DESCRIPTIVE SYNOPSIS OF INSECT COLLECTIONS

FOR DISTRIBUTION

TO ILLINOIS HIGH SCHOOLS

II, ORTHOPTERA
(Grasshoppers, Katydid, Crickets, Roaches, etc.)

BY CHARLES A. HART

1906
DESCRIPTIVE SYNOPSIS OF INSECT COLLECTIONS

FOR DISTRIBUTION

TO ILLINOIS HIGH SCHOOLS

II. ORTHOPTERA
(Grasshoppers, Katydid, Crickets, Roaches, etc.)

By CHARLES A. HART

1906
INTRODUCTORY.

This pamphlet is the second of a series (the first relating to the Lepidoptera) issued especially as a guide to the study and use of the collections which they accompany.

USE OF LIST.

The list and collections correspond in numbering and arrangement. The scientific name of the insect is given first, in italics, followed by the name of the authority who first described the species and assigned to it the specific name; genus and species names recently in general use, but now obsolete, follow in parenthesis, the genus names with a capital initial. Thus Dichromorpha viridis (Chlocalitis) means that this species has been recently known as Chlocalitis viridis. The most reliable and evident characters by which each species may be distinguished from those nearest it are given, in order that one with the collection before him may not make mistakes in identifications in the absence of the related and less common species.

The dates given are for the presence of the main part of a brood, exceptional occurrences being ignored. Thus "L., July to Aug." means that while scattering ones of the single brood of adults may occur late in June or early in September, they are mostly taken from July 1 to August 31, inclusive. Hibernation as eggs laid by the adults follows, as a rule, the young hatching early in the season, and reaching the adult stage as stated. This is the usual orthopterous life history; a minority, however, hatch the same season, winter as young, and mature in early summer or spring.

The abbreviations H. and I. stand respectively for hibernation and adult brood.

EXTERNAL ANATOMY.

For a proper understanding of the terms here used, some description of the orthopterous external anatomy is necessary. Up the middle of the face in grasshoppers runs a more or less double ridge, the frontal costa. Just above the antennae it is usually narrowed at the point of the head, or vertex, and then spreads out as it passes to the top of the head. Between the eye
and the antennal cavity on the outside of the raised line, or carina, of each side of the frontal costa a subtriangular enclosure is often evident, the lateral fornoila. The pronotum, or upper surface of the prothorax, is in most Orthoptera like a blanket thrown across between wings and head. Its sculpturing and that of the head are very important in classification, and especially its variously elevated and notched median crest or carina. The last and plainest dorsally of the pronotal cross-furrows is the principal sulcus; all of the pronotum in front of it is the prozona, that behind it is the metazona; the angulations, usually evident, separating back from sides, are lateral carinae, and the side portions are the lateral lobes. The upper or fore wings are called the tegmina, and the under or hind wings are specified simply as the wings. The tegmina show two groups of stronger longitudinal veins. The area between these is herein referred to as the middle field. The two longer leg-joints (except in the fore legs of the Mantidae) are the inner, the femora, and the outer, the tibiae (singular, femur and tibia). At the hind edge of the last dorsal abdominal segment are, on either side, the fingerlike, flattened, or stylelike cerci (Fig. 3 and 4, c). In male grasshoppers, extending from beneath this segment above, is the flat shieldlike supra-anal plate (a), and above this plate on the hinder margin of the segment at middle in male Melanoplus are often a pair of small appendages, jointly called the furcula (f).

SEXES AND STAGES.

The separation of the sexes and stages, an important preliminary to classification, is not difficult in the Orthoptera. The adults, except in the Phasmidae and some of the rarer Locustidae, have free tegmina, either long or short. The larval stages have neither tegmina nor wings; the pupal stages may have
both, but they are always small and rudimentary (Fig. 1, a). In immature grasshoppers and katydids both tegmina and wings, and in the crickets the wings only, are upside down, so to speak, the front or costal edge, as is evident from the course of the veins, being in this case the upper or inner edge, instead of the lower, as in all adults. In the pupae of crickets the inverted wings are exterior to the tegmina.

The readiest means of separating the sexes of our species are as follows:

**Forficulidae.**—The male forceps are curved apart and well separated, sometimes approaching at base, and always at tip; those of the female and immature forms are not far apart, and are about parallel within except at the tip.

**Blattidae.**—The males of our common species, are long-winged, the females short-winged, or, in some house species, long-winged like the males. The last segment beneath is large and semicircular in the female, sometimes cleft lengthwise; that of the male is smaller and angular, with a pair of small styliets on the hind edge like tiny cerci (except in *Blattella*).

**Mantidae.**—The males are heavy-bodied, with tegmina shorter than abdomen; the males are slighter, the tegmina exceeding the body.

**Phasmatidae.**—The male cerci are subcylindrical, incurved and crossed (Fig. 2, b); those of the female leaf-like and straight (c).

---

**Fig. 2.** The Common Walking-stick: a, base of fore femur of female; b, tip of male, and c, of female abdomen, showing cerci. (Original.)
Acrididae.—The sexes are similar in wing length, the males a little smaller. The male abdomen has an unbroken rounded end below, the tip being turned up (Fig. 3); that of the female is centrally pointed and cleft horizontally and vertically into four hooklike tips (Fig. 4).

Locustidae.—The female ends in a vertically flattened blade, often upcurved (Fig. 5); the male structures are quite different (Fig. 6, 7). The male tegmina have an area at base with irregularly curved veins and intervening membrane, used in singing; the female tegmina have no such area.
**Gryllidae.**—The female ends in a slender stylet of narrow blades, finely saw-toothed at tip, in addition to the two hairy slender cerci (Fig. 8); the male shows cerci only. The male tegmina are broad, flat, and irregularly veined, in the white crickets widening from base to near tip (Fig. 9); those of the female are regularly veined and narrower (Fig. 8), in white crickets tapering from base to tip (Fig. 10).

**REFERENCE BOOKS MENTIONED.**

The two most important general works on our *Orthoptera* are Scudder's "Guide to the Genera and Classification of North American Orthoptera found north of Mexico" (Edward W. Wheeler, Cambridge, Mass., 1897, $1.00), and his "Catalogue of the Described Orthoptera of the United States and Canada" (Davenport Academy of Natural Sciences, Davenport, Ia., 1900, in Vol. VIII. of its Proceedings, separately, $1.00).

The following useful works are referred to in the text by the author's name. The first two and the last are official publications for free distribution.

**Blatchley.** The Orthoptera of Indiana. W. S. Blatchley. Twenty-seventh Annual Report of the Department of Geology and Natural Resources of Indiana, 1902.

**Lugger.** The Orthoptera of Minnesota. Otto Lugger. Third Annual Report of the Entomologist of the State Experiment Station of the University of Minnesota, 1897; also as Bulletin 55 of the Station.
FORFICULIDÆ.


Family FORFICULIDÆ.

1. *Labia minor* Linn. **Common Earwig.** Under bark and leaves; feeds by night on small insects, etc.; taken at lights. About ½ inch long, brownish above; wings extending beyond tegmina.* Male forceps curved within; female, straight. Blatchley, 171; Lugger, 86.

Family BLATTIDÆ.


3. *Ischnoptera inaequalis* Sauss.-Zehntn. Found with No. 2; habits similar. Dark brown, thorax triangular, elliptic, with narrower yellow margin; female with short tegmina. Blatchley, 182.

4. *Ischnoptera uhleriana* Sauss. (**I. unicolor**). **Lesser Forest Roach.** Found with No. 2; habits similar. Smaller, light brown, female with short tegmina. Blatchley, 184; Lugger, 97.

5. *Blattella germanica* Linn. (**Ectobia, Blatta**). **Croton Bug.** A serious pest in bakeries, confectioneries, hotels, etc., especially in warm moist surroundings or in steam-heated buildings. For remedies see Circulars 51 and 46, new series, Bureau of Ent., U. S. Dept. of Agr. Found in all stages throughout the

*For the meaning of terms here used see the introduction, under "External Anatomy."


7. *Periplaneta americana* Linn. **Southern Cockroach.** Very injurious and troublesome in the Southern States and at sea, but not common in Illinois except in some greenhouses and large city buildings. One brood a year. See No. 5 as to remedies. Brown, both sexes long-winged, length to tip of tegmina 1½ inches or more. Circular 51, new series, Bureau of Ent., U. S. Dept. Agr., 8; Blatchley, 195; Lugger, 93.

**Family MANTIDÆ.**


**Family PHASMIDÆ.**

9. *Diapheromera femorata* Say (*D. sayi*). **Common Walking-stick.** Trees and forest undergrowth, feeding on foliage, sometimes destructive to trees. H. as eggs, dropped singly on the ground. I., Aug. to frosts. Brown or green; hind tibiae with subapical spine, small in female; cerci of male cylindrical, curved, bluntly toothed at base; of female straight, short, about half as long as last segment (Fig. 2). Blatchley,
10. _Bacunculus blatchleyi_ Caud. **Prairie Walking-stick.** Weeds in open ground, otherwise habits probably similar to those of No. 9. Brown or green; hind tibiae without subapical spine; cerci of male with minute fingerlike basal appendage, of female about as long as last segment (Fig. 11). Forbes, 211 (_Diapheromera velii_).

![Fig. 11. The Prairie Walking-stick: a, base of fore femur of female; b, tip of male, and c, of female abdomen. (Original.)](image)

Family ACRIDIDÆ.

Subfamily TETTIGINÆ.

11. _Tettix granulatus_ Kirby. On moist ground in forest, feeding on dead and living vegetable matter. H. as adult, young maturing in fall, eggs laid in May in burrow in ground. Antennal joints about 14, vertex exceeding the eyes and slightly widened in front of them, thighs narrow. Blatchley, 220; Lugger, 107.

12. _Tettix arenosus_ Burm. On ground in dry open woods, habits and life history similar to those of No. 11, from which it differs in the shorter and more nearly square vertex, scarcely extending beyond the eyes, and broader middle femora. Blatchley, 224.

13. _Paratettix cucullatus_ Burm. Banks of streams and ponds. Habits and life history otherwise similar to those of Nos. 11 and 12, differing from the latter in its small and narrowing vertex, shorter than the eyes, and distinctly bent downward between them. Blatchley, 227; Lugger, 110.
14. Tettigidea parvipennis pennata Morse (T. lateralis). **Common Grouse-locust.** Generally distributed. Habits and life history similar to those of No. 11. Antennae 22-jointed, pronotum ending in front at about posterior third of eyes in a straight-sided angulation. Tip extending back as far as the ends of the hind thighs. Color variable. Blatchley, 230; Lugger, 111.

15. Tettigidea lateralis Say. Southern form, differing from No. 14 in the less prominent ridge at vertex, the more or less rounded anterior end of pronotum, and the more slender antennae. S. Ill. Blatchley, 231.

**Subfamily Tryxalinae.**


18. Orphulella speciosa Scudd. (Stenobothrus aqualis). In short grass on dry or sandy soils. H. as eggs in ground; I., Aug. to frosts. Coloration variable; dorsum of pronotum \( \frac{1}{2} \) wider behind than at narrowest point, metazona distinctly shorter than prozona. Blatchley, 242; Lugger, 126.

19. Dichromorpha viridis Scudd. (Chleoëaltis). Grass of pastures, open wood lots, etc., especially about ponds. H. as eggs in ground; I., July to frosts. Green or brown; tegmina short; dorsum of pronotum parallel-sided; males much smaller than females. Blatchley, 238; Lugger, 124; Forbes, 212.

20. Chleoëaltis conspersa Harr. (Chrysochraon). In open woods on ground encumbered with leaves, branches, and bushes. H. as eggs in masses in holes bored in soft weathered boards.
ACRIDIDÆ.

and pieces of wood, the hole closed by a gummy plug. | July to frosts. Tegmina short; dorsum of pronotum with slightly incurved sides; male thorax black-sided. Blatchley, 243; Lugger, 124; Comstock, 111.

21. Chorthippus curtipennis Harr. (Stenobothrus). Yellow Grasshopper. In thick grass of low ground and moist situations. H. as eggs; | July to frosts. Lateral foveole of vertex distinctly visible from above; hind tibiae bright red with whitish basal ring; antennæ light colored; a variable medio-dorsal pale stripe. Blatchley, 246; Lugger, 132.

22. Ageneotettix scudderui Brun. (Eremnus). Sand-hills. H. as eggs; | July to frosts. Lateral foveole of vertex distinctly visible from above; hind tibiae bright red with whitish basal ring; antennæ light colored; a variable medio-dorsal pale stripe. Blatchley, 248; Lugger, 132.

Subfamily OEdipodinæ.

23. Arphia xanthoptera Germ. (Tomonotus). Pastures and dry open woods, especially hilly ground. H. as eggs; | late July to frosts. Black wing-border with short inward extension anteriorly, reaching at most not more than half way to base of wing; pronotum with arched crest and acute-angled behind; carinate of frontal costa distinctly separate on the broad vertex. Blatchley, 256; Lugger, 138.

24. Arphia sulphurea Burm. Similar situations to those of No. 23. An early summer species, eggs in ground. H. as nymph; | May to August. Lighter colored than No. 23, black extension of wings long, reaching at least more than half way to base; pronotum with less arched crest, and nearly right-angled behind; frontal carinate united at vertex. Blatchley, 255; Lugger, 136.

25. Chortophaga viridifasciata DeG. (Tragocephala). Winter Grasshopper (Fig. 1). Wide-spread and common in pastures and grass-lands generally. Eggs in podlike mass in ground. Winters in Ill. as nymph; | from April until frosts,
26. *Choristophasa viridifasciata infuscata* Harr. (*Tragocephala infuscata*). The dusky forms of this species commoner among the males than among the females.

27. *Encoptolophus soroides* Burn. Dry pastures and hillsides, flying with a harsh buzzing noise. H. as eggs in ground, in podlike mass. I., Aug. to late fall. Brownish to black beneath, hind tibia blackish, with pale basal ring; pronotal crest marked: wings smoky on outer half. Blatchley, 260; Lugger, 147; Comstock, 110.

28. *Hippicus rugosus* Scudd. Pastures and dry uplands, especially hilly ground. H. as eggs in ground; I., Aug. to frosts. Wings banded, basal area whitish, yellow, orange, or carmine; hind femora yellow and black within; frontal costa broad and shining throughout. Blatchley, 270; Lugger, 150.


30. *Dissosteira carolina* Linn. (*Edipoda*). **Carolina Grasshopper.** Bare ground of roadways, railroad tracks, stream beds, etc. H. as eggs in mass in hole in ground; I., late June to Oct. Various dull colors, wings black with narrow pale yellowish border; pronotum with marked crest. Blatchley, 273; Lugger, 158; Comstock, 111.

31. *Spharagemon bolli* Scudd. Dry, open woods, especially on hillsides or summits. H. as eggs; I., July to frosts. Crest of prozona descending nearly vertically into the notch between it and metazona; hind tibiae red, with pale basal ring
and intervening black ring; three indefinite darker cross-bars on tegmina; markings often dull; wings with black cross-band and pale yellow basal area. Blatchley, 275; Lugger, 163.

32. Spharagemon wyomingianum Thom. (S. collare). Open sandy ground and slopes of sand-hills. H. as eggs; I., July to frosts. Crest of pronotum descending very obliquely forward into the notch, closing the notch above and usually leaving an elongate opening below; hind tibiae red, with faint pale basal ring only; general surface speckled, dotting of tegmina in three indefinite groups in middle field; wings as in No. 31, but black bar shorter. Blatchley, 277; Lugger, 162.

33. Trachyrhachis thomasi Caud. (Mestobregma cincta). Bare or scantily vegetated dry slopes and gravelly surfaces, old roadways, and sand-hills. H. as eggs; I., July to frosts. Pronotal crest notched twice; wings with yellow basal area and black band narrowed anteriorly; hind tibiae black-tipped; tegmina with two blackish spots and a pale space beyond each. Blatchley, 279; Lugger, 164.

34. Psinidia fenestralis Serv. Open sandy or barren ground and slopes of sand-hills. H. as eggs; I., Aug. to frosts. Differs from No. 33 in structural details and in uniform motting of tegmina; wings with broader black band, basal area usually red. Blatchley, 284; Lugger, 166.

35. Trimerotropis citrina Scudd. River-bank Grasshopper. Sandy banks and shores of large rivers and southern seacoast. H. as eggs; I., July to frosts. Pronotal crest only a fine raised line, twice notched; hind tibiae red, femora yellow within with two black cross-bars; wings with strong black band and lemon-yellow to whitish basal area; tegmina with two or three indefinite cross-bars. Blatchley, 282.

36. Trimerotropis maritima Harr. Lake-shore Grasshopper. Sandy shores of the Great Lakes and northern seacoast. H. as eggs; I., July to frosts. Differs from No. 35 in having a narrower black band on wing, and little or no trace of cross-bars on tegmina. Blatchley, 281; Lugger, 163.
ACRIDIDÆ.

37. _Trimerotropis saxatile_ McNeill. Restricted in Illinois to the larger sandstone ledges of the Ozark hills in southern Illinois, closely imitating the lichen-covered rock-surfaces on which they rest. _H._ as eggs; _I._, July to Sept. Greenish white, barred with blackish; hind tibiae not red, femora black within and beneath, with two yellow cross-bars within, one continuous beneath; pronotal crest and wings about as in No. 35.

Subfamily ACRIDIDÆ.

38. _Schistocerca americana_ Drury (Acrídim). **Common Bird Grasshopper.** In heavy grass of low or flat ground, flying far when disturbed and alighting in trees, underbrush, or tall weeds, if any are at hand. Common in southern Illinois. _H._ as eggs in Ill., but wintered adults from the Southern States fly north in spring, so that adults may be found occasionally from April on, those from hibernated eggs occurring from Aug. till late frosts. Tegmina conspicuously spotted, thorax striped on sides and back. Blatchley, 290; Lugger, 174; Forbes, 67, 140.

39. _Schistocerca alutacea_ Harr. (Acrídim, _S. rubiginosa, S. emarginata_). Coarse grasses on dry or sandy soils, flying up, when disturbed, into trees, small bushy growths, or tall weeds. _H._ as eggs; _I._, Aug. to frosts. Reddish or yellowish brown, with no conspicuous marking except often a yellowish dorsal stripe. Blatchley, 294, 296; Lugger, 172, 173, 174 (?); Forbes, 140.

40. _Campylacantha olivacea_ Scudder. Dry or sandy soils; sand-hills. _H._ as eggs; _I._, Aug. to Oct. Green, without definite markings; tegmina about half the length of pronotum; lateral carinae of pronotum feeble. Forbes, 213.

41. _Melanoplus flavidus_ Scudder.* Bare sandy "blow-outs" in sand-hills of western Illinois. _H._ as eggs; _I._, July to frosts. Male cerci finger-shaped, furcula very large, hardly

---

*The long-winged _Melanoplus_ are most reliably identified by the form of the cerci and other terminal structures of the male. In the females the corresponding structures differ but slightly. A number of other characters are available, however, such as the coloration of the hind legs, the structure and markings of the pronotum, the length of the tegmina, etc., by which individuals of either-sex may be located as to species; but these characters in some groups are so nearly alike as to make the separation of the females by means of them a matter of very careful and critical work.
smaller than the cerci, hind tibiae bright violet-blue, femur with two complete bands above, outer face pale, with more or less evident broad longitudinal dark stripe; dorsum of pronotum pale, narrowly darker at middle.

42. *Melanoplus attalus* Riley (*Caloptenus*). **Lesser Grasshopper.** Open slopes and small hills, especially if a little sandy or gravelly; generally distributed in cultivated lands of southern Illinois. H. as eggs in podlike mass in ground (Fig. 12). Adult appears rather early; June to frosts. Male cerci hand-shaped, broad and flat, furcula medium, tip of body (seen from behind) narrow and slightly notched; hind tibiae greenish to red, femur indistinctly banded on outer face, two complete bands above; prozona short, sutural lines rather deep and close together; tegmina usually much exceeding hind knees. Blatchley, 315; Lugger, 190; Forbes, 67, 136.

43. *Melanoplus impudicus* Scudd. Steep, rocky, wooded slopes of Ozark hills in southern Illinois, and in woods on very sandy soils in central Illinois. H. as eggs in ground; I., July and Aug., probably to frosts. Male cerci fingerlike, furcula minute but distinct, body-tip pointed; hind tibiae red, femur banded above and on outer face; tegmina reaching about to hind knees. Blatchley, 316.
44. *Melanoplus scudderi* Uhl. (*Pezottettix*). Common Short-wing Grasshopper. In open woods and thickets, and along rail fences and roadsides, throughout Illinois. H. as eggs in ground; I., Aug. to late frosts. Tegmina about as long as pronotum, nearly or quite in contact; male cerci broadly tapering, furcula almost wanting, body-tip acute; hind tibiae red, outer face of femora plain; lateral pronotal stripe indefinite in female. Blatchley, 302; Lugger, 184; Forbes, 142.

45. *Melanoplus viridipes* Walsh. In low vegetation in open woods. H. as eggs in ground; I., in early summer, May to July. Tegmina and male structures about as in No. 44, but cerci fingerlike; hind tibiae greenish, femora strongly banded; lateral pronotal stripe solid from eyes to rear of pronotum. Blatchley, 305.

46. *Melanoplus obovatipennis* Blatchl. High wooded hillsides throughout Illinois. H. as eggs in ground; I., late Aug. to frosts. Tegmina shorter than pronotum, separated by about half their width; male cerci fingerlike, furcula medium-sized, body-tip with semicircular edge; hind tibiae greenish, outer face of femora nearly or quite plain; lateral stripe solid from eyes to middle legs. Blatchley, 306.

47. *Melanoplus fasciatus* Barnst. Dry or sandy ground in brushy woods. H. as eggs in ground; I., mid-July to Sept. or later. Tegmina not attaining hind knees, reaching only to second stripe of femur; male cerci straplike, furcula very small, body-tip narrowly truncate; hind tibiae reddish or pale; femora strongly banded. Blatchley, 311; Lugger, 210.

48. *Melanoplus femur-rubrum* DeG. (*Caloptenus*). Red-legged Grasshopper (Fig. 3; 4). Cultivated fields, pastures, meadows, and roadsides, especially of central and northern Illinois; abundant and often quite injurious. For remedies see 23d Rep. State Ent. I., p. 64. H. as eggs in podlike mass in ground. I., July to frosts. Tegmina exceeding hind
knees; male cerci finger-shaped, furcula medium, body-tip with semicircular edge (Fig. 3); hind tibia red, rarely greenish, femora banded above on inner side only, outer face not definitely banded; a fine smooth median line more or less evident on prozona as well as on metazona. Blatchley, 317; Lugger, 195; Comstock, 110; Forbes, 67, 136.

49. Melanoplus angustipennis Dodge. Sand-hill slopes and very sandy land. H. as eggs in ground; I., July to frosts. Tegmina exceeding hind knees; male cerci finger-like, apical half concave, furcula medium, body-tip narrowly truncate; hind tibia blue, rarely red in Illinois examples, femoral bands absent on lower half of outer face. Blatchley, 321; Lugger, 198.

50. Melanoplus amplectens Scudd. (M. blatchleyi, Pezotettix occidentalis). Thickets, and open spots with a dense herbaceous growth. H. as eggs in ground; I., July to frosts. Tegmina reaching about to first femoral bands, and with a distinct paler dorsal surface; male cerci thumblike, with concave and truncate tip, furcula small, body-tip obtusely pointed; a black line from middle of first femoral band to base of femur. Blatchley, 313; Lugger, 186.

51. Melanoplus gracilis Brun. (Pezotettix minutipennis). On tall grasses and weeds in ravines and about marshes, masses of wild vines along railroads, weedy growths in the beds of small streams, and in like situations. H. as eggs; I., in June. Tegmina reaching about to hind knees; male cerci fingerlike, with broader concave tips, furcula present; pronotum with lateral stripe solid and complete. Blatchley, 308.

52. Melanoplus minor Scudd. Pastures and roadsides on very sandy land. H. as eggs. A summer species. I., in June. Tegmina reaching about to hind knees; male cerci thumblike with projecting right angle near base below, furcula small;
hind tibiae greenish or red; femora distinctly and very obliquely banded, pronotal lateral stripe wanting on metazona. Blatchley, 322; Lugger, 201.

53. *Melanoplus luridus* Dodge (*M. collinus*). Gravelly hilltops and sandy slopes. H. as eggs; I., Aug. to frosts. Tegmina reaching about to hind knees; male cerci Y-shaped, lower arm spinelike, furcula almost wanting; hind tibiae red, hind femora banded above, indistinctly also on outer face. Blatchley, 324; Lugger, 203.

54. *Melanoplus differentialis* Thom. (*Caloptenus*). Olive Grasshopper. Rank weeds along fence rows and roadsides, and in bottom-land or waste ground; also in corn fields, often perceptibly injurious (23d Rep. State Ent. Ill., 36). H. as podlike mass of eggs in ground; I., Aug. to late frosts. Tegmina exceeding knees; male cerci large, flattened, foot-shaped, with projecting angle at heel, furcula wanting; hind tibiae yellow, femora with two black bars within, outer face ribbed with black; black spots on sides of pronotum and tip of abdomen. Blatchley, 326; Lugger, 204; Forbes, 67, 136.

55. *Melanoplus viola* Thom. Wooded hillsides in southern half of Illinois. H. as eggs in ground; I., July to frost. Tegmina reaching about to second femoral bands; male cerci large and foot-shaped with rounded heel, furcula almost wanting; hind tibiae reddish, femora strongly banded, a black line from middle of first band to base of femur.

56. *Melanoplus bivittatus* Say (*Caloptenus*). Two-striped Grasshopper. Rank vegetation along streams and in low ground. H. as eggs in ground; I., mid-June to early Sept. Tegmina exceeding hind knees; male cerci large, foot-shaped, furcula almost wanting; hind tibiae in Illinois examples usually red (var. *femoratus*, by some considered a distinct species), sometimes yellow (typical *bivittatus*), femora banded within, a longitudinal black stripe on upper half of outer face; a yellowish stripe usually evident along each side of the back. Blatchley, 329; Lugger, 206, Fig. 22-39; Forbes, 67, 136.
Family LOCUSTIDÆ.

57. Scudderia texensis Sauss.-Pict. (S. curvicauda). On bushes and tall weeds and grasses in damp ground and along fences and margins of fields and orchards, flying when disturbed to other weeds or the lower branches of trees. H. as eggs inserted at the edges of leaves of corn and other plants between the upper and lower epidermis. I., late July to early frosts. Male with upcurved posterior ventral prolongation, meeting the tip of a dorsal spine which is broadly notched at apex, a small sharp tooth bounding notch on each side; ovipositor of female broad, strongly upcurved, about ¾ inch long, antennæ close-set; tegmina nearly or quite five times as long as broad; hind tibiae about 1¾ inches long. Blatchley, 344; Lugger, 216 (curvicauda); Forbes, 143.

58. Scudderia curvicauda DeG. (S. furculata). Habits and life history much as in No. 57. Differs from it in the form of the posterior dorsal spine of male, which ends in two round lobes separated by a small acute notch. Blatchley, 345; Lugger, 216 (furculata).

59. Scudderia furcata Brunn. (Fig. 7). Habits and life history not materially different from those of No. 57. A smaller species, hind tibiae not over an inch long, dorsal spine of male ending in a thick U-shaped fork. Blatchley, 348; Lugger, 218; Forbes, 143.

60. Amblycorpypha oblongifoldia DeG. Habits and life history about as given for No. 57. Oviposition unknown. Male abdomen terminating in four minute points, ovipositor of female broad and about ¾ inch long, roundly upcurved; head broadly rounded between antennæ; tegmina reaching (female) or slightly exceeding (male) the hind knees; hind tibiae about 1¼ inches long. Blatchley, 350; Lugger, 222.

61. Amblycorpypha rotundifolia Scudd. On grasses and weeds in damp ground. Oviposition unknown. A smaller species than No. 60, of shorter flight, hind tibiae pale throughout, an inch or less in length; tegmina hardly reaching hind knees,
about three times as long as broad, face about 6 mm. long.
Blatchley, 352; Lugger, 222.

62. Amblycorypha uhleri Brumm. Differs especially from
No. 60 as follows: head much smaller, tibiae dark, tegmina more
elongate, usually with dark dots. Blatchley, 353; Lugger 223.

On trees and bushes; stridulates mostly at night. H. as large
eggs, overlapping in two rows on twigs and similar surfaces.
I., mid-July to frosts. Differs from No. 60 in its very small
and abruptly upcurved ovipositor, its larger size, its tegmina
tapering each way from middle, and its short
legs, the hind knees reaching only about the middle of the tegmina. Blatchley, 354; Lugger, 224.

64. Conocephalus robustus Scudd. In trees
by day, on weeds at twilight, stridulating much
as does the periodical cicada, with a powerful
and penetrating sound. Especially common in
sandy districts. I., Aug.—Oct. Eggs probably
inserted between stems and leaves of large grass-
like plants, by means of the long, straight, ribbon-
like ovipositor. Vertex extending between the
antennae in a conical point, without black mark-
ings beneath; ovipositor at least an inch long.
Blatchley, 368; Lugger, 232.

65. Orchelimum vulgare Harr.* (O. agile).
Common Meadow-grasshopper (Fig. 5, 6). On
long grass and medium-sized weeds along roadsides
and fences and in pastures and meadows. Food,
insects and leaves and floral organs of grasses.
H. as eggs placed in small groups at intervals in
stems of weeds, of tassels of corn, etc., marked by
roughened spots in a feeble spiral (Fig. 13), eggs
placed lengthwise in center of stem, usually two in
each direction. I., mid-July to Oct. Lateral lobe
of pronotum with very prominent posterior "blis-

*The meadow grasshoppers (Orchelimum and Xiphidium) are readily known by the
short rounded knob (not cone) between the large basal antennal joints.
ter," curling the hind margin and pushing it out in a broad projecting lobe, bounded both below and above by a sinus; pronotum large, 5 or 6 mm. long, tips of wings and tegmina in line with the hind knees, or else wings slightly longer—not over 4 mm.—and tegmina intermediate in length; hind femora not spined beneath. Blatchley, 383; Lugger, 234; Forbes, 144.

66. *Orchelimum glaberrimum* Burm. (Fig. 14). Said to occur especially on long grass near bodies of water. Differs from No. 65 principally in the wings being decidedly longer than the hind knees, the tegmina intermediate between the two. Very likely only a variety of No. 65. Blatchley, 385; Lugger, 235; Forbes, 144.

67. *Orchelimum campestre* Blatchl. In long grass of low or wet ground. Habits and life history presumably similar to those of No. 65, from which it may be distinguished by the smaller head and pronotum, the former about 6 mm. long, the latter 3 or 4 mm.; pronotal blister nearly flat, hind edge not curled in or sinuated by it; wings exceeding hind knees 5 mm. or more; ovipositor small. Blatchley, 386; Lugger, 236.

68. *Orchelimum nigripes* Scudd. On smartweed and long grasses along edges of ponds, lakes, and streams. L., late July to October. Pronotal blister shriveled, hind margin nearly straight or even slightly concave; wings usually exceeding hind knees; both hind femora with a few small black spines beneath on the slender part; tibiae and tarsi more or less black. Blatchley, 387; Lugger, 236.

69. *Xiphidium fasciatum* DeG. In pastures, fields, and meadows, especially on low ground near streams. Food: grasses, pollen, and a few insects. H. as eggs, placed as a rule in the interior of soft stems or new growths. L., late July to early frosts. Resembles No. 67, but is smaller, the pronotum
LOCUSTIDÆ.

about 3 mm. long, the femora 12 mm., the face 4 mm.; male cerci nearly straight, ovipositor straight, about two thirds as long as the femora. Blatchley, 372; Lugger, 238; Forbes, 147.

70. Xiphidium brevipenne Scudd. Habits and life history much the same as in No. 69. Male cerci out-curved, ovipositor about as long as hind tibia; dorsum green, with black stripe; tegmina somewhat shorter than abdomen; rarely long-winged individuals occur. Blatchley, 373; Lugger, 239; Forbes, 147.

71. Xiphidium nemorale Scudd. On weeds, bushes, and long grass on slopes in dry open woods, and along fences. H. as eggs, inserted in soft plant-tissues, decaying wood, etc. I., Aug. to frosts. Male cerci nearly straight, ovipositor about half the length of hind tibia; color dusky brownish, apparently in imitation of dead stems, leaves, etc.; dorsum with pale line each side; tegmina of male somewhat shorter than abdomen, of female \( \frac{1}{2} \) length of abdomen. Blatchley, 374; Lugger, 240; Forbes, 147.

72. Xiphidium saltans Scudd. (X. modestum). In long grass of unbroken prairie sod, especially on the ground. I., Sept. and Oct. Male cerci shorter than in No. 73, slightly out-curved; ovipositor scarcely longer than hind femora; tegmina slightly shorter than in No. 73. Blatchley, 377; Lugger, 242.

73. Xiphidium strictum Scudd. Dry meadows and pastures. Food: plant-lice and other insects, pollen, and other vegetation. H. as eggs thrust down between stem and leaf of grasslike plants by means of the long ovipositor. I., Aug. to early frosts. Male cerci incurved, ovipositor variable, at least distinctly longer than hind femora, usually fully one and a half times their length; tegmina of male about half the length of the abdomen, of female not longer than pronotum, rarely fully developed and almost reaching knees. Blatchley, 378; Lugger, 242; Forbes, 147.
74. *Atlanticus pachymerus* Burm. **Shield-back Grasshopper.** In partly wooded and more or less broken country, on dry, sunny beds of dead leaves, under logs, or resting on low vegetation. Food believed to be dead small animals. The young often appear numerously in early spring; adults sing at night. I., June to Aug., perhaps later. Pronotum much narrower anteriorly, front margin little more than half as long as hind margin. Blatchley, 393; Lugger, 245.

Family **GRYLLIDÆ.**

75. *Gryllotalpa borealis* Burm. **Mole-cricket.** Burrowing in ground near water, and beneath wood on sandy shores, but especially in low banks of streams. Eggs placed within the burrows, often in large masses, attached to rootlets of plants. Life cycle said to last 3 years. Both short-winged (*borealis*) and long-winged (*columbica*) forms occur. Fore tibiae with four spines, two fixed and two movable. Blatchley, 411; Lugger, 257; Comstock, 117.

76. *Scapteriscus abbreviatus* Scudd. This mole-cricket inhabits the Gulf coast and other warm regions of the New World. It is similar in appearance and habits to No. 75, and is introduced here because of our insufficient supply of that representative of the interesting group of *Orthoptera* to which these two belong. The tropical mole-crickets are often seriously injurious to cultivated crops. Fore tibiae with two spurs only, both movable; tegmina very short.

77. *Tridactylus apicalis* Say. **Larger Sand-cricket.** Margins of sand-bars along rivers and large streams, making tiny molelike burrows along the damp sand. I., May to Oct. Length to tips of hind femora 7-8 mm.; hind tibiae with four pairs of swimming plates. Blatchley, 414; Lugger, 259.

78. *Ellipes minuta* Scudd. (*Tridactylus minutus*). **Lesser Sand-cricket.** Damp sandy shores and wet places, bare or with scanty vegetation; often found with No. 77. I., Apr. to Sept. Length to tips of hind femora 4-5 mm.; hind tibiae with
one pair of swimming plates. Both long-winged and short-winged forms occur. Blatchley, 415; Lugger, 259.

79. Nemobius fasciatus DeG. Long-winged Striped Cricket. Occasionally found with No. 80; often abundant about electric lights in Aug. and Sept. Differs from No. 80 in the presence of wings, which are long, reaching to the tip of the ovipositor; tegmina reaching the tip of the abdomen. Blatchley, 421; Lugger, 261.

80. Nemobius fasciatus vittatus Harr. (N. vittatus). Striped Cricket (Fig. 8). "Short-winged" form of this species; abundant in pastures and other grass-lands; most active at night. Food: grasses, grains, cow-dung, carrion, etc. H. as eggs; I., late July to frosts. Wings wholly wanting. Male tegmina reaching about to tip of abdomen, tegmina of the common type of female usually covering slightly more than half the abdomen, rounded at tip; those of the less common intermediate form as in No. 79, about as long as the abdomen, within the dorsal field projecting slightly behind. Length to tips of hind femora 9-12 mm., ovipositor 7-10 mm.; color entirely blackish, or striped and dotted with yellowish, top of head striped or all black; the base of the long diagonal discal cell of male tegmina distinctly bent towards the inner margin, making it foot-shaped. Blatchley, 421; Lugger, 262; Forbes, 214.

81. Nemobius canus Scudd. Habits and life history probably similar to those of No. 80; commoner southward. Resembles light-colored examples of No. 80, but is slightly larger, head and thorax yellowish brown; eyes more globose. Blatchley, 423.

82. Nemobius maculatus Blatchl. About logs and dead wood in sparse woods and near streams. Life history apparently similar to that of No. 80; a slightly smaller, sooty-mottled species, tegmina of male shorter than abdomen, of female about half length of abdomen, shorter than in No. 80; ovipositor 5-6½ mm.; cell of male tegmina about as in No. 80; black markings of top of head confused at middle, an evident
dark yellow border on the inner side of each eye, and a tendency to a yellowish connecting cross-band posteriorly. Blatchley, 424.

83. *Miagryllus saussurei* Scudd. S. III., under sticks, logs, and stones on dry slopes and hillsides, especially on bare ground. I., June and July. Resembling a large *Nemobius*; head smooth and shining black as in *Gryllus*, with a pair of yellow parenthesis-like lines enclosing the top of the head, and usually two short lines between them posteriorly. The “ear-drum” which in our other crickets are seen on each side of the base of the fore tibia, are absent on the anterior side in this species. Blatchley, 442.

84. *Gryllus americanus* Blatchl. Under logs and sticks in quiet hillside woods. H. as partly grown nymph; I., May to July. Under-sized, tegmina totally black, unusually divergent in female, peculiarly crinkled; pronotum less than 5 mm. wide, ovipositor 9-11 mm.; hind tibial spines red-brown, often visibly paler than tibia, femora black. Blatchley, 433.

85. *Gryllus pennsylvanicus* Burm. Common about logs, brush, dead leaves, and sticks in open woods in midsummer, appearing about two weeks later than *americanus*. Food varied: grass, dead insects, fruits, etc. H. as young nymphs in cavities under logs, etc. I., late May to frosts, most common in May and June, eggs laid in midsummer, hatching in July and August. Tegmina varying from ochre-yellow throughout or at base to entirely black above; but usually a paler line extending back from the shoulders, especially in the female; sides of tegmina with veins seen to be more or less slightly penciled with yellow, when viewed obliquely; female tegmina reaching 3⁄4 to 3⁄5 to the hind knees; pronotum more than 5 mm. wide, ovipositor 10-14 mm.; hind tibial spines black or nearly so, tibiae black to ochre-yellow, medially in correspondence with the color of the tegmina; hind femora entirely black or with small or indefinite dark red spot near lower basal angle. The short-winged form is the common one; the long-winged form is
occasionally taken with it, and is frequently seen under electric lights. Blatchley, 437; Lugger, 264; Forbes, 214.

86. Gryllus abbreviatus Serv. Field-cricket. Under boards, sticks, and logs in fields, woods, and pastures in late summer and fall. Food: grass, grain, fruit, vegetables, carrion, etc. H. as eggs, laid in fall in irregular masses, usually in the ground, hatching in early June. I., July to frosts, commonest in Aug. and Sept. Very similar to No. 85, and difficult to distinguish from it. Hind femora with large red spot on lower part of basal half, sides of tegmina with veins usually distinctly yellow; ovipositor 14-18 mm.; tegmina dark brown to blackish, a distinct pale line usually extending back from shoulder angle, tegmina of female reaching 2/3 to 3/4 the distance to the hind knees; hind femora as in No. 85. The long-winged form (luctuosus) is rarely taken. Blatchley, 435; Lugger, 264; Forbes, 214 (under pennsylvanicus); Comstock, 118.

87. Ecanthus niveus DeG. White Cricket (Fig. 9, 10). On and about fruit and other trees, feeding on plant-lice and other insects, pollen, fungi, etc. H. as eggs placed in a single row lengthwise in soft twigs, indicated externally by a line of small rough perforations of the bark. I., Aug. to Oct. Green; first two antennal joints each in front with a small nearly round black spot (Fig. 15, a). Blatchley, 446; Lugger, 269; Forbes, 217; Comstock, 118.

88. Ecanthus angustipennis Fitch. Found with No. 87, but preferring larger trees; habits and life history much the same; common on trunks of soft maples in Oct. Green; male tegmina narrower than in the other species; first antennal
joint with a black J, second with a short black line (Fig. 15, b). Blatchley, 450; Lugger, 271; Forbes, 217.

89. *Ecanthus 4-punctatus* Beut. On weeds and bushes in open ground. Habits and life history much as given for No. 87. Eggs in pithy stems of weeds and other vegetation. I., Aug. to Oct. Green; first antennal joint with a black line, and exterior to its upper end a rounded dot; second joint with two parallel lines (Fig. 15, a). Blatchley, 452; Forbes, 217.

90. *Ecanthus nigricornis* Walk. (*E. fasciatus*). On weeds and bushes, especially *Composite*, in fields, pastures, and roadways; but more particularly abundant in low ground. H. as eggs, in pithy stems of weeds, of corn tassels, berry-canies, vines, etc., causing them to split and finally die above the injury; thus often very injurious to plants under cultivation. (Fig. 16.) I., Aug. to Oct. Legs, especially tibiae, under surface, antennae, head, and stripes on pronotum more or less black; basal antennal joints, when not entirely black, with markings resembling those of No. 89, but heavier, often confluent (Fig. 15, E). Blatchley, 450; Lugger, 271; Forbes, 217.

91. *Anaxipha exigua* Say (*A. pulicaria*). On leaves and stems of button-bush, flags, and other plants about bodies of water or in wet ground, not on the ground as is the case with *Nemobius*. I., Aug. to frosts. Resembling *Nemobius* but rather small, uniform light brown; female tegmina nearly reaching tip of abdomen; ovipositor curved decidedly upward. Blatchley, 455; Lugger, 274.