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ANNOTATED LIST OF THE PENTATOMIDÆ
Recorded from America North of Mexico,
with descriptions of some new species.

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For several years past I have been making special efforts to increase my collection of Pentatomids from all parts of the world. Of the species thus far recorded from America north of Mexico, I have been able to secure examples of all but a few, and some of those still wanting in my collection may yet prove to be synonyms of other better known forms. I venture to publish the present notes to put in more permanent form certain observations I have made on our species, and to record additional localities and the range of some of the species as known to me. I am aware that these notes are very fragmentary and that many other species from the West Indies and Mexico doubtless invade our southern border. Records of such additional species, including those from Florida, Texas, Arizona and the Pacific coast, are greatly to be desired, and it is partly in the hope of stimulating the publication of such notes that these fragments have been put in print.

I have quoted largely from the writings of Dr. P. R. Uhler. Too much cannot be said in praise of the work done by Dr. Uhler. In almost every case it is accurate and concise and throughout is remarkably free from errors due to hasty work, and, what is still more rare in work of this character, it has a literary style that makes it delightful reading with which to pass an idle hour. Dr. Uhler's work needs no praise from me. It has been an inspiration

to me in all my studies on the Hemiptera, as has his kind and ready assistance on every occasion on which I have sought it; and I esteem it an honor and privilege to dedicate to him these somewhat disconnected and incomplete notes on our North American Pentatomids.

To make this list more generally useful, I have, in some genera, prepared synoptical tables of the species, intended to apply only to those here enumerated. I have also tried to indicate where the best synopses of the genera in the several subfamilies may be found, and have added references and synonymical notes to supplement and correct those in the Lethierry and Severin Catalogue, the generic arrangement of which I have followed. In a few cases it has seemed advisable to add a short diagnosis of species published in works inaccessible to many of our students.

It has been found impossible, in all cases, to give proper credit to the friends who have sent me material for study or who have kindly allowed me to retain from such material valuable specimens that were still wanting in my collection. I will ask pardon in advance for such omissions, with the assurance that they were entirely unintentional.

This list records the occurrence of 191 species in the United States and Canada, a few of which are still unrecognized by our modern students and may not be valid species. Twenty-eight species of those here listed are still unrepresented in my collection, but twelve of these belong to the *Cybnidae*, a subfamily in which I have done little work. I have indicated these species by an asterisk. One variety and twelve species are here described as new.

In the arrangement of the subfamilies I have followed the sequence and ordinal rank assigned to them in Lethierry and Severin's Catalogue Général des Hémiptères. The generic synonymy established by Bergroth in the *Revue d'Entomologie*, x, p. 235, 1893, has, in every case except *Orsilochnus*, been rejected by Lethierry and Severin, and I have not adopted it here.

The Pentatomidæ form a natural group which is generally placed at the head of the Heteropterous Hemiptera. They are ordinarily known as "stink bugs" or "berry bugs," and may be roughly distinguished by their oval or lozenge shaped bodies, five-jointed antennæ, and large triangular scutellum, which may become half-oval, very convex, and cover the entire abdomen.

Family PENTATOMIDÆ.

A brief synopsis of our four main subfamilies may be found in Comstock's Manual for the Study of Insects, page 128, where, however, they are given family rank. In using this, allowance must be made for certain aberrant forms in the subfamily Asopidæ, etc., in which the scutellum covers almost the entire abdomen, as it does in the Corimelænidæ and Scutelleridæ. For other synopses see: Stal, Hemiptera Africana, i, p. 32; and Genera Pentatomidarum Europæ disposuit, in Of. Kong. Vet.-Akad. Förh., xxix, no. 3, p. 31, 1872 (from both of which the Cydnidæ, including the Corimelænidæ, are excluded); Fieber, Die Europäischen Hemiptera, p. 26 (giving family rank to the Cydnidæ and Tetyræ); and Amyot and Serville, Hemipteres, p. xv *et seq.*

Subfamily CORIMELÆNIDÆ.

This family is united with the *Cybnidæ* by Fieber and Stal, and is placed in a group, *Odontoscelides*, with genus *Odontoscelis* by Amyot and Serville (p. xix). Dr. Uhler separates it as a distinct family under the name used here, and in the Lethierry and Severin Catalogue it is placed as a subfamily under the same name. There is but one genus in our fauna.

Genus **CORIMELÆNA** White.

The following synopsis is founded on the more obvious characters as I have been able to make them out. Unfortunately, many of them are comparative, but with the more common species in hand, such as *unicolor*, *nitiduloides*, *lateralis* and *pubicaria*, which will be found in almost every collection, the species should be located with reasonable certainty.

C. denudata Uhler and *marginalis* Dallas are omitted, as I have not seen specimens and cannot locate them by the published descriptions.

Color ferruginous, becoming blackish anteriorly, the broad elytra and sides of the pronotum white.....**Sayi.**

Color black or blue; elytra with or without white markings1.

1. Elytra concolorous, not marked with white.....2

Elytra marked with white or yellow.....8.

2. Color deep steel-blue, polished, rather obscurely punctured; form oval, somewhat narrowed posteriorly; antennæ pale, pronotum with two distinct impressed points anteriorly**cærulescens.**

Color black, sometimes with blue, purple or bronze reflections3.

3. Short oval or almost hemispherical; whole surface closely punctate; color deep black, opaque or somewhat polished4.
Form oval or more or less narrowed posteriorly, surface polished, punctures distinct or almost obsolete5.
4. Form very short and broad, rounded behind, a little produced before; body distinctly ciliate all around; surface opaque **ciliata**.
Form short oval, somewhat polished above, but closely punctured and transversely wrinkled on the pronotum and base of the scutellum; sides not ciliate **nigra**.
5. Surface highly polished, punctures almost obsolete on the surface above; form regularly oval; size large, 5 to 6 mm. **unicolor**.
Surface polished, distinctly punctured; form more or less narrowed posteriorly6.
6. Sides of the pronotum strongly depressed, the narrow recurved edge becoming obsolete before the polished tubercular humeri **anthracina**.
Sides of the pronotum less abrupt, the narrow recurved edge continued around the humeral angle, humeri not polished and tubercular7.
7. Size larger (4-4½ mm.); apex of the head not recurved; inner sector of the corium distinctly bent inward near the middle, leaving a punctured surface between it and the costal nervure **nitiduloides**.
Size smaller (4 mm.); apex of the head distinctly recurved; inner sector of the corium about parallel with the subcostal nervure. **nitiduloides** var.
8. Corium yellowish with a black spot before the apex; edge of the pronotum and abdomen ciliate (Uhler **obtusa**.
Corium black marked with white or yellow9.
9. Corium with a large white spot covering the base; size large (4 mm.).
renormata.
Corium bordered without, sometimes broadly, with white or yellow 10.
10. White margin of the corium narrowed basally, not passing the subcostal nervure; costal edge tumid, impunctate **Gillettii**.
White margin of the corium extended inwardly at base in conformity with the basal sinus of the scutellum11.
11. Form elongated, narrow; length 3 to 3½ mm.; surface strongly punctured, polished; exposed portion of the corium almost entirely pale or orange.
extensa.
Form broader, ovate; pale margins of the elytra narrower12.
12. Size rather large, about 4 mm. **lateralis**.
Size smaller, about 2½ mm **pulicaria**.

Corimelena unicolor P. B (*helopioides* Wolff, and *atra* A. & S.).

For this species I have followed the identification given by Dr. Uhler in Proc. Boston Soc. Nat. Hist., xix, p. 366, 1878, but have used the name adopted by Lethierry and Severin under the supposition that it is founded on a later comparison with the types. This is our largest *Corimelena* and seems to be most at home in the northeastern states, where it is found singly on weeds and grass in damp situations. It may be best distinguished from *nitiduloides* by

its regularly oval form and its more highly polished surface, with fewer and almost obsolete punctures. I have taken it as far west as Kansas. It ranges in Canada from Quebec to Manitoba.

***Corimelaena nitiduloides* Wolff (*histeroides* Say).**

Compared with *unicolor*, this species is obviously more narrowed posteriorly; it will average a little smaller; the edge of the scutellum at base is a little more deeply excavated, and the coriaceous portion of the elytra is perhaps a little broader and more thinned out inwardly than in *unicolor*. In *nitiduloides* the punctures are deeper and closer, so the upper surface although shining black wants the highly polished look so noticeable in *unicolor*. In *unicolor* the antennæ are longer and stouter, with the apical two joints darker than in *nitiduloides*. In the males the sixth ventral segment is extended forward in a more acute angle in *unicolor*, and in the females of that species the basal plates of the genital segment are distinctly longer on the middle; in *nitiduloides* they are cut almost square across.

This species seems to be more characteristic of the western fauna, although it is found occasionally throughout the east. Among the foot hills near Fort Collins, Colo., last summer, Prof. Gillette and I took it in great numbers from a low weed, *Plantago Purshii*. They were resting on the flower spikes in all stages of development. Perhaps one half of these were covered with a dusky "bloom" that washes off with benzine, and when present gives them a dull bluish-black appearance. This condition may be owing to an accumulation of the pollen of the plant on the surface, but it seems to me more likely that it is connected with the breeding season, as is the "bloom" often found on certain species of *Euschistus*. This species extends its range into Mexico and Guatemala, according to Dr. Distant.

***Corimelaena nitiduloides* var.**

I have in my collection two examples of what I prefer for the present to consider as a variety of this species. It is smaller, more highly polished, and with the punctures less distinct. The head is depressed before the middle, leaving the apex distinctly recurved, and the outer sector on the corium is almost parallel to the subcostal nervure. I took one specimen near Buffalo and the other in New Jersey.

Corimelaena nigra Dallas.

This species, as I have located it, is broader and shorter than *nitiduloides*; the punctures are stronger and closer, leaving the surface more opaque; the pronotum and base of the scutellum are transversely wrinkled; there is a well-defined smooth area occupying the position of the callosities; the base of the scutellum is more deeply excavated on either side, and above this the surface is more strongly impressed.

In July of last year I swept three examples of this species from the dry prairies about Fort Collins, Colo. Another specimen, received some years ago from a correspondent in Canada, is more strongly punctured and wrinkled and is slightly tinged with purple above.

Corimelaena anthracina Uhler.

Under this name I have placed a species from Vancouver Island, of which I have received two specimens from Rev. G. W. Taylor, and have seen others taken by Prof. F. H. Snow in New Mexico, and by Prof. Aldrich in Idaho. In form these most resemble *unicolor*, but they are smaller and more convex above, and the punctures are stronger and more uniformly distributed even than in *nitiduloides*. They may be best distinguished from their nearest relatives by the sides of the pronotum, which are more vertical, with the narrow reflexed margin abbreviated before the tumid impunctured humeri. In the prominent humeri and the style of punctuation this species approaches *nigra*, but the broadly ovate form of the latter will at once separate them.

Corimelaena ciliata Uhler.

This species is even shorter and broader than *nigra*, being almost hemispherical, but a little angularly produced before. The upper surface is opaque, deep black with a tinge of purple. It is very closely and deeply punctured and quite distinctly transversely wrinkled on the disk of the pronotum and scutellum. The fringe of conspicuous ciliae about the body and the short and broad corium are other characters that will serve to distinguish this species.

In July, 1903, I took one example of this very distinct species on the dry prairies, near the Leyden coal mines, just west of Denver, Colo. Another specimen was kindly presented to me by Prof. F. H. Snow, who took it in Morton County, Kan., and Mrs. Slosson has sent me an example taken at Lake Worth, Fla.

Corimelaena cærulescens Stal (*cyanea* Uhler.)

I possess one specimen of this species taken in Arizona and kindly given to me by Dr. Uhler, and the Museum of Comp. Zool. has an example taken at San Bernardino, Cal.

It is allied in form and size to *nitiduloides*. The punctures are finer or almost obsolete on the disk of the pronotum and scutellum; the sides of the scutellum are strongly impressed and coarsely punctured at base; the coriaceous portion of the elytra is broad at base, with the inner edge sinuated to the acute apex; and the antennæ are pale, with the apical joints hardly darker. The steel-blue reflections over the whole insect are very noticeable and apparently characteristic. My specimen does not answer very well to the description given by Dr. Uhler of his *cyanea*, and with sufficient material the two forms may prove to be distinct.

***Corimelaena denudata** Uhler.

I have seen nothing that agrees with Uhler's description of this species. It must be closely related to *nitiduloides* and *unicolor*. The type was from Louisiana.

Corimelaena lateralis Fabr.

This well known species has been recorded from almost all parts of the United States. I have never taken it about Buffalo, nor have I received it from other localities so far to the northeast as this. West of the Mississippi it seems to be very widely distributed and common. I swept it in large numbers from a grass patch far up in Williams' Canyon, near Ogden, Utah, at an altitude of about 7000 feet, in July, 1900, and from Prof. Wickham I have received two unusually large examples taken at Wanatchee, Wash. Distant, in the *Biologia*, records the occurrence of a Mexican example wanting the white border to the corium, and Uhler records the same peculiarity in certain specimens taken by him in the east. It is, however, just possible that a careful comparison would show these to be distinct from the true *lateralis*. In all the specimens I have seen the white border to the corium is expanded within to correspond with the sinus at the base of the scutellum. The whole upper surface in this species is very regularly and distinctly punctured, with a narrow, transverse, smooth area over the callosities, and the apical margin of the abdomen is marked with two elongated whitish spots on each side. In some examples there is a suggestion of a smooth

longitudinal median line above. The anterior extension of the sixth ventral segment in the female is distinctly rounded, with scarcely an indication of an angle, and the truncated posterior margin has a slight tooth-like projection at the middle.

***Corimelæna Gilletti*, n. sp.**

Closely allied to *lateralis* but larger. Head proportionately broader, shorter, and less convex transversely, with the surface more coarsely punctured and the margins less deeply sinuated. Ocelli whitish or uncolored, not rufous as in *lateralis*. Extreme apex of the tylus inferiorly white, in *lateralis* entirely black. Form of the pronotum as in *lateralis* but with the surface before and behind the humeral angles more impressed, the disk posteriorly not so strongly punctured and the smooth area over the callosities less defined. Scutellum with weaker punctuation on the disk, and with a slender carinate margin adjacent to the inner edge of the elytra, defined within by an impressed line. In *lateralis* the surface is punctured to the extreme edge. Elytra black with a narrow smooth costal vitta, widest at its truncated apex and slightly narrowed toward its base. Edge of the abdomen with a strong yellow line on the sixth segment, and in the female a similar line on the genital segment. Apex of the sixth ventral segment in the female regularly arcuated, not sinuated with a slight median tooth as in *lateralis*. Legs piceous, knees paler. Antennæ rostrum and tarsi rufo-castaneous.

Described from two female examples in my own collection, one of which I swept from weeds by the railroad track at Cape May Court House, N. J., August 21, 1902, the other received several years ago from a correspondent in Canada, without locality; and a good series received from Prof. Herbert Osborn, taken at Bay Ridge, Md.; Washington, D. C.; Ironton, Ohio; and South McAlester, Ind. Terr. (Wickham). Two males from Dallas, Texas, differ only in being proportionately narrower and a little smaller. This seems to be the eastern representative of the more western *lateralis*. Considering the localities from which Fabricius doubtless received his American material it would seem more natural to reverse these two species (*lateralis* and *Gilletti*), but his description of the elytra of his species cannot be construed to apply to the present form. For first recognition of this species the larger size (about 4 mm.) and the form of the white costal vitta on the corium will be found most useful.

It gives me pleasure to dedicate this species to Prof. C. P. Gillette, whose services in bringing once more to light the long-lost *Corimelæna albipennis* Say deserves recognition, and whose generous assistance I have had reason to appreciate more than once while prosecuting my work on the Hemiptera.

***Corimelaena marginella** Dallas.

This species I have been unable to identify with any form I have yet seen from North America. Distant figures the type at plate 30, fig. 1, of the *Biologia*. Judging from this figure and from the description by Dallas, it must be very close to *pulicaria*. The type was from Hudson's Bay, and Distant records its occurrence in Mexico.

Corimelaena pulicaria Germar.

This very common and widely distributed insect needs no extended notice. It is the smallest species yet recognized from within our limits, but it shows some variation in size as well as in the width of the pale margin of the elytra. Sometimes the color on the corium is deepened almost to orange. Redescribed as *Galgupha flavo-marginata* by Cyrus Thomas in *Trans. Ill. State Ag. Soc.*, v, p. 455, 1865.

Corimelaena extensa Uhler.

This species, as I have located it, seems to be quite widely distributed in the Rocky Mountains. It is closely allied to *pulicaria*, but is a little larger, much more elongated in form, the head is longer and more triangular, and the antennæ are paler in color, with the apical joints shorter and more slender. It has an obscure pale line on the edge of the sixth ventral segment, but none on the genital segment as in *pulicaria*. Most of my Colorado specimens are smaller than the measurements given by Dr. Uhler and have the elytra orange in place of pale yellow. The narrow black stripe mentioned by Uhler follows the contour of the scutellar margin.

I swept this insect in great numbers from a low labiate plant on the high prairies close up to the foot of Green Mountain, at Boulder, Colo., in July, 1903. I have also taken it in the same State at Pueblo and Fort Collins. Prof. Wickham has sent me specimens taken on Inyo Mountains, Cal., at an altitude of about 8000 feet, and Rev. G. W. Taylor has taken it in Vancouver Island in May. Dr. Uhler records it from Dakota, Oregon, California, Utah, Arizona and Mexico. Mr. C. H. T. Townsend reports it on wild tobacco in Arizona (*Psyche*, vi, 547, 1893). I have never seen dark-green specimens, such as he describes.

Corimelaena renormata Uhler. *Hemiptera of Colorado*, p. 11, 1895.

Of this very distinct species I have three specimens in my collec

tion. Two of these I took on the dry prairies, at the Leyden mines, near Denver, Col. The other was taken at Boulder, Col., and kindly given to me by Rev. M. Wirtner. One of the Denver specimens is immature and is colored almost exactly as described by Dr. Uhler under *C. albipennis* Say in the Hemiptera of Colorado, p. 10. In form and markings *renormata* closely resembles *basalis* Germ. from South America, but it is only about one-half the size of that species, and it is well distinguished in other respects.

Corimelaena Sayi nov. nom. (*albipennis* Say, præc.).

While looking over the very excellent collection of Hemiptera in the Agricultural College at Fort Collins, Col., last summer, I was delighted to find a fine pair of these insects that had been captured in the foot hills about thirty miles northwest of the College. Prof. Gillette very generously gave me one of these specimens for study. Comparing this with the description of *albipennis* given by Uhler in the Hemiptera of Colorado, it becomes evident that the specimen before Dr. Uhler was not *albipennis* at all, but the immature form of *renormata*, as suggested by him. The present specimens correspond with Say's description in every detail. The head is rather long and well rounded before, with the sides very feebly sinuated; antennæ soiled yellow, with the apical joint longer than in *renormata*. Pronotum flatter than usual in this genus, strongly narrowed before, blackish, with the basal disk broadly castaneous, and the broad lateral margins white and calloused, humeral angles rather prominent. Scutellum short and broad, apex regularly rounded, base deeply excavated at the sides; color castaneous, remotely punctured with blackish, and with a blackish impressed area at each basal angle. Coriaceous portion of the elytra when closed very broad, white, with a short black longitudinal streak placed behind the middle and near to the inner margin. Venter very dark castaneous, with the edges interruptedly thickened and rufous; breast black; legs brown, tarsi pale. The punctuation of the upper surface is rather shallow and almost concolorous on the disk of the pronotum and scutellum. In form this species most nearly resembles *ciliata*.

These individuals and another sent by Prof. Gillette to Prof. Herbert Osborn and recorded by him in Ent. News, iv, p. 91, 1893, and Proc. Iowa Acad. of Sciences, vol. i, pt. 4, p. 121, 1894, are, so far as I can learn, the only known specimens. Unfortunately

Say's name for this species was preoccupied by *C. albipennis* Esch. from Chili, published ten years earlier; I have therefore substituted for it the name of the illustrious naturalist who first described it.

***Corimelena obtusa** Uhler. Hemipt. of Lower Calif., Proc. Calif. Acad. of Sci., Ser. 2, iv, p. 225, 1894.

I have never seen this species, which was described from specimens taken in Lower California and therefore not really belonging to our fauna. Judging from Uhler's description, it must be very closely related to *Sayi* in some of its characters.

Family SCUTELLERIDÆ.

A good synopsis of the American genera of this subfamily is given by Stål in "Bidrag till Hemipterernas systematik" in Of. Kongl. Vet.-Akad. Förh., xxiv, no. 7, p. 491, 1867, under the name *Tetyridæ*. They are listed in the Enumeratio Hemip., i, p. 4, 1870. Germar's Monograph, in his Zeits. für Ent., vol. i, pt. 1, pp. 1-146, 1839, although old, is quite indispensable in the study of this family.

***Tetyra bipunctata** H. S.

My specimens are from Maryland and Washington, D. C. Its recorded range includes Texas, Mexico and Lower California.

***Tetyra arcuata** Fabr.

Mrs. Slosson has kindly sent me for study an individual of this species taken at Biscany Bay, Fla. It is almost as light in color as *arcuata*, but rather more tinged with grey. The markings are about the same as those of *bipunctata*, but it can be readily distinguished from that species by the shorter head, the black antennæ, banded with white at each incisure, and the short rostrum, which reaches only to the middle of the second ventral segment, while in *bipunctata* it reaches well on to the fifth segment. This is the first recorded occurrence of this insect in our territory, unless Uhler's *robusta* should prove to be a form of the same.

***Tetyra robusta** Uhler. Trans. Md. Acad. of Sci., i, p. 383, 1897.

Dr. Uhler describes this species from material taken in Arizona and Mexico, and suggests its relationship with *arcuata* Fabr. I have not seen it.

Pachycoris torridus Scopoli.

Uhler gives California as a habitat for this species under the name *Fabricii*, and describes it from Lower California under the name *Stallii*. In the Lethierry & Severin Catalogue it is accredited to California. It seems to me not improbable that the above references to "California" really refer to Lower California, a province of Mexico, and therefore excluded from the faunal limits of the present list.

Orsilochus guttatus H. S.

Dr. Uhler has been kind enough to give me a specimen of this species that was taken in Florida. Mrs. Slosson has taken it in the same State, and the Museum of Comparative Zoology has it from South Carolina.

Diolcus irroratus Fabr.

Mrs. Slosson has kindly sent me for examination one specimen of the form named *flavescens* by Westwood, that she took in southern Florida. This form of *irroratus* approaches *Bosci*, but may be distinguished by its more convex form, the absence of the metallic punctures on the sides of the pleuræ, etc. It makes an interesting addition to our fauna.

Diolcus chrysoorrhœus Fabr.

Say described this species, as *viridipunctatus*, from Florida, and Uhler records it from South Carolina and Mississippi, and Mr. Henshaw has sent me several that were taken in Texas. It may be distinguished from *Bosci*, which it resembles in color, by its being much more convex.

Genus **AULACOSTETHUS** Uhler.

This genus is not included in Stal's Synopsis. It closely resembles *Diolcus*, and has the bisulcate tibiæ of that genus, but may be distinguished by having the osteolar canal long and slightly curved, with an obtuse apex.

Aulacostethus marmoratus Say.

The only specimens I have of this species were sent to me from Georgia by the former State Entomologist, Mr. W. M. Scott. It has been recorded from New Jersey, Maryland, and North Carolina, and Mr. Henshaw has sent me specimens taken at Dallas, Tex.

***Alacostethus simulans** Uhler.

Recorded from California only. I have not yet seen it.

Genus **HOMÆMUS** Dallas.

The following key refers only to the four species known to me:

- Dilated anterior margin of the prostethus when viewed vertically from below forming a distinct but obtuse angle beneath the antenniferous tubercles; posterior half of the lateral margin of each ventral segment black **proteus**.
- Dilated anterior margin of the prostethus rounded 1.
1. Osteolar canal regularly curved at apex, not abruptly bent; size small, color pale **grammicus**.
- Osteolar canal abruptly bent forward at apex nearly parallel to the outer margin of the metapleura. 2.
2. Latero-anterior margins of the pronotum concavely arcuated; anterior prolongation of the 6th ventral segment broader, distinctly angled; head generally bronze-black, without pale markings. **æneifrons**.
- Latero-anterior margins of the pronotum straight or feebly convexly arcuated; anterior prolongation of the 6th ventral segment narrower, distinctly rounded; head generally with a broad submarginal pale vitta. **bijugis**.

Homœmus æneifrons Say.

This is a widely distributed and in some localities an abundant species. I have never been able to detect it about Buffalo, but have taken it in numbers at Lake Placid in the Adirondacks. It occurs all through New England, and in Canada it is distributed from Quebec to Vancouver Island. In the Rocky Mountains it spreads southward to New Mexico, where it has been taken by Dr. Skinner, and Distant records it from Mexico. On the eastern side of the continent it extends along the Alleghany Mountains into Maryland and Virginia.

Homœmus bijugis Uhler.

This species is very close to the preceding. After a careful examination of a long series of specimens from various localities, I have, however, found two characters that seem quite constant, and may perhaps serve for separating these forms. In *æneifrons* the anterior prolongation of the sixth ventral segment is distinctly broader, with the angles more pronounced, and in the male with its anterior margin feebly produced in the middle. In *bijugis* this anterior prolongation is narrower and more rounded before. In *bijugis* also the submargins of the head have a broad, pale vitta, and the general color is paler, with the markings above more clearly

defined, and beneath the punctures are paler or quite uncolored. The edge of the abdomen beneath is plainly marked with black points at the incisures in *æneifrons*, while in *bijugis* these black points are nearly or quite absent. In size these species present about the same range: from $6\frac{1}{2}$ to 9 mm.

This species seems to be an inhabitant of the arid plains bordering the Rocky Mountains. I have taken it wherever I have collected in such situations in Colorado and Utah, and have received specimens taken by Prof. Wickham at Carson City, Nev. Dr. Uhler records it from as far east as Dakota and Nebraska and Prof. Osborn from Iowa.

Homœmus grammicus Wolf.

This is the smallest species of *Homœmus* known to me. The males in my collection measure $4\frac{1}{2}$ mm. in length, the females 6 mm. In color and markings it closely resembles *bijugis*, but may be distinguished by the more gently curved osteolar canal, a somewhat variable character however, and the form of the genital segment in the male, which is regularly arcuated in *grammicus*, and truncated or feebly concave in *bijugis*. In *grammicus* the head is narrower anteriorly, less convex, of a deep black color, hardly bronze-black, as in *bijugis*, and the punctures are finer. The broad, pale submarginal vitta is present as in *bijugis*. The pronotum differs in having the humeri decidedly more prominent and subacute. On the scutellum the lateral brown vittæ are less curved within and are discernible to the lateral margin, which is hardly true of *bijugis*. The males in my possession are as clearly marked as are the females, which is not the case in the allied species.

This species is more southern in its range than *æneifrons* and *bijugis*. It occurs from North Carolina south to Florida and west to Texas and Mexico. My own specimens were taken in Kansas by Mr. Crevecoeur. It is also included in Gillette and Baker's List of the Hemiptera of Colorado.

***Homœmus consors** Uhler.

Dr. Uhler's description of this species seems to be incomplete, as it fails to mention the size of the species or the locality of capture. I have seen nothing that would answer to this description, and it has never been mentioned by later writers on our Hemiptera. It would seem to be rather closely allied to *grammicus*.

Homœmus protens Stal.

I am indebted to the generosity of Prof. H. F. Wickham for three strongly marked Texan specimens of the "var. d," as described by Stal in *Stet. Ent. Ziet.*, xxiii, p. 82, 1862. I can find no other record of its having been found within our territory except in Prof. Osborn's List of the Hemiptera of Iowa. It is just possible that this reference is an error either of determination or locality. I have in my collection one specimen of "var. a" Stal, taken in Costa Rica. The recorded southern range of this species reaches to Columbia. More recently Mr. Henshaw has informed me that the Museum of Comparative Zoology has an example taken at St. Barbara, California.

This species exhibits the same range of variation in marking that we find in the other species of *Homœmus*, *Sphyrocoris*, *Symphylus*, *Diolens* and, in a modified form, in *Eurygaster*. From *Homœmus æneifrons* and *bijugis* it differs in being smaller, more convex above; the scutellum is broader behind the middle but narrower at tip; the head is broader and more convex toward the apex, with a pale stripe down the middle of the tylus and a broader one on each cheek, at apex separated from the median vitta by the narrow black margins of the tylus. The pronotum is more convex, especially toward the sides, which are straight and very narrowly reflexed; the humeral angles are less prominent; the elytra, when spread, show a large angular black spot interior to the apex of the coriaceous portion which is not indicated in the allied species. Beneath the colors are much darker and the posterior half of the lateral margin of each segment is black.

Sphyrocoris obliquus Germ.

Most of my material in this species has been received from Hayti and Costa Rica, but I have seen a few specimens taken in southern Florida by Mrs. Annie Trumbull Slosson, and Dr. Uhler records it from Arizona. This insect presents the same general pattern of marking seen in *Homœmus æneifrons* and *bijugis*.

Genus *Sphyrocoris* may be distinguished from *Homœmus* by its having the osteolar canal broadly expanded and bent at right angles toward the apex, the surface there being punctured and the borders ill defined from the surrounding disk of the metapleura. In *Homœmus*, while the apex of the osteolar canal is sometimes quite ab-

ruptly bent, its surface is impunctate, with well defined borders, and its form is narrow, almost linear, throughout. In *Symphylus* from South and Central America, in which the pattern of marking is much the same, the osteolar canal is short and straight. *Diolcus* is a broader form, with bisulcate tibiae, and the osteolar canal barely longer than broad. *Camirus* has the pronotum transversely impressed across the middle, while in *Odontoscelis* the osteolar orifice is wanting and the whole insect is clothed with matted hairs.

Camirus porosus Germ.

Of this small black species I have seen one specimen, taken in Florida by Mrs. Slosson, and another from the same State was kindly given to me by Mr. Otto Heidemann. Dr. Uhler records it from California and Texas, and the Museum of Comparative Zoology has an example from Vancouver.

***Camirus consocius** Uhler.

Dr. Uhler describes this species under genus *Zophoessa* from Arizona. I have not yet seen it.

Of the described species of *Camirus* not found in our territory, I have seen only *conicus* from British Guiana. This is a brown species, marked much as in *Sphyrocoris obliquus* Germ. *Camirus socius* Stal seems to be most nearly allied to *conicus*, while *moestus* Stal is a larger black species. Both are from Mexico.

***Acantholoma denticulata** Stal.

Described from Illinois. I have not yet seen it.

Phimodera torpida Walker.

The only specimen of this species I have seen was kindly given to me by Rev. M. Wirtner, and bears a label "Boulder, Colo." It is of a dark fuscous color, marked with a pale semicircular patch, circumscribed with blackish, on the base of the scutellum at either side. The surface is minutely dotted with pale, and there is an obsolete pale median line above.

***Phimodera binotata** Say.

I have never seen anything I could locate as this species. Judging from Say's description it must be very near to *torpida*.

Phimodera corrugata n. sp.

Size of *P. torpida* Walker. More convex above, broader, almost truncated behind; shoulders prominent, tumid, and the whole upper surface roughly cor-

rugata. Color dull brown, varied with ash grey and ferruginous, and covered in places with a close grey pubescence. Head more strongly deflexed than in *torpida*, with the cheeks more tumid above and narrower at apex, their sides very feebly sinuated; surface of the head blackish clothed with greyish pubescence, the tumid disk of the cheeks and tylus obscure fulvous. Antennæ rather slender, black with pale incisures, basal joint very short, second about as long as the fourth, reaching about to the apex of the head, third scarcely longer than the basal, fifth longest. Rostrum black, reaching to the base of the abdomen. Pronotum very uneven, strongly constricted a little before the middle; posterior lobe moderately convex, with a median and two somewhat irregular longitudinal carinæ on either side, all of which are common to the anterior lobe, where they diverge a little; anterior lobe convex on the middle, this elevated portion transversely impressed and forming almost a hood over the base of the vertex; surface more depressed toward the anterior angles, the sides deeply sinuated, forming a right angle before the prominent tumid shoulders; the surface is pale on the posterior lobe and raised areas, and blackish in the depressions of the anterior lobe. Scutellum subquadrate, broadly rounded behind, not quite covering the connexum; surface roughly pitted and corrugated, with an uneven semicircular carina at base enclosing a depressed area which is bisected by the subcarinate median line, this line forms a tubercle at base and connects with a square apical area; surface a little depressed at base near the lateral margins. Pleural pieces black, greyish pubescent, the prominent shoulders forming an angular projecting shelf on either side beneath. Venter blackish brown, sparsely grey-pubescent, with a row of pale spots within the stigmata, and a whitish tubercle at each incisure on the edge of the abdomen. Legs black, knees and a broad band on each tibia pale. In fully colored examples there is a pale basal patch on either side of the disk of the pronotum, another on either side of the base of the scutellum invading the exposed base of the corium, a square spot on the scutellum circumscribed with blackish, and an indefinite area anterior to this. All these areas are ill-defined except the square apical patch. The pale median carina is generally well defined and intensified by darker on either side. Length, male 5 mm.; female 6½ mm.

Colorado. Described from two male and four female examples taken at Fort Collins, in June and August, by my good friend, Elmer D. Ball. Those taken in June were accompanied by their pupa cases, indicating that they reached maturity at that season. *Phimodera torpida* is less convex both above and below, the body is more narrowed posteriorly, the pronotum is more feebly impressed and not so strongly elevated over the base of the head, the sides are much less deeply sinuated, and all the irregular carinate lines and corrugations that cover the whole upper surface in *corrugata* are wanting. In both *torpida* and *corrugata* the posterior trochanters are unarmed. I regret that it has been impossible for me to compare *corrugata* with the descriptions of some of the Siberian species published by Jakowleff.

Eurygaster alternatus Say.

This is probably the most abundant and universally distributed Scutellerid found in North America. It is common throughout the northern States and Canada and is perhaps equally abundant in the Rocky Mountain region south to New Mexico and west to California. On the eastern side of the continent, according to Dr. Uhler, it is rarely found so far south as Maryland. I once took it in great numbers from the sedges on the flats bordering Quinipiac River, near New Haven, Conn., and everywhere it shows a preference for swampy spots. This species varies much in size,—6½ to 10 mm. in my material,—and equally in the distinctness of its markings. Some individuals are quite strongly suffused with pink, and frequently the dark alternations on the connexivum are nearly or quite obsolete.

Eurygaster carinatus n. sp.

Form of *hottentotus* nearly, a little smaller, but distinctly larger than *alternatus*, depressed, triangular before, scutellum with a tumid base and carinate line. Color testaceous grey, becoming ochraceous on the abdomen, disk of the pronotum closely dotted with smooth pale points some of which become confluent. Head triangular, more obtuse and less incurved than in *hottentotus*, sides very slightly concave, surface almost flat, regularly punctate; tylus reaching almost or quite to the apex of the head. Rostrum attaining the posterior coxæ. Antennæ rufous brown or fuscous, second, third and fourth joints subequal, fifth longest. Pronotum depressed, the latero-posterior edge deeply arcuated behind the prominent and subacute humeri, latero-anterior margin straight, continuing the line of the head. Scutellum rather narrow, edges slightly concave near the middle, the surface strongly depressed either side leaving a triangular tumid base and carinate line which becomes evanescent toward the depressed tip. Connexivum ochraceous with coarse black punctures segregated on the middle of each segment. Pleural pieces coarsely punctated, marked with a smooth area on the middle of the pro- and meso-pleuræ; osteolar canal black on the expanded apex. Venter more finely and obscurely punctured, marked on each segment with marginal groups of black punctures, a double median group more or less distinct and sometimes an intermediate group. Apex of the genital segment of the male more deeply sinuated than in *alternatus*. Length 10 to 12 mm.

Described from two male and three female examples taken from the following localities: Salt Lake City, Utah, one example taken May 30th by Mr. G. Wesley Browning and one received from Prof. Herbert Osborn; Moscow and Lewistown, Idaho, two examples taken by Prof. J. M. Aldrich; and Reno, Nevada, one example taken by Prof. H. F. Wickham, July 18, 1903. This very distinct form may be distinguished from our only other known North Ameri-

can species, *E. alternatus* Say, by its large size, depressed form, flat triangular head and thorax, and the carinate scutellum.

Genus **ODONTOSCELIS** Lap.

This genus may be distinguished from *Camirus* by the absence of an external osteolar orifice and by the short transverse pronotum, the surface of which, while flattened, has no transverse furrow but a distinct longitudinal depression parallel to the lateral margin. The margins in the typical forms are feebly arcuated and expanded so as to form a more or less distinct ledge beneath on the sides of the propleura. In the European *dorsalis* and *fuliginosa* the head is shorter than broad, and rounded before, and the pronotal margins are incised before the humeral angles. In the two species described below, the head is longer and the humeri are entire, but with the limited material at my command I do not like to establish a new genus on these characters alone.

In the Bulletin of the U. S. Geol. and Geog. Survey of the Territories, vol. ii, pl. xix, fig. 4, Dr. Uhler figures an *Odontoscelis catulus* Uhler, and includes the same name in his Check List, with the habitat "W. Ind." I cannot, however, find that he ever published a description of this form, and Lethierry and Severin omit it from their Catalogue Generales des Hemipteres. The following key may assist in discriminating the species described below :

- Buculæ triangularly elevated posteriorly; head shorter, broad at tip, dark brown; sides of the pronotum feebly arcuated; scutellum with vermiculate brown markings **Balli.**
 Buculæ rounded, head longer, obtusely triangular at tip, black; sides of the pronotum feebly sinuated; scutellum with an incomplete black annulus at apex, and in the female with a black subbasal patch and indistinct oblique rays **producta.**

Odontoscelis Balli n. sp.

Closely allied to *dorsalis* of Europe but a little smaller and more elongated in form. Fulvous brown, closely punctured and covered with a short cinerous pubescence, which becomes longer on the head, sides of the pronotum, and abdominal margins; scutellum with vermiculate brown marks. Head a little longer and more convex above than in *dorsalis* sides before the eyes almost parallel, the apex broadly rounded; cheeks broad at apex, tumid, the sutures either side of the tylus deeply impressed, color dark brown, closely covered with a long brown pubescence mixed with cinerous along the sutures. Buculæ elevated posteriorly in a broad triangle. Antennæ rufous-brown, in structure characteristic of the genus; second and third joints subequal, fourth longer, fifth longest and with the preceding slightly flattened. Rostrum reaching the posterior coxæ, apical

two joints thickened, black. Pronotum transverse, anterior and posterior margins straight and parallel, sides depressed with margins rather broadly flattened, the edge narrowly recurved and slightly arcuated, fringed with stiff hairs; anterior angles rounded, humeri obtuse, not incised as in the European species; color fulvous brown, the broad submargins and a few irregular transverse lines on the disk posteriorly, and the callousities, blackish. Scutellum longer than in *dorsalis*, sides parallel, apex regularly rounded; color fulvous brown, with darker vermiculate markings, which in the male become finer and transverse along the middle where they are interrupted, forming an irregular blackish patch on either side of the disk, and outlining an indistinct triangular apical spot; base with a short longitudinal black line on either side. Pronotum and scutellum with a common obsolete pale longitudinal median line. Connexivum alternated with dark brown and pale fulvous. Beneath black; coxal region, an ill-defined spot on the hind edge of the mesopleura, legs and venter, obscure rufous, the latter becoming darker toward the margins. Sides of the propleura strongly depressed, the edge of the pronotum forming a broad shelf beneath. In the female the vermiculate lines on the scutellum are more irregular and coalesce to form a blackish patch on the disk either side of the middle; the colors below are more strongly contrasted, and the femora and inner surface of the tibiae are black. Length 5 to 6 mm.

Described from one pair taken at Fort Collins, Colo., May 20, 1899, and a female from Independence, Cal., taken July 17th by Prof. H. F. Wickham. Prof. Wickham has also sent me a nymph taken July 27th at Hawthorne, Nev., and more recently Prof. Gillette has sent me a long series taken at Fort Collins during May and June, and Mr. Henshaw one from Wyoming. The Fort Collins types were sent to me by Prof. Elmer D. Ball, an enthusiastic collector and an able student of the Homoptera, to whom I take much pleasure in dedicating this first described American species of *Odontoscelis*.

This species and that described below are best located in the genus where I have placed them, although the head in these American species is longer and the humeri want the incision found in the European species; the general form is also proportionately longer, but all other characters are those of *Odontoscelis*. As this genus has not before been recognized from our fauna, I have included in the description given above a number of purely generic characters.

***Odontoscelis producta* n. sp.**

Closely allied to the preceding but still more elongated. Head long, shaped as in *Lumirus conicus* Germ., above strongly convex, sides subparallel for some distance before the eyes, then obliquely truncated to the broad rounded apex of the tylus; color black, obscured by a dense coating of matted cinerous hairs above and below; buccine rounded. Pronotum proportionately longer than in *Balli*, the margins not so broadly expanded, feebly sinuated anteriorly. Upper surface of the whole insect closely and finely punctured with brownish, and covered with

a short grey pubescence; color soiled yellowish or tawny, paler than in *Balli*, marked above with a longitudinal pale median line, which becomes almost obsolete on the pronotum. Narrow lateral and posterior margin of the pronotum and the region of the callousities sometimes blackish. Impressed submargins and a few obsolete markings on the disk of the pronotum brown. Scutellum in the female with an oval subbasal black spot, and on each side of this an indefinite longitudinal vitta that is deflected to the lateral margins behind the middle and the apical region brownish, bordered incompletely with black. In this dusky apical field is a pale spot defined anteriorly by a black semicircle, and there are groups of dusky punctures near the basal angles and on either side of the pale median line behind the black subbasal spot. In the male all these dark markings become nearly obsolete but the pale median line and the black apical semicircle persist. Beneath black with the antennæ, base of the rostrum, coxæ and venter pale. Legs piceous, with the knees, exterior surface of tibiæ, and base of the tarsi pale. Connexivum alternated with brown. In the female the ventral sutures and a line on the stigmata are blackish. In both sexes the whole lower surface is densely white pubescent. Length 5 mm.

Described from a pair taken at Holly, Colo., September 8, 1898, and sent to me by Prof. Ball with the preceding species, and three females taken at Fort Collins, Colo., in June, and kindly sent to me by Prof. C. P. Gillette. This species might be placed in *Gomirus* were it not for the absence of an osteolar orifice and the form of the pronotum. The hairy vestiture of the whole surface is also characteristic of *Odontoscelis*.

Subfamily GRAPHOSOMIDÆ.

This subfamily is represented in our fauna by but two genera. These are black and rough-looking little insects, with the scutellum large, covering nearly the whole upper surface of the abdomen and furnished with a very short frenum. They have the humeral angles of the pronotum emarginate, with a tooth before the sinus; the anterior angles of the pronotum are armed with a tooth or lobe, and the head is long with the sides sinuated, the eye prominent and stylated, and the cheeks broad at apex, equalling or exceeding the tylus. They may be distinguished as follows:

Cheeks thin, flattened, a little longer than the tylus; antenniferous tubercles prominent beyond the sides of the head, armed without with a curved spine; angles of the pronotum armed with a short acute tooth.

Genus **Podops**.

Cheeks convex, tumid, considerably longer than, and contiguous before, the tylus; antenniferous tubercles scarcely prominent beyond the sides of the head, unarmed; anterior angles of the pronotum armed with a prominent rounded and denticulate lobe Genus **Oncozygia**.

Genus **PODOPS** Lap.

Our two species belong to the subgenus *Amaurochrous* Stal, included in his synopsis of the genera of American Pentatomidæ under the name *Scotinophara* Stal:

Size larger (6½ mm.); humeral tooth large, obtuse, its anterior edge arcuate; disk of the venter posteriorly more nearly smooth; outer apical angles of the male genital segment projecting beyond the general contour line, visible from above; apex of the female genital segment with a median sinus. **cinctipes.**

Size smaller (5 mm.); humeral tooth short, acute, anterior margins rectilinear, continuous with the latero-anterior margin of the pronotum; disk of the venter strongly punctured to the apex; outer apical angles of the male genital segment obtuse, scarcely prominent; apex of the female genital segments truncated **parvulus.**

Podops cinctipes Say.

I have placed under this name the larger species found throughout the northern States and Canada. Dr. Uhler records its occurrence in several of the southern States, so it probably extends its range over pretty nearly the whole of the United States and Canada. So far as I can see, the figure and description of *dubius* in the large work of Palisot de Beauvois answers in almost every particular for the present species, but Stal, in the Enumeratio, places it as distinct, giving Cuba and San Domingo as the habitat for *dubius*, and states that the lateral processes of the pronotum are longer than in *cinctipes*. These species are also cited as distinct in Lethierry and Severin's Catalogue, and it is therefore probably safe to assume that there is a West Indian form that is sufficiently distinct from *cinctipes*. The latter species is not uncommon about Buffalo, and I have seen specimens from Montreal and New Jersey. As the species described below has heretofore been confounded with this, I will not attempt to quote other localities.

Podops parvulus n. sp.

Allied to *cinctipes* but smaller with the humeral tooth more acute. Head as in *cinctipes* but with the stylated eyes a little more slender and separated more widely from the angles of the pronotum. Antennæ a little shorter and more slender, second and third joints more strongly differentiated, these and the fourth a little paler than in *cinctipes*. The pronotum differs in having the median transverse furrow more uniform, the anterior furrow farther from the fore border with the surface before it more elevated above the base of the head, the lateral margins more strongly arcuated anteriorly, with the humeral tooth more acute, and produced more backward and downward. The venter is

deeply and uniformly punctured, while in *cinctipes* the disk of the sixth segment is almost smooth, the punctures becoming obsolete toward the median line. The genital characters of these species are quite distinct. In *parvulus* the male has the punctured basal area longer, the apical sinus broader and more shallow, and the outer apical angles rounded and hardly prominent. In *cinctipes* these angles are strongly produced in obtuse but narrow recurved lobes that project distinctly beyond the apex of the scutellum when viewed from above. In the female of *parvulus* the inner plates and median plate nearly or quite attain the line of the outer plates, while in *cinctipes* they are shorter, leaving an obvious median sinus on the apical margin. Length about 5 mm.

Described from a pair taken in Colorado, a male from Montreal, Canada, and a female taken from Wood's Hole, Mass., and Prof. Osborn has sent me a pair taken in Colorado and a male from Douglas County, Kan.

***Oncozygia clavicornis* Stal.**

Mr. Otto Heidemann has very kindly given me a specimen of this interesting species that was taken at Fortress Monroe, Va., October 10, 1891. Stal's type came from Texas.

Subfamily CYDNIIDÆ.

These little brown ground-bugs are quite distinct both in appearance and habits from our other Pentatomidæ. I have at present but a very inadequate representation of this group in my collection, and these are but partially worked up, so for the present I will merely list the species thus far reported from our territory. A very complete monograph was published by Signoret in the volumes of the *Annales de la Societe Entomologique de France* for the years 1881 to 1884. An earlier paper on our North American forms was published by Dr. Uhler in volume three of the *Bulletin of the United States Geological and Geographical Survey of the Territories*, which contained a somewhat unsatisfactory synopsis of the genera. This paper is, however, invaluable and contains most that we know of our species.

***Cyrtomenus mirabilis* Perty.**

Recorded from South Carolina, Georgia, Florida and South America by Dr. Uhler; Prof. Snow has taken it in New Mexico; and Mr. Henshaw has sent me an example from Texas.

Cyrtomenus castaneus A. and S.

A southern form extending its range northward to Texas and Arizona.

***Macroporus repitetus** Uhler.

California (Uhler).

Homaloporus congruus Uhler.

Colorado and Texas (Uhler).

***Cydnus (Æthus) communis** Uhler.

Florida and Texas (Uhler).

***Cydnus (Cryptoporus) compactus** Uhler.

Described from Texas.

***Cydnus (Trichocoris) conformis** Uhler.

Described from California.

***Cydnus (Rhithidoporus) indentatus** Uhler.

Recorded from Florida by Dr. Uhler.

Cydnus (Microporus) obliquus Uhler.

Described from California, Utah and Texas. More recently Prof. Wickham has taken it in numbers in New Mexico and California.

***Cydnus (Microporus) testudinatus** Uhler.

California (Uhler).

***Cydnus politus** Sign.

Described from California.

Pangæus bilineatus Say.

Dr. Uhler records this from most of the Eastern and Southern States, from New York and Massachusetts to Texas and Utah, and Prof. Osborn from Iowa and Oregon.

Pangæus discrepans Uhler.

Described from material taken in Indian Territory, California, Texas and Mexico. Prof. Aldrich has taken it at Lewiston, Idaho.

***Pangæus margo** Dallas.

Dr. Uhler records this species from Arizona.

Pangæus piceatus Stal. Arizona (Uhler).

California Museum of Comp. Zool., Cambridge).

***Pangæus Spahnbergi** Sign.

Described from Texas.

Pangæus Uhleri Sign.

Recorded by Dr. Uhler as *rugifrons* H. S. from South Carolina and Georgia.

Geotomus parvulus Sign.

Described by Dr. Uhler from California as *Melanæthus elongatus*.

Geotomatus pennsylvanicus Sign.

Dr. Uhler described this as *Melanæthus picinus* from Pennsylvania. I took a single example from under stones at Griffin, Georgia, in May, 1899.

Geotomus robustus Uhler.

The types were from Maryland and Massachusetts. Rev. M. Wirtner has kindly given me a specimen from Jeanette, Pa., and it is included in Smith's Catalogue of Insects of New Jersey.

***Geotomus subglaber** Walker.

Described from "North America." It does not seem to have been recognized by recent students.

***Geotomus Uhleri** Sign.

"Am. Boreali" (Signoret).

Geotomus punctatissimus Sign.

Described from Sitka.

Amnestus spinifrons Say.

Generally distributed throughout the United States as far west as Colorado and Texas.

Amnestus pusillus Uhler.

A common species in the eastern United States. I have seen specimens from New York, New Hampshire, Indiana, Mississippi, Kansas and the Island of Trinidad. Dr. Uhler records it from

North Carolina, Tennessee and Lower California, and Prof. Osborn from Iowa. *A. subferrugineus* of Smith's Catalogue of the Insects of New Jersey may belong here.

***Lobonotus anthracinus** Uhler.

Described from Texas.

Sehirus cinctus P. B.

Dr. Uhler gives as the habitat of this species "Almost all of the United States as also Canada and Mexico." About Buffalo it grows to a larger size than farther south and west. I have seen Canadian material from Manitoba (Hanham) and Montreal (Chagnon).

Subfamily PENTATOMIDÆ.

Our best synopsis of the genera in this large subfamily is that published by Stal in *Of. Kongl. Vet.-Akad. Forh.*, xxiv, No. 7, pp. 522-532, 1867. In the Proceedings of the Iowa Acad. of Sciences, Vol. vi, pp. 40-46, 1898, Mr. H. E. Summers has published an adaptation of Stal's synopsis, which contains much original work, and has the advantage of being in the English language and of being more nearly up to date. Mr. Summer's synopsis contains also the American genera of the subfamilies Graphosomidæ, Asopidæ and Acanthosomidæ.

Mecidea longula Stal.

Described from Texan material, but it has since been reported from New Mexico by Uhler, and from Iowa by Prof. Osborn; and Prof. E. D. Ball has kindly sent me an example taken at Holly, Colo., Sept. 8, 1898. Both in form and coloration this singular Pentatomid bears a strong resemblance to the common Capsid, *Miris affinis*, and might readily be mistaken for a large example of that species.

Genus **BROCHYMENA** A. and S.

This genus forms a very distinct group in the North American Pentatomid fauna. Of the twelve recorded species all but two have been found within our territory. I have seen many uncertain forms of *Brochymena* that I cannot locate to my satisfaction. The whole genus sadly needs revision. The following key may assist in locat-

- Humeral angles produced in a short, dentate and truncated lobe.....1.
 Humeral angles prominent but oblique or rounded anteriorly, and minutely serrated or unarmed.....3
1. Anterior tibiæ dilated toward their apex; cheeks scarcely exceeding the tylus (a species not yet found within our limits).....**hædula**.
 Anterior tibiæ scarcely dilated.....2.
2. Basal one half of each antennal joint pale.....**Poyei**.
 Narrow base only of antennal joints pale.....**arborea**.
3. Lateral margin of the pronotum behind the sinus entire, unarmed; before the the sinus rounded and calloused, smooth or obtusely dentate (Stål).
myops.
 Surface of the pronotum punctured to the edge along the latero-anterior margins.....4.
4. Cheeks distinctly longer than the tylus and contiguous or nearly so before its apex, or generally leaving a deep narrow sinus; second joint of the antennæ shorter than the third; rostrum reaching on to the second ventral segment.....**quadripustulata**.
 Cheeks equalling or slightly exceeding the tylus, in the latter case with their apices rounded and not approaching.....5.
5. Cheeks considerably produced before the apical sinus, their tips obtuse, surpassing the tylus but not contiguous before it; second antennal joint nearly or quite as long as the third.....6.
 Head shorter, truncated at apex; cheeks scarcely exceeding the apical sinus, little longer than the tylus but sometimes contiguous over its depressed apex; second antennal joint distinctly shorter than the third.....8.
6. Basal two joints of the antennæ rufous; latero-anterior margins of the pronotum strongly dentate.....**affinis**.
 Antennæ fuscous or black with the narrow base of the third and fourth joints pale.....7.
7. Size medium; latero-anterior margins of the pronotum with but about three distinct teeth.....**obscura**.
 Size large; latero-anterior margins of the pronotum closely set with strong teeth; color cinerous with a few large black punctures, and more numerous smaller uncolored ones.....**cariosa**.
8. Latero-anterior margins of the pronotum armed with irregular teeth; base of the pronotum and the elytra with many smooth white points; head truncated before, the apical sinus almost obsolete; bucculæ armed anteriorly with a small acute tooth.....**Harrisii**.
 Latero-anterior margins armed with numerous regular teeth; pronotum and elytra without dots; bucculæ with a large stout tooth anteriorly.....9.
9. Head before distinctly triangular, the subapical lobes prominent, obtuse; elytra with a discal white point.....**annulata**.
 Head truncated, scarcely longer on the middle; white discal point on elytra obsolete; size large.....**marginella**.

Brochymena arborea Say.

This is a distinct and well-known form that is distributed over nearly the whole of the United States and Canada, but seems to be

most abundant in the regions well covered with forests of deciduous trees. It is subject to some variation in the form of the apex of the head, the armature of the sides of the pronotum, and the sculpturation at the apex of the scutellum. In all the specimens before me the cheeks slightly surpass the tylus, with their apex narrow and obtuse, their subapical tooth large, usually obtuse, and almost attaining the tip of the head; the apex of the scutellum is rather blunt and more or less distinctly impressed on the middle. The antennæ are fuscous with the extreme base of the second, third and fourth joints pale. The mesosternum is marked with a transverse black spot.

Brochymena Poeyi Guer.

Mr. Otto Heideman has kindly given me a male from Florida that was determined by Dr. Uhler as *Poeyi*. It differs from Stal's descriptive notes on this species by having the bases only of the antennal joints pale, the tylus attaining the extreme apex of the head, and the mesosternum marked with the large black spot found in *arborea*. It is much paler in color than *arborea*, the obtuse apex of the cheeks does not exceed the tylus and the subapical tooth is reduced to an obtuse angle at the base of the apical sinus. The tip of the scutellum is also more produced and narrowed to an obtuse angle. As this evidently belongs to a species sufficiently distinct from *arborea*, I prefer for the present to leave it as determined by Dr. Uhler, even though it does not fully accord with the known characters of this species.

Brochymena hædula Stal.—This is a Mexican species not yet recorded from our territory. I have included it in the synoptical table above to make that more complete. *B. aculeata* Dist. is another closely allied form from Mexico that may be distinguished from *hædula* by the stronger armature of the pronotum and the uniformly fuscous antennæ.

Brochymena quadripustulata Fabr.

This is by far our most abundant species of *Brochymena* throughout the eastern United States and Canada. It ranges west to Arizona, Utah and California. I have seen this species in several collections under the name *annulata*. Stal gives a very clear and concise characterization of these two species in his *Enumeratio* that should preclude any possibility of error in their discrimination. The

long head, narrow and cleft at apex, the rounded anterior margin of the humeri, and the pale irregular teeth on the sides of the pronotum anteriorly will distinguish this species. It has been described as *B. 4 punctata* by Provancher and later placed by him under *B. annubita* Fabr. Dr. Uhler in his check list entered Provancher's name as *4 notata*.

***Brochymena myops** Stal and **laticornis** Say.

These are the only species from our territory that I have not yet seen. Judging from Stal's synoptical notes *myops* should be distinguishable from *quadripustulata* by the pale calloused latero-anterior margins of the pronotum which are unarmed or nearly so. Could not Say's *Pentuloma laticornis* be the same?

Brochymena obscura H. Sch.

As represented in my collection this species is a little smaller and proportionately broader than *quadripustulata*, the cheeks are shorter, scarcely exceeding the tylus and marked above with longitudinal smooth pale rugæ; the surface of the pronotum is more evenly and closely punctured, and the sides anteriorly are armed with about three stout acute teeth; the scutellum is shorter, with the apex less produced and the surface closely and deeply punctured as is the pronotum; the second joint of the antennæ is almost equal to the third, and the rostrum is longer, reaching to the middle of the third ventral segment in the female. On the upper surface there is a smooth median line, somewhat interrupted, from the tip of the tylus to the apex of the scutellum. This species seems to be peculiar to the Southwestern States, occurring from Colorado to California and southward to Mexico.

Brochymena affinis n. sp.

Very closely allied to *4-pustulata* Fabr.; differing principally from that species in having the genital segment of the male very short and broad, extending on either side beyond the sixth ventral segment and beyond the projecting apex of the membrane, and heavily fringed with long pale hairs either side of the median sinus. Two basal joints of the antennæ rufous, the remaining joints black with rufous incisures, second joint nearly or quite as long as the third, fifth a little shorter than the preceding. Head about as in *4-pustulata* but with the tylus scarcely shorter than the cheeks. Sides of the pronotum distinctly rounded and strongly toothed before the sinus. Scutellum perhaps a little broader and more rounded at tip than in *4-pustulata*. Rostrum reaching to the middle of the third ventral segment, pale with a black tip and median line within. Other characters

substantially as in *4-pustulata*. The general color, however, seems to average somewhat lighter. Length 13-16 mm., width across the humeri 7-8 mm.

Described from two male and six female examples taken at Palo Alto, California, in January, 1892, labelled "L. S. Jr. U. (Leland Stanford Jr. Univ.), No. 19," and received from Cornell Univ.; one male taken at Moscow, Idaho, by Prof. Aldrich, and one male taken at Olympia, Wash., by Mr. T. Kincaid, also received from Cornell University.

It may seem rash to describe a new species in this difficult genus on such slight characters, and I would not think of doing so were it not that the form of the genital segment of the male is entirely distinct from that of any described species known to me. The rufous two basal joints of the antennæ, with the second as long as the third also seems to be characteristic. The head is elongated as in *4-pustulata* and *obscura*, but the apex is formed about as in *curiosa* Stal, being intermediate between the *4-pustulata* group and the *annulata* group.

Brochymena curiosa Stal.

This is our most showy and, excepting *marginella*, our largest species of *Brochymena*. The black punctures and markings on the pale yellowish ground gives it a very lively and pretty appearance. The form of the head is about as in *obscura* and *affinis*. Aside from its large size and strongly contrasted markings it may be distinguished from *obscura* by the numerous large teeth on the sides of the pronotum, and from *affinis* by the form of the genitalia. In the only specimen now in my collection the basal two joints of the antennæ are paler than the others, but not rufous as in *affinis*. This species is known from Texas, Arkansas, Louisiana, Mississippi and Florida.

Brochymena annulata Fabr.

This species is very distinct from *4-pustulata*, representing a different section of the genus, distinguished by the more broadly ovate form. The short and broad head is truncated at apex, with the apical sinus nearly transverse; the surface is finely and closely punctured and ornamented in places with groups of larger black punctures; the sides of the pronotum before the sinus are strongly arcuated and armed with close regular teeth; the second joint of the antennæ is much shorter than the third, and the rostrum is long,

usually attaining the third ventral segment. In *annulata* the cheeks are more produced than in the two allied species (*marginella* and *Harrisii*), and converge at apex over the tip of the tylus which they very slightly exceed. There is a small pale point on the disk of each elytron posteriorly and the connexivum is quite strongly banded.

This seems to be a comparatively rare species which I have seen from the eastern United States only. It is more abundant toward the south, my material showing a range from southern New York to Florida. *Hulys carolinensis* Westw. is certainly a synonym of *annulata* and not of *4 pustulata* as given in the Lethierry and Severin Catalogue.

Brochymena marginella Stal.

Through Mr. George Frank, of Brooklyn, I have received a fine example of this large species. It is considerably larger even than *cariosa*, this individual, which was captured in Harris County, Texas, in March, 1901, measuring 20 mm. in length. The pale margin of the connexivum is nearly continuous though not at all conspicuous; and there is an almost obsolete pale band in the middle of each segment; the apex of the head is a little shorter and blunter than in *annulata*, and the tips of the cheeks do not meet over the apex of the tylus. The Lethierry and Severin Catalogue erroneously gives "Carolina" as the habitat of this species. It should read "Texas." Prof. Osborn has recently sent for my examination an example taken in Florida.

Brochymena Harrisii Uhler.

This name is placed as a synonym of *annulata* by Lethierry and Severin and is doubtfully referred to the same species by Stal in the Enumeratio. The present species, however, agrees better with Dr. Uhler's description than does *annulata*, and I believe it is the one described by him. This description was comparative with *annulata*, but his *annulata* was evidently the *4 pustulata* as recognized above. It may be distinguished by the short head, almost square across the apex, the coarser teeth on the sides of the pronotum, and the paler smooth raised points on the pronotum, scutellum and elytra. The scutellum is shorter than in *annulata*, and at each basal angle is marked with an oval group of deep black punctures. The female

genitalia are also quite distinct, the valves being more convex and the outer plates more produced inwardly on the apical margin. The rostrum is a little shorter in my specimen and the second joint of the antennæ is longer, the tooth at the anterior end of the buccula is much smaller than in either of the allied species. My only specimen is a female kindly sent to me by Mr. W. M. Scott, formerly State Entomologist of Georgia, in which State it was captured. I have seen another from the same State in the Cornell University collection.

Genus **SCIOCORIS** Fallen.

This is distinctively a palæartic genus of which no species has heretofore been recorded in this country. Butler has described one from South America, and Walker another from St. Vincent, but the latter may not be correctly located here. Recently Prof. Osborn has sent me for study a single specimen that he thinks was taken in southern Texas, and from Mrs. Slosson I have received a specimen of *microphthalmus* captured by her in the White Mountains. Prof. Osborn's species I have not been able to identify with any yet described; I do not, however, like to publish it as new without more material.

Sciocoris microphthalmus Flor.

Mrs. Annie Trumbull Slosson has very kindly sent for my examination a specimen of this species taken by her on Mt. Washington, New Hampshire. It is the first and only occurrence of this species in our territory of which I have knowledge. This is a little brown depressed bug with alternated connexivum and broad rounded head and scutellum.

Genus **PERIBALUS** M. and R.

Scutellum broad and concolorous to the apex, without a white tip; connexivum alternated.....**tristis.**

Scutellum with a white tip.....1.

1. Connexivum alternated; scutellum moderately broad.....**abbreviatus.**

Connexivum black with a pale margin.....2.

2. Scutellum broad; body strongly convex, broadest behind the middle.

piceus.

Scutellum narrow at tip; form more depressed and narrowed posteriorly.

limbolarius.

Peribalus limbolarius Stal.

A very abundant species found throughout the United States and Canada. I possess specimens from New York, New Jersey, Georgia,

Kansas, Colorado, Utah, California and Vancouver Island, and have seen others from Montana and Manitoba. It has also been recorded from Arizona, Texas and Mexico. The specimens from the east are mostly large and dark colored, while those from the arid regions are small and pale. In some of the dark specimens the pale margins of the connexivum are scalloped within, thus showing an approach to those having the connexivum alternated. A good figure of a moderately dark specimen is given at Plate VI, fig. 19 of the *Biologia*.

***Peribalus abbreviatus* Ulder.**

This species, described as a *Hulcostethus*, has been omitted from the Lethierry & Severin Catalogue. It seems to be characteristic of the Rocky Mountain region. I have found it quite common in July on the mesquite bushes growing on the dry mountain sides in Colorado. Prof. Wickham has sent me a specimen taken at Kalispell, Montana, in June, and Dr. Uhler records it from Kansas, Utah, California, British America and Lower California.

***Peribalus tristis* n. sp.**

Form depressed, oval, scarcely narrowed posteriorly, sides of the pronotum strongly arcuated, apex of the scutellum broad, scarcely touched with white at tip, connexivum alternated with black and fulvous, beneath black with fulvous spots on the margin of the venter. Fusco-luteous, very thickly and strongly punctured with black giving the whole insect a bronzy-black appearance, especially on the head, sides of the pronotum, base of the scutellum, and sides of the venter. Apex of the head distinctly emarginate, the median line above obscurely pale. Pronotum broad, depressed, humeral angles rounded, edge fulvous, callousities black, marked with a pale point as in *piceus*. Scutellum broader at apex than in either *bimolaris* or *abbreviatus*, proportionately a little longer and more contracted posteriorly than in *piceus*, extreme tip paler but not white and calloused as in our other species. Elytra paler and more mottled than the rest of the upper surface. Beneath with more obvious coppery reflections, punctures larger on the pleural pieces, becoming confluent toward the anterior and lateral margins. Disk of the venter somewhat paler, the extreme edge with a pale spot on the middle of each segment. Legs pale, the femora with black punctures which may become confluent toward their apex. Antennæ testaceous or rufous, becoming black toward the apex, incisures pale. Rostrum reaching between the posterior coxæ, pale with the median line and tip black. Length 8 mm., humeral width 4½ mm.

Vancouver Island, British Columbia. Described from two female examples received from Rev. Geo. W. Taylor, and labelled August 20, 1897, and May 24, 1898.

This species may be distinguished by the broad, almost concolorous apex of the scutellum and the depressed pronotum, with the sides strongly arcuated, together with the maculated connexivum and blackish submetallic venter. It is doubtless subject to variation in the extent of obscuration by black punctures.

Peribalus piceus Dallas.

Like the preceding, this insect has a northern habitat. My only specimen was taken at Bozeman, Mont. in July, and kindly presented to me by Prof. R. A. Cooley. Mr. W. H. Harrington has taken it near Ottawa, Ont.; Prof. Osborn records the capture of a pair in Iowa, and the type was from Hudson's Bay. *Peribalus piceus* differs from our other species in being broadest behind the middle of the abdomen and more convex both above and below. It is a dark-colored form, with the pale margins of the abdomen and the apex of the scutellum strongly contrasted. There is a pair of round white dots on the disk of the pronotum anteriorly, and the pale margin of the connexivum is undulated within; the legs are piceous, becoming pale brown on the outer surface of the tibiæ and base of the tarsi; antennæ brown, shading to piceous on the apical joints and with the incisures pale; rostrum brown, reaching the posterior coxæ.

Dr. W. L. Distant writes me that *Pentatema dubia* of Dallas (List, p. 237) is a *Peribalus*. It was described from North American material, but I cannot make the short diagnosis agree with any of the species enumerated above. It might well be a form of *limborius* were it not for the use the author makes of the word "pilosis." The only other North American species to which this would apply is *Trichopepla semivittata* Say.

Genus **TRICHOPEPLA** Stal.

Antennæ rufous with the apical two joints black; head narrow at apex; sides of the pronotum more oblique.....**semivittata**.
Antennæ black, basal joint only rufous; head broader at apex; sides of the pronotum less oblique.....**atricornis**.

Trichopepla semivittata Say.

Widely distributed and locally abundant. My collection contains material from New York, New Jersey, Delaware, Washington, D. C., Indiana and Colorado, and Mr. Chagnon has taken it at Montreal. I once found this insect in large numbers on carrot blossoms in a

waste field near Buffalo as late as November 3d. They were in all stages of development, and I was surprised to find that the imagoes were blackish at first with the connexivum margined with pale. After they attained full maturity they assumed their ordinary pale color, with the connexivum maculated.

Trichopepla atricornis Stal.

As stated by Dr. Uhler, this species belongs more to the north and west of North America. My specimens are from Montana (Cooley) and Idaho (Aldrich). Uhler records it from Illinois, Wisconsin, Colorado, California, British America and Alaska. It differs from the preceding species in having black antennæ, a broader head, and a proportionately longer pronotum, with the lateral margins distinctly less oblique. This species exhibits the same variability in the markings on the connexivum found in *semivittata*, but here the pale border seems to persist, in some of the fully matured adults, which I have never found to be the case in *semivittata*.

Genus **PENTATOMA** Osh.

- Lateral margins of the pronotum carinated but not distinctly reflexed. (*Lioderma* Uhler.) 1.
- Lateral margins of the pronotum acutely carinated and narrowly sharply reflexed 2.
1. Second and third joints of the antennæ subequal; length to the tip of the membrane about 10 mm.; color olive green or brown; costal margin broadly pale, bordered within with a black line. **saucia**.
 Second joint of the antennæ longer than the third; length about 8½ mm.; form oval, triangularly produced before; color green or olive green, margins, including those of the head, and the apex of the scutellum pale. **viridicata**.
2. Second and third joints of the rostrum equal or subequal, fourth shorter than the third; form more elongated and produced before. (*Rhytidoloma* Stal.) 3.
 Second joint of the rostrum longer than the third, the latter subequal to the fourth; form proportionately broader and less produced before. (*Chlorochroa* Stal.) 6.
3. Color pale straw-yellow, elytra deep piceous or black **Osborni**.
 Color green or olive 4.
4. Color uniform dark olive brown or somewhat greenish; margins of the pronotum and elytra paler; form more elongated **senilis**.
 Color green or olive brown, entire margins behind the head and a median line on the scutellum, sometimes almost obsolete, pale; form proportionately broader, more oval 5.

5. Smaller, 11 mm. in length. Antennae black, first, second, and base of the third joint green; apex of the genital segment of the male deeply concavely excavated, outer angles subacute **faceta.**
Larger, 15 mm. in length; antennae black, basal joint only green; costal edge of the elytra beyond the middle blackish; apex of the genital segment of the male feebly concave with a rounded median tooth, outer angles obtuse **Belfragei.**
6. Form elongate oblong; outer margins, apex of the scutellum, three large dots on its base, and numerous smooth calloused points on the pronotum, scutellum and elytra whitish, the margins sometimes tinged with red **Sayi.**
Form broader, the three smooth dots on the base of the scutellum when present inconspicuous 7.
7. Form broad oval; color deep clear green; entire margins behind the head and tip of the scutellum reddish yellow or even crimson; genital segment of the male strongly produced on the ventral surface; inhabits eastern and northeastern States **juniperina.**
Margins of the entire body and tip of the scutellum usually inconspicuously pale, if strongly contrasted or red then the genital segment of the male is not produced on the ventral surface; inhabits the western States. 8.
8. Size large, form oblong; outer margins and apex of scutellum conspicuously pale or even crimson; pronotum, scutellum and elytra distinctly marked with smooth pale dots; ventral punctures dark **ligata.**
Pale outer margins inconspicuous, or the form more ovate with the punctures on the venter concolorous 9.
9. Size smaller (9-12 mm.); pale outer margins and apex of the scutellum inconspicuous; genital segment of the male produced on the ventral surface; form ovate **congrua.**
Larger (12-15 mm.); pale outer margins and elytral granules moderately conspicuous, the latter sometimes a little paler than the surrounding surface **Uhleri.**

Pentatoma (Lioderma) saucia Say.

So far as I can learn, the range of this species is confined to the country adjacent to the Atlantic seacoast. I took a few examples on the salt marshes about New Haven, Conn., in 1882; Prof. Ball has sent me several taken at Revere, Mass., in September, and in Smith's List of the Insects of New Jersey it is recorded as having been taken on Staten Island by Mr. W. T. Davis. Say records it from Virginia and Florida, and doubtfully from Pennsylvania or Indiana. The olive brown color, with a longitudinal black line within the costa, will readily distinguish this species.

Pentatoma (Lioderma) viridicata Walker.

This very distinct little species is generally accredited to Uhler, but it was really described by Walker (List ii, p. 28) eight years

before Uhler's description appeared. Walker doubtless received his material from Dr. Uhler with this MS. name attached, which he afterward used when he published his description. I believe this is a rare or at least a local species. Dr. Uhler records it from Montana, Colorado, and Lower California, and the collection of the Agricultural College at Fort Collins, Colo., contains a good series from that State. The color varies, probably with maturity, from light green to dark olive green. The peculiar shape of the insect is well shown in Dr. Uhler's figure.

Pentatoma (Rhytidolomia) senilis Say. (*Ovalis* Westw., Hope Cat., i, p. 39, 1837.)

This species seems to be not uncommon along the Atlantic coast of Long Island, Staten Island, and New Jersey. I cannot learn that it occurs elsewhere, although its range doubtless extends southward at least to Virginia. The long narrow form and uniform dull olive color will distinguish this species. It closely resembles the figure of *Elia atricornis* Westw. given by Distant in Proc. Zool. Soc., 1890, pl. 53, fig. 8, but is much larger than the size indicated on the plate.

***Pentatoma (Rhytidolomia) Belfragci** Stal

I am indebted to Prof. Herbert Osborn for the opportunity of examining a fine specimen of this interesting species taken at Little Rock, Iowa. The color is a light greenish testaceous, with the elytra and venter of a clearer green, the narrow edge of the pronotum and elytra and a broad median vitta on the scutellum are yellowish. There is a slender curved black line on the sides of the propleura anteriorly, and the costal edge of the elytra beyond the middle and the sides of the scutellum at apex are blackish. The sides of the head are less deeply sinuated than in *faceta*, and the tibiae are much more deeply sulcate above.

This is certainly a rare species, and is probably confined to the Mississippi Valley and the adjacent fertile plains. Stal records it from Illinois, and Uhler adds Canada and Nebraska.

Pentatoma (Rhytidolomia) Osborni n. sp.

Form of *P. faceta* Say, but much larger. Pale testaceous yellow, coarsely and deeply punctured, elytra piceous black, the costa broadly pale. Head long and tapering as in *faceta*, cheeks hardly longer than the tylus, not so long as in *senilis*; punctures confluent on the cheeks, more distant on the base of the vertex, almost

obsolete on the tylus. Antennae long, pale greenish, becoming infuscated toward the apex; first joint very short, reaching about half way to the tip of the head, second longer than the third, fourth and fifth subequal, a little thicker than the preceding. Rostrum reaching almost to the base of the third ventral segment, pale, with a median line beyond the middle, and the apical joint, black. Pronotum strongly narrowed anteriorly, the sides straight or very feebly arcuated, sharply carinated, punctures closer and finer anteriorly, becoming larger posteriorly. Scutellum more sparingly punctured toward the tip which is a little broader than in *faceta*. Elytra piceous black, darker in the male, the costal area testaceous yellow, the punctures finer than on the pronotum and becoming confluent near the base. Membrane fuscous, nervures strong. Connexivum testaceous yellow. Beneath testaceous, pleural pieces strongly punctured. Venter obsoletely aciculate-punctate. Legs pale greenish-yellow becoming infuscated on the tarsi. Length 13 mm. Width across the humeri 7.4 mm.

Colorado and Texas. Described from a male taken at Rockyford, Colo., July 16, 1901, by Prof. E. D. Ball, another male taken at North Braunfels, Texas, June 16th, by Prof. Wickham, and two females labeled "Alpine, Texas, July 26th." One of these was kindly given to me by my friend, Prof. Herbert Osborn, in whose collection two of the types now are, and to whom I take pleasure in dedicating this very distinct and interesting species as a slight token of my appreciation of his faithful and invaluable labors on the North American Hemiptera, and of his generous assistance to me in my studies.

The uniform pale yellowish color of this species, with the strongly contrasted black elytra, will at once distinguish it.

***Pentatoma (Rhytidolomia) faceta* Say.**

Say described this species from "Missouri," which, of course, included much more than the Missouri of to day; Uhler records it from Dakota and California. Prof. Ball has sent me a good series from Colorado, and I have received it from Salt Lake City (Browning), and Keeler, Cal. (Wickham). In July, 1900, I took numbers of both young and adults on a grassy meadow close to the river bank at Grand Junction, Colo. In but one or two specimens does the longitudinal pale line on the pronotum become at all conspicuous. Sometimes there is a black line on the margin of the scutellum either side of the apex.

This is the last of our species having an elongated form with the head and pronotum more triangularly produced and the third joint of the rostrum much longer than the fourth. The species following belong to the subgenus *Chlorochroa* Stal. While it is possible quite

readily to separate the species of the latter subgenus by their form and general appearance, it is sometimes very difficult to indicate in words any salient points for distinguishing them. The characters given in the key are the best I have yet been able to detect. When living on the whitish vegetation characteristic of the parched prairies of the arid regions, the colors become correspondingly pale. Under other conditions, at least in *Soyi* and *ligata*, they become deep blackish green with the markings strongly contrasted.

***Pentatoma (Chlorochroa) juniperina* Linn.**

When fully colored, this is a beautiful insect, with its bright crimson border about the clear green body. It is abundant in the eastern States north of New Jersey and in eastern Canada. How far west in Canada it extends I have not yet been able to determine.

***Pentatoma (Chlorochroa) Uhleri* Stål.**

This is perhaps the most abundant *Pentatoma* found in Colorado and the adjacent portions of the Rocky Mountain region. A long series received from the Agricultural College at Fort Collins shows a very marked variation toward *juniperina* on the one hand and *ligata* on the other. Either this is still a plastic group or species that has not become well fixed or my material contains two or more species I have not been able to delimit. The form I have considered typical *Uhleri* is most nearly allied to *juniperina*, but has a more broadly ovate form, and the genital segment of the male is much shorter on its ventral aspect; viewed from the side, this portion projects but little beyond the dorsal portion. In this, as in all the allied species, the retracted dorsal edge of this segment is feebly sinuated with a minute median notch, and on the base below are two distant, oblique, oval, blackish spots that are ordinarily quite inconspicuous.

In Horre Soc. Ent. Rossiz, vol. 4, p. 99, 1867, Kouchakevitch describes a *Cimex flavomarginatus* that I believe is the same as *Uhleri*. If this proves to be the case, the latter name will have to give way to *flavomarginatus*. For the benefit of those who have not access to the paper by Kouchakevitch, I copy here his Latin diagnosis, and append a free translation of his Russian notes that was kindly made for me by Dr. Schröter of this city. I leave the final determination of the synonymy of this difficult species until a more careful revision of the genus can be made.

"*Cimex flavomarginatus* A. Kouch. Male, female, long. 12 mm., lat. 6½ mm., tab. 2, fig. 3. Oblongo-ovatus, viridis, punctatus, thorace hemielytris margine antico abdomineque lateralibus anguste flavis, lævibus, nitidis; scutellum, maculis tribus in ipsa basi et quarta majore, triangulari pallide flavis nitidis. Antennis pilosis apice obscurioribus, rostro articulo ultimo nigro; pedibus viridibus, tibiis flavicentibus pilosis; unguiculis nigris."

"Similar to *juniperina*, more convex and narrower. Color lighter and clearer green; three pale points on the base of the scutellum, two of these on the basal angles more distinct, and a large triangular one on the apex; from this a feeble furrow runs forward, on each side of which are a few paler raised points. Rostrum reaching the base of the abdomen, last joint piceous. Antennæ, first joint green, second olive green, remaining joints rufescent."

This species might be identified with *juniperina* were it not that the author compares his insect directly with that species and considers it as distinct. His figure indicates a broader species, with the three pale calloused points on the base of the scutellum more pronounced and the outer margins paler in color than in *juniperina*. In both of these species the antennæ are green becoming rufous or rufopiceous toward the tip.

On page 98 Kouchakevitch describes another species from Monterey, of which the following is a copy of the Latin diagnosis:

"*Cimex albosparsus* A. Kouch. Male long. 13 mm., lat. 7½ mm., tab. 2, fig. 2. Pallide viridis, opacus, punctatus; thorace, scutello, et corio elytrorum callositatibus albis, lævibus, irregulariter conspersis; membrana hyalina, connexivo flavo-viridis; subtus pallidus, abdomine medio flaviscente viridibus."

I have not yet been able to identify this with any Mexican Pentatomid known to me. Some points in the description indicate *Soyi*, but the form absolutely forbids such a reference. Well executed figures of this species and *flavomarginatus* are given in the paper from which these descriptions are copied, and for the loan of which I am indebted to the kindness of Dr. Henry Skinner of the Philadelphia Academy of Natural Sciences.

Pentatoma (Chlorochroa) congrua Uhler.

This species is somewhat of a puzzle to me. Uhler's description agrees very well with some of the smaller specimens of *P. Uhleri*. I have, however, followed the lead of others and identified it with a small species that has come to me from various correspondents under the names *congrua* Uhler, *intricata* Uhler, and *Harrisii* Westw.

My material in this species represents the following localities: Colorado (Ball), Ogden, Utah, and Salt Lake City, Utah (Browning), Moscow, Idaho (Aldrich), and Gallatin County, Mont. (Cooley). Prof. Osborn has kindly sent me a Colorado specimen determined as *congrua* that agrees very closely with mine.

Pentatoma (Chlorochroa) ligata Say. (*Cimex rufomarginatus* Kouch.)

This species averages larger than any of the preceding. The elytra and sometimes the scutellum and pronotum are well sprinkled with smooth, pale points; the antennæ are entirely black or with the basal joint only green, and the venter is strongly punctured with dusky or black. This species often becomes of a blackish green color, with the pale markings strongly contrasted. This is in fact the only color I have seen in Mexican material. *P. ligata* ranges from Mexico northward through the Rocky Mountains to Vancouver Island and apparently still farther north to Alaska. The Latin diagnosis of Kouchakevitch, a copy of which I give here, agrees in every particular with our *ligata*, and I am sure there can be no doubt of its identity. Some of the characteristic points mentioned in this description are the black antennæ with a pale basal joint; the pale calloused points on the scutellum and elytra, and the olivaceous venter with piceous punctures and black stigmata. The color, shape and markings agree exactly. Stal evidently did not know of Kouchakevitch's paper, although it was published five years before Part II of the Enumeratio.

"*Cimex rubromarginatus* A. Kouch. Male, long. 12½ mm., lat. 6½ mm. tab. 2, fig. 4. Elongatus-ovatus; suprapiceus-olivaceus, punctatus, oculis olivaceis. Thorace lateralibus, scutello apice, elytrorumque marginibus anticis, connexivo, supra et subtus rubrotestaceis. Scutello et corio elytrorum punctis callosis albis, sparse notatis. Membrana fusca, nitida. Subtus olivaceus, pallide piceo-punctatus lateribus abdominis fuscentibus stigmatus nigris. Pedibus olivaceis, tarsis fuscis. Rostro olivaceo, articulis apicalibus nigris, nitidis. Antennis nigris, articulo primo olivaceo."

The habitat given by Kouchakevitch for this species is Russian America.

Pentatoma (Chlorochroa) Sayi Stal. (*Pentatoma granulosa* Uhler. Hayden's Survey of the Terr., 1872, p. 398).

This is the most easily recognized of our *Chlorochroas*. The narrow elongated form, the numerous smooth white points on the

pronotum, scutellum, and especially on the elytra, and the three large calloused points on the base of the scutellum are characteristic. The antennæ are black, with the first and sometimes the base of the second joint green. The ventral surface of the male genital segment is strongly produced. The colors vary exactly as in *C. ligata*. This seems to be a very abundant species throughout the Rocky Mountains, and Prof. F. H. Snow has taken it as far east as western Kansas. My material is from Montana, Idaho, California, Utah, and Colorado. In the latter State it has even become a serious pest in the grain fields during the past summer. I have taken it in greatest numbers from a low *Lonicera* growing on the foot-hills in Colorado.

Pentatoma Harrisii Westw

This species is so uncertain, both as to habitat and identity, it seems best to pass it for the present with the statement that Distant gives a good figure of it in Proc. Zool. Soc., 1900, pl. 53, fig. 2.

Carpocoris lynx Fabr.

Not uncommon throughout Colorado and the adjoining States. I have taken it at Ogden, Utah, and Prof. Wickham has sent me specimens from Williston, N. Dak., and from Prof. Cooley I have received some taken in Montana. Dr. Uhler records it from California. The pale green and pink of the upper surface gives this insect a very pretty appearance.

In Of. Finisk. Soc., xxvi, p. 32, 1884, Reuter has described a variety *longiceps* of this species. I have not seen this description, and cannot state how it differs from the ordinary form of the species.

Mormidea lugens Fabr.

This insect is common everywhere throughout the eastern United States and Canada, and is somewhat less abundant in the west from British America to Mexico. Say described it as *Pentatoma punctipes*.

Mormidea pictiventris Stal.

Mr. Samuel Henshaw has kindly prepared for me a list of the North American Pentatomids in the Museum of Comparative Zoology at Cambridge. This list includes a number of species not before recorded from our territory, and among them the present, which is credited to Texas.

Mormidea sordidula Stål.

Recorded from New Mexico and Texas within our territory. My material is from Mexico. This species is pale testaceous punctured with black, with the narrow apex of the scutellum, three points on its base, two on the disk of the pronotum anteriorly, and the slender outer margins of the pronotum and base of the elytra white and calloused.

Mormidea tetra Walker.

Prof. Wickham has very kindly sent me a specimen of this large pale species taken at Del Rio, Texas, in June. It is larger than the preceding species, has the white markings still more reduced, and the connexivum maculated. The venter wants the median vitta and the antennæ are entirely black. It has not before been recorded from north of Mexico.

Cebalus pugnax Fabr.

This is a southern species that reaches its northern limits from southern New York westward to Ohio and Iowa. In my collection are specimens from New Jersey, Washington, D. C., North Carolina, Georgia, Mississippi, Kansas, and Colorado, and Uhler records it from Texas, Arizona, and Florida. It also inhabits Cuba and Mexico. This is *Pentatoma augur* Say.

Genus **EUSCHIISTUS** Dallas.

Margin of the abdomen somewhat calloused pale; connexivum marked with a black line within; pronotum quite convex behind; apical ventral segment with two smooth points.....**comptus.**

Margin of the abdomen not calloused, or distinctly pale; connexivum usually maculated; pronotum but slightly convex behind; apical ventral segment without smooth points.....1.

1. Membrane normally distinctly dotted with fuscous; tergum in fully developed examples black.....2.

Membrane destitute of dots; tergum rarely fuscous or black.....12.

2. Margin of the venter with a minute black point at each incisure.....3.

Margin of the venter immaculate, angles of the segments concolorous....11.

3. Body strongly convex, especially below; humeri forming short acute but abrupt spines, distinctly inclined forward.....**crassus.**

Body less convex, sometimes obviously depressed.....4.

4. Apex of the head strongly incised; cheeks distinctly produced beyond the rounded apex of the tylus, subacute; elytra as wide as the abdomen.

fissilis.

Cheeks very little if at all longer than the tylus; elytra narrower than the abdomen exposing the maculated connexivum.....5.

5. Form not distinctly depressed, the sides of the pronotum sometimes a little expanded and reflexed before the humeri, in that case the middle of the venter marked with a row, sometimes incomplete, of black spots. 6. Form distinctly depressed especially within the lateral margins of the pronotum; venter without black spots. 9.
6. Size larger (12-14 mm.); venter without distinct black spots on the median line 7.
Size smaller (under 12 mm.); venter with a row of black spots, sometimes almost obsolete. 8.
7. Humeri prominent, acute or rounded, never spinose; upper surface rather closely irregularly punctured; inhabits eastern and southern States.
servus.
Humeri acutely spinose; upper surface paler; punctures more distinct and regularly disposed. **impictiventris.**
8. Humeri prominent, rounded; fifth joint and apical half of the fourth joint of the antennae black **tristigmus.**
Humeri produced, acute or spinose; antennae entirely pale or rufous.
var. **pyrrhocerus.**
9. Size larger (over 10 mm.); punctures on the upper surface forming round black scattering dots, more noticeable on the elytra; genital segment of the male broadly concavely arcuated. 10.
Size small (under 10 mm.); latero-anterior margins of the pronotum almost rectilinear, pale, defined within by black punctures; genital segment of the male with a rather deep rounded median notch. **politus.**
10. Legs dotted with black; apical portion of the fifth antennal joint blackish, second joint shorter than than the third. **conspersus.**
Legs with not more than about four black points; apical two joints of the antennae dusky, second and third joints subequal **inflatus.**
11. Pronotum with a raised calloused somewhat irregular line between the humeri; genital segment of the male without a black spot on its base.
ictericus.
Pronotum without a continuous calloused line between the humeri; genital segment of the male with a blackish basal spot. **variolarius.**
12. Size larger (11-12 mm.); punctures finer and closer on the head and anterior portion of the pronotum leaving an obvious but somewhat irregular pale vitta between the prominent subacute humeri, these punctures segregated so as to form scattering round black dots on the elytra.
bifibulus.
Smaller (10 mm. or less). 13.
13. Form broad ovate; humeri prominent, acute; upper surface with scattering pale points; genital segment of the male rounded at apex, feebly sinuated at the middle. **crenator.**
Form oblong; upper surface regularly and coarsely punctured; genital segment of the male broad at the apex and feebly trisinuated.
zopilotensis.

Euschistus flissilis Uhler.

This is one of the most abundant and widely distributed of our North American Pentatomids. It is found from Quebec to Van-

cover Island and toward the south ranges to Florida and Texas. It may be distinguished from *servus*, its nearest ally, by the incised apex of the head and the narrower abdomen, which does not extend beyond the sides of the elytra.

Euschistus servus Say. (*Pentatoma spilota* Westw. Hope Catalogue, i, p. 42, 1837.)

In the southeastern States this largely replaces the preceding species. I have not seen it from north of New Jersey and Ohio or west of Kansas, Texas and eastern New Mexico. I included this species in my List of the Hemiptera of Buffalo, but on a closer examination am convinced that that specimen was a form of *fissilis* with the apex of the head scarcely incised. There certainly seems to be a tendency in these two species to intergrade along the line where their areas of distribution overlap.

Euschistus impictiventris Stal.

The form I have identified as this species is closely allied to *aeruus*, but the pronotal angles are acutely produced. I possess a single example taken at Las Cruces, New Mexico, by Prof. T. D. A. Cockerell, and have seen another in the collection of Mr. Otto Heidemann that was labelled "*Euschistus proprius* Uhler." The species generally identified as *impictiventris* Stal is smaller and more depressed, having much the form of *conspersus* Uhler and *inflatus* Van D., with the latter of which I have identified it as a variety or race. It probably, however, should be considered a distinct species.

Euschistus inflatus Van Duzee. (Trans. Am. Ent. Soc., xxix, p. 107, 1903.)

This is the Rocky Mountain or western representative of *servus*. It occurs from Colorado to New Mexico, and may be distinguished from the eastern species by its broader and more depressed form, the more rounded apex of the scutellum, the fewer punctures and the rufous color beneath.

A smaller variety or race of this species, of which I have specimens from California and Idaho, has been determined by Dr. Uhler as *impictiventris* Stal. I do not, however, see how Stal's very short and inadequate description can be construed to fit this species. Comparing it with the form of *tristigmus* with acute humeri, Stal says that it is larger, which this is not, and that it has the same

acuminate humeri, which this form certainly has not. Two characters he mentions—the elevated apex of the tylus and the unspotted venter—are found in several allied species. To answer these few characters, the only ones given, it is necessary to select some species in this section of the genus, that is larger than *tristigmus*, with the apex of the tylus elevated, the humeral angles acute and the median row of black spots on the venter wanting. The form placed as *impictiventris* above is the only one known to me that does this.

Euschistus conspersus Uhler. Trans. Md. Acad. Sci. i, p. 388, 1897.

I have recently received from Rev. G. W. Taylor two females taken in Vancouver Island that answer in every particular to Dr. Uhler's description, except that in one the rufous flecks on the venter are wanting and in the other almost obsolete. I have no doubt but that this is the insect described by Dr. Uhler. Comparing these two specimens with a long series of *inflatus*, I find a few points for distinguishing the two species that seem to be constant. The antennæ in *conspersus* are rufous, with the apical two thirds of the fifth joint blackish; in *inflatus* the apical two joints are dusky except at base. In *conspersus* the second joint is distinctly shorter than the third; in *inflatus* these joints are subequal. In *conspersus* the scutellum is more convex on the base and narrower toward the apex than in *inflatus*, and has the extreme tip slenderly edged with white and obviously depressed; the latter character, however, I imagine may not be constant. In *conspersus* the legs are conspicuously dotted with black; in *inflatus* they have but about four black points in a row on the lower surface of the femora, and these may become pale or almost obsolete. The above characters will sufficiently distinguish these forms as at present known. It would not be surprising if further collecting in intervening localities should bring to light intermediate forms connecting these two species.

Euschistus politus Uhler. Can. Ent. xxix, p. 117, May, 1897.

A neat little species, of which I have seen but very few examples. The only one now in my collection was taken in Ohio by the late Dr. Kellicott. The small size, depressed form, and the pale margins of the pronotum, bordered within by a blackish shade, will sufficiently distinguish this species. Dr. Uhler records it from Massachusetts, Rhode Island, Pennsylvania, Maryland and the District of Columbia, Mrs. Slosson has taken it on Mount Washing-

ton, and apparently it is in Smith's Catalogue of the Insects of New Jersey under genus *Podisus*.

Euschistus tristigmus Say. (*inconspicua* Westw. Hope Catalogue, i, p. 42, 1837).

Common and widely distributed from northern Canada to southern Mexico. The typical *tristigmus*, of which the *luridus* Dallas is a strict synonym, is the more northern form, with prominent but rounded humeri and with the apical two joints of the antennæ, except at their base, black. In this form the ventral row of black spots is well developed, at least in all the specimens I have recently examined.

Var. *pyrrhocerus* H. S.? I have placed under this name the form with the humeri more produced, either acute or spinose, and the antennæ very little if at all darker on their apical two joints. In this form the ventral row of black spots is frequently reduced to a slender longitudinal line on the sixth ventral segment. It is more common to the south, where it seems to replace the other form.

Euschistus variolarius F. B.

Inhabits almost the whole of the United States and Canada, and is especially abundant in the northern States. In this species the humeri vary from subacute to spinose; the apical two joints of the antennæ are black, with the base of at least the fourth pale; the apex of the scutellum is usually slender, with the extreme tip pale, and the genital segment of the male has a rather large blackish spot near its base. From *fissilis* and *servus* it can be distinguished by its slightly smaller size and the absence of black points at the incisures on the edge of the abdomen. This is the typical "stink-bug" or "berry-bug" of the northeastern United States.

† ***Euschistus jugalis*** Prov.

I have no knowledge of this species, except the description given by Provancher, but judging from that I would be very much inclined to consider it a not fully developed example of *fissilis* or *variolarius*. When not well hardened the juices are apt to settle under the pronotum forming a black spot or band there. The type was taken at Vancouver.

Euschistus ictericus Linn.

Found in the northern States and Canada across the whole width of the continent. It is generally to be found on sedges in swampy

spots or along the borders of streams or other bodies of water. It may be distinguished from the foregoing by the calloused ruga connecting the humeri which are more produced than in *variolarius*, and the genital segment of the male wants the black spot found in that species.

Euschistus crassus Dallas.

This seems to be a southern form. I have one specimen taken in Georgia by Prof. W. F. Scott, and another from Florida kindly given me by Mr. Heidemann. It is apparently a rare species. Its thick convex form with the short acute humeri pointing well forward will distinguish it from all our other species.

Euschistus zopitotensis Distant.

Described from Mexico. I have an example from Galveston, Texas, that differs only in having the humeri subacute. It has the convex elongated form of *strenus*, but the upper surface is more regularly punctured and not so roughly sculptured.

Euschistus crenator Fabr.

This common South American species has been recorded from Texas and Arizona, and Mrs. Slosson has sent me an example labelled "California." It may be distinguished by its small size, broad somewhat depressed form, acute prominent humeri and the narrow male genital segment which has a feeble sinus at apex. The upper surface is dotted with smooth pale points, and the edges of the pronotum are usually blackish and strongly serrated.

Euschistus bifibulus P. B.

I have received examples of this species taken in Florida by Mrs. Annie Trumbull Slosson and Prof. W. S. Blatchley. It has about the size and form of *variolarius*, but the pale immaculate antennæ and legs and the undotted membrane will distinguish it. The pronotum has a somewhat indefinite calloused ruga between the humeri.

***Euschistus comptus** Walker.

Some time ago Mr. Heidemann kindly sent for my inspection an example of this species that was taken in Texas. According to Stål it may be distinguished from all our other species by the pale calloused margin of the abdomen. A good figure is given by Distant, Pl. I, fig. 11, of the *Biologia*.

***Proxys punctulatus* P. B.**

Dr. Uhler records this species from Texas, Indian Territory, Louisiana, Georgia, Florida, and one specimen from so far north as Philadelphia. It is common in the West Indies and Mexico.

† *Proxys albo-punctatus* P. B.

Recorded from the southern States in Uhler's Check List. There is, perhaps, some mistake in this.

Genus *delius* Say.

Widely distributed and common in the United States and Canada but apparently precinctive. In the north it occurs from Quebec to Vancouver Island. Its southern range includes Florida and Texas.

***Hymenarcys equalis* Say.**

In our territory Dr. Uhler gives Maryland, the southern United States, Texas and the Indian Territory as the habitat of this species. I have seen specimens from New York City, New Jersey, Ohio, Kansas and Montana, and Prof. Cockerell records it from Colorado.

***Hymenarcys nervosa* Say.**

This is a larger oval species that seems to have about the same range as the preceding. I have never succeeded in taking either of them about Buffalo, although both occur near here. Provancher records *nervosa* from Quebec, and Dr. Felt has sent me a specimen taken at Albany, N. Y.

****Hymenarcys crassa* Uhler. Trans. Md. Acad. Sciences, i, p. 387, 1897.**

I have not yet seen this recent addition to our fauna. The type was from Arizona.

***Ælia americana* Dallas.**

Apparently a rare and local species. I have taken it in the suburbs of Denver, Col., and have seen specimens from Manitoba (Hanham), Nebraska (Wickham), and Montana (Cooley). Dr. Uhler records it from Dakota, and Provancher has taken it in Quebec.

Genus *NEOTTIGLOSSA* Kirby.

- Upper surface of the head almost flat transversely, not tumidly elevated within the lateral margins **undata.**
 Upper surface of the head strongly tumid within the lateral margins 1.
 1. De-flected anterior portion of the head strongly impressed forming an excavated basin in which the tylus is not all elevated **cavifrons.**

Deflected anterior portion of the head a little impressed each side of the tylus; not forming an excavated basin; tylus quite distinctly elevated to its apex **sulcifrons.**

Neottiglossa undata Say.

A common species, especially in the northeastern United States and Canada. In the latter country it is found from Quebec to Vancouver Island. Its southern range, so far as I can now learn, is New Jersey, Illinois, Nebraska and Colorado.

In 1877 Dr. Uhler separated the *trilineata* Kirby, assigning to this name a larger dark colored form taken in Canada, Nebraska, Dakota and California. I have never been fortunate enough to see one of these dark specimens and will not now venture to give any characters separating the two forms.

Neottiglossa sulcifrons Stal.

This species seems to be most at home in the southern States, although Dr. Uhler records it from as far west as New Mexico, Texas and Utah. I took one example at Griffin, Georgia, in May, 1899, and Mr. Heidemann has kindly sent me a specimen from Washington, D. C. Prof. Osborn has specimens from Kansas and Nebraska.

Neottiglossa cavifrons Stal.

I captured one individual of this species at Ogden, Utah, in July, 1900, and have seen another from Utah taken by Mr. Heidemann. The type came from Texas, and Prof. Osborn has a specimen from California. It may be separated from *sulcifrons* by the characters given by Stal in the Enumeratio, ii, p. 18, but the two species are close and possibly should be considered but varieties of a single form.

Genus **COSMOPEPLA** Stal.

The following key is a copy of that part of Montandon's synopsis that applies to our species :

- Scutellum very obtusely rounded at the extremity; frenum very short, not quite one third the length of the scutellum; shape of the body broadly oval.....1.
- Scutellum less obtusely rounded at the extremity; frenum reaching almost one half of the length of the scutellum; the body a little longer than that of the preceding group; above slightly brassy and thickly punctured -2.
1. Scutellum black with a red spot on each side near the apex; transverse fascia and longitudinal central spot of the pronotum narrow linear; abdomen above narrowly edged with red **caruifex.**

- Scutellum entirely concolorous, transverse fascia of the pronotum irregular, broadened in the middle, slightly elevated; abdomen beneath broadly edged with ochraceous; this margin inwardly sinuated opposite each stigma **Uhleri.**
2. Transverse yellowish ochraceous fascia of the pronotum irregular, slightly elevated; scutellum punctured to the apex; narrowly edged with yellow at the apex; abdomen beneath broadly edged with yellow; yellow margin deeply sinuated on each segment; stigmata black.
- conspicillaris.**
- Transverse yellowish ochraceous fascia of the pronotum shining, regular; apex of the scutellum more broadly edged with yellowish ochraceous 3.
3. Scutellum punctured near the apex on the yellowish ochraceous part; transverse fascia of the pronotum extended backward to near the base of the pronotum; two dark spots in the middle of the fascia; abdomen beneath with the lateral margins broadly pale ochraceous; a segmental series of small dark rounded spots covering the stigmata **binotata.**
- Apex of the scutellum shining; impunctate on the yellowish ochraceous part; transverse fascia of the pronotum not extended backward, impunctate, slightly elevated; abdomen beneath with pale ochraceous lateral margin of equal width, including the stigmata **decorata.**

Cosmopepla carnifex Fabr.

One of the most abundant of the Pentatomids occurring in the eastern United States and Canada. Its western limits seem to be Texas, Colorado and Washington, but it is much more at home east of the Rocky Mountains as far south as Mississippi. It was re-described as *Pentatoma bimaculata* by Thomas, in Trans. Ill. State Ag. Soc., v, p. 455, 1865.

***Cosmopepla Uhleri** Montd. Proc. U. S. Natl. Museum, xvi, p. 48, 1893.

I have not yet seen this species. It is described as "castaneous," so it should be easily recognized from our other species. The types came from Nevada and California.

Cosmopepla conspicillaris Dallas.

I have specimens of this species from Colorado and Montana (Cooley), and California (Heidemann). Its range extends from Vancouver Island to Mexico and Lower California. It seems to replace *carnifex* west of the Rocky Mountains.

***Cosmopepla binotata** Distant.

Montandon reports having seen a specimen of this Mexican species from Wisconsin in the collection of M. Lethierry.

Cosmopepla decorata Hahn.

Distant records this species from Texas and Arizona. My specimens from Lower California were kindly given to me by Dr. Uhler. The deep blue-green ground color with orange and white markings make this our most showy species of *Cosmopepla*.

Eysarcoris intergressus Uhler. Proc. Ent. Soc. Wash., ii, p. 363, 1893.

Described from Kansas, Utah and California. I have specimens from Colorado, Idaho (Aldrich), Montana (Cooley), and Vancouver Island (Taylor). It seems to have about the same range as *Cosmopepla conspicillaris*. I have seen this in collections labeled *Eysarcoris melanocephalus*, a European species that probably does not occur in this country, and Dr. Uhler figures it under this name in Bull. U. S. Geol. & Geog. Surv., Vol. ii, No. 5, pl. 19, fig. 7, 1876.

Meneles incertus Say.

Widely distributed in the United States, but apparently nowhere abundant. Dr. Uhler records it from Massachusetts, Pennsylvania, Illinois, Missouri, Kansas, Nebraska and California, Stal from Arkansas, and Prof. Osborn reports it as rare in Iowa. I have seen specimens taken in Ohio by the late Dr. Kellicott, and near Ottawa, Canada, by W. H. Harrington. It was once taken in numbers from small hickory trees growing near Lewiston, N. Y.

Prionosoma podopioides Uhler.

This western species has been reported from Vancouver Island, Colorado, Utah, Nevada, California and southward through Arizona and New Mexico to Lower California. Lethierry and Severin in their Catalogue include *villosa* Prov. as a distinct species, but I can see no possible justification for this as his description answers in every respect to the ordinary form of *podopioides*.

Genus **THYANTA** Stal.

Size medium or large (for this genus); second joint of the antennæ little or not at all longer than the third 1.

Size small; second joint of the antennæ considerably longer than the third . . . 3.

1. Size medium (8-9 mm.); punctuation coarser, less dense; the intervening surface rugosely uneven; edge of the abdomen with black points. **casta**.

Size larger (9-12 mm.); punctuation close and regular; intervening surface even or with a few raised points. 2.

2. Humeri acutely spinose; edge of the abdomen fulvous with black points.

perditor.

- Humeri obtuse or acute, not spinose; edge of the abdomen sometimes pale but without distinct black points . . . **custator** and **pallidiventris**.
3. Head short, narrowed before the eyes to the rounded apex, the sides not at all parallel; surface closely and evenly punctured **brevis**.
 Head longer, sides distinctly parallel before the antennæ, apex broad, rounded 4.
4. Color dark green; tip of the scutellum and a band connecting the humeri, scolloped posteriorly, pale or in part sanguineous. . . . **antiguensis**.
 Color green or greenish white, without pronotal band 5.
5. Connexivum distinctly maculated; venter with a row of black points on the hind edge of each segment **punctiventris**.
 Connexivum immaculate or with nearly obsolete spots; black points on the venter wanting **rugulosa**.

Thyanta perditor Fabr.

This species seems to be more typical of the West Indies and Mexico. According to Dr. Uhler it is found in the eastern United States as far north as Savannah, and in the west from Nebraska to Colorado and Arizona. Prof. Osborn records it from South Dakota and Prof. Cockerell has taken it in New Mexico. This species varies in about the same manner as *custator*, but in all the specimens I have seen the humeri are produced in acute spines, the edge of the abdomen is fulvous with conspicuous black points, and the stigmata are black. In my collection the specimens from Mexico and the West Indies have the pronotal band more pronounced.

Thyanta custator Fabr.

A variable and widely distributed North American species which becomes more abundant toward the south and west. I have seen specimens from New York to Vancouver Island and south to Arizona but in the east at least it is rare to the north of New York City. The sanguineous band on the pronotum is generally wanting in specimens from the north and east. Sometimes there are black points on the stigmata and at the incisures on the edge of the abdomen, but generally these are wanting, and the connexivum is concolorous. On the hot arid prairies of the west the color becomes whitish green, and when immature it is often of a testaceous color.

Thyanta pallido-virens Stal.

I have seen two or three specimens from Utah and California that agree in all particulars with Stal's description of this species, but I can find no characters that will satisfactorily distinguish

them from *custator*. For the present I prefer to leave them without further attempt at discrimination.

Thyanta casta Stal.

My specimens are from Hayti, but the species has been recorded from California and Arizona by Dr. Uhler. I have distinguished *casta* from *custator* by the punctuation, which is coarser in *casta*, not so deep and close, and the intervening surface is uneven, in places irregularly calloused. It closely resembles the South American *patruelis* in size and form. In my specimens the margins of the pronotum before the humeri are not distinctly pallid or luteous, but the extreme edge in one specimen is slenderly blackish, a character often found in not fully developed examples of *custator*.

Thyanta antiguensis Westw. (*teniola* Dallas).

Dr. Distant announces (Proc. Zool. Soc., 1900, p. 812) what all students of the Pentatomids must regret, that the awkward name given by Westwood must supplant that of Dallas. I possess a good series taken in Mexico and Hayti, the latter kindly sent to me by Prof. Elmer D. Ball. This species varies in length like *rugulosa* from about $5\frac{1}{2}$ to 7 mm. In general appearance it most closely resembles *punctiventris* with which it agrees in its somewhat depressed form. It may best be distinguished by its coarse, deep, uniform punctuation, and the testaceous band between the humeri. This band is scolloped behind where it is margined with deep brown or sanguineous. The head is about as long as in *rugulosa* and *punctiventris*, but is more strongly narrowed toward the apex. The color above is dark green, not bright bluish or pea green as in *rugulosa* and *brevis*. Here the venter is paler, coarsely and sparsely punctured with darker. In all my specimens the edge of the venter is marked with four black points placed on the second to the fifth incisures, and the tip of the scutellum is dull sanguineous. It has been recorded from Arizona and California.

Thyanta rugulosa Say.

This species is exceedingly common on the dry arid prairies of Colorado and Utah. While collecting in such localities in 1900 I found it most abundant on a low species of *Atraphax* having a whitish green foliage. On these bushes the insect assumes a green grey color assimilating to the color of its surroundings. The insect which I believe I have correctly identified as *rugulosa* has the head long,

with a blunt apex, the edges of the pronotum are sharp and concavely arcuated, with the humeral angles prominent, rounded, or scarcely angled, and crossed on its anterior disk by a slender, slightly elevated ridge, reaching to the middle of the callosities on either side. The whole upper surface, but especially the pronotum and elytra, are coarsely and rugosely punctured, giving the insect at times a coagulated or mottled appearance. The tergum is black, with the apex beyond the tip of the scutellum and the sides green. In pale examples the connexivum is obscurely marked with brown at the incisures where there is also a black dot on the extreme edge, and sometimes there is an indication of a brown point on the base of the membrane on either side of the tip of the scutellum.

I have examined a long series of this species taken at Grand Junction, Colorado, and have found it not uncommon at Pueblo, Rifle, and at other localities in that State and Utah where the prairies are covered with a sparse growth of *Atriplex* and similar vegetation. I have also received a specimen from Prof. Wickham, taken at Havre, Montana. Other specimens formerly received by me from correspondents and determined as *rugulosa* may belong to the next species which possibly is but a pale variety of this. I venture, however, to describe it as new as it is sufficiently distinct to require a varietal name in any case.

***Thyanta punctiventris* n. sp.**

Proportionately longer and more depressed than *rugulosa*. Sides of the pronotum distinctly concavely arcuated. Humeral angles prominent, obtuse. Head long, sides distinctly sinuated before the eyes, then subparallel to the broad rounded tip. Apex of the scutellum narrow, subacute. Membrane surpassing the tip of the abdomen, whitish, dotted with brown toward the base. Connexivum maculated at the incisures. Venter coarsely punctured with greenish brown and marked with a transverse row of about eight or ten black points close to the hind margin of each segment. Mesosternum with a black vitta on each side and there may be a curved black streak on the propleura behind the eye. Color pale or whitish green, above coarsely punctate and irregularly mottled with dark green, intermixed, especially on the pronotum and elytra, with some pale callosous dots or rugæ. The legs are punctured with darker and the femora have an obscure band before their apex; tarsi and usually the apex of the tibiæ blackish. Antennæ pale with the apical joint and sometimes the fourth more or less obscured. Length to the tip of the membrane 6 to 7 mm., width across the humeri $3\frac{1}{2}$ to 4 mm.

This species is closely allied to *rugulosa*. It may best be distinguished by its more elongated and depressed form, the broad macu-

lated connexivum, the rows of dots on the venter, the narrow tip of the scutellum, and by the slightly wider apex of the head. The tergum is black in this species as in *rugulosa*, with the sides and apex green. The pronotum is depressed within the lateral margins leaving the edges sharp, and there is a transverse linear elevation occupying the position of the callousities.

Described from twelve examples representing both sexes. Several of these were taken by me at Grand Junction, Colorado, in July, 1900; five, received from Prof. Wickham, were taken by him at Williston, North Dakota, June 8th and 9th; one received from Mr. Otto Heidemann was taken at Salt Lake City, Utah, June 14th, and one was taken in Colorado by Prof. E. D. Ball. The two latter came to me labelled *Thyanta rugulosa*.

Thyanta brevis n. sp.

Small, oval, convex. Head shorter and more narrowed toward the apex than in any of the allied species, the edges broadly sinuated before the eyes then converging to the rounded apex. Head, pronotum and scutellum closely, evenly and rather finely punctured, the surface without the smooth sphaecelated spots frequently so noticeable in *rugulosa* and *punctiventris*. Pronotum convex, a little impressed within the lateral margins which are sharp and nearly rectilinear or very feebly sinuated anteriorly. Humeral angles almost rounded. Scutellum short with the apex proportionately broad. Membrane as long as the abdomen in the females, a little longer in the males. Venter coarsely, rugosely, but not deeply punctured. Color as in the allied species varying from bright pea green to almost white. In green examples somewhat paler on the front of the pronotum, base of the scutellum, and beneath, especially toward the median line. Membrane with two blackish spots at base placed on either side of the apex of the scutellum. Mesosternum with a black spot on either side between the anterior and intermediate coxæ. Eyes, last joint of the antennæ, and sometimes the apex of the fourth joint, tarsi and apex of the tibiæ blackish. Connexivum immaculate. Tergum black on the two basal segments. In fully colored examples the thin reflexed edges of the pronotum are pale, becoming rosy on the humeral angles. Length $5\frac{1}{2}$ mm., width across the humeri 3 mm.

Described from ten examples taken by me at Grand Junction, Colorado, July 28, 1900. Like its congeners this insect becomes pale or almost white when it occurs on the low whitish *Atriplex* and other prairie vegetation growing on the parched deserts of the arid regions. This is the smallest *Thyanta* known to me. It may be recognized by its oval convex form, fine even punctuation, the two blackish spots at the base of the membrane, and especially by the short narrowed head. The spots at the base of the membrane, although apparently always present in *brevis*, cannot be relied upon

to distinguish the species as they are sometimes indicated in *rugulosa* and generally in *punctiventris*.

Loxa flavicollis Drury.

Dr. Uhler records the capture of this fine insect in New Mexico and Texas, and Mrs. Slosson has taken it in Florida.

Murgantia histrionica Hahn.

This common cabbage pest of the southern States has spread northward to the vicinity of New York City, southern Ohio, Indiana, Kansas, Colorado and California. Prof. Osborn thinks it has about reached the northern limits of its distribution (Proc. Ia. Acad. Sci., I, pt. iv, p. 121, 1893).

Murgantia varicolor Westw. (*munda* Dallas).

Accredited to "Western States" in Uhler's Check List.

Murgantia violascens Westw.

Mr. G. Beyer of New York City has recently sent me a pair of this beautiful species taken by him at Key Largo, Florida. This is its first recorded occurrence within our territory. It may be distinguished from *munda* by the markings of the scutellum and elytra which have been carefully described by Dallas. In *violascens* the median pale line of the scutellum reaches the apex, before which it is joined by the pale lateral vittæ, and the membrane is fuliginous with a hyaline border.

Vulsirena violacea Fabr.

I am indebted to the kindness of Dr. Uhler for an example of this beautiful species that was taken in Florida, and Mrs. Slosson has another taken in the same State. I do not find that this species has before been recorded from our territory.

Genus **NEZARA** A. and S.

- Osteolar canal short and truncated at apex.....**viridula**.
 Osteolar canal long and curved, becoming gradually evanescent.....1.
 1. Form short oval, sides of the pronotum strongly arcuated; head short, the cheeks exceeding the tylus; margins of the abdomen concolorous with black points at the incisures.....**pennsylvanica**.
 Form ovate; sides of the pronotum almost rectilinear; head longer; tylus equalling the cheeks; margins of the abdomen fulvous with black points at the incisures.....2.

2. Apex of the genital segment of the male nearly transverse, distinctly trisinate, the outer apical angles acute; inhabits the northern States and Canada.....**hilaris**.
 Apex of the genital segment of the male quite deeply and subacutely emarginate, very obscurely sinuated, the outer apical angle obtuse; inhabits Mexico and the West Indies.....**marginata**.

Nezara pennsylvanica De Geer.

This distinct species seems to be rare and local. I took one specimen with the young at Woodbine, N. J., in August, 1902, and have seen three others from the same State. Prof. D. S. Kellicott once sent me an example captured in Ohio, and more recently Mr. Chagnon has taken one at Montreal. Prof. Osborn records it from Iowa, and Dr. Uhler from New Jersey, New York, Massachusetts and Illinois, and Say's type (for *abrupta*) was from Georgia. Dr. Distant includes it in the Biologia material.

Nezara viridula Linn.

Dr. Uhler says that in the United States this species inhabits the littoral plains from Virginia to Florida and Louisiana. It may be roughly distinguished from the two following which it closely resembles by the longer head, concolorous abdominal margins and the short truncated osteolar canal. For the Westwood synonyms of this species see Distant's paper in Proc. Zool. Soc., 1900, p. 818.

Nezara marginata P. B.

According to Dr. Uhler this southern species inhabits the coastal region of southern Florida and Texas. I have seen a specimen taken in Arizona by Prof. F. H. Snow and another taken in California by Mr. D. W. Coquillett, and Mr. Townsend has taken it on *Cercis* in Arizona.

Nezara hilaris Say.

This is a showy but very common insect throughout the northeastern United States and Canada. Toward the south its range extends through the southern States and West Indies to Brazil. In the West it occurs in Kansas, Iowa, Colorado, Montana, Utah, Arizona and Texas, and perhaps over all the western States. This is a larger species than *marginata*, and is more oblong in form with the apex of the scutellum more slenderly produced. The form of the male genital segment is quite distinctive and will at once distinguish the species.

Genus **BANASA** Stal.

Stal did not separate this genus from *Nezara* in his Synopsis but the next year he characterized it in the Rio Janeiro Hemipter-Fauna, and in 1873 Uhler described it under the name *Atomosira*. Distant says in the Biologia: "This genus is closely allied to *Nezara*. The body is subovate and less oblong, head sinuated on each side, lobes of equal length and apex rounded. This is another of those genera in which the differences seem more apparent than real; the shape of the body and different coloration gives *Banasa* a more distinct appearance from the genus *Nezara* than structural details fully carry out." The following key may assist in distinguishing our species:

- Apical angle of the abdominal segments slightly prominent, acuminate.....1.
 Apical angle of the abdominal segments obtuse, not prominent.....2.
1. Head distinctly narrowed before; edge of the abdomen with conspicuous black points; second joint of the antennæ a little shorter than the third.
calva.
- Head broad before; margins of the abdomen with minute points; second joint of the antennæ about half the length of the third....**dimidiata.**
2. Color clear green; basal angles of the scutellum with a large white calloused spot.....**euchlora.**
- Basal angles of the scutellum without the white calloused spot.....3.
3. Upper surface quite closely and regularly punctured.....**sordida.**
 Upper surface with large distant punctures, irregularly disposed. **Packardii.**

Banasa calva Say (*catinus* Dallas).

After a careful study of a long series of this species and the *dimidiata* I am compelled to change my former determination. Say's description of *calva* agrees perfectly with some southern specimens in my collection of the form I have formerly determined as *catinus*. Material from the north in this species have the colors paler but do not differ otherwise. They are a little larger and more attenuated posteriorly than *dimidiata*; the head is very plainly narrower toward the apex, which certainly is not the case in *dimidiata*; the second joint of the antennæ is uniformly longer, and the colors are always paler than is usual in *dimidiata*. On the venter the punctures along each side are fewer and less strongly contrasted in *calva*; the lateral incisures are marked with a conspicuous black point, and the genital segment of the male is narrower. About Buffalo this species is tolerably abundant on various deciduous trees from August to October. I have received examples from Georgia and have seen others

from Montana (Cooley). Say's type was from Virginia. For some reason Stal failed to locate this species in *Banasa* in the Enumeratio, and possibly, on that account, it was not properly placed in the Lethierry and Severin Catalogue.

Banasa varians Stal.

A southern species that has recently been recorded from Las Vegas Hot Springs, New Mexico, by Dr. Uhler (Proc. U. S. Nat'l Museum, xxvii, p. 351, 1904). It may be distinguished from *calva*, which it closely resembles, by its shorter head and the absence of black points at the incisures on the margins of the venter. From *dimidiata* it differs by the longer second antennal joint, the different punctuation and the absence of black points on the margins of the venter. The record adding this species to our fauna was received too late to allow of its inclusion in the accompanying synopsis of our species.

Banasa dimidiata Say.

This is a common and widely distributed species. The types were from Georgia and Florida, and I have seen specimens from most of the eastern States, Colorado, Utah, North Dakota and Montana. In Canada it ranges from Quebec to Vancouver Island. When fully colored this is one of our most beautifully colored Pentatomids. It is quite variable in size, punctuation and the convexity of the pronotum. The larger eastern specimens I have heretofore determined as *calva*, and the smaller western form as *dimidiata*, but there seems to be no line of demarcation between them, and I can now see no reason for keeping them separate.

Banasa sordida Uhler.

Dr. Uhler describes this species from Massachusetts, Maryland and Virginia, and later recorded it from New Mexico. It is included in the Gillette and Baker List of the Hemiptera of Colorado, and more recently I have examined specimens that were taken in Arizona, and a deeply colored pair taken in Vancouver Island by Rev. G. W. Taylor. It differs from *Packardi* in being more strongly and densely punctured, and the color is darker, or even brownish chestnut, with the apex of the scutellum more broadly white, and the black dots on the edge of the abdomen much larger.

Banasa Packardi Stal.

This species is well described by Stal, and may be distinguished by its coarse, distant, irregularly disposed punctures. My only specimen is from St. Augustine. Stal describes it from North Carolina; the Museum of Comparative Zoology has examples from Georgia; and in Prof. Smith's List of the Insects of New Jersey it is accredited to "Sea Isle City, N. J."

Banasa euchlora Stal.

The clear light green color of this pretty insect with the white spot at the basal angles of the scutellum will readily distinguish it. Stal records it from Texas and South Carolina; Uhler from Maryland, Florida and Indian Territory; Osborn from Iowa, and I have seen others from Georgia.

Piezodorus Guildingi Westw.

In giving the distribution of this species in his paper on the Heteroptera of Grenada, Dr. Uhler accredits it to southern Florida, and Prof. Osborn has recently sent me an example captured in New Mexico.

Piezodorus incarnatus Germar.

From Mr. Otto Heidemann I have received an example of this European species that is labelled "Jacksonville, Fla.?" It has not before been recorded from this side of the Atlantic, and if taken in Florida has doubtless been introduced there. It is a larger species than the preceding, and well distinguished by the deep black tergum bordered without by the pale yellowish connexivum. The inner field of the elytra and base of the pronotum are shaded to dark castaneous; the color on the pronotum, however, is not differentiated before by a pale band as in *Guildingi*. The large black stigmata are, perhaps, characteristic of the genus, as is the long ventral spine which passes the intermediate coxæ.

Arvelius albopunctatus De Geer.

Dr. Uhler records this from Arizona, California and Florida. I have seen specimens taken in the latter State by Mrs. Slosson. It is readily distinguished by the sharp projecting apex of the cheeks, the acute humeral angles, the pale general color, with white calloused points on the elytra, and a few scattering black punctures over the rest of the surface.

Genus **LIOTROPIS** Uhler.

Bergroth, in *Revue d'Entomologie*, Vol. X, p. 228, 1891, substituted the name *Dendrococis* for that given by Uhler, but doubtless, for some very good reason, this change was not accepted by Lethierry & Severin in their Catalogue. Our four species may be distinguished as follows:

- Head not longer than broad; inner angles of the connexivum marked with a square black spot.....**fruticicola**.
- Head longer than broad; connexivum with or without spots on the outer margins, immaculate within.....1.
1. Head broad at apex; outer edges of the connexivum with a black spot at each incisure.....**humeralis**.
- Head distinctly narrowed at apex.....2.
2. Humeri prominent, forming an obtuse or right angle; anterior one half of the pronotum blackish; punctures in part dusky.....**contaminatus**.
- Humeri rounded; punctures concolorous or nearly so; form more elongated and regularly oval.....**pini**.

Liotropis humeralis Uhler.

Our most abundant and widely distributed *Liotropis*. I have looked in vain for it about Buffalo, but it is found throughout New England, in New Jersey, Maryland, Pennsylvania, Ohio, Georgia, Iowa, Kansas, Colorado and California. In Colorado I have beaten it in numbers from scrub oaks growing in the Garden of the Gods, and on the adjacent mountain sides, and in most similar situations where I there collected.

Liotropis fruticicola Bergroth.

The only specimen I have of this species was kindly given to me by Mr. Otto Heidemann. It is a male captured in Key West, Florida, and I have seen a female taken in the same State by Mrs. Slosson. This species may be best distinguished by the short and broad head; the third joint of the antennæ is shorter than the first two, while in *humeralis* it is longer; the stigmata are black and the connexivum on its *inner* margin is marked by a black spot at each incisure; the pronotum is more convex, the sides less deeply sinuated, the humeral angles are somewhat less prominent than in *humeralis*, and the two black points on the posterior disk are more conspicuous. Bergroth has well distinguished this from *humeralis*, the only species with which it can be confounded.

Liotropis contaminatus Uhler (*Trans. Ind. Acad. Sci.*, I, p. 190, 1897).

This pretty species may readily be distinguished from the preced-

ing by the broader form, the narrower and more pointed head, the pale yellowish color with the anterior lobe of the pronotum blackish. The pronotum is shaped about as in *fruticicola*, but it is less convex and sometimes there is an obsolete median carina. The pale color is often well obscured by blackish punctures. The types were from Arizona, but Prof. Wickham has sent me some that were captured in the Inyo Mountains, California, in July, at an altitude of 7000 to 9000 feet, and Prof. Osborn has a few examples taken at El Paso, Texas, in July, by Prof. Wickham.

Liotropis pini Montandon (Proc. U. S. Nat. Mus., xvi, p. 51, 1893).

Distinguishable from our other species by its regularly ovate form, rounded humeral angles and uniform coloration, which varies from pale ochraceous to ferruginous or almost rufous. The head is narrowed anteriorly as in *contaminatus*, there is a short median carina at the anterior margin of the pronotum, the third joint of the antennæ is twice as long as the second, but shorter than the first two together, and there is a small impunctate area on the disk of each elytron. The whole insect is unusually depressed even for this genus. It varies in length from 5 to 8 mm. The types were from the Argus Mountains in California, but in Prof. Osborn's collection are specimens from Arizona and Texas, and Prof. E. D. Ball has kindly given me one taken in Colorado.

Edessa bifida Say.

Dr. Uhler records this insect from Florida and Louisiana. It doubtless inhabits the whole southern coastal region of the United States. So far as I can learn this is the only species in this large tropical American genus that extends its range northwardly into our territory.

Subfamily ASOPIDÆ.

A good synopsis of this subfamily by Stal may be found in his *Bidrag till Hemip. Systematik*; Of. k. Vet.-Akad. Förh., xxiv, pp. 495-499, 1867. Our genera are also included in Summer's *Synopsis of the Nearctic Pentatomidæ*.

Stiretrus anchorago Fabr.

Of this extremely variable species I have seen but three well-marked varieties:

Var. *fimbriatus* Say.—Figured in *Am. Ent.*, pl. 43, upper left figure. Say's specimen came from Pennsylvania. Dr. Uhler re-

records it from Massachusetts and Maryland, and adds that "it is not uncommon in all the States north of Virginia." I have recently seen an example in the Cornell University collection, that was taken near Ithaca, N. Y.

Var. pulchellus Westw.—I have a typical example of this variety from Baton Rouge, Louisiana, taken in May, and have seen another from Del Rio, Texas, taken by Prof. Wickham in June. This variety is much larger than *fimbriatus*, and is of a deep blue black color marked with orange.

Var. violaceus Say.—Prof. Osborn has sent me for study one individual of this variety taken by Prof. Wickham at Del Rio, Texas, in June, and Dr. Uhler records it from Pennsylvania, Georgia, Florida and Texas.

**Var. personatus* Germar.—Dr. Uhler records this variety from Pennsylvania. I have not yet seen it.

Stiretrus anchorago as a species has been recorded from about all the southern States, and as far north as Iowa and Massachusetts. Southwardly it extends through Mexico to Panama. Two of the varieties are figured on Plate I of the Biologia.

Oplonus dichrous H. S.

Another very variable southern species of which I possess examples taken in Nogales, Arizona, in August, by Prof. Wickham, and an individual taken in a greenhouse in Philadelphia. This species in all its varieties may be distinguished from its congeners by having the anterior edge of the prosternum produced in a rounded lamina either side of the base of the rostrum. The head is narrowed at the apex, and in the male the cheeks are prolonged, contiguous, and strongly depressed before the apex of the tylus.

Genus **PERILLUS** Stal.

- Form somewhat depressed; pronotum scarcely raised above the level of the scutellum **confluens.**
- Form more convex; pronotum quite strongly convex above the base of the scutellum 1.
1. Anterior femora with a blunt tubercle in place of a spine **exaptus.**
 Anterior femora with a stout spine 2.
2. Surface finely and closely punctured, anterior margin of the sixth ventral segment broadly rounded; antennæ black, with metallic-green reflections **splendidus.**
 Surface coarsely punctured, anterior margin of the sixth ventral segment quite distinctly produced in an angle more or less obvious 3.

3. Antennæ black, basal joint and incisures only pale.....**bioculatus.**
 Antennæ black, first two joints and basal half of the third rufous.
circumcinctus.

Perillus confluens H. S.

Dr. Uhler reports this species from Texas and New Mexico, Prof. Cockerell from Colorado, and Prof. Osborn has an example taken at Tuscan, Arizona, by H. F. Wickham. It is included in Prof. Smith's List of the Insects of New Jersey, but I strongly suspect that this is an error of determination. Possibly the closely related *Mineus strigipes* was the insect intended.

Perillus exaptus Say.

In this pretty and variable species the spine on the inner face of the anterior femora is reduced to a mere tubercle. The whole upper surface is closely and deeply punctured. The antennæ are black, with the incisures and sometimes the base of the first joint pale, and the head is strongly deflexed. Of this species I have before me the following varieties:

Var. *a*, *variegatus* Kirby.—Color yellowish fulvous, marked with black as follows: head, excepting the narrow fore borders and sutures beneath; pronotum, excepting a broad transverse band anteriorly; scutellum, excepting a broad submarginal vitta; elytra within; some large spots on the breast and venter, and the legs in part. Colorado and Montana. In July of this year I took an example of this pattern at Fort Collins, Colorado, in which the color on the pronotum is deepened to crimson, and Dr. E. P. Felt has sent me one taken at New Russia, New York, in which the pale color over the whole insect is of a rich crimson red. In all of these there is a narrow black border on the base of the pronotum before the scutellum. *Zicrona marginella* Dallas is a red form of this variety.

Var. *b*.—Pale whitish yellow. Head crimson red with the base, tylus and slender outer margins black. Pronotum with a transverse band before that is deflected and runs parallel to the outer margins almost to the humeri, and an arcuated band on the hind margin before the base of the scutellum black; between these black bands is a broad arcuated crimson band connecting the humeri and slenderly edged with the pale ground color. Scutellum with a median longitudinal vitta, abbreviated at either end, and the narrow lateral margins almost to the tip black; at either side at base is an oblique

crimson spot. Elytra with a wedge shaped longitudinal median vitta. Connexivum black, edged with pale. Beneath: pleural pieces with a lateral crimson spot on each side bordered with black, the intermediate smaller; venter crimson, the base and a connected longitudinal curved vitta on each side, and the genital segment black. Rostrum and femora rufous, tibiae and tarsi black, the former lined with pale. Antennae black, basal joint rufous, the next incisures pale. One example of this gaudily marked variety taken in Colorado is in the collection of Prof. Herbert Osborn, and two from Wyoming are in the Museum of Comparative Zoology at Cambridge.

Var. *c.*—Deep black; pronotum, except the base and broad anterior disk, wide margins of the propleura, and the disk of the venter crimson red. This is another beautiful variety of which I took one specimen at Salida, Colorado, in July, 1900.

Var. *d.*—Entirely black or with the costal margin narrowly pale. One specimen from Colorado (Ball), and another from the Cornell University collection taken at Olympia, Wash., by Mr. Kincaid.

This species in some of its varieties seems to extend across the entire continent from New England and Quebec to Washington and Vancouver Island, and southward to New Jersey in the east and New Mexico in the west.

Perillus splendidus Uhler.

Dr. Uhler records this from California, Texas and Lower California, and Prof. Osborn from Colorado. My only specimen, from Los Angeles, California, was kindly presented to me by Mr. Otto Heidemann. It corresponds very closely with Uhler's description.

Perillus bioculatus Fabr.

This is the *Pentatomus elauda (elauda)* of Say. In adopting the Fabrician name I am merely following the lead of the Lethierry and Severin Catalogue. It is a common insect in certain parts of the Rocky Mountain region. My specimens are from Colorado, Nevada (Wickham), Idaho, Montana, New Mexico (Cockerell), and Kansas. Dr. Uhler also records it from California, Utah and Arizona, and Prof. Osborn from Iowa and Oregon.

There are two quite distinct varieties or styles of marking in this species: the typical *bioculatus* Fabr., which is black, with the characteristic markings varying from pale rufous to crimson, and the

elytra black, with the costa narrowly pale. This form includes the varieties "b" and "c" of Say's *Pentatomid clauda*. The other form is of a chestnut brown or piceous black, with the characteristic markings ivory white, and the elytra white, with the narrow inner margin and a wedge shaped median vitta black. This variety is the typical *clauda* of Say, and also includes his variety "a." This form bears quite a strong resemblance to the figure of *Pecillus virgatus* Stal on Plate 3, figure 22, of the Biologia. In the specimens I have seen of the typical variety *clauda* Say, the base of the antennae are blackish, not rufous as described by Say.

***Pecillus circumcinctus* Stal.**

This species seems to replace the preceding in the eastern United States and Canada. In the west it extends from Manitoba to Missouri, and possibly southwardly to Mexico, as Dr. Uhler records its occurrence in Panama and Trinidad, and Distant figures what he takes to be a black variety from Mexico. The form of this species is narrower and more convex above, and the pronotum is distinctly longer than in *bioculatus*. I have observed but little tendency to vary in this species.

***Mineus strigipes* H. S.**

This insect bears quite a strong resemblance to *Pecillus confluentis* or a small specimen of *bioculatus* Fabr., but it can be readily distinguished by the unarmed anterior femora, a character separating this genus from *Pecillus*. The color is deep blue black, with the narrow anterior, latero-anterior margins and median longitudinal line, and the broad latero-posterior submargin of the pronotum, and a submarginal vitta on the scutellum forming a perfect V, of a fulvous or red. The narrow costal margin, the connexivum, and the body beneath are of the same fulvous red color, with the sutures of the pleurae, a row of stigmatal spots, a narrow vitta on the base of the venter, a large subapical square spot bifid before, and the anal segment blue-black. The antennae and legs are black, with the coxae and femora beneath pale. Rostrum black, basal joint pale. The head is slenderly edged with pale before, sometimes the larger ventral spot is broken into about six smaller ones, and in one individual the red margin of the pronotum is continued around the base. Dr. Uhler records this species from New York, Maryland, South Carolina, Georgia, Texas and New Mexico. It is included in the Gil-

lette and Baker List of the Hemiptera of Colorado, and in Smith's Catalogue of the Insects of New Jersey. For the specimens in my collection I am indebted to Prof. C. W. Johnson and Mr. de la Torre Bueno for material taken respectively in New Jersey and at Mosholu, N. Y. Prof. Osborn has more recently sent me specimens from Ohio and Washington, D. C., and I have seen others from Massachusetts.

Rhacognathus americanus Stal.

I have seen but four specimens of this species, all darker in color than the description by Stal would indicate. They are virtually black, but a close inspection shows the testaceous rugæ between the punctures. The specimen now in my collection was taken at Winnipeg, Manitoba, by Mr. Hanham. Prof. Osborn has two specimens taken at Londonville, Ohio, in June.

Zicrona cærulea Linn.

Uhler records this pretty species from Idaho, Arizona, New Mexico, Colorado and Utah; Prof. Cockerell has kindly given me a typical example taken in the Organ Mountains, New Mexico; and an example of the bronze variety described as *cuprea* by Dallas, taken at Salt Lake City, Utah, in July, 1899, was sent to me by Mr. G. Wesley Browning. Mrs. Slosson has taken it on Mt. Washington, New Hampshire.

Genus **PODISUS** H. S.

In the 45th Annual Report of the Massachusetts State Board of Agriculture, for 1897, pp. 412-439, Mr. A. H. Kirkland gives us a very full and careful account of this genus. I give below a more extended synopsis of the species to supplement that given by Mr. Kirkland. It includes one southern species (*sagitta* Fabr.) not included by him and restores *bracteatus* Fitch to the specific rank I believe it should have.

- Cheeks longer than the tylus, at times approaching and subcontiguous before it, its inner angle acute; size large.....1.
 Apex of the head truncated; cheeks and tylus equally long, or rounded with the tylus exceeding the cheeks.....3.
 1. Humeri rounded, not at all prominent; posterior angles of the pronotum produced in a short acute spine (*Apateticus*)**Gilletti**.
 Humeri prominent, obtuse or acute (*Apacilus*)2.
 2. Median valve of the female genital segment quadrangular **cynicus**.
 Median valve of the female genital segment triangular.

bracteatus and **crocatus**.

3. Apex of the head rounded, tylus slightly exceeding the cheeks, humeri acutely spinose, basal angles of the scutellum with a large calloused spot (*Tylospilus*) **acutissimus.**
 Apex of the head truncated, cheeks as long as the tylus, outer angles rounded, inner subacute (*Podisus*) 4.
4. Humeri acutely spinose, directed forward; latero-antero margins and two discal dots of the pronotum, and the apex of the scutellum distinctly calloused and white **mucronatus.**
 Humeri obtuse or acute, directed outward; latero-anterior margins of the pronotum and apex of the scutellum not conspicuously calloused. 5.
5. Humeri obtuse, almost rounded; form oblong, broader posteriorly than is usual in this genus; venter normally with two rows of black points each side; membrane without a distinct vitta **placidus.**
 Humeri acute or spinose; membrane with a longitudinal dusky vitta 6.
6. Humeri distinctly but not deeply emarginate a little before the tip... **sagitta.**
 Humeri entire, acute or spinose 7.
7. Smaller (7 to 8 mm.); humeri less acute; legs immaculate; ventral spine short, not reaching to the hind coxæ **modestus.**
 Longer (8 to 10 mm.); humeri more acute or spinose 8.
8. Color dark, quite strongly tinged with rufous, especially on the legs and antennæ; the femora darker toward their apex and sometimes with an obscure darker subapical annulus; median row of black spots on the venter grading larger posteriorly; ventral spine very short.
sereiventris.
 Color more gray or brown; legs with two black points near the apex of the femora; median row of black spots on the venter small with the posterior one much larger; ventral spine long. **maculiventris.**

Podisus (Apateticus) Gilletti Uhler. Gillette and Baker's Hemiptera of Colorado, p. 12, 1895.

So far as I can make out this insect corresponds in every particular with Stal's description of *marginiventris* (Enum. Hemipt., 1, p. 49; Distant, Biologia, pl. 4, fig. 24), and I have little doubt but a comparison with Stal's type would show their identity. I place this species in *Apateticus*, although it does not altogether agree with the characters given by Dallas. The posterior angles of the pronotum are armed with a short and very acute spine, a character noticed by Stal, but overlooked by Uhler. This species strongly resembles *Jalla dumosa* of Europe, but may be separated at once by the unarmed anterior femora. Genus *Jalla* has a stout femoral tooth.

I took two females of this rare species at Horse Tooth Gulch near Ft. Collins, Colorado, in July, 1900, and Dr. Uhler's type, which I have examined, came from the same locality. So far as I know these are the only known specimens of this species, unless we add Stal's type of *marginiventris* which was from Mexico, and another mentioned by Dr. Distant.

Podisus (Apœcilus) cynicus Say. *Arma grandis* Dallas.

In the Lethierry and Severin Catalogue *cynicus* and *grandis* are given as distinct species, but their descriptions evidently refer to the same insect. This is a common species throughout the eastern United States and Canada, and I have seen specimens from as far west as Galveston, Texas. This is, I think, the largest Pentatomid found in the eastern United States. I have seen specimens taken about Buffalo that measured 20 mm. in length.

Podisus (Apœcilus) bracteatus Fitch.

Described from New York. I have seen specimens taken in Montreal (Beaulieu); Idaho (Aldrich); and Vancouver Island (Taylor). It is distinctly a northern species, and in this form at least does not extend south of New York. One of the Vancouver Island specimens is the darkest I have seen; the pronotum and scutellum being of an almost uniform deep metallic green, with a few scattering pale areas, and the elytra are mottled with metallic green and dusky ferruginous. This species averages a little smaller than *cynicus*; the humeri are more abrupt and less acute, and the latero-anterior margins of the pronotum are more strongly crenulated. *P. bracteatus* and the form mentioned below as *croceatus* may always be distinguished from *cynicus* by having the median valve between the basal plates in the female genital segment triangular. In *cynicus* it is quadrangular. The Lethierry and Severin Catalogue erroneously gives 1859 as the date of this species, it should have been 1856. I cannot agree with Mr. Kirkland in placing it as a synonym of *cynicus*.

Podisus croceatus Uhler. Trans. Md. Acad. Sciences, i, p. 384, 1897.

A pale form that I cannot distinguish, except in color, from *bracteatus* is common throughout Colorado, Utah, Arizona and the adjoining portions of the Rocky Mountains, and has been taken in Manitoba by Mr. Hanham. I have seen specimens of this in at least two collections that were determined by Dr. Uhler, as his *croceatus*, although it does not correspond as well with his description as does the preceding form which I have called *bracteatus* Fitch. I am forced to the conclusion that this is the paler southern form of that species, although I do not care to merge them until they have had more thorough study and with fuller material than is now available.

Podisus maculiventris Say. Desc. of new species of N. Am. Insects found in Louisiana by Joseph Barabino, p. 11, 1831. Reprint in Psyche, viii, p. 307, 1899.

This is the insect long known as *Podisus spinosus* Dallas. We are indebted to Dr. Scudder for the re publication of the rare paper by Say in which his description first appeared. It is a common predacious insect over a great part of the United States and Canada, but becomes less abundant west of the eastern slopes of the Rocky Mountains. Dr. Uhler's western records include California, Colorado and Texas; Prof. Osborn adds Arizona, and I have seen specimens from Montana (Cooley), Manitoba (Hanham), and Vancouver Island (Taylor).

Podisus sereiventris Uhler.

This species is very close to *maculiventris*. The few specimens I have seen have all been smaller, more reddish in color, and have the humeri less acute and produced. I possess specimens from Vancouver Island (Taylor), and Kalispell, Montana (Wickham), and Mrs. Slosson has taken it at Franconia, New Hampshire. Mr. Kirkland reports this as "by far the most common representative of the genus" in Massachusetts, but his description seems to refer to the form given here as *maculiventris*. A study of the type is greatly needed.

Podisus modestus Dallas.

Common throughout the northeastern United States and Canada, and extends westward to Manitoba (Hanham), Dakota, Nebraska, Colorado, Montana (Cooley), Vancouver Island (Taylor) and Mexico. The small size, pale colors and short ventral spine will distinguish this species from *maculiventris*. I would differentiate it from *sereiventris* by its smaller size, narrow and more depressed form, paler colors and the shorter second joint of the antennæ. Kirkland adds the shorter ventral spine, but as I identify *sereiventris* this spine is even shorter than in *modestus*.

Podisus placidus Uhler. Am. Ent., ii, p. 203, 1870; Can. Ent., xxix, p. 115, 1897.

Omitted from the Lethierry and Severin Catalogue. An interesting and distinct species that has been recorded from Canada, Massachusetts, New York, Michigan and Colorado by Kirkland, and from Iowa by Osborn. The rounded humeri, rectilinear latero-anterior margins of the pronotum, immaculate membrane, and long

ventral spine will distinguish this species. The sides of the head are narrowly black in all the specimens I have examined.

Podisus sagitta Fabr.

A Mexican and West Indian form that has been reported by Dr. Uhler from Texas. A fairly good figure is given by Distant in the *Biologia*, pl. 1, fig. 22. The imperfectly emarginated humeri will distinguish this species from *maculiventris*, its nearest relative in our northern fauna.

* **Podisus pallens** Stal.

I have seen one specimen, undoubtedly *pallens*, in the collection of Prof. Herbert Osborn. It is certainly very close to *maculiventris* and *modestus*, but without material for study I cannot attempt to place it in my synoptical key. Stal's types were from California, and Dr. Uhler has recently recorded it from Lower California.

Podisus mucronatus Uhler. *Trans. Md. Acad. Sciences*, i, p. 386, 1897.

Mrs. Annie Trumbull Slosson has generously given me an example of this distinct species taken in southern Florida, and the types were from the same source. It cannot be confounded with any other species known to me.

Podisus acutissimus Stal.

Of this very pretty species I possess four examples from Texas. Two of these were taken at Brownsville by Prof. Wickham. All of my specimens have the median callous on the base of the scutellum, as pictured by Distant in the *Biologia*, pl. 2, fig. 22. Dr. Uhler reports this species from Colorado, and the types were from Texas and Mexico.

Mutycha phymatophora P. B. Indian.

This is a large West Indian form that has been taken in southern Florida by Mrs. Slosson. Distant considers it as distinct from the South American *grandis*, and it is so listed in Lethierry and Severin's Catalogue.

Mutycha grandis Dallas.

Mr. Otto Heidemann has an example of this species that was taken in southern Florida. Distant distinguishes it from the preceding by its having the humeral spines directed somewhat forwards and in having the base of the scutellum and the elytra more closely punctured. In the few specimens I have examined of this species

the ventral spine is longer, the apical angles of the sixth ventral segment are more strongly produced and the colors are paler than in *phymatophora*.

Euthyrhynchus floridanus Linn.

Amyot and Serville report this species from Philadelphia, Stal from New Orleans, and Prof. Ball has sent me an individual taken at Dayton, Tennessee. It is more abundant toward the south, and in Costa Rica and other tropical countries takes on its most brilliant coloring of metallic green or blue and orange.

Subfamily ACANTHOSOMIDÆ.

This subfamily is well distinguished from our other Pentatomids by the biarticulate tarsi and the sharply keeled sternum. But one genus has as yet been reported from our territory.

Genus ACANTHOSOMA Curtis.

- Greenish testaceous; elytra with a transverse band near the middle and the apical margin clouded with brown. Size small **lateralis**.
 Pale or yellowish testaceous; inner and apical margins of the elytra sanguineous or brown. 2.
 2. Antennæ pale, apical joint dusky; pronotum with large, scattering, fuscous punctures **cruciata**.
 Antennæ piceous or black; punctures on the pronotum concolorous nearly to the hind margin. **atricornis**.

Acanthosoma lateralis Say.

Edessa nebulosa Kirby. Fauna Bor. Am., Insects, p. 277, 1837.

Acanthosoma affinis Westw. Hope Catal., i, p. 30, 1837.

Acanthosoma picicolor Westw. Hope Catal., i, p. 30, 1837.

For the Westwood synonymy given here I am indebted to Distant's Studies on the Hope Collection. This is a widely distributed species in the northern United States and Canada, and Distant even reports a specimen from Mexico, the only references he gives for Mexico, however, are referable to one example in the collection of Dr. Signoret, and it is more than likely that there may have been an error in the locality from which it came. My material is from Montreal, New York and Vancouver Island, the latter kindly sent to me by Rev. G. W. Taylor.

Acanthosoma cruciata Say. (*Acanthosoma borealis* Westw. Distant, Proc. Zool. Soc., 1890, p. 818.)

This species is of a pale testaceous yellow, with the apex of the

antennæ and tarsi darker. The hind edge of the pronotum, the inner and apical margins of the elytra, and the apex of the abdomen are sanguineous. The whole upper surface is dotted with large blackish punctures which become almost concolorous and distant on the outer disk of the elytra. It seems to be distributed across the whole northern part of the continent. I have seen specimens from New York, North Carolina, Montreal (Cooley), Utah (Browning), and Vancouver Island (Taylor).

***Acanthosoma cruciata* Say, var. *Cooleyi* n. var.**

Closely allied to the European *dentata*. Pale yellowish testaceous tinged with green on the posterior disk of the pronotum; humeral angles and latero-posterior margins of the pronotum, a triangular indefinite spot covering most of the base of the scutellum, broad inner margin of the corium connecting with a large spot at the outer apical angle, and the apex of the abdomen, reddish or sanguineous. Head with a very few large punctures, which are blackish on its disk becoming concolorous apically; sutures at the base of the tylus brown; tips of the cheeks attaining the apex of the tylus on either side, but slightly exceeded by its rounded end. Antennæ pale or almost rufous, fourth joint a little dusky, the fifth fuscous beyond the middle. Pronotum a little longer than in *dentata*, marked with a few large, scattering, black punctures, which omit the callosities and form an arcuated line on the anterior submargin. Punctures on the scutellum large and scattering, the narrow excavated tip smooth. Elytra more closely punctured near the inner and apical margins, these punctures but little darker than the adjacent surface. Membrane very slightly embrowned toward the base and outer angles. Beneath pale yellowish, immaculate, with large uncolored punctures on the posterior half of the propleura. Legs pale, tarsi and apex of the tibiae dusky. Genital segment of the male rounded behind where there is a broad, shallow sinus extending for half its width, mostly filled with a close-set brush of stiff bristles so arranged as to form a triangular median notch. In *dentata* this sinus is indicated only by a small black tooth on either side. Length 7-8 mm.

Described from one male and two female examples collected at Bozeman, Montana, by Prof. R. A. Cooley. I have also examined specimens, hardly separable, from New York and Canada. These with further material from Prof. Cooley show connecting links with *cruciata* that lead me to consider this as but a variety of that species.

Acanthosoma cruciata Say is a larger insect (10 mm. long), with a broader and shorter pronotum, more sinuated on its latero-posterior margin; the tylus is a little longer, the sternal lamina is more elevated between the anterior coxæ, and the intermediate lateral plates of the female genital segment are shorter and almost rounded behind. In my variety (*Cooleyi*) these plates, lying between the valve and the outer plates, are extended at the inner apical angle almost or quite to the apical margin of the outer plates and are sub-

acute. *Acanthosoma dentata* of Europe is closely related to *cruciata*. It has the same form of female genital pieces, but the apical angle of the sixth abdominal segment is more acute, the sternal lamina is less elevated, and the punctuation above is finer and closer, especially on the elytra and scutellum. Further observation and material may show *cooleyi* to be a distinct species.

***Acanthosoma atricornis* n. sp.**

Size and form of *cruciata* nearly. Head pale, shorter and broader than in our other species; the tylus hardly longer than the cheeks, which are a little thickened on the edges; disk with a few almost obsolete uncolored punctures. Eyes black, ocelli red. Antennae shining black becoming fuscous toward the apex, the nodes touched with pale. Pronotum pale, the punctures shallow and concolorous, inconspicuous; humeral angles rather prominent, subacute, shining piceous black, shading into sanguineous on the base of the elytra and along the latero-posterior and hind margins of the pronotum. Scutellum faintly reddish on the base and tip, paler across the middle, the punctures scattering, dark brown or black. Elytra pale, dull sanguineous along the inner and apical margins or deepened to piceous on the shoulder and rounded apical angle, costa narrowly pale at base. Membrane with a brown cloud at base and a well-defined fuscous spot over the dark apical angles of the last abdominal segment. Beneath pale becoming fulvous on the venter and deepening to sanguineous toward the tip and to black on the acute apical angles of the sixth segment. Stigmata brown, transverse. Sternal laminae much elevated between the anterior coxae, as in *cruciata*. Legs pale, the apex of the tibiae and tarsi dusky. Valve of the female genital segment more triangular than in *cruciata*, the intermediate plates short and obtuse, as in that species. Apex of the male genital segment feebly rounded, the sinus almost obsolete, the apical bristles short, forming but a small brush either side of the middle. Length 9 to 10 mm., width across the humeri 5 to 5½ mm.

Described from many examples taken in Montreal by Mr. Germain Beaulieu, and two taken in Indiana by Prof. W. S. Blatchley. There are also specimens in the Cornell University collection taken in New York. So far as my observations extend this seems to be our most abundant northern species of *Acanthosoma*. I formerly determined it as *cruciata* Say, but the black antennae and humeral angles, and uncolored punctures on the pronotum will at once distinguish it from that species as well as from the European *dentata*. It is apparently the insect described by Provancher as *cruciata* Say (Petite Faune Ent. du Canada, Hemip., p. 48), but from his notes he had evidently seen the true *cruciata* without recognizing it as distinct.

ADDITIONS.

During the printing of this paper I have received material from Mr. Samuel Henshaw, Mr. Otto Heidemann and Mr. Harry G. Barber that adds something to the facts therein recorded and brings the total number of species and distinct varieties here listed up to 204. This includes a few additions incorporated with the body of the paper while it was going through the press. Further research will doubtless materially increase this number.

***Corimelena minuta** Uhler.

Mr. Heidemann has sent me an example of this species that was taken at Jacksonville, Florida. It was described from Cuba. This tiny little insect closely resembles *pulicaria*, but is only about half the size of that species, and has the pale border of the corium narrow and of equal width throughout, not widened inwardly at base.

Homocemus consors Uhler.

An insect determined as this species by Dr. Uhler was sent to me by Mr. Henshaw. It answers in every particular to Dr. Uhler's description of *consors*, but I have been unable to detect any character to distinguish it from his earlier species—*bijugis*. Prof. Osborn writes me that he has come to the same conclusion as to the identity of these species.

Anlacostethus simulans Uhler.

Mr. Henshaw's material contained an example determined by Dr. Uhler as this species. It seems to me to be but a clearly marked example of *marmoratus* Say. I have found these clearly marked specimens in all the material of this species that I have examined. They have in all cases been females, and so far as I can see this seems to be the pattern characteristic of that sex of *marmoratus*. Western material in this case, as in many of the allied species, is more clearly marked than is the eastern.

* **Camirus consocius** Uhler.

Two examples of this species are in the Heidemann collection. They are a little larger than *porosus*, with the surface, perhaps, more coarsely punctured, and the scutellum marked with fulvous on the apex, on the median line before the apex, and near the base on either side. They are from Edingburg, Texas.

* **Acantholoma denticulata** Stal.

Mr. Heidemann has an example of this species that was taken in Kansas—the first I have seen. It closely resembles *Camirus porosus* Germ., but the pronotum is broader before, with its edge and the margins of the head inferiorly minutely denticulate.

* **Podops dubius** P. B.

Mr. Heideman has sent me a pair determined as this species that were taken at Fortress Monroe, Virginia. After a careful study of these specimens I feel, no doubt, but that the determination is correct, at least as the species is identified by Stal. The following note may assist in locating it in the future:

Larger than *cinctipes* Say. Length, male, 7 mm.; female 9 mm. Head about as in *cinctipes*, the tylus more tumid and prominent for its whole length. Second joint of the antennæ obviously longer than the third, the incisure distinct. Pronotum shaped as in *cinctipes*, the tooth at the anterior angle more prominent, directed outward and a very little forward. Scutellum in the female proportionately broader and shorter than in *cinctipes*. Punctures becoming obsolete and distant along the middle line of the venter, as in *cinctipes*; the sixth ventral segment strongly and almost acutely produced anteriorly, as in *parvulus*. The genital characters of the male are about those of *cinctipes*, but the depressed apical smootish area of the genital segment is broader and rounded anteriorly, not subproduced and encroaching upon the punctured basal area as in *cinctipes*, and the apical angles are even more strongly produced than in *cinctipes*, with their tips pale. In the female the apex of the genital segment is distinctly emarginate, and the apical margin of the sixth ventral segment is feebly produced at the middle, a character quite obvious in some examples of *cinctipes*. This pair is paler in color than is usual in the allied species, and the pale colors on the breast and legs are correspondingly more extended. The form of the scutellum does not differ in the two sexes in our other two species, and it is quite possible that this difference is not constant in *dubius*.

Euschistus biformis Stal.

Mr. Harry G. Barber of New York City has a specimen of this species that was taken in Arizona. This is its first recorded occurrence within our territory.

Eysarcoris punctiger Walker.

Described from California. Unrecognized by recent students.

Padæus irroratus H. S.

Mr. Barber has added this species also to our fauna. He has a specimen taken in Florida.

Genus **BREPHOLOXA** n. gen.

Aspect of a small *Loxa*, but more closely allied to *Liotropis* Uhler. Head long, triangular; cheeks longer than the tylus and nearly or quite contiguous before its apex, the sides nearly rectilinear, scarcely sinuated before the eyes; surface flat, edge carinated. Antennæ short, basal joint not reaching the apex of the head, second longest, third, fourth and fifth a little shorter, subequal. Bucculæ percurrent, but slightly elevated, forming a prominent tooth near the base of the rostrum. Rostrum reaching to the hind coxæ, first joint scarcely attaining the base of the head, second longest, fourth shortest. Pronotum rather short, humeri prominent, latero-anterior margins crenulated. Scutellum triangular, the frenum extending somewhat beyond the middle. Apical angles of the abdominal segments scarcely prominent; base of the venter with a short acute spine that reaches between the hind coxæ. Femora unarmed. Osteolar canal short, truncated. Sternum ecarinate.

This genus may be distinguished from *Loxa*, *Chlorocoris* and their allies by the ventral spine, and from *Ægius*, with which it would fall in Stal's synopsis, by the different length of the antennal joints, shorter rostrum, longer ventral spine, form of the abdomen, smooth margins of the venter, and especially by wanting the elytral dilatation. Superficially this genus bears a strong resemblance to *Thyanta*. It is still nearer to *Liotropis* Uhler, but differs in its more elongated form and the shorter truncated osteolar canal. It corresponds very closely with *Liotropis* in the form of the head and pronotum and in the presence of a ventral spine. I would arrange it immediately before that genus.

Brepholoxa Heidemanni n. sp.

Uniform pale testaceous yellow, closely and evenly set with concolorous punctures. Apex of the antennæ and rostrum, margins, both above and below, of the head and of the pronotum as far as the humeri, tinged with rufous, these margins more or less edged with blackish for a little space before and behind the eyes. Tarsi sometimes tinged with rufous. Tergum concolorous, impunctate. Humeri subacute. Wings hyaline. Apex of the scutellum produced, narrow, the tip subacute. The elytral costa is very feebly angled about one-third of the length from its base. Sixth ventral segment roundedly produced anteriorly on

the middle, the hind margin deeply excavated in the male for the reception of the genital segment, the apical angles incurved, subacute. Male genital segment narrow produced at apex with a deep narrow median notch. The exterior plates of the female genital segment surpass the median plates and approach before them.

Described from one female and two male examples kindly sent me for description by Mr. Otto Heidemann, to whom I take pleasure in dedicating them. They are from Biscayne, Florida, and bear a label "*Chlorocoris lozops* Uhler MS.

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ERRATA.

Page 19, line 21, for *Generales* read *General*.

“ 23, “ 12, “ *Wood's Hole* read *Woods Holl*.

“ 25, “ 10, “ **Geotomatus** read **Geotomus**.

“ 62, “ 2 from bottom, for *Trans. Ind.* read *Trans. Md.*

“ 72, “ 27, delete “*Indian*” after **Mutycha phymatophora** P. B.