they had, if in existence, the same chance of being troublesome, and that fellow was feeding on the body of a moth that was new to me, although there were others quite as toothsome-looking specimens on the boards.

A NEW PLANT-LOUSE INJURING STRAWBERRY PLANTS IN ARIZONA.

BY T. D. A. COCKERELL, EAST LAS VEGAS, N. M.

Myzus fragæfolii, n. sp.

"Apterous female and larvæ white or faintly yellowish. Eyes dark brown. Antennæ concolorous with body or faintly brownish; apex of the fifth, the sixth and its spur pale dusky. Tarsi dusky, their apex black.

"Winged female: slightly more yellow, the head, thoracic lobes and sternal plate blackish brown. Antennæ black; the two basal joints of colour of body, or with a faintly dusky tinge. Legs pale dusky; the terminal third or half of the femora pale dusky; apex of tibiæ and the tarsi black. The abdomen is marked with a small, squarish, dusky spot in front of nectaries. Stigma pale dusky, veins black." (Theo. Pergande MS.).

Apterous ♀ 1200 μ long; cornicles 400 μ. Rostrum reaching to insertion of hind legs. Back with capitate hairs (about 65 μ long) *on all the segments*; there are also two capitate hairs on the front, between the frontal tubercles; two at apex of each frontal tubercle; three on gibbosity of first antennal joint, one of them short; one on second antennal joint; one short one about 39 μ from base of third antennal joint. Antennæ 6-jointed, joints measuring as follows in μ: (1.) 90, (2.) 50, (3.) 300, (4.) 200, (5.) 220, (6.) 505, with the basal part, to the notch, 90. Hind legs: femur, 360; tibia, 630; tarsus (excl. claw), 84 μ.

Winged ♀ 1200 μ long; hind tibia 800 μ; antennæ about 1500 μ; eyes prominent, large. Frontal tubercles slightly gibbous anteriorly, the gibbosity about 15 μ high; first antennal joint gibbous in front, the gibbosity rounded and very blunt.

Hab.—Jerome, Arizona, on leaves of strawberry, very abundant, not producing any deformation. Collected Dec. 10, 1900, by Mr. E. L. Jordan, who reported the insect as very destructive the year previous; "they get in the buds and blossoms and destroy the young fruit, and the berry is imperfect when ripe."

M. fragæfolii is noticeable for the abundant development of the capitate hairs in the apterous form, whereby it is allied to *M. ribis* and *M. clæagni*. I am greatly indebted to Mr. Theo. Pergande for the information that it is surely undescribed, and for a description of its colours in life, which I have quoted above. While I have prepared this article in deference to Mr. Pergande's wish, it will be apparent to the reader that the credit for the discrimination of the species is really his.

ON SOME ARIZONA ACRIDIIDÆ.

BY A. N. CAUDELL, WASHINGTON, D. C.

The following species of Acridiidæ were recently purchased by the writer from the collector, Dr. R. E. Kunze, of Phœnix, Arizona. There are thirty-two specimens, representing eleven species, one of which is apparently undescribed, representing a new genus. Several of the species are, for various reasons, quite interesting, and all are herein listed. They are as follows:

1.—HIPPISCUS LEPROSUS, *Sauss.*

Xanthippus leprosus, Sauss. Prodr. Oedip., 92 (1884).

Hippiscus leprosus, Scudd. Psyche, VI., 334 (1892).

One female; Pinal Mts., Gila Co.; July 24, 1900.

This species was determined by Mr. J. A. G. Rehn, of Philadelphia.

2.—TRIMEROTROPIS VINCULATA, *Scudd.*

Trimerotropis vinculata, Scudd. Proc. Bost. Soc. Nat. Hist., XVIII., 270 (1876).

Trimerotropis cincta, Sauss. Prodr. Oedip, 171 (1884).

One male, two females; Pinal Mts., Gila Co.; July 12–18, 1900.

One of the females has the posterior tibiæ very slightly tinged with red.

ARÆOPTERYX, nov. gen.

Head moderately prominent, nearly as wide as the metanotum and distinctly elevated above the pronotum. Antennæ filiform. Eyes subglobular, prominent, quite remote from each other, the space between them three times as broad as the extreme width of the basal segment of the antennæ. Fastigium feebly sulcate, with well-elevated margins, which terminate between the eyes. A moderately distinct median carina extends from the middle of the fastigium to the anterior margin, where it meets with the lateral carinæ, which converge at that point. Lateral foveolæ large, shallow and subtriangular in shape. The frontal costa averages about one-third the width of the interocular space, is sulcate throughout, has moderately-elevated margins and gradually narrows in the upper half to just before reaching the vertex, where it suddenly broadens and then immediately narrows again as it meets the fastigium. Lateral carinæ of the face about as prominent as the sides of the frontal costa and subparallel with them. Thorax transversely wrinkled on the slightly tectate pronotum and longitudinally rugose on the flattened disc of the metanotum. The principal sulcus cuts the thorax before the middle,

making the metanotum nearly a third longer than the pronotum. Median carina distinct but faint on the metanotum, on the pronotum visible only as longitudinal rugosites. Lateral carinæ present only on the metanotum, and there very blunt, scarcely more than rounded shoulders. Thorax obtusely angled behind, in front truncate, but considerably produced in the middle. Lateral lobes subperpendicular, subangulate at the posterior angle. Interspace between both meso- and metathoracic lobes very strongly transverse. Tegmina and wings very long and slender, especially the former, which is nine times as long as the middle breadth. Humeral shoulder slight. Intercalary vein moderately strong, transversing nearly the middle of its area. Posterior femora moderately slender, the dorsal carina considerably elevated.

This genus has a general resemblance to Trimerotropis, Conozoa, Psinidia and Anconia, but differs in some particulars from all of them. It is probably the most nearly allied to Anconia, by reason of the slight development of the median carina on the pronotum, but is readily separated from that monotypical genus by the form of the frontal costa, the rugose metanotum and the more elongate elytra.

3.—ARAEOPTERYX PENELOPE, nov. sp.

One female; Prescott; September 29, 1900.

Head of a uniform reddish brown colour with a number of somewhat minute fuscous spots on the facial carinæ and the margins of the fastigium and frontal costa. Eyes quite prominent, almost globular, not so long as the infraocular portion of the genæ and concolorous with the head. Antennæ black, except the first and second segments, which are light. Thorax reddish brown, with the prosternum pallid. The sides with an oblong black mark extending diagonally across the middle, directed upwards and backwards and terminating before it reaches the posterior border of the metathoracic lobe. This is very probably a variable character, as it differs slightly on the two sides of the present specimen. Elytra more than twice as long as the posterior femora, very slender, gently inclined backwards distally and membranous over most of the apical half. Ground colour a shade lighter than that of the thorax and somewhat irregularly maculate throughout with fuscous, the infuscation being most conspicuous on the humeral angle and an oblong space at the end of the basal half of the costal margin, where it is quite dense. Wings considerably more than twice as long as the greatest width, base reddish pink in colour, beyond hyaline with infuscation along some of the veins

and very slightly infumate on the lower half next the coloured base. There is a long black stigma and an ill-defined tænia extending nearly to the base. Abdomen a little lighter in colour than the rest of the body. Anterior and middle tibiæ twice banded with fuscous and with the extreme tip black, armed below towards the apex with a few sharp black spines. Fore and middle tarsi variegated above, the basal segment pallid with the proximal end black, the second segment wholly black and the terminal segment entirely pallid with the claws tipped with black. Posterior femora slightly hoary on the outer face, very inconspicuously banded on the apical third with fuscous. Inner face black with light crossbars on the apical half, where the fuscous becomes eliminated. Genicular arcs slightly marked with fuscous. Posterior tibiæ and tarsi yellowish, the former preapically infuscated below and armed above with moderately stout spines, eight or nine in the outer series. Calcaria and spines black on the terminal half.

Length of body, 25 mm.; tegmina, 27 mm.; wing, 24 mm.; posterior femora, 12.5 mm. Width of elytra at middle point, 3 mm.; of wing at broadest part, 11.5 mm.

Type No. 5717, U. S. N. M.

Dedicated to my wife, in recognition of her interest and aid in my work.

4.—Anconia integra, *Scudd.*

Anconia integra, Scudd. Ann. Rept. Chief Eng., 1876, 515 (1876).

Two males, five females; Phœnix; April 12—September 29, 1900.

This variable species was described from a single pair collected by Dr. O. Loew in the Mojave Desert, Lower California. Since then it has been reported from Death Valley, California.

The colour of this species varies from an almost uniform greenish yellow to very conspicuously spotted with fuscous on the head, thorax and elytra. The posterior femora are usually distinctly bifasciate above with black. The thorax is sometimes very conspicuously varied above by four cream-coloured marks: two, almost approximate, on the anterior part of the pronotum, and two, divergent and widely separated, on the lateral borders of the metanotum. These markings fade somewhat in drying. The lateral lobes of such marked specimens are pallid along the lower borders and furnished near the middle, in front, with an oblong, similarly coloured mark.

5.—SCHISTOCERCA SHOSHONE, *Thom.*

Acridium shoshone, Thom. Proc. Acad. Nat. Sc. Philad., 1873, 295 (1873).
Schistocerca shoshone, Scudd. Proc. Amer. Acad. Arts Sc., XXXIV., 469 (1899).

Two males; Phœnix, October 8, 1900, and Pinal Mts., Gila Co., July 24, 1900.

6.—SCHISTOCERCA VAGA, *Scudd.*

Acridium vagum, Scudd. Proc. Bost. Soc. Nat. Hist., XVIII., 269 (1876).

One female; Prescott; without date.

7.—HESPEROTETTIX FESTIVUS, *Scudd.*

Hesperotettix festivus, Scudd. Rev. Mel., 60, pl. IV., f. 10 (1897).

Three males, six females; Phœnix; September 29—October 22, 1900.

This species has hitherto been reported only from California and Utah. The specimens from Arizona have distinct red pregenicular annulations on the posterior femora, and there are no blackish genicular crescents, as mentioned in Scudder's description. Mr. Rehn thought they might be an undescribed species, but they too nearly agree with the types of *H. festivus* in the collection of the National Museum to be considered different.

8.—MELANOPLUS DEVASTATOR?, *Scudd.*

Melanoplus devastator, Scudd. (pars.) Proc. Bost. Soc. Nat. Hist., XIX., 285–8 (1878).
Melanoplus devastator, Scudd. Rev. Mel., 196, pl. XIII., figs. 3–7 (1897).

One female; Phœnix; October, 4 1900.

A single female specimen is referred with some doubt to the above species. It seems to belong near the variety *typicalis*.

9.—MELANOPLUS HERBACEUS, *Brun.*

Melanoplus herbaceus, Brun. Bull. Div. Ent. U. S. Dep. Agric., No. 28, 25–6, f. 13 (1893).
Melanoplus herbaceus, Scudd. Rev. Mel., 153, pl. X., f. 10 (1897).

One female; Phœnix; October 9, 1900.

10.—MELANOPLUS RILEYANUS, *Scudd.*

Melanoplus Rileyanus, Scudd. Proc. Amer. Phil. Soc., XXXVI., 7, 32 (1897).
Melanoplus Rileyanus, Scudd. Rev. Mel., 151, pl. X., f. 9 (1897).

One female; Phœnix; September 30, 1900.

11.—MELANOPLUS YARROWI, *Thom.*

Caloptenus yarrowi, Thom. Rep. Geol. Geog. Expl. 100th Mer., V., 894, pl. XLV., f. 5 (1875).

Melanoplus yarrowi, Scudd. Rev. Mel., 369, pl. XXV., f. 2 (1897).

Two males, three females; Phœnix; October 2–10, 1900.

One of the females is very large, the measurements being as follows: Length of body, 35 mm.; tegmina, 26 mm.; posterior femora, 19 mm.

This species was described by Thomas from a single female collected in one of our Western States. The type was afterwards lost, but Scudder has re-identified the species from one male and one female from Grand Junction, Mesa County, Colorado. Thomas's specimen was probably from Arizona, though no definite locality was given at the time.

LECANIUM WEBSTERI, CKLL. AND KING, N. SP., WITH NOTES ON ALLIED FORMS.

BY GEO. B. KING, LAWRENCE, MASS.

IN CANADIAN ENTOMOLOGIST, 1895, p. 255, Prof. Cockerell gave some notes and briefly described a species of *Lecanium*, found by Prof. Webster and others, as *L. ribis*, Fitch. Later, in April, 1899, in "The Industrialist," p. 234–5, he again describes it and gives measurements of the antennæ and legs, and states that Mr. Pergande has some doubt about the identification. In November, 1900, Prof. Cockerell sent me two lots of *Lecanium*, collected by Prof. W. D. Hunter at Ames, Iowa. These I determined as *L. ribis* (based on Prof. Cockerell's notes), and sent a statement of my determination to him. Very soon I received a reply, in which he cited Fitch's description of *L. ribis*, and stated that under the circumstances the species which he called *L. ribis* apparently must be something else, and suggested for it the name *Lecanium Websteri*, based on the species from Ohio, described in "The Industrialist," April, 1899, p. 235. On receipt of this letter, I wrote to Dr. Howard, requesting him, if possible, to let me have some of Fitch's *L. ribis*. His reply was as follows: "Mr. Pergande says that he is unable to decide which of our Eastern species is identical

with *L. ribis*, Fitch. Fitch's type has been destroyed, and there is nothing left but a fragment of the twig on which the species was found, showing only the original size, which must have been between 5 and 6 mm. in diameter. Since Fitch's short description appears to agree with *L. armeniacum*, Mr. Pergande thinks it to be that species, or a pale form of *L. cerasifex*, which is our most common Eastern species." At the same time, Dr. Howard kindly sent me some of Prof. Cockerell's *L. ribis*. These, together with specimens from Dr. Fletcher, P. J. Parrott, and those found by me in Massachusetts, were critically studied.

During the examination of these several lots of scales, it was questioned whether some, or perhaps all, might be very near if not identical with *L. Kansasense*, Hunter. I therefore wrote to Prof. Hunter for some of his species. Without delay, he kindly forwarded one of his type slide mounts, together with some scales *in situ*. These proved to be different from the species described by Prof. Cockerell as *L. ribis*, although in the antennæ and legs there seems to be no specific difference, but in the scale they differ very materially, being larger, very shiny, dark chestnut brown, distinctly pitted, and the texture of the scale much thicker. *L. Canadense*, Ckll., differs in the scale being much larger than *Websteri* or *Kansasense*, smoother, not so shiny, more convex, and not distinctly pitted. The antennæ and legs are larger and stouter, although the formula of the antennæ is nearly the same. *L. armeniacum*, Craw., is another perplexing species, which has practically seven-jointed antennæ, although, however, we find some individuals with only six joints, with the third very long and much resembling those already cited above. The scale of this species is quite large, of a pale brown colour, texture very thin, crowded closely together on the twigs, minutely pitted and not shiny. *Lecanium Websteri*, therefore, will be known by its very small size: 3 mm. long, 2 broad and about 2 high, of a yellowish brown colour; texture thin, not at all shiny, apparently inclined to be much shrivelled, nearly hemispherical in shape and not distinctly pitted, as in *L. Kansasense*, which is its most nearly related species. *L. Websteri* is normally a six-jointed species. In no instance did I find an individual with both of its antennæ to have seven joints. One would be six and the other seven, while it was not an uncommon occurrence to find individuals distinctly six-jointed. This will also apply to *L. Kansasense* and *L. Canadense*. The following measurements in micromillimeters will, it is hoped, assist in the recognition of the various species cited in this paper:

ANTENNAL SEGMENTS OF LECANIUM WEBSTERI.

	1	2	3	4	5	6	7	
Prof. Cockerell's original description of specimen from Ohio.	42	32	99	18	15	33		Formula 316245.
Those received from Dr. L. O. Howard.	36	36	80	16	20	32		Formula 3(612)54.
On mulberry at Kansas. (P. J. Parrott.)	40	40	100	20	20	40		Formula 3(612)45.
On *Celtis occidentalis*, Ames, Iowa. (W. D. Hunter.)	20 20	32 28	92 92	20 20	20 20	52 40		Formula 362(145). " "
On *Acer saccharinum nigrum*, Ames, Iowa. (W. D. Hunter.)	36 32 32	36 32 32	40 76 76	24 12 16	16 20 24	16 40 40	36	Formula 3(712)4(56). " 36(12)54. " "
On Ribes, at Nova Scotia. (Dr. J. Fletcher.)	28 20	40 40	88 44	20 44	24 16	44 20	44	Formula 362154. " (347)2(61)5.
On high-bush blueberry, Lawrence, Mass. (G. B. King.)	40	36	100	24	24	44		Formula 3612(45).
On white birch, Methaen, Mass. (G. B. King.)	40 48	40 44	108 64	24 52	24 80	60		Formula 36(12)(45). An abnormal 5-jointed form.
On *Spiræa*, Lawrence, Mass. (G. B. King.)	40	40	100	20	20	48		Formula 36(12)(45). This had also a 7-jointed individual, 3 divided in the centre.

LECANIUM KANSASENSE.

On *Cercis Canadensis*, Kansas. (Prof. Hunter type sp.)	32	28	76	20	16	36		Formula 361245.

LECANIUM KANSASENSE.

On *Cercis Canadensis*, Kansas. (Prof. Hunter type sp.)	32	28	76	20	16	36		Formula 361245.
On shad-bush, Methuen, Mass. (G. B. King.)	24	40	72	16	12	44		Formula 362145.
	28	40	76	20	16	40		" "
	20	28	92	20	30			An abnormal 5-jointed antennæ, and these have a 7-jointed antennæ.

LECANIUM CANADENSE.

On Ulmus Americana, Kansas. (S. J. Hunter.)	44	40	96	24	28	48		Formula 36(12)54.
On oak, Andover, Mass. (G. B. King.)	48	56	100	20	20	48		Formula 32(61)(54).
Prof. Cockerell's measurements of the 7-jointed form from Maine.	42	32 39	62 98	54	20 22	20 22	40 47	The formula of the 6-jointed form from Maine and Canada: 326154 3(126)54 362145.

LEG OF L. WEBSTERI.

	Coxa.	Femur and trochanter	Tibia.	Tarsus.	
Prof. Cockerell's spec. from Ohio.	99 115	145 149	99	54	
Those from Dr. Howard.	92	160	112	64	
	72	44	24	20	broad.
On *Celtis occidentalis*. (W. D. Hunter.)	80	128	84	60	
On *Acer saccharinum nigrum*. (W. D. Hunter.)	80	120	72	60	
On high-bush blueberry, Lawrence, Mass. (G. B. King.)	80	160	108	70	
	60	48	24	20	broad.

COLLECTING NOTES ON KANSAS COLEOPTERA.—II.

BY W. KNAUS, MCPHERSON, KANSAS.

The past two seasons in Kansas have proved fairly profitable to the collector of Coleoptera. To the plains collector the "open" season for successful collecting extends from April 1st to October 15th. If he is so fortunate as to reside beside or near a wooded stream, his "open" season covers the cycle of the months, as winter sifting proves almost as profitable as collecting during the summer months, especially if he looks after the small things, and he is not possessed of the genuine collector's spirit if he does not look carefully after the minute things in insect life.

My collecting for the past two seasons has been done principally at McPherson, near Medora, Reno County; at Rago, Kingman County; Belvidere, Kiowa County, and at Wallace, in Wallace County; and at each locality something new develops each season. Wallace is always an interesting collecting region, and the collector can count on finding some "good things." Here along the clay bluffs south of the Smoky Hill River, is found during June and July *Amblychila cylindriformis*, Say, the elephant, in size, of the tiger beetle family. Hidden in holes and burrows during the day, they emerge at nightfall and seek for food, dining off the various insects of the region, and themselves proving a dainty morsel for the predatory skunk. I collected at Wallace on July 11th and 12th of this season in company with Nathan Reist, of Lime Rock, Pa., and in two evening's work we were so fortunate as to take eleven specimens of *Amblychila*.* They do not move at all rapidly, but if one emerges from a hole and sees you, it does not take him long to seek protection under ground. In collecting in the semi-darkness you are liable to be deceived by the Buffalo cricket and the slow-moving *Tenebrionid*, *Eleodes longicollis*, both of which forage at night. I have never taken *Amblychila* except at Wallace, but my friend, Claude J. Shirk, found a specimen near the Canadian River, in Hansford County, Texas, the latter part of July.

Another desirable *Cicindelid* found at Wallace was *Cicindela pulchra*, Say. Some fifty specimens were taken during two days collecting. They were found along and near abandoned or little-travelled roads on the upland and towards the top of the clay bluffs along the

*Prof. S. W. Williston, of the State University at Lawrence, Kansas, who was one of the original discoverers of this species at Wallace, tells me that in 1877, while collecting along these bluffs with his brother, he took as many as a hundred specimens in one night. In recent years, however, they have never been taken in any numbers.

edge of the Smoky Valley. Another species taken was *Cicindela micans*, Fab., the green or more rarely blue variety of *punctulata*. They mingle with the *punctulata* in the proportion of about one of *micans* to ten of *punctulata*.

Three species of *Calosoma* were taken: *obsoletum*, Say, on the upland; *triste*, Lec., on the bottom land, and *lugubre*, Lec., in both localities. All are crepuscular and hide during the day. *Obsoletum* were found under boards, cow chips and weeds during the day, but on the evening of the second day the sky became overcast about five o'clock and *obsoletum* suddenly appeared by the hundreds. One could walk along the main travelled road and pick them up every few feet.

Collecting in the Smoky Hill, here a shallow, narrow, rapid-running stream, fed by springs, two specimens of the comparatively rare *Hydrophilus ellipticus*, Lec., were taken. Just above the valley, south of the Smoky at Wallace, the Yucca is abundant. In July the upright stems bear large seed-pods, and among these seed-pods were taken on July 12th over sixty specimens of the beautiful *Clerus Spinolæ*, Lec. Their scarlet bodies were easily discernible, but as they were quick movers in the hot sunshine, it took dexterous work to capture them. Feeding on these Yucca pods were numbers of the large black blister beetles, *Epicauta corvina*, Lec., with an occasional *Macrobasis immaculata*, Say.

Quite rare and usually difficult to take, careful work will disclose each season a few of the handsome *Clerus cordifer*, Lec. They are found on thistles, the sage brush and a few other plants. Beating sage brush and flowering plants enabled us to take a number of *Trirhabda attenuata*, Say. While beating willows for *Poecilonota thureura*, Say, numbers of which can be taken each season, I took in July, 1899, a single specimen of a large Mordellid, *Tomoxia bidentata*, Say. The same species has been taken at Onaga, Kansas, by F. F. Crevecœur. Seven specimens of *Cantharis biguttata*, Lec., were found on flowering plants along the road over the clay bluffs south of the Smoky Hill. The specimens vary much in size and marking, the spot on each elytron frequently being obsolete.

But one species of *Apion* was found at Wallace last season, *Apion varicorne*, Smith. It is a common south-west plains species, being taken at Coolidge, Kansas, and I have received specimens from New Mexico. The large *Curculionid*, *Ophryrastes tuberosus*, Lec., is taken occasionally, and *O. vittatus*, Say, more commonly. *Endalus setosus*, Lec., occurs

rarely, and a single specimen of *Anthonomus hirtus*, Lec., was taken last season. *Anthonomus squamosus*, Lec., was taken in numbers in July.

Collecting at McPherson and vicinity last season developed a number of interesting forms. The first *Cicindelid* observed was a *purpurea*, Oliv., on February 5th. Several specimens of this, together with a few *graminea*, Sch., and numbers of *splendida*, Hentz., were taken in an abandoned sand pit two miles south-east of McPherson during March and the first half of April. The same species, but in less numbers, were found in this locality in September and October. A pair of *scutellaris*, Say, were also taken there the latter part of April. *Splendida* was taken in all its varied forms. Near this same locality early in June numbers of the very small *Apion tenuirostrum*, Sm., were taken feeding on flower catkins; and on the leaves of the water dock growing in the pools of a small creek were found a number of *Anchodemus angustus*, Lec. The electric lights of McPherson attract much desirable material. One specimen of *Apenes lucidula*, Dej., was taken in August. During July and August a few examples of *Helluomorpha bicolor*, Harr., were taken, and in June and July numbers of *Laccophilus 4-lineatus*, Horn, were secured, and a less number of *Eretes sticticus*, Linn. A half dozen specimens of *Dineutes vittatus*, Germ., were taken from the light globes. The specimens were at least a third larger than Pennsylvania specimens of this species. *Pelonomus obscurus*, Lec., were attracted in large numbers by the lights during June and July. One or two specimens each of the *Elaterids*, *Anelastes Druryi*, Kirby, and *Latreillei*, Lec., were taken from the lights late in the season. A rather curious looking *Lampyrid*, *Phengodes plumosa*, Oliv., also occurred in the electric lights the last season. Of the rare *Lachnosternids*, *inversa*, Horn, and *Ulkei*, Smith, were taken in June, probably a dozen specimens in the two species. Late in July two specimens of *Polymoechus brevipes*, Lec., were found in the light globes, the only time I have ever taken this Scarabæid in this State. A specimen each of *Tenebrionid*, *Alphitobius piceus*, Oliv., and *Platydema micans*, Horn, were also taken from the lights. Neither had ever been recorded from the State before. Two specimens of the comparatively rare *Myodites scaber*, Lec., were taken three miles north of the city in June feeding on flowers. Their striking resemblance to a Dipteron would cause them to be overlooked. *Macrops humilis*, Gyll., is not at all a common Curculionid attracted to light, as only a single specimen was found. A few *Endalus setosus*, Lec., turned up this season

in the lights. One specimen of *Balaninus uniformis*, Lec, was also taken at McPherson. A single specimen of *Anthribulus rotundatus*, Lec., was taken early in the spring under a piece of board, the first record of this species in Kansas. *Lachnosterna bipartita*, Horn, occurred in large numbers the latter part of last April, together with a less number of *marginalis*, Lec. Among almost a hundred specimens of *bipartita*, less than a half dozen females were found.

A brief collecting trip October 15th, to the north-western part of McPherson County, resulted in finding some desirable species. Three miles south-west of Marquette, where a stream issuing from the sandstone bluffs feeds a small rivulet, the lichens and ferns growing over the damp sand yielded a half dozen specimens of *Bembidium lugubre*, Lec., and four specimens of a rather rare *Staphylinid*, *Geodromicus brunneus*, Say. Under stones along the margin of the brook were found numerous specimens of *Phænonotum extriatum*, Say, a *Hydrophilid* not heretofore recorded from Kansas. In the pools were found *Agabus semivittatus*, Lec.

The range of sand hills near Medora, Reno County, sustains a large and varied insect family, and each year furnishes surprises to the collector. While walking along the railway from the station to the point where the road cuts through the sand hills, on May 29th, in company with Mr. Reist, two specimens of *Helluomorpha Clairvillei*, Dej., were taken under railway ties. This species is south-eastern, and has never been previously recorded from this State. Near a pile of new railway ties a single specimen of *Trichodes Nuttalli*, Kirby, was found. This species had probably been introduced in the larval state in the ties. *Brachyacantha albifrons*, Say, was taken this year by beating willows; a few specimens only. In the Yucca flowers were taken a single specimen of *Carpophilus melanopterus*, Er., and a few specimens of its variety, *rufus*. This species was also found feeding on Yucca flowers at Rago, in May. Feeding on a species of dock near the sand hills, quite a number of *Lema cornuta*, Fab., were captured. *Lema collaris* was even more numerous. Both are shy and are not easy of capture. A *Lachnosternid*, near *affinis*, Lec., was taken during the early evening at Medora. Feeding on willows were numerous specimens of *Metachroma angustula*, Cr., and *Metachroma parallelum*, Horn. Both are comparatively rare in collections. *Ammodonus fossor*, Lec., has always been a rare *Tenebrionid*, but will not be so in the future. It was the most numerous *Tenebrionid* of the season. It occurs on the bare sand, and is protected by its colour being of the same shade as the

surrounding sand. They were found in almost every depression, and careful looking would show an occasional specimen walking over the surface of the sand with a quick jerking motion. Other cases of almost perfect colour mimicry are furnished by the small *Anthicids*, *Mecynotarsus candidus*, Lec., and *Anthicus pallens*, Lec. They are remarkably quick runners, and almost the exact colour of the sand. The first species was rather common; the other, only two specimens found. Both are Atlantic species, and are taken on the sand dunes of the New Jersey coast. *Oberea pergrata*, Say, is found on the willows, and *Apion segnipes*, Say; *griseum*, Smith, and *occidentale*, Fall., are taken on sunflowers. This season I found three specimens of *Stephanucha pilipennis*, Kraatz, and a dozen specimens of *Cremastochilus nitens*, Lec. *Cotalpa lanigera*, Linn., was common feeding on willow catkins.

A single half day's collecting along the Republican River, near Superior, Nebraska, May 25th, was rewarded by a capture of a number of interesting species. *Bledius ineptus*, Casey, or a species closely allied, is found burrowing in the sandy mud bars close to the river. *Scymnus Phelpsii*, Cr., is a small *Coccinelid*, with elytra almost entirely pale, a single specimen of which was taken by beating. *Mantura floridana*, Cr., was beaten from the willows in small numbers. A single specimen of *Macrorhoptus hispidus*, Deitz, was beaten from willows, as well as a number of *Anthonomus Bolteri*, Deitz.

At Rago, in Kingman County, *Horistonotus Uhlerii*, Horn, was beaten from willows on June 24th. An undescribed species of *Diplotaxis* was also found here. *Strigoderma pygmæa*, Fab., was also found here, the first record of its capture in Kansas. It is an Atlantic coast species from Florida to New Jersey. *Oberea oculaticollis*, Say; *Schaumii*, Lec., and *cana*, Newm., were also taken by beating. A single specimen of *Zeugophora scutellaris*, Suffr., was also taken by beating. *Metaparia clytroides*, Cr., was common both here and at Belvidere, Kiowa County. Four specimens of the rare *Dichoxenus setiger*, Horn, were taken at Rago, and one specimen at Garden City. This species was described from Texas. *Apion impunctistriatum*, Smith; *oblitum*, Smith, and *modestum*, Smith, were all taken by beating willows and sunflowers. *Cleonus canescens*, Lec., and *Copturus nanulus*, Lec., were two other *Curculionids* taken at Rago.

About a mile north-east of Belvidere, Kiowa County, is a salt marsh of considerable extent. Collecting there June 25th with Mr. Reist, we

found in abundance *Cicindelids*, *fulgida*, Say.; *sperata*, var. Lec.; *circumpicta*, Laf., and W. Horn's variety, *apicalis* of *togata*. In less numbers were found *macra*, Lec. The black variety of *Carpophilus pallipennis*, Say, was found in thistle heads at Belvidere. Three specimens of the beautiful *Chrysobothris purpureovittata*, Horn, were beaten from small elm shrubs. It is a rare Texan species. *Polyphylla Hammondi*, Lec., was also taken in considerable numbers. They were encountered flying just at nightfall, and continued their flight as late as ten o'clock. For so large an insect, they are swift flyers, and have to be taken quickly when they settle on a plant or on the grass. When taken, they make a very pronounced squeaking noise. Out of some sixty specimens captured, only one female was found. This preponderance of males is observed in other species of the *Scarabæidæ*. *Graphops varians*, Lec., the largest species of the genus, is taken sparingly at Belvidere. The colour varies from bronze to a greenish blue. A not uncommon *Crysomelid* taken here is *Zygogramma heterothecæ*, Linell. It is a handsome species. The *Meloid*, *Pyrota discoidea*, Lec., was common on the red flowers of a running vine. Another conspicuous species of the Texan fauna found here is *Cantharis fulvipennis*, Lec. It feeds on the Mexican poppy, and is easily taken. The pretty, bright green coloured *Otiorhynchid*, *Mitostylus tenuis*, Lec., was abundant June 24th, feeding on a small green species of ragweed. The rather large *Curculionid*, *Cleonopsis pulvereus*, Lec., is also taken at Belvidere. *Desmoris pervisus*, Deitz, and *Anthonomus alfopilosus*, Deitz, both occur here, and are taken by beating.

I have seen but two specimens of the rather odd-looking *Curculionid*, *Ampeloglypter longipennis*, Casey; one I took at Salina, Kansas, and the other was from Onaga, Kansas, taken by F. F. Crevecœur. The small *Scolytus*, *Monarthrum fasciatum*, Say, I took at Benedict, Wilson County, Kansas, on freshly-sawn lumber. I was also so fortunate as to secure at Benedict a single specimen of *Canthon perplexus*, Lec., a Texan species that resembles very closely *Canthon viridis*, Beauv. By the use of the beating net at Benedict, two specimens of *Fornax calceatus*, Say, were taken. They usually occur in numbers, when found, but I was not so fortunate as to discover a colony.

Blapstinus sulcatus, Lec., taken at Coolidge in June, is a Southern California species, south-west Kansas being its eastern limit.

SYSTEMATIC ARRANGEMENT OF THE NORTH AMERICAN LEPIDOPTERA.

BY A. RADCLIFFE GROTE, A. M., HILDESHEIM, GERMANY.

The first attempt at an arrangement of the N. Am. Lepidoptera, including a reform in the nomenclature, which I published in 1896[1], calls for some corrections. In the present list I have endeavoured to supply these, but, doubtless, there are others which have escaped me. Since 1896, Lord Walsingham and Mr. Durrant[2] have fixed the types of the genera *Tortrix*, *Tinea*, *Aluci'a* and *Pterophorus*, in the two former confirming my doubtful determination of 1895[3] and correcting the type of the last named genus to *monodactyla*. I have followed Dyar, in CAN. ENT., in using Hipocritidæ instead of Arctiidæ. I cannot find the sure type of *Geometra* or *Noctua*. I reject, however, the latter name, since it was differently used by Klein in 1753, and the assumption of 1758 as the basis of nomenclature is arbitrary. The present arrangement is based on that of the Syst. Lep. Hild., 1895. The views of Dyar with regard to the value of the larval tubercles are adopted. The superfamilies are regarded as parallel growths. It seems probable that the Hesperiades, Sphingides, Saturniades and Bombycides (Agrotides) are separate developments from the Tineid phylum. The subfamilies mark breaks in the sequence. This latter is arbitrary, but no scientific reason has been adduced for changing the general Linnæan plan, which is practically the most convenient. With regard to the family names, the oldest term, employed in a collective form and not preoccupied, is retained. At a time when new Catalogues are preparing, the publication of systems will be useful. The diurnals are arranged according to the diphyletic classification of 1897, the sequence and value of the groups are given by me in April, 1900[4]. With regard to the origin of the Lepidoptera, the Micropterygides show hymenopteriform and trichopteriform, the Hepialides neuropteriform characteristics.

LEPIDOPTERA.

Superfamily *Papilionides*, Grote emend. 1897.

Family Parnassiidæ.	Type Parnassius apollo, L.
Family Papilionidæ.	Type Papilio machaon, L.

1 Mitt. Roemer Mus., No. 7.
2 Ent. Month. Mag., 1897.
3 Systema Lep. Hild., August, 1895.
4 id. Zweite Folge.

Superfamily *Hesperiades*, Grote emend. 1897.

Family Pieridiдæ.	Type Pieris rapæ, L.
Family Nymphalidæ.	Type Nymphalis lucilla, L.
Family Libytheidæ.	Type Libythea celtis, F.
Family Riodinidæ.	Type Riodina lysippus, L.
Family Lycænidæ.	Type Lycæna meleager, Esp.
Family Hesperiadæ.	Type Hesperia malvæ, L.
Family Megathymidæ.	Type Megathymus yuccæ, B. & Lec.

Superfamily *Sphingides*.

Family Sphingidæ.	Type Sphinx ligustri, L.

Superfamily *Saturniades*, Grote, 1896.

Family Saturniadæ.	Type Saturnia pavonia major, L.
Family Citheroniadæ.	Type Citheronia regalis, F.

Superfamily *Bombycides* (Agrotides).

Family Lachneidæ.	Type Lachneis catax, L.
Family Hypogymnidæ.	Type Hypogymna morio, L.
Family Melalophidæ.	Type Melalopha curtula, L.
Family Ptilodontidæ.	Type Ptilodon camelina, L.
Family Platypterygidæ.	Type Platypteryx hamula, L.
Family Geometridæ.	Type Geometra papilionaria, L. (?)
Family Brephidæ.	Type Brephos parthenias, L.
Family Dioptidæ.	Type Dioptis cyma, Hübn.
Family Thyatiridæ.	Type Thyatira batis, L.
Family Nycteolidæ.	Type Nycteola degenerana, Hübn.
Family Lithosiadæ.	Type Lithosia complana, L.
Family Sphecomorphidæ.	Type Sphecomorpha incendiaria, Hübn.
Family Hipocritidæ.	Type Hipocrita jacobæa, L.
Family Pericopidæ.	Type Pericopis zerbina, Stoll.
Family Agaristidæ.	Type Agarista agricola, Don.
Family Apatelidæ[5].	Type Apatela aceris, L.

Superfamily *Tineides*, Grote, 1895.

Family Cochlidionidæ.	Type Coclidion limacodes, Hübn.
Family Megalopygidæ.	Type Megalopyge lanata, Cram.

5 This is (*Noctua* failing) the oldest collective term I can find, and I employ it for the whole group in sensu Lederer, etc. The group has been divided into families by Guenée and Herrich-Schaeffer (Agrotidæ, etc.).

Family Thyridæ.	Type Thyris fenestrella, Scop.
Family Pyromorphidæ.	Type Pyromorpha dimidiata, H.-S.
Family Pterophoridæ.	Type Pterophorus monodactyla, L.
Family Pyralididæ.	Type Pyralis pinguinalis, L.
Family Tortricidæ.	Type Tortrix viridana, L.
Family Sesiadæ.	Type Sesia culiciformis, L.
Family Cossidæ.	Type Cossus cossus, L.
Family Ptochopsychidæ.	Type Ptochopsyche Melsheimerii, Harris.
Family Psychidæ.	Type Psyche viciella, Schiff.
Family Adelidæ.	Type Adela Degeerella, L.
Family Tineidæ.	Type Tinea pellionella, L.
Family Orneodidæ.	Type Orneodes hexadactyla, L.

Superfamily *Micropterygides*, Grote, 1895.

Family Micropterygidæ.	Type Micropteryx Sparmannella, L.
Family Eriocephalidæ.	Type Eriocephalus calthella, L.

Superfamily *Hepialides*, Grote, 1895.

Family Hepialidæ.	Type Hepialus humuli, L.

THE LINNÆAN GENUS GRYLLUS.

BY JAMES A. G. REHN, PHILADELPHIA.

The Linnæan genus *Gryllus*, as first recognized in the tenth edition of Systema Naturæ, was composed of a number of sections which, while some have been recognized, are generally discarded. These names are used in the sense of subgenera, and as such are entitled to recognition. The case in hand being a deeply involved one, we must find some guide to be used as a standard in properly handling these names, and as to-day the Code of the American Ornithologists' Union is generally recognized as the *vade mecum*, we shall follow that. Canon XIX. of this Code is to the effect that a name "once established is never to be cancelled in any subsequent subdivision of the group, but retained in a restricted sense for one of the constituent portions." With this before us we must proceed to find on what a name should be retained. As was the case with the earlier writers (and is frequently the case with modern writers), Linnæus specified no types, and we must refer to the Code for help. Canon XXIV. informs us that "when no type is specified, the only

available method of fixing the original name to some part of the genus to which it was originally applied is by the process of elimination, subject to the single modification provided for by Canon XXIII." The last mentioned Canon is as follows: "If, however, the genus contains both exotic and non-exotic species—from the standpoint of the original author—and the generic term is one originally applied by the ancient Greeks or Romans, the process of elimination is to be restricted to the non-exotic species." Of the six Linnæan subgenera—*Mantis*, *Bulla*, *Acheta*, *Acrida*, *Tettigonia* and *Locusta*—four are classic: *Mantis*, *Acheta*, *Tettigonia* and *Locusta*.

The momentous question of the type of the blanket genus *Gryllus*, is now of importance, and, as Linnæus left no section of his genus as a restricted *Gryllus*, we are compelled to examine the subsequent writers for the first restriction of the genus to one of its component sections. De Geer (Mem., III., p. 505, 1773) is the first author who attempts to do this, and he considers that *Gryllus* should only be used for the subgenus *Acheta*, the last eliminated species of which is accordingly the type of *Gryllus*.

The treatment of each subgenus in detail will give a more comprehensive explanation.

MANTIS.

gigas	= *Eremoplana*, Stal, 1871.
phthisicus	= *Musonia*, Stal, 1877.
siccifolius	= *Phyllium*, Illiger, 1798.
gongyloides	= *Gongylus*, Thunberg, 1815.
religiosus.	
oratorius	= *Iris*, Saussure, 1872.
precarius	= *Stagmatoptera*, Burmeister, 1838.
bicornis	= *Schizocephala*, Serville, 1831.
tricolor	= *Harpax*, Serville, 1839.
strumarius	= *Chæradodis*, Serville, 1831.

As Linnæus really never considered any of the species as European, we must treat them all, the result being that *religiosus* is the type.

BULLA.

unicolor	= *Pneumora*, Thunberg, 1810.
variolosus	= *Pneumora*, Thunberg, 1810.
serratus	= *Prionolopha*, Stal, 1873.
carinatus	= *Xiphocera*, Latreille, 1825.

bipunctatus = *Tetrix*, Latreille, 1804.
subulatus = *Tetrix*, Latreille, 1804.

As will be seen from the above, *serratus* is the type of *Bulla*, it being the last one removed.

ACHETA.

—*gryllotalpa* = *Gryllotalpa*, Latreille, 1804.
—*domesticus*.
—*campestris* = *Liogryllus*, Saussure, 1877.
—*umbraculatus* = *Platyblemmus*, Serville, 1839.

In this and the succeeding classic genera, the non-exotic species are preceded by a dash. The type of *Acheta* (and accordingly of *Gryllus*) will be seen to be *domesticus*. As a name once used cannot be cancelled, the last eliminated species (aside from the type of *Gryllus*) must be considered as the type of *Acheta*, the result being that *Liogryllus* is a synonym of *Acheta*.

ACRIDA.

nasutus.
turritus.

The diversity of opinion regarding the use of the name *Acrida* is certainly rather singular. Mr. Scudder (Psyche VIII., p. 168) has given us his opinion on the subject, but some parts of it are rather misleading. The genus *Acrida* of Linnæus, as shown above, was based on *nasutus* and *turritus*. Fabricius included both of these species and also *brevicornis* in his genus *Tryxalis*, the result being that *brevicornis* is the type of *Tryxalis*, the other two species being the basis of *Acrida*. Brunner's genus *Metaleptea* is thus a synonym of *Tryxalis*, but not because of Stal's restriction as Scudder argues. The work of Stal was the logical outcome of a study of the original genera involved.

TETTIGONIA.

citrifolius = *Posidippus*, Stal, 1874.
laurifolius = *Microcentrum*, Scudder, 1862.
myrtifolius = *Ctenophlebia*, Stal, 1873.
elongatus = *Mecopoda*, Serville, 1831.
lamellatus = *Mecopoda*, Serville, 1831.
ocellatus = *Pterochroza*, Serville, 1831.
acuminatus = *Oxyprora*, Stal, 1873.
triops = *Conocephalus*, Thunberg, 1815.

rugosus	= *Sathrophyllia*, Stal, 1874.
coronatus	= *Acanthodis*, Serville, 1831.
aquilinus	= *Brisilis*, Stal, 1873.
melanopterus	= *Clonia*, Stal, 1874.
fastigiatus	= *Gryllacris*, Serville, 1831.
coriaceus	= *Moristus*, Stal, 1873.
—*viridissimus*	= *Phasgonura*, Westwood, 1835.
—*verrucivorus*	= *Decticus*, Serville, 1831.
pupus	= *Hetrodes*, Fischer Waldheim, 1833.

Of the two species which are non-exotics, *viridissimus* is the most recently removed, and, therefore, the type of *Tettigonia*.

LOCUSTA.

elephas	= *Pamphagus*, Thunberg, 1815.
cristatus	= *Tropidacris*, Scudder, 1869.
morbillosus	= *Phymateus*, Thunberg, 1815.
miliaris	= *Aularches*, Stal, 1873.
hæmatopus	= *Calliptamus*, Serville, 1831.
—*migratorius*	= *Pachytylus*, Fieber, 1854.
—*tartaricus*	= *Acridium*, Latreille, 1804.
variegatus	= *Zonocerus*, Stal, 1873.
—*cærulescens*	= *Œdipoda*, Latreille, 1825.
—*italicus*	= *Calliptamus*, Serville, 1831.
—*stridulus*	= *Psophus*, Fieber, 1854.
carolinus	= *Dissosteira*, Scudder, 1876.
obscurus	= *Pycnodictya*, Stal, 1873.
flavus	= *Humbella*, Bolivar, 1881.
—*apricarius*	= *Stenobothrus*, Fischer, 1854.
—*viridulus*	= *Stenobothrus*, Fischer, 1854.
—*biguttulus*	= *Stenobothrus*, Fischer, 1854.
—*rufus*	= *Gomphocerus*, Thunberg, 1854.
—*grossus*	= *Mecostethus*, Fieber, 1854.
—*pedestris*	= *Podisma*, Latreille, 1829.

The papers of Fieber and Fischer are both seen to be 1854, for, though Fischer is dated 1853 on the title page, the preface is dated in November; but Fieber has priority, as Fischer refers to some of Fieber's genera, which were (as far as the writer can ascertain) not published previously. The types of *Locusta* are *apricarius*, *viridulus* and *biguttulus*, of which genus *Stenobothrus* becomes a synonym.

ON CERTAIN IDENTIFICATIONS IN THE GENUS ACRONYCTA.

BY HARRISON G. DYAR, WASHINGTON, D. C.

Prof. Smith has been to London, and now radically changes the synonymy in the genus Acronycta, which I had hoped was to have been finally settled in the revision which was published by him and myself. The changes involve the identification of three of Guenée's species and one of Walker's. As to *impleta*, Walk., we must accept Smith's identification as *luteicoma*, G. & R. I would suggest that the type ought now to be destroyed, lest future changes in the synonymy result. Guenée described eighteen species of Acronycta from North America, of which the larvæ of six were mentioned. In a genus like Acronycta, where the imagoes are so similar as not to be readily differentiated by description, while the larvæ are very diverse, the larval descriptions are relatively important. Of the three species now changed (*clarescens*, Gn.; *hamamelis*, Gn.; *brumosa*, Gn.), two have original larval descriptions. As to *clarescens* I have no comment, especially as Grote's first identification is now restored. But the others are different. *Hamamelis*, formerly referred to an oak-feeding species (*inclara*, Smith), is now transferred to *afflicta*, Grt. But Guenée's description contradicts *afflicta* in the colour of the hind wings, whereas it fits well the species named *subochrea* by Grote, better even than it fits *inclara*, and to this the larva also applies. As to *brumosa*, Smith says (Revision, p. 118) "the original description will fit either one of two or three species." The characterization of the larva should then be allowed to prevail and the name be referred to *inclara*.

I do not think that Guenée's types should be exclusively considered. Smith remarks (CAN. ENT., XXXII., 335) that *hamamelis*, Gn., is the same as *brumosa*, var. b; but Guenée described no variety b. So it is not unlikely that there has been some mixture of or addition to Guenée's types during the fifty years since they were described. I am, therefore, inclined to the following synonymy:

Brumosa, Guen.	Hamamelis, Guen.
inclara, Smith.	*subochrea*, Grt.

Afflicta and *persuasa* will remain good species as formerly, and thus two of Prof. Smith's changes can be avoided.

THE AMERICAN BEES OF THE GENUS ANDRENA DESCRIBED BY F. SMITH.

BY REV. F. D. MORICE AND T. D. A. COCKERELL.

[In 1891 Mr. Chas. Robertson wrote (Tr. Am. Ent. Soc., XVIII., 49): "After careful study, I have been unable to determine more than two of Smith's species" of *Andrena;* and went on to explain that Smith's descriptions omitted certain characters which were necessary for the exact determination of the species. It is probable that Mr. Robertson did not have before him many of Smith's species, and hence, naturally, could not recognize them in his material; but it is nevertheless true that the determination of Smithian *Andrenæ* from the description alone is often a matter of great uncertainty.

Under these circumstances, I ventured to ask the Rev. F. D. Morice, who has done such excellent work on European *Andrenæ*, if he would examine Smith's types in the British Museum, and report on certain characters which I enumerated. This he has kindly done. Writing under date, January 29, he says: "I have been in London for a few days and examined Smith's *Andrena* types at the British Museum. Here are the notes I made upon them. I could not always get a really satisfactory view of the labrum, but have done my best. Some specimens are very dirty, and the light in the insect room is not good for minute investigations. In each case the specimen described is that which bears a label stating it to be the 'type' of the species. With *fastuosa* (♀) is placed a ♂, apparently belonging to it, but I do not know whether the latter has ever been described. I could only find a description of the ♀. Pray use my notes just as you please." In the following article, the notes by Mr. Morice are all included within inverted commas, and will thus be easily distinguished from my own comments.—T. D. A. C.]

Andrena aliena, Smith, 1853.

♀. "Area transversely striated; abdomen greasy, but seems to be smooth between the punctures; tubercle emarginate." Here and in all the notes given below, "area" means the basal area of the metathorax, propodeum, or median segment. "Tubercle" means the basal tubercle or process of the labrum.

This species, from Florida, would seem to fall close to *A. Forbesii*, Rob., but it is evidently not the same.

Andrena victima, Smith, 1853.

♀. "Tubercle truncate; area rugose at its base; abdomen punctured like *trimmerana*, not the least like *convexiuscula*."

♂. "Apical ventral valve emarginate, and genitalia like *rosæ* or *florea;* antennal joint 3 and those following subequal." This ♂ is the type of *A. desponsa*, Sm., which Mr. Morice says is no doubt the opposite sex of *victima*, as Smith suspected. "I think it is *trimmerana*, or close to it." Type locality, Nova Scotia.

In many respects this resembles *Macgillivrayi*, Ckll., but in that the tubercle is by no means truncate. Smith's description of *victima* ♀ seems to suggest that the anal fimbria is fulvous; in *trimmerana* (which also appears to be a larger insect) it is black.

Andrena integra, Smith, 1853.

♀. "(Type.) Tubercle roundly truncate; clypeus granulose and punctured; area obliquely strigose (about as coarsely as *labialis*), with no raised border; abdomen shining, with distinct but very fine delicate punctures, apices polished and reddish. One at least of the specimens under this name is evidently different, with emarginate tubercle and rugulose abdomen." Described from "United States."

This almost agrees with *A. serotina*, Rob., but the shining abdomen may separate it. *A. lauracea*, Rob., is also similar, but has the tubercle emarginate. *A. spiræana*, Rob., differs by the sharp ridge bounding the area behind.

Andrena simplex, Smith, 1853.

♀. "Tubercle truncate; specimen very old and dirty, but area seems to be dull, very finely rugulose or granulated; abdomen finely reticulate all over and also punctured, of an obscure red (perhaps only faded?), much narrower than the abdomen of *fuscata*, with which Smith compares it; it reminds me rather of *analis* or *chrysosceles*." Described from "U. S."

This seem to be different from anything seen by me.

Andrena clypeata, Smith, 1853 (nec Brullé).

"Like a small specimen of *chrysosceles;* tubercle truncate; area hid by hairs and grease, *seems* ill-defined; abdomen aciculated, and I should say not punctured, but it is very dirty in both the two specimens, reddish like the last species." The type is a ♂ from Florida; the name, being preoccupied, has been changed by Dalla Torre to *clypeolata*.

This is very like *A. ziziæ*, Rob.; should it be the same, *ziziæ* has priority over *clypeolata*.

(To be continued.)

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