

NEW NORTH AMERICAN ACRIDIDÆ, FOUND NORTH OF THE
MEXICAN BOUNDARY.

BY
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(With Plate I.)

During the early part of 1884 Dr. C. V. Riley and the writer began the preparation of a conjoint Monograph of North American Acrididæ. For various reasons the publication of this work has been delayed, and, at the suggestion of Dr. Riley, and as a result of that conjoint work, the following new North American Acrididæ are herewith characterized in advance, in order that others who may be desirous of studying the same family of insects can have the benefit of the undescribed material in this group contained in the collections of the National Museum. This material has been steadily increasing ever since the publication of Dr. Thomas' Synopsis of North American Acrididæ by the United States Geological Survey. At present this collection contains typical specimens of nearly all of the described forms, besides many that are new to the country north of the Mexican frontier. Dr. Riley will probably soon publish descriptions of the new species belonging to the genera *Melanoplus*, *Pezotettix*, *Hesperotettix* and allies, to which he has paid especial attention on account of their economic relations to agriculture. The writer wishes here to acknowledge his aid in different ways while engaged on the work, and for having the accompanying illustrations prepared.

In the preparation of the present paper no special efforts have been made towards a natural classification of the species represented by the material herein described. The conocephalids have, however, been placed together—an arrangement which seems more natural than that sometimes adopted heretofore by writers treating of the family of locusts. The division into sub-families is that followed by the more recent European specialists.

The following new species and genera are described in the present paper:

Acridina.	Aulocara (?) Scudderi.
<i>Mesops cylindricus</i> .	Mestobregma pulchella.
Pyrgomorphinae.	Conozoa texana.
<i>Dracotettix</i> gen. nov.	<i>albolineata</i> .
<i>Dracotettix monstrosus</i> .	Koebelei.
Tryxalinae.	Trimerotropis cyaneipennis.
<i>Ochrilidia crenulata</i> .	<i>azureus</i> .
<i>cinerea</i> .	<i>bifasciata</i> .
<i>Mermiria texana</i> .	<i>californica</i> .
<i>maculipennis</i> .	<i>modesta</i> .
<i>Syrbula aenticornis</i> .	<i>thalassica</i> .
Eritettix gen. nov.	(?) <i>pacifica</i> .
<i>Eritettix variabilis</i> .	<i>perplexa</i> .
<i>abortivus</i> .	Cireotettix lapidicolus.
Boötettix gen. nov.	<i>shastanus</i> .
<i>Boötettix argentatus</i> .	Edipoda (?) <i>occidentalis</i> .
<i>Pedioscirtetes pulchella</i> .	Thrinco aridus.
Ædipodinae.	<i>maculatus</i> .
<i>Psoloessa Buddiana</i> .	Haldemanella Saussure.
(?) <i>eurotiæ</i> .	<i>Haldemaella robusta</i> .
<i>Arphia Saussureana</i> .	

Sub-family ACRIDINÆ.

Mesops cylindricus sp. nov.

Very similar to *M. wyomingensis* Thos. in structure and general appearance, but differing from that insect in color and its considerably larger size.

Head long, considerably longer than the pronotum; the face very oblique, straight; cone of the vertex horizontal, the margins raised, the center sulcate and furnished with a well defined median carina in both sexes; frontal costa expanding below, sulcate to the labrum. The sides sharply defined. Antennæ ensiform, triquetrus, rather heavy, and somewhat exceeding the length of head and pronotum combined; occiput gently rounded, slightly expanding posteriorly. Pronotum sub-cylindrical. The anterior edge slightly expanding, lower lateral edge a very little upwardly arcuate in the middle; the anterior and posterior extremities gently rounded, median carina distinct throughout, most prominent on last lobe, which is slightly granulate; last transverse impressed line faint, to the rear of the middle. Tegmina and wings very delicate, a little more than one-half as long as the abdomen, and furnished with few veins, their apices rounded. Posterior femora slender, gently and evenly tapering, about two-thirds the length of the abdomen in both sexes. The abdomen rather long and cylindrical, in the male terminating with a long wedge-shaped last ventral segment or process. Valves of the female ovipositor very short and nearly obscured by the overlapping anal processes.

General color a nearly uniform reddish-brown or grayish-fawn color, marked only by a bright white line reaching from the base of the antennæ along the lower edges of the pronotum to base of middle pair of legs; antennæ, face, and eyes ferruginous.

Length of body, ♂, 26^{mm}, ♀, 34^{mm}; of antennæ, ♂, 11^{mm}, ♀, 13^{mm}; of pronotum, ♂, 35^{mm}, ♀, 5^{mm}; of tegmina, ♂, 12^{mm}, ♀, 14^{mm}; of hind femora, ♂, 10.35^{mm}, ♀, 13^{mm}.

HAB.—Valentine, Nebr., along the north side of Keya Paha Creek, also on the bluffs south of Chadron, Nebr., (L. Bruner).

This very interesting grasshopper was seen for the first time, by me, during the month of August last, while on a collecting trip into the northwestern part of the State. Belonging, as it does, to a sub-family of locusts that are particularly noted for their mimicry to certain forms of vegetation, it can be readily seen how it has so long escaped the eyes of collectors. This insect lives upon the stems of several species of the tall grasses of that region, to which it clings so closely that it is difficult to see it unless first disturbed. Even then it sometimes succeeds in eluding its would-be captor. Its actions are slow, as would naturally be supposed from the form of its jumping legs and the smallness of its wings. It is more of a climber or walker than a jumper.

Sub-family PYRGOMORPHINÆ.

Dracotettix gen. nov.

Composed of rather large and clumsy insects of dull colors, in which the tegmina and wings are somewhat shorter than the abdomen. The vertex of the head, broad and projecting; the pronotum large, cristate, and quadrilobed; the prosternum strongly spined, and the legs as in the *Eremobinae*. Females fully twice the size of the males.

Entire surface of body and limbs very rough, having a granular appearance. Antennæ rather short, crassate, subtriquetrous, 17-jointed, the joints somewhat flattened, punctate, the apex blunt. Vertex broad and projecting considerably in front of the eyes, of nearly equal width throughout, almost horizontal, the lateral edges projecting, but gently sulcate, furnished in the middle with a blunt, longitudinal carina; the fastigium broadly rounded; lateral foveolæ elongate, scarcely sulcate; frontal costa narrow and very prominent above, suddenly contracting to ordinary height at the ocellus, where the walls are deeply cut by a profound transverse sulcus, rather deeply sulcate throughout, the walls below the ocellus slightly divergent and quite heavy; lateral facial carinæ moderately prominent and united below by a transverse carina with the carina of the frontal costa, making two walled enclosures. Eyes, moderately large and rather prominent, sub-globular. Pronotum large and broad, with strongly marked lateral carinæ, which are evenly divergent posteriorly, the disk nearly flat, the front and back edges angulate, the latter greatly prolonged, as in the genus *Haldemanella*; the

median carina tectiform, cristate, strongly quadrilobed; posterior lateral edges oblique, the lower angle rounded. Tegmina and wings somewhat abbreviated, the axillary field in the latter very large, especially in the males, where it occupies fully one-third of the entire area. Posterior femora moderately robust, with the upper and lower carinæ but little elevated; posterior tibiæ gently tortuous; the spines few, stout, and those on the inner edge nearly twice the length of those outside and curved; tarsi of anterior pair of legs very short; pulvilli between claws very minute, almost obsolete. Abdomen strongly compressed, tectiformly carinate, tapering rapidly near its apex; the last ventral segment of male conical; the supra-anal plate triquetrous, the upper edge narrowly but quite deeply sulcate. Prosternal spine quite large, pyramidal, the front edge flat, the hind edge rounded.

As indicated from the above description and by reference to the figure of *D. monstrosus*, it will at once be seen that the insects comprising the genus *Dracotettix* form a very distinctly marked group among the Acridians of the world. Like most all of the other large robust forms of the family, these locusts are also inhabitants of semi-desert, or desert-like regions, for the rigors of which they are eminently fitted.

Their dull color is protective, their shield-like pronotum and leathery tegument a safety against the attacks of lizards and other reptiles, while their rugosity is in unison with their surroundings. Being denizens of a rough country their general "make-up" partakes of a like rough nature. Like some of the reptile forms that frequent these regions these locusts also bear a very striking resemblance to the pictured dragons of mythological lore, hence the name "dragon locust."

Dracotettix monstrosus sp. nov. [Pl. I, Fig. 1.]

Dull, dirty white, gray and brown, with a few flecks of black along the carinæ of face, pronotum, and posterior femora; the latter black inside; posterior tibiæ and tarsi red inside, gray outside. Antennæ reaching only to last transverse sulcus of pronotum.

Vertex between the eyes about as broad as their longest diameter (♂) or fully twice as broad as their shortest diameter (♀), horizontal, gently tapering anteriorly, the fastigium broadly rounded, the median carina rather blunt but distinctly visible throughout, the lateral walls converging posteriorly to the hind edge of the eyes, where they suddenly approach nearly to the median carina; occiput furnished with two supplementary carinæ or rugosities, commencing at the upper posterior edges of the eyes and reaching backwards and inward until they are lost from view beneath the front edge of the pronotum. Face in front and on cheeks rugose. Pronotum large; the surface tuberculate, granulate; the crest or median carina tectiform, high; the last transverse sulcus a little in advance of the middle, the anterior portion trilobed, the three lobes together arched, the front one nearly or quite as long as the other two; the crest on the posterior lobe a little lower and

evenly arched, as in the genus *Acrolophitus*, lateral carinæ continuous, increasing in size backwards, and forming overhanging blunt walls to the lateral lobes; posterior extremity acute-angled, with the tip upturned and strongly marginate. Tegmina lanceolate-ovate, in the female about half as long, and in the male only a trifle shorter than the abdomen; wings shorter than the tegmina, the humeral field very narrow, the axillary equal to the post-axillary or radial field and bordered with very heavy veins, like this portion of the wing in *Rhomalea* and *Tenioptoda*, and like these are evidently used as musical organs.

General color, dirty grayish-white, with a slight rusty tinge to the sides of the pronotum and thorax. Lower half of tegmina brown. Inner face and lower sulcus of posterior femora black nearly to the knee; inner edge of posterior tibiæ bright vermilion, outside grayish-white. Carinæ of face, pronotum, and posterior femora flecked with dark brown and black. Tips of antennæ infuscated, remainder grayish. Spines of posterior tibiæ testaceo-cinereous in the middle, their bases and tips black.

Length of body, ♂, 27^{mm}, ♀, 45^{mm}; of antennæ, ♂, 8^{mm}, ♀, 11^{mm}; of pronotum, ♂, 10.75^{mm}, ♀, 15.5^{mm}; of tegmina, ♂, 14^{mm}, ♀, 17^{mm}; of hind femora, ♂, 14^{mm}, ♀, 19^{mm}; width of pronotum, ♂, 7^{mm}, ♀, 10^{mm}.

Described from two specimens, male and female.

HAB.—Los Angeles, Cal., March 5 and 27 (D. W. Coquillitt).

Sub-family **TRYXALINÆ**.

Ochrilidia (?) *crenulata* sp. nov.

Related to *O. occidentalis* (*Stenobothrus occidentalis* Thos.), from which it differs in its smaller size, shorter occiput, and in its markings.

Occiput rather short and slightly rounding; the vertex between the eyes about as wide as the length of the basal antennal joint, the front margined by a blunt carina, forming at the fastigium a right angle, with the apex, gently rounded; lateral foveolæ missing; frontal costa prominent above, where it is very narrow, widening evenly below, sulcate throughout, the literal walls sharp. Eyes pyriform, not prominent. Face straight, very oblique. Pronotum short, nearly as broad as long, the lateral carinæ greatly bowed, faint; median carina visible throughout, severed about the middle by the last transverse impressed line; anterior edge slightly ascending upon the occiput; posterior edge broadly rounded. Tegmina narrow, the anterior edge bowed, the posterior edge straight; the veins of the disk not uniting and forming cells. Posterior femora slender, in the female just reaching, but in the male surpassing, the tip of the abdomen about one-third of their length. Interior apical spines of the posterior tibiæ fully twice as long as those on the outside, the lower one much the longest. Antennæ long, with the basal joints somewhat flattened, and the apex acuminate.

General color light testaceous, striped, and marked with brown. Frontal costa and a quite broad median line reaching from the fas-

tigium to the front edge of the pronotum, a similar one extending from the lower edge of each eye down the face to the corner of the clypeus; in some specimens this line is separated into two by the very narrow yellow front border of the cheeks; there is a third line or band of the same color directed backwards from the middle of the eyes, widening as it goes, and continued upon the sides of the pronotum, of which it covers a little more than the upper half. This last band is partially interrupted on the front edge of the pronotum by a pointed streak of yellow which reaches nearly to the lateral carinae. Disk ferruginous, with two lateral triangular brown spots on the posterior lobe, that appear as if separated from the coloring of the sides by the narrow yellow lines along the carinae. Tegmina with the disk brown to the apex, the anterior edge of which is much the darkest and deeply crenulate or waved, remainder grayish, becoming somewhat transparent apically. Wings pellucid, with the veins and nerves of the apical third infuscated. The posterior femora, with the upper carina and the upper half of the outer face brown, also with indications of two dusky bands on the upper edge. Posterior tibiae dirty grayish-yellow, becoming infuscated apically. Venter dull yellow. Antennae testaceous, in some specimens inclining to lavender.

Length of body, ♂, 13^{mm}, ♀, 18.5^{mm}; of antennae, ♂, 9^{mm}, ♀, 7^{mm}; of pronotum, ♂, 2^{mm}, ♀, 2.92^{mm}; of tegmina, ♂, 9^{mm}, ♀, 12.5^{mm}; of hind femora, ♂, 8.6^{mm}, ♀, 11^{mm}; of hind tibiae, ♂, 7.65^{mm}, ♀ 10^{mm}.

HAB.—Silver City, N. Mex. (Chas. H. Marsh); Yellowstone Valley, Mont., Helena and Fort Benton, Mont., and from several points in northern Wyoming, southwest Dakota, northwest Nebraska (Bruner).

This trim little locust is quite common throughout the regions above indicated, where it is to be met with among the short bunch grasses of the plains; and especially is it partial to localities where the surface is somewhat strewn with gravel and small stones.

Ochrilidia (?) *cinerea* sp. nov.

Somewhat larger than *O. crenulata* and *O. occipitalis*. Dull, dirty, grayish-yellow, with the tegmina evenly mottled throughout.

Differing from the species just described in the somewhat longer, more acute vertex, which expands a little in advance of the eyes and is quite deeply hollowed; also in the presence of rather plain, elongate, triangular lateral foveolae. Pronotum as in *occipitalis*. Tegmina with the discal cells closed at about two-thirds the distance to the apex, and the marginal field somewhat expanding on the basal half. Antennae a little heavier and more flattened than in *occipitalis*. Posterior femora as in that species to which it is most closely related.

General color cinereo-testaceous, with faint indications of the brown markings of the head and thorax, as seen in the other two species. Tegmina evenly mottled throughout, with small fuscous quadrate spots. Posterior femora crossed by two faint, dusky, oblique bands, plainest

above. Posterior tibiæ testaceous, the spines black-tipped. Antennæ grayish-brown.

Length of body, ♂, 15.5^{mm}, ♀, 21^{mm}; of antennæ, ♂, 8–10^{mm}, ♀ 9^{mm}; of pronotum, ♂, 2.45^{mm}, ♀, 3.35^{mm}; of tegmina, ♂, 11.5^{mm}, ♀, 14^{mm}; of hind femora, ♂, 9.25^{mm}, ♀, 11.2^{mm}; of tibiæ, ♂, 8^{mm}, ♀, 10^{mm}.

HAB.—Fort McKinney, Wyo., Birch Creek, Idaho, and Burleigh County, Dak. (Bruner), northwest Nebraska (Bruner).

This and *occipitalis* are frequenters of the mountain slopes and foothills, and especially so where these localities are somewhat sandy. Like *crenulata*, they are most partial to partly bare surfaces, and are very active in their movements. The present species reminds one not a little of the different members of the genus *Mermiria* in its general appearance and actions.

Mermiria texana sp. nov. [Pl. I, Fig. 11.]

A rather robust species with comparatively short hind legs. Dark brown, testaceous, and dirty white or pale lavender.

Head moderately short, the vertex short (though not quite so short as in *M. bivittata*), narrow, rounded in front, with but very slight traces of raised lateral carinæ and no median carina; frontal costa plainly visible throughout but not prominent, straight, narrow above and gradually widening below (♂), or with the sides parallel (♀), sulcate throughout. Eyes large and moderately prominent, elongate pyriform—as long as that portion of the cheeks immediately below them. Antennæ rather narrow, reaching one-third of their length beyond the hind extremity of the pronotum. Pronotum short and broad, the sides nearly parallel, rounded above on the anterior and nearly flat on the posterior lobe, which is rather coarsely punctate; median carina quite prominent, severed back of the middle by the last transverse impressed line; lateral carinæ nearly obsolete; anterior margin slightly concave; posterior margin very broadly rounded. Tegmina broad, the apex rounded, with the veins quite prominent, reaching beyond the tip of the body in both sexes. Posterior femora shorter and heavier than usual, not quite reaching (♀) or a trifle surpassing (♂) the tip of the abdomen; tibiæ heavy, with rather short, stout spines. Last ventral segment of the male abdomen less elongate than in *M. bivittata* and *M. alacris*.

General color light grayish-brown, heavily lined and marked with dark brown, and testaceous. A broad brownish band, commencing at the tip of the vertex and extending backwards along the middle of the occiput and pronotum to the middle of the dorsal edge of the closed tegmina; another reaching from the eyes backwards along the upper half of the sides of the pronotum upon the tegmina, the entire sides of which (save a narrow costal line of testaceous) it covers. These lines are darkest on the pronotum, where the color is nearly black. There is also a continuation of this color on the upper portion of the frontal costa and also a narrow line down the inner edges of the lateral facial carinæ.

These brown lines are much darker in the male, where the antennæ and the anterior and middle legs are also of this color. The dark lines are broadly bordered with testaceous, of which color are also the antennæ of the female, a line along the upper and lower edges of the posterior femora, and also the tarsi of the posterior pair of legs. There are also lines of the brown along the upper carina and upper edge of the outer face of the posterior femora, which terminate at a rather wide preapical annulus of the testaceous color. Posterior tibiæ bright red, in some specimens inclining to purplish at the immediate base and towards the apex; the spines black-tipped.

Length of body, ♂, 27-29^{mm}, ♀, 43^{mm}; of antennæ, ♂, 14^{mm}, ♀, 16^{mm}; of pronotum, ♂, 4.85^{mm}, ♀, 6.45^{mm}; of tegmina, ♂, 23-26^{mm}, ♀, 35^{mm}; of hind femora, ♂, 15.5-17^{mm}, ♀, 21-24^{mm}; of hind tibiæ, ♂, 14.5-16^{mm}, ♀, 20-21-5^{mm}.

HAB.—El Paso, Tex.; also Lerdo, in the State of Durango, Mexico, during November (L. Bruner).

This locust was only met with among the *sisal* producing plant (a sort of *Agave*, I believe) growing upon the rocky hills back from the rivers. It is very active, wild, and difficult to capture, and when disturbed flies great distances, invariably alighting among the thorny, rigid, and fleshy leaves of the plant above referred to. Whether or not it feeds upon the leaves of this plant I was unable to ascertain.

Mermiria maculipennis sp. nov.

Large and robust, with the tegmina more or less mottled. Testaceous and brown.

Head large and wide, the occiput shorter than in *M. neo-mexicana* and *M. alacris*; face straight, less oblique than in those species; eyes large, quite wide, and prominent; vertex not quite so wide as in the species just mentioned, short and broadly rounded in front, not sulcate; lateral foveolæ lunate and small; frontal costa moderately prominent above, slightly widening and fading below, gently sulcate above the ocellus (♀) or throughout (♂). Antennæ long, of medium width near the base, apex acuminate. Pronotum broad, without lateral carinæ, subcylindrical above, the posterior lobe expanding; anterior margin nearly straight, posterior margin subangulate. Tegmina extending just beyond the tip of the abdomen, with the nerves and veins prominent. Posterior femora robust, reaching past the tip of the body and wings in both sexes. Posternal spine quadrate, short, bluntly acuminate, directed gently to the rear.

Dull testaceous, in some specimens inclining to ferruginous, with the usual dark band along the sides of the head and pronotum, which extends upwards upon the edges of the disk of the latter; occiput furnished with two rather narrow, somewhat interrupted central brown stripes inclosing a still narrower one of yellow. Median carina of the pronotum sometimes occupied by a narrow brown stripe. Tegmina with

a subcostal and dorsal yellow lines, remaining portion brownish cinereous, becoming translucent beyond the basal third; veins and cross-veins brown. There are also a number of rather large dim fuscous blotches arranged along the middle field and a few smaller ones above and below. Posterior femora with the upper half of the outer face, together with the upper inner face, dusky; there is also a row of small dark spots along the lower outer edge; apex fuscous above; posterior tibiæ light red, inclining to pinkish in the female, their spines black on the outer half. Antennæ testaceous, lightest in the female. Besides the markings already mentioned there are, in some specimens of the female, small crescent-shaped black marks on the face below the ocellus, and interrupted bands of brown reaching from the lower edge of the eyes down the cheeks. Also a dim broad band just below the lower lateral edges of the pronotum.

Length of body, ♂, 36^{mm}, ♀, 46–52^{mm}; of antennæ, ♂, 21^{mm}, ♀, 15^{mm}; of pronotum, ♂, 5.85^{mm}, ♀, 8^{mm}; of tegmina, ♂, 27^{mm}, ♀, 37^{mm}; of hind femora, ♂, 21.5^{mm}, ♀, 31^{mm}; of hind tibiæ, ♂, 21^{mm}, ♀, 29^{mm}.

HAB.—San Antonio, Tex., in June (M. Newell); Carrizo Springs, Dimmit County, Tex., also in June (A. Wadgyar).

Syrbula acuticornis sp. nov.

Very closely resembling *S. admirabilis* (Uhl.) in its general appearance and size, but differing from that species in its somewhat slenderer form and in several other respects.

Antennæ acuminate, the basal joints flattened and wider than long, reminding one not a little of the different members of the genus *Mermiria*, not quite as long as the head and pronotum combined. Vertex between and in advance of the eyes as in *admirabilis*, but with the carinæ much more strongly developed; the lateral foveolæ inconspicuous; frontal costa of only medium width, the sides straight and diverging but little towards their lower end, continuous to and upon the clypeus, sulcate at upper end and below the ocellus; lateral facial carinæ straight and nearly parallel with those of the frontal costa; eyes similar in form to those of *admirabilis*, but larger and slightly more prominent than there. Pronotum with the lateral carinæ greatly arcuate, heavier and more prominent than the median, all three severed by the single transverse impressed line upon the disk a little back of the middle, the lateral lobes slightly deeper than in the other species. Tegmina and wings as in *admirabilis*. Posterior femora moderately heavy, reaching slightly beyond the tip of the abdomen.

General color grass-green, marked upon the pronotum and tegmina as in *admirabilis*, with this possible difference, that these members, together with the wings, are more deeply infuscated here than there.

Length of body, ♀, 34^{mm}; of antennæ, 8.5^{mm}; of pronotum, 5.75^{mm}; of tegmina, 24–25^{mm}; of hind femora, 22^{mm}.

Described from 3 female specimens. Male not known to me.

HAB.—Southwestern Texas (F. G. Schanpp).

Eritettix gen. nov.

Related to the genera *Orycoryphus*, and *Stenobothrus* of Fischer in the general make up of the body; but differing from these in having the occiput tricarinate, which carinæ are continuous upon the disk of the pronotum as the median and two supplementary carinæ, these latter about midway between the median and lateral carinæ which are common to all the other genera of the sub-family Truxalinae. Vertex nearly horizontal, only moderately broad, increasing but little and extending in advance of the eyes about as far as the distance which separates them, the apex roundly angulate. Antennæ with the joints more or less flattened towards the base, the apex clubbed to bluntly acuminate, of moderate length, not reaching the posterior extremity of the pronotum; face oblique, slightly arcuate; the frontal costa prominent and broad, with its sides greatly divergent below, shallowly sulcate at the ocellus; the lateral facial carinæ rather faint, arcuate. Pronotum short to medium in length, somewhat tumid at the sides below, the front edge nearly straight, the posterior edge roundly angulate above; median carina rather prominent, straight; the lateral but gently (*carinatus*, *tricarinatus*, *virgatus*, and *variabilis*) or considerably arcuate (*abortivus*); the fast transverse impressed line faint, nearly in the middle. Tegmina from one-half to as long as the abdomen, when the latter just reaching (♀) or slightly surpassing the tip of the abdomen (♂). The anterior or costal area of the former but gently inflated. Valves of ovipositor short and blunt. Posterior femora stout, surpassing the tip of the abdomen.

Second internal tibial claw almost twice as long as the first. The two sexes very unequal in size, the female being much the largest.

All the species of this genus of locusts, so far as I am aware, live through the winter as larvæ or pupæ, and mature very early in spring, in that respect reminding one of the genera *Chortophaga*, *Chimarocephala*, *Psoloessa*, and a few of the representatives of the genera *Hippiscus* and *Arphia* among the *Ædipodinae* and the *Tettiginae*.

Eritettix variabilis sp. nov.

Very similar in size and general structure to *Stenobothrus carinatus* Thos., and like that insect also very variable as to color. In this latter species the antennæ are acuminate instead of clavate, the vertex is narrower between the eyes, and the supplementary carinæ of the pronotum and occiput are less prominent than there.

Size and color of *carinatus*.

HAB.—Silver City, N. Mex., in the month of May (Chas. H. Marsh).

Eritettix abortivus sp. nov. [Pl. I. Figs. 8, 9.]

Short and compact with aborted wings. In general appearance resembling the genus *Orycoryphus*, but belonging with *St. carinatus*, *St. tricarinatus*, and *St. virgatus* in a distinct genus; very variable in color, ranging from bright grass-green to dull wood-brown.

Vertex triangular, about as wide as the smaller diameter of the eyes; the margins but gently raised, furnished with a well-defined longitudinal carina, which, with two supplementary carinæ, extend backward across the occiput to the front edge of the pronotum, where the lateral supplementary ones are more or less interrupted, but appear again upon the disk of the posterior lobe. Face oblique, nearly straight, the frontal costa prominent, evenly widening below where it reaches the clypeus, sulcate at the ocellus (♀) or from the antennæ nearly to the lower end (♂); lateral facial carinæ minute, straight, antennæ with the joints slightly flattened but not ensiform. Pronotum short and rather broad, the median carina very prominent; lateral carinæ much curved, the disk provided with a pair of supplementary carinæ, one on either side and parallel to the median, as mentioned above; anterior edge nearly straight, posterior edge broadly angulate; posterior impressed line back of the middle, faint. Tegmina abortive, furnished with rather prominent nerves, acuminate, not quite (♀) or a little more than half as long as the abdomen (♂). Posterior femora large, compressed, just reaching (♀) or considerably surpassing the tip of the abdomen (♂); posterior tibiæ with the middle terminal claw more than twice as long as the others.

Very variable in color, like the other species of the genus, varying from dull wood-brown to nearly wholly green. Lateral carinæ of the pronotum, together with a median lateral line, of bright yellow, also the disk and rather wide lower lateral border of testaceous, a dusky band on disk, just inside of lateral carinæ, crossing to outside in middle, and recrossing at hind extremity; also one on middle of sides, somewhat interrupted near the hind margin. Antennæ ferruginous or darker.

Length of body, ♂, 9^{mm}, ♀, 16^{mm}; of antennæ, ♂, 3.5^{mm}, ♀, 4^{mm}; of pronotum, ♂, 2.3^{mm}, ♀, 3.1^{mm}; of tegmina, ♂, 4.5^{mm}, ♀, 4.25^{mm}; of hind femora, ♂, 7^{mm}, ♀, 9^{mm}.

HAB.—Central Texas (Schaupp); Washington County, Texas (Bruner).

Found quite plentifully in closely grazed pastures during the month of April, when the sexes were taken *in coitu*.

Boötetix gen. nov.

Comprising insects of medium size, somewhat related to *Pedioscertetes* Thos., in the form of the pronotum and posterior femora, but otherwise approaching *Gomphocerus* and *Stenobothrus*. Heads of medium size, occiput rather short; the eyes moderately prominent, rounded behind, nearly straight in front; vertex broad, nearly horizontal, triangular, shallowly sulcate, with a minute median longitudinal carina, the lateral margins sharp, fastigium very pointed; face rather oblique, straight, the frontal costa pointed above, broadest between the antennæ, plain, fading near the clypeus; lateral facial carinæ parallel in the male, gently divergent in the female. Antennæ about 20-jointed, slightly flattened

near the base and apex, the latter pointed; in the female very short, reaching only to the front edge of the pronotum, in the male a little beyond its posterior extremity. Pronotum rather short and moderately broad, depressed in the middle, rounded above on the anterior lobe, from which point it expands rapidly posteriorly; lower lateral edges nearly straight, the sides deep, the lower posterior angle square, the point rounded; anterior edge slightly rounded, posterior margin broadly rounded. Tegmina and wings reaching beyond the tip of the abdomen in both sexes, rather narrow in the female, the costal field considerably dilated in the male as in *Chloëaltis* and *Arcyptera*. Posterior femora long and slender, reaching (♀) or extending past the tip of the body (♂). Prosternum armed with a large, very low, quadrate process.

Boëtettix argentatus sp. nov. [Pl. I, Figs. 4, 5.]

Light green marked with deep ferruginous, brown and black. A series of silvery blotches along the sides and beneath is a distinguishing character. Body and limbs hirsute. About an inch in length.

Vertex between the eyes quite broad, nearly as wide as the shortest diameter of the eyes; fastigium pointed, triangular, very shallowly sulcate and furnished with a minute central longitudinal carina, lateral margins sharp, abrupt; lateral foveolæ elongate, narrow, fading away along their lower edge where the surface is rather coarsely granulate; lateral ocelli very large and situated lower down the face than ordinarily. Front coarsely punctate, the costa widest above between the antennæ, not sulcate, but punctate throughout. Antennæ slightly flattened, nearly twice as long in the male as in the female. Pronotum glabrous, with the anterior lobe equal, rounded above, the posterior lobe rapidly expanding, nearly flat above, well shouldered; front edge gently advanced upon the occiput, posterior edge broadly rounded, marginate; transverse impressed lines well defined, continuous, rather sinuous, the last about the middle; median carina visible throughout (♀), or only on the posterior and on the front edge of the anterior lobe. Tegmina long and narrow, the apex rounded, reaching beyond the tip of the abdomen in both sexes; the costal margin considerably dilated in the male, forming the stridulating organ, or rather the "sound board," as in the genus *Gomphocerus*. Posterior femora long and slender; the tibiæ as long as the femora, the spines slender and more numerous than usual. Metasternum furnished with two converging keels which terminate near the center at the front edge and are united by a strong cross-piece. Prosternum armed with a short, blunt, quadrangular process. Terminal segment of the male abdomen elongate, wedge-shaped; supranal plate elongate cordate, roundly scooped out, the sides bent down so as to clasp the underlying processes. Cerci a little more than twice as long as broad, tapering, blunt.

General color light transparent green, with a metallic luster. Lateral foveolæ and fastigium of the vertex black, changing to plain brown

above; occiput with a rapidly widening median brown band; median carina of the pronotum furnished with a similar band commencing in front with the carina alone, but spreading evenly posteriorly until covering the entire upper surface just before reaching the posterior extremity, where it changes to a bright rust brown. There is also a large patch of this color down the sides of the pronotum in advance of the last transverse impressed line, and another on the sides of the head back of each eye. Tegmina furnished with a row of rather large fuscous blotches along the posterior edge, also a few smaller ones along the disk which vary in size and number in different individuals; wings dull transparent green, with the principal veins and the cells on the outer third of the posterior field fuliginous; anterior or humeral field, with the veins greenish and the cells clear. Sides of meso- and meta-thorax brown, inclining to black. Posterior femora with four broad fuscous bands, apex ferruginous; tibiæ furnished with a narrow basal annulus of black, followed by a very broad one of greenish yellow; below this they are dull red, more or less infuscated at the apex and in the middle, brightest in the male. Anterior and middle femora brown, banded in the middle with greenish. The most striking feature in the coloration of this insect, and one which readily distinguishes it from all other North American locusts with which I am acquainted, is a series of pearly or bright silvery markings situated as follows: A rather wide line commencing just below the lateral angle and following down the front edge and around the corner to the middle of the lower edge of the pronotum; a large blotch upon the side just above the insertion of the middle pair of legs, a third just below the base of the wings, and a fourth on the trochanter of the posterior legs. There is also a very conspicuous one along each of the two metasternal carinae mentioned above; besides these, each of the middle and posterior femora has a rather conspicuous blotch of this color on the middle of its outer face. Immersion in alcohol does not erase these. Antennæ and tarsi ferruginous; tibial spines tipped with black. Eyes alternately lined with perpendicular lines of yellow and brown.

Length of body, ♂, 19^{mm}, ♀, 23.5^{mm}; of antennæ, ♂, 7.75^{mm}, ♀, 4^{mm}; of pronotum, ♂, 3.92^{mm}, ♀, 4.5^{mm}; of tegmina, ♂, 18^{mm}, ♀, 19^{mm}; of hind femora, ♂, 11.75^{mm}, ♀, 12.35^{mm}; of hind tibiæ, ♂, 11^{mm}, ♀, 12^{mm}.

HAB.—Arizona and El Paso, Texas, (G. W. Dunn); Lerdo and Comaicho, in the State of Durango, Mexico, during the month of November (Bruner).

Described from numerous specimens of both sexes.

This peculiar and gaudily colored locust is entirely "arboreal" in its habits, and lives upon a peculiar evergreen shrub (*Ceanothus*) among the small smooth oval leaves of which it readily conceals itself. During the middle of the day when the sun shines hot it is very active, and by jumping and flying from bush to bush easily eludes the pur-

suer. When the sky is overcast with clouds and during early morning it is very sluggish and can readily be taken. Its presence is easily detected by the sharp stridulating sound produced by the males, which closely resembles that produced by some of the *Stenobothri* and allies. Although of medium size, so closely does its color resemble the plants upon which it lives that it is difficult to find, even though you are aware of its presence upon a particular plant that is quite isolated.

Pedioscertetes pulchella sp. nov. [Pl. I, Fig. 10.]

Olivaceous, variegated with pinkish-yellow streaks and mottlings. The middle two fifths of the wings crossed by a fuliginous band. Exceedingly hirsute.

Occiput moderately long, ascending rapidly to the fastigium of the vertex, which is acute; vertex between the eyes a trifle broader than the shortest diameter of the pyriform eyes, convex; frontal costa very narrow and prominent above the base of the antennæ, where it suddenly diminishes in height, sulcate throughout, the lateral walls gently and evenly diverging, continuous to the clypeus. Antennæ somewhat flattened, rather heavy, considerably longer than the head and pronotum combined. Pronotum short, the posterior lobe greatly divergent; anterior lobes nearly equal, rounded above; transverse impressed lines rather faint, the posterior one about the middle; median carina distinct throughout; lateral carinæ present only on posterior lobe as sharp shoulders; anterior margin rounded, ascending upon the occiput; posterior margin also rounded, marginate. Legs slender, somewhat heaviest in the female; posterior femora a little surpassing (δ) or not quite reaching the tip of the abdomen (♀); posterior tibiæ as long as the femora, gently bowed downward, the spines minute, slender. Tegmina of moderate width, broadest in middle, the anterior edge somewhat arcuate, posterior edge nearly straight; wings rather narrow, the cross-veins unusually faint and distant. Last ventral segment of male abdomen acuminate; the preceding segment furnished beneath with a cordate depression, which is margined by sharp carinæ that meet and continue as a median ridge to the apex of last segment. Valves of the ovipositor rather large and exerted.

General color olive green, the male somewhat brightest, streaked and mottled with dull pinkish-yellow. The entire insect covered to a greater or less degree with a whitish powder, which, together with the hair-covered surface, gives it a sort of hoary appearance. The pinkish lines are arranged as follows: On the back of the head, one on each side; another from the lower edge of the eyes obliquely backwards to the back margin of the cheek, where it continues as a border to the lower corners, the carinæ of the face, and borders of the clypeus and labium; on the pronotum as an entire border, on each side of the disk in place of the lateral carinæ, and a short backward projection from the middle of front edge of sides to first transverse impressed line; on the teg-

mina along the two principal veins, the front and back margins with others joining these, thereby giving the wing the appearance of being heavily and irregularly marked with dark olivaceous blotches. Posterior femora with three oblique lines each of the olivaceous and pinkish yellow; posterior tibiæ, with the under surface and anterior and middle legs testaceous; the former with the base and middle somewhat infuscated, giving them an obscure banded appearance; spines without dark tips. Wings with the basal fourth (♀) or fifth (♂) tinged very slightly with dull yellow, the apical fourth hyaline with the principal veins and some of the cross veins black; remaining portion of the wing fuliginous, a rather broad shoot extending nearly to the base along the costal margin. Antennæ ferruginous.

Length of body, ♂, 19^{mm}, ♀, 27^{mm}; of antennæ, ♂, 11^{mm}, ♀, 12^{mm}; of pronotum, ♂, 3.40^{mm}, ♀, 4.85^{mm}; of tegmina, ♂, 18^{mm}, ♀, 22.50^{mm}; of posterior femora, ♂, 10.5^{mm}, ♀, 13^{mm}; of tibiæ, ♂, 10.5^{mm}, ♀, 13^{mm}.

HAB.—Birch Creek, Idaho (Brunner).

A single pair taken in August, 1883, upon the small thorny plant known as *Grayia polygaloides*. Other specimens might have been secured had there not been a heavy frost the preceding night, thereby causing most of the locusts to seek shelter for the time being. The only time we could spare here*for collecting was early morning before the heat of the day.

This species differs considerably from the description and figures of *P. nevadensis* Thos., in its variegated color, the much shorter pronotum which is rounded instead of truncate in front, and in the rounded anterior edges of the tegmina.

Subfamily CEDIPODINÆ.

Psoloessa Buddiana sp. nov. [Pl. I, Fig. 6.]

In size and general structure very similar to *P. ferruginea* Scudd., but differing from that species in the coloration, which here is very decided.

Vertex rather deeply sulcate in the form of a new moon, without indications of a median carina; the lateral carinæ quite prominent; frontal costa plain above, gently sulcate just below the ocellus; lateral facial carinæ arcuate, united at their upper and lower ends by cross carinæ with those of the frontal costa, forming elongate walled fields, as it were, in the center of each of which is a lunate depression directly opposite to the lower edge of the ocellus. Pronotum with its lateral carinæ arcuate, the median carina prominent throughout, straight. Tegmina narrow, a little surpassing the tip of the abdomen. Posterior femora a little stouter than in *ferruginea*, reaching just past the abdomen.

Face, sides of pronotum, under side, and abdomen yellowish white; the former with a few brown dots along the costa and carinæ. Upper side of pronotum, occiput, and anterior half of tegmina testaceous, the

atter with a few dots along the overlapping edges. Posterior femoral testaceous, with the usual markings of brown, though less conspicuous than common. The characteristic marking is, however, a dark-brown band commencing at the eyes and extending back to the sides of the pronotum, the upper edge of which it covers and continues across the sides of the meso and meta thorax to the tegmina, the lower or anterior halves of which it follows almost to their tips. On the pronotum this band is broadly deflected near both edges, sending down an anterior and posterior shoot nearly to the lower edge. Above, this dark band is edged with a narrow one of bright yellow.

Length of body, ♀, 20^{mm}; of antennæ, 6^{mm}; of pronotum, 4.1^{mm}; of tegmina, 17.5^{mm}; of hind femora, 13^{mm}.

HAB.—Southwestern Texas, Carrizo Springs (A. Wadgymar).

Named for my friend H. S. Budd, of El Paso, Tex., from two female specimens.

Psoloessa ? *eurotiæ* sp. nov.

A beautiful species that resembles the highly colored *Mestobregma pulchella* Bruner in its general color and markings. In structure and size very similar to *P. coloradensis* Thos.

Head rather small; the vertex depressed, of moderate width, the sulcus quite deep with the bounding walls sharp and arcuate, the median carinæ slight; lateral foveolæ large, subquadrate (♀) or triangular (♂). Face gently arcuate, the frontal costa moderately broad, evenly expanding and shallowly sulcate throughout. Pronotum short, the lateral carinæ greatly bowed, the last transverse impressed line cutting all three carinæ a little in advance of the middle; posterior margin very obtuse-angled. Tegmina slightly surpassing (♂) or not quite reaching (♀) the tip of the abdomen. Posterior femora moderately heavy, not quite reaching the tips of the tegmina. Antennæ rather heavy, joints 4-5 about equal, a little shorter than the others.

General color creamy white with a greenish tinge, conspicuously marked with very dark brown and black spots and bands. On the head the mouth parts, antennal sulci, a narrow circle around each eye, and a band directed backwards from the middle of the eyes black; on the pronotum a band of medium width along the upper lateral edges which cross over to the disk back of the sulcus, also the lower anterior fourth of the same color; on the thorax all but a narrow white stripe reaching from near the base of the wings to the base of the posterior femora black. Tegmina with a median line of elongate blackish spots and the two edges and apical half infuscated. Posterior femora marked above with three spots and the apex black, the middle spot the largest and continued over to the inner and outer faces. There is also a slight basal blotch and a few smaller dots of the same color along the lower edge of the outer face. Posterior tibiæ pale yellowish-red more or less infuscated; spines with their outer half black. Antennæ brunneus inclining to fuliginous.

Length of body, ♂, 12^{mm}, ♀, 18^{mm}; of antennæ, ♂, 6.2^{mm}, ♀, 4.5^{mm}; of pronotum, ♂, 2.15^{mm}, ♀, 2.85^{mm}; of tegmina, ♂, 11^{mm}, ♀, 13.25^{mm}; of hind femora, ♂, 8^{mm}, ♀, 9.5^{mm}.

HAB.—Laramie River, just inside of the Colorado line during early July, at an elevation of about 8,000 feet above sea-level (Bruner).

This is one of the few of our North American locusts that is known to have a particular food-plant. In this instance the plant is *Eurotia lanata* or the sweet sage of the West, which is also known as "winter fat" and several other local popular names. It certainly is an interesting fact to know that *Mestobregma pulchella*, a species found in quite a different region, that is also partial to the same food-plant is likewise similarly marked—showing the tendency of mimicry in color between an insect and its surroundings.

Arphia Saussureana sp. nov.

Small and rather slender; with the wings bright vermillion, which with the general appearance at the first glance reminds one of a diminutive *A. tenebrosa* Scudd.

Vertex between the eyes broad, the sulcus broadly pyriform and furnished with a strong median longitudinal carina which is severed in the middle by a deep transverse arcuate depression; bounding walls rather prominent; occiput rugulose, with two quite large semi-triangular depressions, one on either side of a slight median carina; frontal costa broad, a trifle expanding at the ocellus, very coarsely granulated and punctate throughout, slightly sulcate in the male with a heavy median carina reaching from the fastigium to the ocellus; antennæ rather heavy, a third longer in the male than the female. Disk of the pronotum tuberculate, the median carina subcristate, notched about the middle by the last transverse impressed line; posterior angle nearly square. Tegmina of medium width, reaching (♀) or extending nearly one-third of their length beyond the tip of the abdomen (♂).

General color dull brown, heavily mottled with dark brown and dull black. Wings bright vermillion or roseate, with the outer third and a rather broad tapering ulnar ray reaching nearly to the base dark fuliginous. Posterior femora obscurely fasciate with fuscous; the tibiæ with a wide basal annulus of dull testaceous, remainder more or less infuscated.

Length of body, ♂, 15.75^{mm}, ♀, 21^{mm}; of antennæ, ♂, 6^{mm}, ♀, 4.25^{mm}; of pronotum, ♂, 3.50^{mm}, ♀, 4.5^{mm}; of tegmina, ♂, 16^{mm}, ♀, 18^{mm}; of hind femora, ♂, 10^{mm}, ♀, 11^{mm}; of hind tibiæ, ♂, 9^{mm}, ♀, 10^{mm}.

A large series of both sexes.

HAB.—On the hills lying back of San Francisco, Cal., during the latter part of October (Bruner, Koebele).

Aulocara Scudderi sp. nov.

About the size of *A. decens* Scudd., from which it differs in its more robust form and in having the posterior tibiæ red instead of blue.

Vertex between the eyes rather broad, the fastigium either right-angled (δ) or slightly obtuse (φ), not so deeply sulcate as in *Elliottii* and *decens*; lateral foveolæ rather large and prominent, a little elongate, the upper and lower edges parallel, the latter not quite horizontal; frontal costa continuous to the clypeus, but gently sulcate in the male, scarcely depressed at the ocellus in the female. Eyes rather large, not prominent, rounded behind, nearly straight in front. Pronotum as in the other species, except that here the median carina is but once severed by the transverse sulci. Tegmina and wings about as long (φ) or a trifle surpassing the tip of the abdomen (δ). Posterior femora stout, just reaching the tip of the body in the female but surpassing it in the male. Posterior tibiæ with the second inner terminal claw long and strong, much as in the genus *Scyllina*.

General color dull brown, in some specimens inclining to ferruginous, the tegmina usually very heavily and evenly mottled with dark brown quadrate spots, sometimes only confined to the disk. Some specimens have a light testaceous band reaching from the vertex backwards across the middle of the occiput and pronotum to the tips of the tegmina. Posterior femora marked as in the other species, but plainer; hind tibiæ bright coral red with a whitish basal annulus, the knee deep black; antennæ ferruginous, testaceous or lavender—usually the latter in living specimens. Lower surface dirty yellowish-white.

Length of body, δ , 14.5^{mm}, φ , 20^{mm}; of antennæ, δ , 10^{mm}, φ , 7^{mm}; of pronotum, δ , 3.1^{mm}, φ , 3.45^{mm}; of tegmina, δ , 11^{mm}, φ , 12–14^{mm}; of hind femora, δ , 10.5^{mm}, φ , 11.65^{mm}.

HA.B.—Nebraska, Dakota, Colorado, Wyoming, Montana, British America in Saskatchewan Valley (Bruner); Kansas (F. W. Cragin).

This is a very common species throughout the region west of the Mississippi River.

Mestobregma pulchella sp. nov.

A beautiful greenish-white species marked with black and gray; wings hyaline, without a band as in *M. kiowa*. Distinct from all other North American species in habits and appearance.

In general form and size most closely related to *M. kiowa*, but differing from that species in its somewhat smaller size, the proportionately broader lower face, the smaller eyes, and generally smoother surface of head and pronotum.

The general color is a beautiful greenish white, in imitation of the plant upon which it feeds; heavily marked with the characteristic markings belonging to genus, which in the present instance are black and quite sharply defined. These latter are arranged as follows: A narrow transverse line connecting the upper extremities of the eyes, another but broader extending from the edges of the frontal costa immediately below the base of the antennæ backward across the lower half of the eyes upon the sides of the pronotum to the first transverse impressed line;

on the pronotum nearly the entire sides of the anterior lobes, also the front half of the disk along both sides of the median carina; on the meso- and metathorax the entire pleuræ except two short narrow anteriorly directed oblique blotches of the light color. The tegmina have the dorsal or posterior half free from marks, save at the immediate base, where they have the narrow converging fuscous dashes; on the lower half are three rather large black blotches, the first with its outer margin defining the basal fourth, the second about the middle, and the third just beyond; apex and base also containing a few small scattered quadrate spots; apical third more or less hyaline, the principal veins black. Wings hyaline, with the faintest possible yellowish tinge at the immediate base; veins on the outer third and along the costal margin more or less dusky. Antennæ piceous, becoming greenish white, in some specimens obscurely annulate. Posterior femora with three deep black patches above, which continue over to the inner face; lower outer carina furnished with a few dusky dots, outer face somewhat clouded. There is also an obscure clouded or marbled appearance noticeable throughout the greater portion of the greenish upper surface. Posterior tibiæ glaucous, the apex and a narrow band just beyond the base infuscated, the spines black; anterior and middle legs quite regularly annulate with dark brown or black. Sides of abdomen marked with a row of dusky dots, which are plainest in the male.

Length of body, ♂, 18^{mm}, ♀, 23^{mm}; of antennæ ♂, 9^{mm}, ♀, 8^{mm}; of pronotum, ♂, 3.62^{mm}, ♀, 4.75^{mm}; of tegmina, ♂, 18^{mm}, ♀, 21; of posterior femora, ♂, 11^{mm}, ♀, 12.3; of tibiæ, ♂, 9^{mm}, ♀, 10.85^{mm}.

HAB.—Yellowstone Valley, Montana, between Livingston and Gardiner; also at Glendive, below the mouth of Powder River (L. Bruner).

This interesting species has been observed to feed upon the foliage of the "Sweet Sage" (*Eurotia lanata*) to the exclusion of all other plants; and although so far as at present known, is local in its distribution, yet not at all rare. Why it should be confined to the valley of the Yellowstone is not known, for certainly the same plant occurs at other localities in far greater quantities. In Colorado, on the Laramie River, there is another locust found with a similar habit, which also very singularly possesses almost identical markings, although belonging to a different genus. This latter species is also new and described here for the first time.

The preparatory stages of *pulchella*, like the mature insect, are so characteristically marked and so closely resemble the perfect specimens that there can be no mistaking their identity. These also feed upon the same plant.

Conozoa texana sp. nov.

About the size of *C. sulcifrons* and *C. albolineata*, to the latter of which it is most nearly related, but differing from it in general coloration, in the shorter and more robust hind femora, in the shorter anterior lobes of the pronotum, and in the larger more globular eyes.

Vertex deeply and roundly sulcate, the bounding walls continuous with those of the frontal costa, the fastigium furnished with a rather deep V-shaped depression, from the apex of which a median carina extends backwards through the sulcus and across the occiput; lateral foveolæ rather large and shallow; frontal costa quite prominent, widening below. The sides a little contracted just below the ocellus, deeply sulcate throughout. Pronotum rather smooth. The anterior lobes combined about one-half as long as the posterior lobe; median carina twice notched, nearly equal throughout; posterior extremity about a right angle; lower lateral tooth less elongate than in *C. albolineata*. Tegmina long and narrow, reaching about one-fourth their length beyond the tip of the abdomen. Posterior femora rather robust, with the carinæ inconspicuous.

General color cinereo-testaceous, profusely and heavily mottled with dark brown and black. Antennæ black, annulate with testaceous. Tegmina testaceous on lower or anterior half, dirty white above, very heavily and profusely mottled with black. These spots not congregating in bands. Wings sulphur-yellow on basal half, crossed by a broad, arcuate, black band that sends a wide ray half way to the base near the anterior edge; apical third hyaline, with two pretty well defined longitudinal black rays reaching from the extreme tip nearly to the outer edge of the band, most apparent in male specimens. Posterior femora light testaceous, with two dark patches above and an outer face, also some dots of same color along the carinæ; posterior tibiæ pale coral red with a wide white basal annulus.

Length of body, ♂, 22^{mm}, ♀, 26^{mm}; of antennæ, ♂, 11.5^{mm}, ♀ 11^{mm}; of pronotum, ♂, 4.3^{mm}, ♀, 5^{mm}; of tegmina, ♂, 23.5^{mm}, ♀, 28^{mm}; of hind femora, ♂, 11.85^{mm}, ♀, 13^{mm}.

HAB.—El Paso, Tex. (G. W. Dunn).

Conozoa albolineata sp. nov.

Rather slenderer than the other species of the genus. Grayish-brown streaked with white.

Vertex somewhat elevated; fastigium as in *C. sulcifrons*, continuous with the deeply sulcate frontal costa, which expands evenly and gradually to the clypeus; eyes of medium size, slightly prominent, separated above by about their width; antennæ as long as the posterior femora; pronotum quite smooth in comparison with that of *C. sulcifrons* and *C. wallula*, considerably depressed at last transverse sulcus, from which point it expands and ascends quite rapidly posteriorly; median carina not prominent but visible throughout, twice notched, anterior portion most elevated, lateral carinæ slight, only noticeable on the posterior lobe, posterior angle a little less than a right-angle. Tegmina extending about one-fourth their length beyond the tip of the abdomen, slender.

General color grayish-brown above streaked with white, yellowish

beneath. Head white, slightly tinged with ferruginous on the sides and front, somewhat obscured with the general color on the occiput; lateral carinae of the fastigium more or less marked with black; antennae reddish-brown, the basal joint whitish. Pronotum with a rather broad white stripe extending along the outer edges of the dorsum, a quadrate spot of the same color on the front edge opposite the lower angle of each eye and another in the middle of the sides; there is also a narrow border of white about the lower anterior angles. A white streak also extends obliquely backward from the base of the tegmina to the insertion of the posterior femora, also one from the middle of the back edges of the lateral lobes of the pronotum to that of the middle legs. Tegmina with the costal edge streaked with white three-fifths of their length; central field clouded with brown, not forming definite bands; nerves of apical portion dusky. Wings dull lemon-yellow at the base, crossed about the middle by a light fuliginous band of medium width, which is parallel to the body when spread; nerves of apical portion, which is vitreous, dusky. Posterior femora whitish, with the apex and two very oblique bands black externally and two ordinary ones internally; posterior tibiae yellow with black-tipped spines, the extreme base also black. Abdomen citron yellow at base, becoming paler apically.

Length of body, 23^{mm}; of antennae, 12.5^{mm}; of pronotum, 3.32^{mm}; of tegmina, 22^{mm}; of posterior femora, 13^{mm}; of posterior tibiae, 12^{mm}.

Described from a single ♂.

HAB.—Los Angeles, Cal. (D. W. Coquillett).

Conozoa Koebelei sp. nov.

A little smaller than *C. wallula* Scudd. Light gray, marked with dirty white and brown. Hind tibiae deep blue with a black base and quite wide sub-basal light-colored annulus.

Vertex between the prominent, nearly globular eyes a little wider than in *C. wallula*, deeply and broadly sulcate, the lateral walls gently diverging anteriorly to the middle and then converging to nearly one-half of the greatest width at the fastigium; frontal costa moderately broad, somewhat constricted above the antennae, where it is plain, gently widening, and sulcate below. Pronotum smooth above; the median carina slight, twice notched, the anterior portion the highest; posterior extremity nearly a right-angle; lower lateral angles more rounded than in *wallula*. Tegmina extending past the tip of the abdomen about one-fourth their length. Posterior femora a little heavier than in *wallula*, which insect it most nearly resembles in size.

General color light cinereus with the usual markings of the genus fuscous. There are two rather broad diagonal bands of dirty white extending from the lower edge of the lateral carinae of the pronotum in the middle forward along the side of the head, just below the eyes and meeting in the front upon the clypeus; there are also two others along

the outer edges of the disk of the posterior lobe of the pronotum, and the dorsal edges of the tegmina are also of this color. Wings greenish yellow on the basal half, followed by a rather broad indistinct fuliginous band which sends the usual tapering shoot along the preanal area nearly to the base, and continues around the outer edge nearly to the anal angle. Veins and nervules of the apical half dark, also those near the edge of the anal angle. Posterior femora dimly banded; posterior tibiæ deep blue with pale basal annulus.

Length of body, ♂, 17^{mm}, ♀ —^{mm}; of antennæ, ♂, 9.25^{mm}, ♀, —^{mm}; of pronotum, ♂, 3.85^{mm}, ♀ —^{mm}; of tegmina, ♂, 17^{mm}, ♀, —^{mm}; of hind femora, ♂, 10^{mm}, ♀, —^{mm}; of hind tibiæ, ♂, 9^{mm}, ♀, —^{mm}.

A single male specimen.

HAB.—Placer County, Cal., in September (Koebele).

Trimerotropis cyaneipennis sp. nov.

Color of posterior wings very dark blue crossed by a moderately broad dark fuliginous band, as in *T. similis* Scudd.

In size and general structure this insect is very similar to *T. vinculata*, but differs from that species in the more nearly equal size of the sexes, in the slightly larger head with larger and more prominent eyes, the slightly longer and deeper sulcus of the vertex, which here has the lateral carinæ nearly parallel and quite prominent, and also the frontal costa deeply sulcate throughout. Besides these differences already mentioned there is a general resemblance in *cyaneipennis* to the various species of *Circotettix*, and especially the slenderer ones. In the mottling of the tegmina *cyaneipennis* resembles *T. cæruleipennis* Bruner, from which it is quite distinct in the structure of the vertex and anterior lobe of the pronotum, the latter being plain above in *cyaneipennis*, while in *cæruleipennis* it is greatly elevated and tuberculate. The posterior femora are also much heavier in that species than in this.

General color dark gray with a rusty tinge above in some specimens, profusely mottled and marked with fuscous. Face, cheeks, and occiput gray, profusely mottled below and above between the eyes with brown; also two diverging bands of the same color on the occiput and another backwards from the middle of each eye. Pronotum with the disk bordered on the sides by a rather wide lighter band, also a mesial ray from the front edge and a central quadrate spot of the same color on the sides. Tegmina profusely mottled with rather large quadrate brownish spots, which in most specimens are congregated into three patches—the first occupying the basal third, the second the center of the middle, and the third the outer third of the wing—most profuse on the basal and middle areas, but not forming definite bands as in most of the other species belonging to the genus. Wings very dark blue on their basal half, crossed beyond by a rather wide fuliginous band that does not continue around towards the anal angle; apical third hyaline with the veins and nerves black. Posterior femora crossed externally by three

moderately broad oblique brown bands, internally with the basal half and a single band in advance of the light yellow preapical annulation black. Posterior tibiæ deep cœrulean blue with light basal annulation, spines black-tipped. Abdomen deep blue above in some specimens, inclining to greenish along the sides; dirty white to gray below. Antennæ brown, darkest at the apex, with faint annulations of a lighter brown.

Length of body, ♂, 25^{mm}, ♀, 29^{mm}; of antennæ, ♂, 11^{mm}, ♀, 10^{mm}; of pronotum, ♂, 4.5^{mm}, ♀, 5.8^{mm}; of tegmina, ♂, 25^{mm}, ♀, 28.5^{mm}; of hind femora, ♂, 12^{mm}, ♀, 13.75^{mm}; of hind tibiæ, ♂, 10^{mm}, ♀, 11.25^{mm}.

HAB.—Salt Lake Valley, Utah, near the mouth of Ogden Cañon, just at the upper shore-line of the ancient Lake Bonneville (Bruner, Dodge).

Numerous specimens both male and female. •

The present species differs greatly in its habits from those of *cœruleipennis* and *azurescens*, which latter are only to be met with upon almost bare alkali flats and slopes. *T. cyaneipennis*, on the other hand, frequents rather well-clothed surfaces among the rocky *talus* of mountain sides, where it is found in company with *Pycnodyctia Wheeleri*? Thos., also a blue-winged *Edipodini*.

Trimerotropis azurescens sp. nov.

This form differs from *T. cœruleipennis* Bruner, with which it has hitherto been confounded, in the entire absence of all traces of the band on the wings, as also in the structure of the pronotum. It is also a slenderer and longer winged insect than that species.

Vertex between the eyes very broad, depressed, and quite deeply sulcate, with the median carina nearly as prominent as the bounding walls; the pit at the extreme vertex very well defined but not quite so deep as in *cœruleipennis*. Eyes not quite as prominent as in that species, and with the frontal costa not so deeply sulcate as there. Pronotum with the anterior lobe plain above, the median carina nearly equal throughout; posterior edge a little less than a right-angle. Wings a little more ample than in *cœruleipennis*, with the nerves of the outer half of the post-axillary field very irregular. Posterior femora shorter and narrower than in that species, and the antennæ a little heavier and longer than there.

General color light grayish yellow varied with brown. The tegmina usually quite evenly flecked with quadrate fuscous spots, which in some specimens have a tendency of gathering into groups as in *cœruleipennis*. Wings very delicate diaphanous cœrulean blue on the immediate basal portion from which point the color gradually fades outward, without the slightest indication in cell or vein of the usual dusky band—being the only species of the genus entirely without a trace of this character; veins and cross-veins black except at the immediate base and a small space on the axillary field towards the apex. Posterior femora dimly banded externally; internally, alternately yellow and

black. Posterior tibiæ and tarsi yellow, with black spines. Anterior and middle legs mottled and banded with fuscous. Abdomen and under side dull whitish yellow or cream-color. Antennæ very markedly annulate.

Length of body, ♂, 20-23^{mm}, ♀, 29-31^{mm}; of antennæ, ♂, 10.5^{mm}, ♀, 10^{mm}; of pronotum, ♂, 5^{mm}, ♀, 6^{mm}; of tegmina, ♂, 23-25^{mm}, ♀, 29-32^{mm}; of hind femora, ♂, 11^{mm}, ♀, 13^{mm}; of hind tibiæ, ♂, 9^{mm}, ♀, 11^{mm}.

HAB.—Fort Benton, Mont., U. S. National Park, Wyoming, and Lemhi or Salmon River, Idaho (Bruner); Alkali Stage Station, Green River, Wyoming (S. H. Scudder).

The present species is what might well be termed a barren ground locust from its habit of frequenting only desolate alkali flats and the dried-out beds of shallow saline lakes, where it maintains its almost solitary existence upon the few dwarfed and straggling *Chenopodiaceæ* that manage to draw a scant sustenance from the strongly impregnated soil.

Trimerotropis bifasciata sp. nov.

Having the general appearance of *T. pseudofasciata* Scudd., and probably that species as determined by Saussure [Prodrom. (Edipod, p. 172)]. It differs from it, however, in several important characters.

Head rather short and broad, eyes wider apart than usual in the genus, not prominent, fastigium bounded by well defined carinæ and separated from the sulcus of the frontal costa by a Λ -shaped carina, the apex of which continues as a median carina that divides the fastigium into two longitudinal furrows that are interrupted about the center by a lateral triangular projection from the front edges of the eyes; pronotum rather short and broad, deeply cut by the last transverse sulcus, anterior lobe tuberculate, rather prominent, glossy, posterior lobe roughly granulose, median carina distinct, twice notched, lateral carinæ forming well defined shoulders to posterior lobe, posterior angle obtuse.

General color ferruginous and ochraceous.

The tegmina are rather shorter than usual and very distinctly bifasciate. The basal fourth dark chocolate brown, darkest at outer edge, and the second band a rather broad one of same color with its inner edge just about the middle of the elytra, and reaching entirely across; beyond this the remaining portion is hyaline with a few inconspicuous spots confined to the upper and lower edges, veins and cross-veins dark. Posterior femora with the apex black internally and brown externally, followed below by a rather broad yellowish-white annulation and below this by one of black, giving it the appearance of that of *Hadrottetix trifasciatus*. Posterior tibiæ with the basal third yellowish and the remainder deep plumbeous. Wings with the basal half very light greenish yellow crossed by a rather narrow, interrupted, arcuate, fuliginous band, with the inner edge about the middle; beyond this band the wing is hyaline with dusky nerves and cross-veins. Principal nerves of basal portion greenish.

Size of *T. cyaneipennis*.

HAB.—Los Angeles, Cal. (D. W. Coquillett).

This locust has something of the appearance of a species very common in the vicinity of Ogden, Utah, that I have referred to *T. citrina* Scudd., but is much heavier in its structure. It and *T. pacificus* were taken upon a sandy, rather barren soil, judging from their glossy appearance.

In addition to these there is a third species of this genus, which appears to be new. The specimens here described were received from the same gentleman.

Trimerotropis californica sp. nov.

In size and general appearance this insect comes very close to *T. caruleipennis* Bruner, from which, however, it is quite distinct as the color of the posterior tibiae and wings will at once indicate. It is also a somewhat slenderer species than the one named above.

Vertex between the eyes moderately broad, fastigium as in *T. caruleipennis*, partly closed in front by the meeting of the lateral carinae which separate it from the rather deep quadrangular pit at the upper extremity of the frontal costa. Frontal costa nearly equal to (δ) or expanding considerably (η) below the ocellus; not very deeply sulcate. Antennae normal, not annulate, nearly black. Pronotum with the anterior lobe somewhat elevated, though much less so than in the species above referred to, rather coarsely granulose; median carina well defined, posterior border a right angle, lower posterior lateral angles acute. Tegmina and wings moderately long and narrow, surpassing the abdomen nearly one-third of their length in the male, and about one-fourth in the female. Posterior femora nearly (η) or quite (δ) reaching the extremity of the body, somewhat slenderer than in *T. caruleipennis*.

General color above dirty yellowish gray profusely flecked with dull brown and black spots and dots. Tegmina with these brown spots congregated into three irregular, dim bands, situated as in *T. vinculata*. Wings yellow on the basal half, crossed in the middle by a moderately broad, dark, fuliginous band, which sends a humeral ray nearly to the base as well as along the humeral vein almost to the apex; apical portion hyaline, with the median, axillary and subaxillary veins black. Posterior femora crossed externally by three slightly oblique dusky bands, internally by the one nearest the apex; basal half and apex also black. Posterior tibiae with the base black, followed by a moderately wide annulus of whitish yellow, below which they are a bright coral red; tarsi also red. There is also a reddish hue upon the upper side of the abdomen—most decided in the male—yellowish white beneath.

Length of body, δ , 22^{mm}, η , 24^{mm}; of antennae, δ , 11.25^{mm}, η , 9^{mm}; of pronotum, δ , 4.42^{mm}, η , 5^{mm}; of tegmina, δ , 24^{mm}, η , 25^{mm}; of posterior femora, δ , 11.75^{mm}, η , 13^{mm}; of posterior tibiae, δ , 11^{mm}, η , 12.15^{mm}.

Described from two males and a single female.

HAB.—San Louis Valley, Cal. (D. W. Coquillett).

Trimerotropis modesta sp. nov.

Pale tile color inclining to gray, with two rather narrow dusky bands upon the tegmina. Posterior tibiæ red; the wings with a wide, light, fuliginous, arcuate band just beyond the middle, the basal portion dull yellow.

Vertex of moderate width, shallowly sulcate, partly closed in front with the median carina faint; frontal costa not prominent, the sides a trifle constricted just below the ocellus, plain above, sulcate from the antennæ down. Face distantly and shallowly punctate, slightly oblique. Pronotum with the disk nearly flat, the anterior lobe much the same as in *T. thalassica*; posterior lobe coarsely granulated and furnished with a series of medium sized tubercles arranged in a similar manner with those of *T. pistrinaria* and *T. laticincta* Sauss. Tegmina as long as the body, extending about one-fourth of their length beyond the tip of the abdomen. Posterior tibiæ and femora heavy, as long as the abdomen.

General color pale rust brown inclining to gray, lightest beneath. Tegmina furnished with two narrow converging brown bands and a few scattered quadrate spots on the basal part of the apical third; wings pale yellow, crossed by a wide but not very dark fuliginous band shaped as in *T. vinculata*, save that the distal ray reaches nearly to the base of the wing in the present species. Apical portion hyaline, with the principal veins infuscated. Posterior femora with but a single dusky band outside, and two black and three yellow ones inside. Posterior tibiæ light coral red. Antennæ very dark brown on the apical third and of the color of the body on the basal portion.

Length of body, ♂, —^{mm}, ♀, 26^{mm}; of antennæ, ♂, —^{mm}, ♀, 10.5^{mm}; of pronotum, ♂, —^{mm}, ♀, 5.5^{mm}; of tegmina, ♂, —^{mm}, ♀, 26^{mm}; of hind femora, ♂, —^{mm}, ♀, 13.25^{mm}; of hind tibiæ, ♂, —^{mm}, ♀, 12^{mm}.

Described from two female specimens.

HAB.—Silver City, N. Mex. (Charles H. Marsh).

There is some resemblance between this insect and the one known as *Conozoa Behrensi* Sauss., but a comparison of the two will at once show their distinction. The main cause of their resemblance is their color, and this resemblance becomes less apparent upon a slight comparison.

Trimerotropis thalassica sp. nov.

About the size of *T. vinculata* Scudd. Varying in color from dark to griseo-testaceous, with the colored portion of the wings sea-green. Wings and tegmina but dimly banded. Posterior tibiæ deep cœrulean with basal annulus of dirty whitish.

Head, when seen from in front, as broad above as below, a little longer than common with the species of the genus; the eyes rather large and prominent, separated above by the flat (♀) or slightly sulcate (♂) vertex, which in both sexes is furnished with a faint median carina that terminates in front without perceptibly branching and uniting with the

lateral carinæ; frontal costa of nearly equal width throughout, sulcate only at the ocellus. Face minutely punctate, the punctæ brown or black. Antennæ of the normal length, light testaceous, with very faint annulations of a darker color. Pronotum somewhat smoother than usual, the anterior lobe but gently raised above; the median carina rather faint and nearly equal; posterior angle slightly acute in the male, about a right angle in the female; posterior lateral edges furnished with a minute tooth-like downward projection as in *T. californica* and *T. pacifica*, the lower angle with the apex minutely rounded. Tegmina moderately narrow, the veins and cross-veins not prominent, the latter more numerous than usual on the apical third. Posterior femora normal, reaching the tip of the abdomen in both sexes; posterior tibiæ in the single female specimen examined greatly sinuous.

General color dark gray (δ specimen) to testaceous gray (φ specimen), evenly and minutely flecked with dusky dots, thereby giving the surface a granular appearance. Tegmina very dimly (φ) or with the bands moderately well defined, brown and arranged as in *T. vinculata* (δ). Wings deep sea-green, a little the lightest in the female, with a very faint fuliginous arcuate band just beyond the middle in the male, but in the female indicated only by the infuscation of the nerves belonging to that region; apical portion hyaline with most of the veins dark. Posterior femora black internally with a preapical yellowish annulus, externally without any bands, but furnished with an upper and lower elongate black spot in advance of the pale annulus. There is also a faint greenish tinge on the basal portion of the abdomen above.

Length of body, δ , 20^{mm}, φ , 26^{mm}; of antennæ, δ , 9^{mm}, φ , 9.35^{mm}; of pronotum, δ , 4.4^{mm}, φ , 5.25^{mm}; of tegmina, δ , 21^{mm}, φ , 26^{mm}; of hind femora, δ , 10.5^{mm}, φ , 13.85^{mm}; of hind tibiæ, δ , 9^{mm}, φ , 12.15^{mm}.

HAB.—Los Angeles, Cal., in September and October (A. Koebele).

Trimerotropis pacifica sp. nov.

Size and markings similar to those of *T. vinculata*. Pronotum quite long and smooth. Head deeper than usual in the genus.

This locust has a slight general resemblance to one form of *Hadrotettix trifasciatus* Say, and, if it were not for other characters which forbid its being placed there, I should feel inclined to refer it to that genus.

Head and thorax deeper than usual in the genus, with the carinæ and angles well defined, but otherwise appearing smooth and glossy to the naked eye. The magnifying glass, however, reveals numerous small pits or poculi that are evenly distributed throughout the face as well as the anterior lobes of the pronotum. Fastigium of the vertex flat, sloping gently forward and divided into two lateral halves by a rather prominent median carina, with the lateral edges rather blunt but plainly visible, continuous with the carinæ of the frontal costa, expanding slightly but evenly downward, fading before reaching the clypeus, deeply sulcate, deepest at the ocellus, bounding walls prominent but rounded,

smooth. Ocellus and lateral ocelli very round and shining, ferruginous. Antennæ a trifle longer than usual in the genus, somewhat flattened. Pronotum deeper than usual, expanding slightly downward to the lower edges anteriorly so as to make them nearly parallel; posterior lower angles more acute than in any other species with which I am acquainted; dorsum with the median carina visible and nearly equal throughout, twice notched; the middle lobe very short, expanding rapidly posteriorly, lateral carinæ visible as rounded shoulders on the posterior lobe; posterior edge a little more than a right-angle. Tegmina and wings as in *T. vinculata*.

General color light cinereous, with a plumbeous tinge about the head and pronotum, mottled with dark brown. Head dirty bluish white, darkest above, the pits appearing as specks of dust; antennæ dark ferruginous, annulated with ochraceous, eyes ferruginous; pronotum cinereous with a central quadrate whitish spot upon the lateral lobes, posterior margin marked with a series of dark brown spots. Tegmina marked with dark brown, much as in *T. vinculata*, save the middle band, which here only reaches two-thirds across the wing, and if anything the apex is less mottled than in that species; wings with the base very light yellow, crossed by a rather narrow fuliginous band, which is divided into two parts by the yellow humeral veins; humeral portion extending nearly to the base of the wing, the portion beyond the dusky band hyaline with the nerves whitish except at the extreme tip, where they are fuliginous. Posterior femora as in *T. vinculata*, posterior tibiæ yellowish with black-tipped spines.

Length of body, 23^{mm}; of antennæ, 14^{mm}; of pronotum, 6^{mm}; of tegmina, 25^{mm}; of posterior femora, 9^{mm}; of posterior tibiæ, 8^{mm}.

Described from a single male.

HAB.—Los Angeles, Cal. (D. W. Coquillett).

Trimerotropis perplexa sp. nov.

A peculiarly perplexing form belonging to the group of non-banded winged species and resembling to a certain extent the *Tr. azurea* of the extreme west and northwest, but from which it is to be distinguished by its more robust form, shorter and broader tegmina and wings, and in the much heavier posterior femora.

Vertex between the large moderately prominent eyes, broad, smooth and quite deeply sulcate, with well defined lateral and longitudinal median carinæ, the latter branching at the apex of the fastigial depression and uniting with the lateral in front and continuing posteriorly upon the occiput almost to the front edge of the pronotum; frontal costa moderately broad, with well defined edges, quite deeply (♂) or more shallowly (♀) sulcate, not continuous with the sulcus of vertex. Pronotum nearly as broad as long, the surface finely rugose, the disk nearly flat, the anterior lobes quite smooth and but gently raised above; the median carina nearly equal and quite plain throughout;

lateral lobes with the anterior and posterior edges almost parallel. The lower posterior angle evenly rounded; first and last transverse impressed lines continuous, the latter considerably in advance of the middle; posterior extremity more than a right angle. Tegmina rather broad, and shorter than in the allied forms, reminding one of these members in the genus *Circotettix*, and especially those of *C. maculatus*, not reaching more than one-fifth of their length beyond the tip of the abdomen. Wings nearly as broad as long in some specimens. The radial or anal field full and furnished with strong radial veins, the cross-veins few and quite irregular in their arrangement. Posterior femora robust, almost reaching the extremity of the abdomen in both sexes. Abdomen a little heavier than usual in members of the genus. Body without the pruinescens or hairs usual in other species found in like localities.

General color light gray, varied and mottled with dull or plain brown; in some specimens inclining to pale fawn or testaceous. Tegmina more or less densely mottled with pale brown quadrate spots that show a tendency to congregate into three patches, the one occupying the basal third, the second the middle, and the third the outer third of the wing; remainder of wing light gray. Wings without any indication of transverse dusky band, the basal portion very pale dull yellow, inclining to greenish when seen as folded. The veins and cross-veins of apical half (save near the anterior edge where they are white) dusky. Posterior femora with the usual dusky markings outside, and with inner face and lower sulcus chiefly black; the posterior tibiae pale greenish yellow with black spines. Antennae faintly annulate.

Length of body, ♂, 25^{mm}, ♀, 30^{mm}; of antennae, ♂, 12^{mm}, ♀, 11^{mm}; of pronotum, ♂, 4.85^{mm}, ♀, 6.75^{mm}; of tegmina, ♂, 23^{mm}, ♀, 28^{mm}; of hind femora, ♂, 11.5^{mm}, ♀, 14.15^{mm}.

Described from 4 male and 7 female specimens.

HAB.—Bad Lands, about five or six miles to the north of Chadron, Nebr., during the month of August (L. Bruner).

This peculiar locust, like all of the allied forms, is partial to nearly bare surfaces, and especially to such as have the soil more or less strongly impregnated with alkalis. It is a noisy insect and produces a very decided clatter when upon the wing, showing that it is not distantly removed from the various members of the genus *Circotettix*, as many of its structural characters would also indicate.

Circotettix lapidicolus sp. nov.

Dark grayish brown, profusely mottled with dull black. Wings bottle-green without a well-defined dusky band; nerves and cross-veins of apical half more or less infuscated. Posterior tibiae glaucous with light basal annulus.

Head of moderate size, the eyes quite prominent, giving the upper portion a square appearance. Vertex between the eyes of moderate

width, somewhat narrower, with the sulcus of the fastigium also a trifle deeper than in *C. undulatus*, the bounding walls sharper and better defined than there and continuous with the lateral carinæ of the frontal costa. The latter and also the lateral facial carinæ much more prominent than in *undulatus*. It also differs from that species in its smoother body, more graceful and slenderer form, its longer and broader wings, and shorter antennæ, which are very slender and thread-like. The chief and distinguishing characteristic of this species, however, is in the venation of the hind wings. Instead of there being but a single vein along the middle of the axillary field there are two of nearly equal prominence; the secondary or auxiliary vein being a branch of the first radial which in the female unites with the primary vein several millimeters before reaching the outer margin, but in the male continues parallel with a little divergent from it to the edge. The radial veins here are no heavier in the male than in the female, and the cross-veins of the humeral area are irregular, while in *undulatus* they are very regularly scalariform. There are also other slight differences in the venation of the wings between the two species, as there is also in the margin. In *apidicolus* the margin is even more undulate or lobed than in *undulatus*.

General color dark-brownish cinereous, very profusely mottled with rather small quadrate fuliginous spots, giving the insect a dingy black color in imitation of the rocks among which they were taken. Wings bright bottle-green or greenish yellow with a very faint indication of the usual fuliginous band on the humeral field in some specimens, wanting in others; apical portion with the veins and cross-veins black. Posterior tibiæ glaucous, furnished with a moderately broad, light, testaceous, basal annulus; tibial spines black; tarsi testaceous. Antennæ dimly annulate.

Length of body, ♂, 30^{mm}, ♀, 31^{mm}; of antennæ, ♂, 9.5^{mm}, ♀, 9^{mm}; of pronotum, ♂, 6.3^{mm}, ♀, 6.5^{mm}; of tegmina, ♂, 32^{mm}, ♀, 30.5^{mm}; width of wing, ♂, 21^{mm}, ♀, 18.5^{mm}; length of posterior femora, ♂ and ♀, 14.5^{mm}; of tibiæ, ♂ and ♀, 12^{mm}.

HAB.—Salmon City, Idaho (Bruner).

This locust was observed at but a single locality in the Salmon River range of mountains, west of Salmon City. It occurred among the fine rocks forming the talus at the foot of a high precipice facing the south. Although local, it is quite common, and was found in company with several other locusts, such as *Arphia tenebrosa*, *Circotettix verruculatus*, etc. In habits it is very similar to those of its allies, and during the hottest, brightest hours of noonday is to be seen and heard in the air, producing its clattering music, which is anything but soothing.

Circotettix shastanus sp. nov.

A moderately slender species about the size of or a little larger than *C. verruculatus* Kirby, but more closely related to *C. undulatus* Thos. Wings with the disk yellow, brightest near the posterior outer edge.

Structure and markings of head, pronotum, and tegmina as in *C. lapidicolus* Bruner, but differing from that species in the venation and coloring of the wings. There is but a single axillary vein present in the male of this species, while in *verruculatus* and *lapidicolus* there are two; *undulatus* also has the secondary vein present, although much obliterated. Besides this difference in the axillary field there is also a difference in the venation of the radial field—the present species having the cells of the outer edge very regular, short and wide, and the radial veins very strong. Posterior tibiæ glaucous, the spines black. Apical portion of the wing hyaline, with dark veins and cross veins preceded by a slight indication of a fuliginous band.

Length of body, ♂, 25^{mm}, ♀, —^{mm}; of antennæ, ♂, 8^{mm}, ♀, —^{mm}; of pronotum, ♂, 5.5^{mm}, ♀, —^{mm}; of tegmina, ♂, 28^{mm}, ♀, —^{mm}; of hind femora, ♂, 12^{mm}, ♀, —^{mm}; greatest breadth of wing, ♂, 17^{mm}, ♀, —^{mm}.

Described from a single male specimen.

HAB.—Hazel Creek, Shasta County, Cal., in the month of August (Jas. Behrens).

Cædipoda (?) *occidentalis* sp. nov. [Pl. I, Fig. 7.]

Resembling rather distantly the various members of the genus *Circotettix*, but with much shorter tegmina and wings. Dirty grayish brown, the mottlings on the tegmina gathered into obscure bands. Wings light greenish yellow, without the usual fuliginous band in most specimens, apical half hyaline with the nerves and cross-veins dark.

Head short and broad, widening but gently below, the face straight, perpendicular. Antennæ of medium length, a little heavy, with the joints somewhat flattened, the apex acuminate in the male. Vertex considerably depressed, between the rather prominent, almost globular, eyes nearly (♂) or quite as broad as their shortest diameter (♀), the sulcus irregular, a little expanding in front, quite shallow, furnished with a distinct longitudinal median carina that divides in front and after joining with the lateral carinæ continues down the face as the walls of the frontal costa; frontal costa rather wide, a little constricted at the upper end and just below the ocellus, from this latter point expanding and reaching the clypeus, a rather deep Λ -shaped pit at its upper extremity, plain between the antennæ, sulcate at and below the ocellus. Face coarsely pitted and transversely wrinkled. Pronotum short and broad, rapidly widening posteriorly; anterior lobe short, rounded above, nearly equal, coarsely wrinkled transversely and severed from the front edge of the posterior lobe by the deep last transverse impressed line; posterior lobe coarsely and closely granulate, with well-defined shoulders; median carina slight, twice severed, the last only one-third the distance from the front edge; posterior extremity nearly (♀) or quite (♂) a right-angle; anterior edge slightly advanced

upon the occiput; lower lateral edges rather more rounded than in the allied forms. Tegmina moderately broad, and very closely reticulated—so much so as to give the unmagnified surface a sort of granular appearance—most of the cross-veins as heavy as the veins, extending a little beyond the tip of the body in both sexes. Posterior femora ample, with heavy carinæ, considerably longer than the tibiæ, reaching the tip of the abdomen in both sexes.

General color dirty grayish brown, inclining to ferruginous in some specimens, lightest beneath. The tegmina mottled with small quadrate fuscous spots, which are gathered into groups forming two dim bands, the one with its outer edge defining the basal third, and the second across the middle of the wing; there are also a few scattered spots on the apical third; all the nerves and veins of the tegmina are brownish testaceous, darkest near the base, the wing itself being dull dirty yellow becoming more or less transparent apically. Wings light greenish yellow on the basal half, usually without any well-defined fuliginous band, but in some specimens represented by a very faint cloudiness in some of the cells just beyond the middle of the wing; veins and cross-veins of the apical half of the wing black, which on the middle of the humeral field reach nearly to the base. Posterior femora with the basal half of the inner face and lower sulcus black, the former followed by a narrow yellow then a black band; externally crossed by two faint dusky oblique bands; posterior tibiæ glaucous with a rather wide dull yellow annulus just below the knee; spines black. Antennæ dark, obscurely annulate.

Length of body, ♂, 17^{mm}, ♀, 21^{mm}; of antennæ, ♂, 7^{mm}, ♀, 6.5^{mm}; of pronotum, ♂, 3.6^{mm}, ♀, 4.5^{mm}; of tegmina, ♂, 16.5^{mm}, ♀, 19^{mm}; of hind femora, ♂, 10^{mm}, ♀, 12^{mm}; of hind tibiæ, ♂, 8.35^{mm}, ♀, 9.75^{mm}.

HAB.—On high stony hill-tops to the southwest of San Francisco, Cal., late in October (Koebele, Bruner).

Thrinacus (?) *avidus* sp. nov. [Pl. I, Figs. 2, 3.]

Considerably larger than *Thrinacus californicus* Thos., with the tegmina and wings much longer than these. Cinereo-testaceous, profusely mottled with dull rust brown and black.

Head proportionately broader and longer than in *T. californicus*, and less sunken into the front edge of the pronotum than in that species. Vertex between the eyes a very little broader (♂), or nearly twice as broad (♀) as the diameter of the basal antennal joint, depressed, roundly sulcate, rather shallowly in the female but deeper in the male, the lateral carinæ parallel, reaching from near the posterior edge of the eyes deflecting and meeting in front in a right angle; frontal costa rather narrow above, expanding below and fading just before reaching the clypeus, gently sulcate throughout in both sexes. Face, sides of head and thorax coarsely pitted and wrinkled, giving the surface a very rough appearance. Pronotum short and broad, the anterior lobe with

the sides nearly parallel, rounded above; posterior lobe rapidly expanding, the disk nearly flat, coarsely granulate; median carina almost obsolete; posterior edge forming a rather obtuse angle with the apex cut off. Tegmina and wings extending about one-third (δ) or only one-fifth of their length beyond the tip of the abdomen (φ). Posterior femora rather heavy, just reaching φ , or slightly surpassing the tip of the abdomen δ ; posterior tibiæ with the spines few, long, and stout.

General color cinereo-testaceous, profusely mottled with dull rust brown and black, darkest above. The face and sides of pronotum and body thinly covered by a whitish, mealy powder or pruinescens. Tegmina irregularly mottled with numerous quadrate brown spots which arrange themselves in rows along the dorsal edges; wings pellucid on the basal third, beyond this hyaline inclining to pale fuliginous apically, the veins and cross-veins of the outer two-thirds for the most part dusky. Posterior femora marked externally in the middle with a faint and preapically with a nearly black fascia; tibiæ inclining to light blue-gray along the bases of the spines which latter are black tipped; anterior and middle legs mottled, the mottlings congregating into obscure bands. Antennæ testaceous, a little infuscated apically, in some specimens annulate.

Length of body, δ , 15^{mm}, φ , 27^{mm}; of antennæ, δ , 6^{mm}, φ , 8.2^{mm}; of pronotum, δ , 3^{mm}, φ , 5.15^{mm}; of tegmina, δ , 17^{mm}, φ , 25^{mm}; of hind femora, δ , 9^{mm}, φ , 14.5^{mm}; of hind tibiæ, δ , 8.1^{mm}, φ , 12^{mm}; greatest width of thorax, δ , 4.85^{mm}, φ , 8^{mm}.

HAB.—Arid slopes back of Albuquerque, N. Mex., in May (H. Bruner).

Thrinicus (?) *maculatus* sp. nov.

The female quite large and robust; grayish, heavily mottled with dark brown or dull black; posterior femora with lower sulcus on inner face deep purple-red; tibiæ with inner edge also of same color.

Vertex between the eyes moderately wide, shallowly sulcate, with a rather prominent median longitudinal carina that extends from the apex across occiput to front edge of pronotum; there is also a more or less distinct transverse ridge just about the middle that divides the sulcus into four nearly equal subquadrate fields, the two posterior ones with their surface smooth and well defined, the anterior two, rough and dim in outline; lateral fovealæ obsolete, and their place occupied by a raised triangular field, in the center of which are situated the large lateral ocelli; frontal costa quite broad above, a little contracted just above the antennæ, and terminating immediately below the ocellus, at which it is a trifle depressed; lateral facial carinæ tortuous, rather dim; eyes large and prominent, reniform, fully as long as that portion of the cheeks just beneath; antennæ filiform, nearly as long as the head and pronotum combined. Pronotum widening posteriorly, rugose tuberculate, the disk nearly flat; the three transverse impressed lines nearly equally plain, continuous, the last a little in advance of the middle; anterior

edge nearly straight, posterior edge a little acute angled, with the apex rounded, entire pronotum strongly marginate. Tegmina straight and moderately broad; reaching fully one-fourth their length beyond the tip of the abdomen; the veins moderately well defined, wings normal. Posterior femora, with their base not greatly inflated; the carinæ and pinnæ of outer and inner disks strong, but not prominent, extending slightly beyond the tip of the abdomen. Tibiæ strong, few-spined and somewhat hirsute; anterior and middle femora with their apices inflated beneath externally.

General color dirty grayish white, inclining to a pale testaceous in some specimens, very heavily blotched and mottled with dull black or dark brown, most heavily upon the tegmina, which in some specimens are almost entirely obscured with the darker color. Posterior femora and tibiæ with their inner face deep purplish red. Antennæ fuscous, annulate with testaceous. There is usually a more or less distinct pruinescens upon the entire upper surface of the insect, which in conjunction with its dull color would render its detection exceedingly difficult in the desert.

Length of body, ♀, 45^{mm}; of antennæ, 12^{mm}; of pronotum, 9.5-10.25^{mm}; of tegmina, 35-37^{mm}; of hind femora, 20^{mm}; greatest width of thorax, 11^{mm}.

Described from four female specimens.

HAB.—Needles, California (Wickham).

Genus *Haldemanella* Sauss.

In a recent work* Mr. Henry de Saussure establishes the genus *Haldemanella* for the reception of certain large locusts that inhabit the arid regions of Arizona and New Mexico. Of these two species have been described by American authors, viz: *Ephippigera tshivavensis* Haldemann and *Eremobia magna* Thos. In 1872, Mr. Townend Glover figured an insect under the manuscript name of *Phrynotettix verruculata* Uhler, which also belongs here [Illustr. Amer. Entom. Orthopt., Pl. VI, figs. 25, 25 side view]. This latter evidently is synonymous with Haldemann's *tshivavensis*; while Thomas' insect is distinct, as can be seen by comparing the two descriptions and figures.

I herewith add a third to these toad-like locusts of the deserts.

The genus *Haldemanella* can be characterized as follows:

Body very obese, depressed, rugose, somewhat pubescent.

Antennæ filiform, moderately long. The head not large; the face vertical, broadening a little below; the vertex between the eyes broad, declivant in front; the eyes rather large and prominent; the frontal costa quite wide and prominent above between the antennæ, fading below the ocellus. Lateral foveolæ nearly obsolete, in the female, minute in the males, where they are triangular. Lateral ocelli transparent.

*Additamenta ad Prodromum (Edipodiorum, p. 153.

Pronotum broad and shield-like; the front lobe strongly coarctate above, the hind lobe broad and flattened and drawn out to a prolonged point behind. Tegmina and wings abbreviated; the former in the female lateral, about as broad as long, the apex broadly rounded, in the males sometimes fully two-thirds as long as the abdomen and meeting on the back. Abdomen heavy at the base but tapering rapidly backwards, not carinate. Tip of male abdomen strongly upturned, the last ventral segment small and entire. Posterior femora robust, pubescent, the upper and lower carinæ destitute of teeth; the tibiæ bowed, heavy. Entire surface with an earthy or dirt-covered appearance.

Haldemanella robusta sp. nov.

A very distinctly marked species that differs considerably from both *H. tschivavensis* and *H. magna*. White, testaceous, and fawn color. Female very large and robust; the male more graceful.

Pronotum, head and sides of thorax very rough—being ridged, pitted and “warty” in appearance, reminding one very much of the skin of our roughest toads. Vertex between the eyes very wide, equaling that of the shortest (δ) or fully equal to the longest diameter (♀) of the moderately prominent eyes; in the female plane, but broadly and ather deeply sulcate in the male; the apex greatly depressed and closed in front by a transverse carina; frontal costa very irregular, sulcate above and below the antennæ but plane between them, the sides somewhat contracted just below the fastigium and strongly pinched below the ocellus where they terminate, the costa continuing to the clypeus as a swelled ridge; antennæ rather heavily filiform, reaching only to middle of pronotal shield, 22-jointed. Pronotum very large and shield-like, the surface very coarsely and irregularly rugose and tuberculate; the anterior lobe without lateral carinæ, the middle and posterior lobes with these strongly marked; anterior edge slightly advanced in the middle; the posterior lobe greatly but broadly elongate, its edges undulate and toothed; the median carinæ perceptible only on posterior lobe; transverse sulci profound, continuous, the third in advance of the middle. Tegmina and wings abortive; the former, which are broadly rounded in the female, only reaching to front edge of second abdominal segment, in the male three-fifths as long as the abdomen, tapering; wings fully as long as the tegmina—both these and the former densely reticulate. Abdomen tapering rapidly in the female, but less so in the male, very faintly carined above; the apex of male quite strongly upturned, the last ventral segment conical; valves of the ovipositor exerted, short, strong, and unusually blunt.

Posterior femora coarse and heavy, the carinæ of the outer disk rather inconspicuous, and the pinnæ distant and few; posterior tibiæ heavy, bowed, the inner spines much the longest and heaviest, arcuate, very sparsely hirsute as is, in fact, the entire insect.

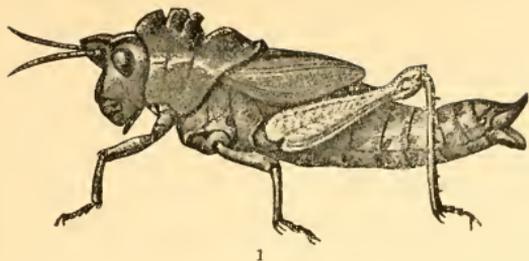
General color (dried after remaining for a short period in alcohol) dirty white below; testaceous, marked with streaks and blotches of light reddish-brown above. The brown markings are arranged somewhat as follows: Sides of frontal costa, the margin of clypeus, middle of cheeks, nearly all of occiput; on the pronotum along the line of lateral carinæ, a pair of stripes upon the disk that cross each other at first transverse sulcus, and four elongate dashes on disk of posterior lobe; also a median lateral band with a shorter one above near the posterior edge. Sides of thoracic and abdominal segments, anterior and middle femora and upper half of posterior femora also more or less mottled; all of the tibiæ fasciate with brown and testaceous. Tegmina with the veins and a few mottlings of the brown, remainder testaceous. Markings of the female less conspicuous than those of the male.

Length of body, ♂ 32^{mm}, ♀ 46^{mm}; of antennæ, ♂ 11.5^{mm}, ♀ 14^{mm}; of pronotum, ♂ 16^{mm}, ♀ 22^{mm}; of tegmina, ♂ 14^{mm}, ♀ 8.5^{mm}; of hind femora, ♂ 17^{mm}, ♀ 20.5^{mm}; greatest width of pronotum, ♂ 9.75^{mm}, ♀ 15^{mm}.

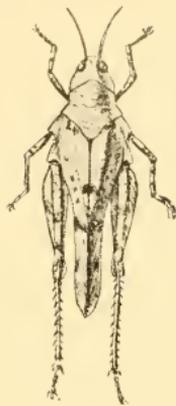
Described from two males and two females.

HAB.—Collected in southern Arizona during the summer of 1887 by G. W. Dunn. Received from the curator of the museum of the California State University (Bruner).

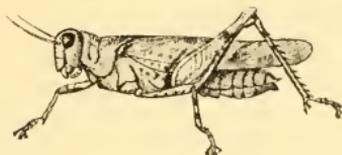
Like the other two described North American representatives of the genus this locust is also a denizen of the deserts, for which life it is eminently fitted, both as to structure and coloration.



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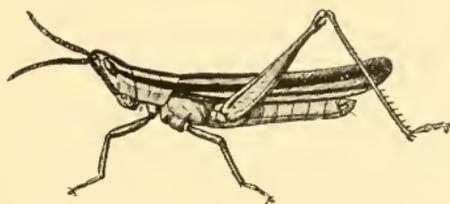
8



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11

- 1. *Dracotettix monstrosus*, ♀ (Page 50.)
- 2. *Thrinacus* (?) *aridus*, ♀. Side view. (Page 78.)
- 3. *Thrinacus* (?) *aridus*, ♀. Dorsal view. (Page 78.)
- 4. *Boöettix argentatus*, ♀. (Page 58.)
- 5. *Boöettix argentatus*, ♂. (Page 58.)

- 6. *Psoolessa Buddiana*, ♀ (Page 61)
- 7. *Edipoda* (?) *occidentalis*, ♀. (Page 77.)
- 8. *Eritettix abortivus*, ♀. (Page 56.)
- 9. *Eritettix abortivus*, ♂. (Page 56)
- 10. *Pedioscirtetes pulchella*, ♂. (Page 60.)
- 11. *Mermiria texana*, ♂ (Page 53)

