

the mandibles are clothed with stiff, reddish bristles; the legs and palpi are of the usual shape, and clothed with moderately short hairs and some spines; the triangular piece at base of venter has a depressed area on its posterior part, broadest behind, and its margin each side terminated by a deep indentation.

One specimen, Los Angeles, California [Davidson]. It is easily distinguished by the serrate appearance of the lower finger [which does not occur in any other species], and by the coloring of the palpi.

Discussion followed by Messrs. Ashmead, Banks, and Marlatt relating more particularly to structural characteristics commented on by the author of the paper, and particularly the value of the mandibular teeth of insects in classification, Mr. Ashmead speaking of the use of this characteristic in the classification of ants by old authorities; and the modification or wear of the teeth in old specimens was also noted and the important modification which wear sometimes effects in the case of cicada larvæ two or three years after moulting was described by Mr. Marlatt.

—The third paper was by Mr. Dyar, and was entitled:

DESCRIPTIONS OF THE LARVÆ OF FIFTY NORTH AMERICAN NOCTUIDÆ.

By HARRISON G. DYAR.

The Noctuid larvæ here described are from the collection of the U. S. National Museum, and are those of which descriptions have not been previously published to my knowledge.

Unless otherwise stated, the head is rounded, almost as high as wide, moderately bilobed, the clypeus reaching about half way to the vertex; slightly retracted below joint 2. Cervical shield indistinct, not cornified. Body cylindrical, abdominal feet equally developed on joints 7 to 10 and 13; joint 12 not, or but slightly, enlarged. Tubercles normal, single, iv behind the spiracle, about equally distant from iii and v or nearer to iii than to v. The longitudinal lines are the dorsal, situated centrally on the back, unpaired; the subdorsal, half way between the dorsal and the spiracles, paired; the lateral, half way between the subdorsal and the spiracles, not touching the latter; the suprastigmatal or stigmatal, just touching the tops of the spiracles or partly enclosing them and occupying all the space between the lateral and substigmatal lines; the substigmatal running below the spiracles and enclosing their lower portion. The ordinary lines are the

dorsal, subdorsal, and substigmatal. The subdorsal oblique shades extend from the subdorsal line on the anterior margin of each segment to the dorsal line on the posterior margin. Lines not mentioned in the descriptions are absent. "Bordered," without qualification, means edged on both sides. The measurement of the head given is its approximate width. All descriptions are believed to be from full-grown larvæ.

1. *Rhynchagrotis rufipectus* Morrison.

Head 1.5 mm., pale, heavily mottled with dark brown, which forms a continuous band closely bordering the median suture and clypeus from vertex to mouth. Joint 12 rather distinctly enlarged. Body heavily mottled with light and dark brown dottings, mixed with greenish laterally, forming obscure dark subdorsal oblique streaks and a distinct blotch on joint 13 anteriorly. All the ordinary lines lost except the dorsal, which is narrow, straight, sordid white, distinct, broken only in the incisures, sometimes edged with blackish there. Thoracic feet pale, leg shields dusky; tubercles and setæ minute, in pale rings. Spiracles dark.

Food plant, grass. Dept. of Agriculture, No. 3503.

2. *Rhynchagrotis alternata* Grote.

Head 3 mm., pale, reticulated with brown, the curved band from vertex nearly contiguous to median suture, faint below, concentric with a narrower line that runs upward from the eye. Body heavily mottled with dark brown, subventral region and feet much paler. Dorsal line whitish, very narrow, broken somewhat broadly in the incisures; oblique subdorsal shades dark, diffuse, paler edged posteriorly; subdorsal line obsolete, just indicated by a paler shading; substigmatal band sharp above, defined by a white line which undulates, passing below the spiracles, mottled below with reddish-brown and shading off into the pale subventral area. Tubercles and setæ minute except on the feet. Spiracles black rimmed.

Food plants, oak, hickory, etc. Dept. of Agriculture, No. 3355.

3. *Rhynchagrotis crenulata* Smith.

Head 3.3 mm., pale, reticulated with brown, the curved band from the vertex distinct below and a brown patch in the clypeus; line upward from eye not more distinct than the other reticulations. Body brown, the ground color pale brown, finely striate-mottled with dark brown; dorsal line pale, narrow, nearly broken down in the centers of the segments, edged with black-brown in the incisures; subdorsal line more distinct, pale, on joints 3 to 12, narrow; oblique shades pale, but alternating before with somewhat wedge-shaped black patches that rest on the subdorsal line; sides finely mottled, obscurely streaked, the substigmatal line broad, but very faint, only a shade paler than the body, sharp-edged above and below. Feet concolorous, brown. Tubercles minute. Spiracles black rimmed.

Food plants, "various plants." Alameda Co., Cal. A. Koebele, No. 171.

4. *Eueretagrotis sigmoides* Guenée.

Head 2.5 mm., rather dark brown, obscuring the markings, which are as in *R. alternata*. Body pale brown, somewhat pinkish or cream-color; dorsal line narrow, pale, brown marked, and shortly broken in the incisures; subdorsal shades and lines scarcely perceptible; substigmatal line straight above, narrowly pale, edged with a dark line that runs through the centers of the spiracles (except on joint 12), broad, illy defined below, and shading off into the pale subventral area.

Food plant not stated. Dept. Agriculture, No. 3185. Close to *R. alternata*, but the stigmatal line is more rigid and the subdorsal shades obscure.

5. *Noctua bicarnea* Guenée.

Head 3.5 mm., pale, distinctly reticulated, the vertical curved band very heavy and nearly black, distinct below, but without spot in clypeus; line from eye distinct on lower half of face. Body a little flattened, light brown, streaked and mottled with darker brown; dorsal and subdorsal lines pale, narrow, about alike, the former broadly bordered with a dark brown area, which is retracted at the incisures, the latter narrowly brown bordered, thus leaving a pale space between that widens at the incisures; a broad, regular, dark brown, mottled suprastigmatal band, just enclosing the spiracles, edged below by the whitish, narrow, slightly waved, upper line of the substigmatal band. This is pale, illy defined, reddish, sharply edged, but nearly indistinguishable from the light brownish subventral area. Feet pale; tubercles minute. Spiracles brown, black rimmed.

Food plant not stated. Washington, D. C., Dept. Agriculture.

6. *Feltia vancouverensis* Grote.

Head 3.6 mm., pale, reticulate, the curved vertical dark band faint below; ocellar line not strongly marked. Much as in *R. alternata*. Brown and cream-color, mottled on a greenish ground that appears subventrally; cervical shield gray, not well cornified. Lines all obsolete except the narrow, pale, dorsal one, which is moderately distinct on the anterior portion of the body only. The brown mottlings are heavier dorsally (contracted at the incisures), and above the normal position of the subdorsal line, enclosing a pale space that widens in the incisures. Tubercles in distinct, brown, corneous areas; setæ minute; spiracles black.

Food plant, wild cherry. Placer Co., Cal. A. Koebele, No. 236.

7. *Carneades wilsonii* Grote.

Head 3.6 mm., pale brown, reticulations very obscure, paler than the ground color which is thus divided into polygonal areas; vertical band obsolete above and below, existing as a dash beside the clypeus. Body green, lined with white. Dorsal, subdorsal, and lateral lines rather narrow, straight, but transversely cut into blotches; substigmatal line broad, obscurely double, being narrowly centered with green. Feet pale; spiracles black. Tubercles in distinct cornified areas; setæ minute.

Food plants, "two species of plants on the sea-coast." San Francisco, Cal. A. Koebele, No. 257.

8. *Carneades brunneigera* Grote.

Head 2.7 mm., roughly shagreened, dark brown, a pale space above the eyes on the side of each lobe; no reticulations. Body dull, sordid brown, the skin somewhat translucent. Cervical shield brown; markings obsolete; the pale dorsal line can be made out the whole length edged with a dark shade that is contracted at incisures; also a dark shade at position of subdorsal line, leaving a pale space widening at incisures as in *F. vancouverensis*. Spiracles black; tubercles in cornified areas; setæ minute.

Food plant not stated. Placer Co., Cal. A. Koebele, No. 141. Very similar to *F. vancouverensis*, but paler, more translucent, and the head roughened.

9. *Carneades perexcellens* Grote.

Head 3 mm., reddish-brown, shining; faintly marked by pale reticulations. Cervical shield shining brown, slightly cornified. Body sordid brown, somewhat translucent as in *C. brunneigera*, and similarly marked. Dorsal space broadly pale, nearly obscuring the pale dorsal line, this pale area only slightly widening at the incisures, and reaching almost to the faintly traceable, narrow, pale subdorsal line. Substigmatal line faintly shadowed, whitish, concolorous with the pale subventral area. Spiracles black; tubercles cornified; setæ minute.

Food plant not stated. Alameda, Cal. A. Koebele, No. 582. Closely similar to *C. brunneigera*, but the head is not roughened.

10. *Carneades divergens* Walker.

Head 2.9 mm., shining brown, the dark curved vertical shade distinct above and near the median suture; reticulations pale, obscure, dividing the sides into rounded dark spots. Cervical shield brown, darker before and behind, bisected by pale. Body sordid grayish, translucent, scarcely marked. Dorsal area broadly pale and nearly straight as in *perexcellens*. Subventral region light. Nothing else appears, at least in the inflated specimen. Spiracles black; tubercles cornified; setæ minute.

Food plant not stated. Placer Co., Cal. A. Koebele, No. 267. Similar to *C. brunneigera* and *perexcellens*, but more translucent than these, the tubercles distinctly contrasted.

11. *Mamestra meditata* Grote.

Head 2.5 mm., shining dark brown, reticulate with a still darker tint, the curved vertical band black, distinct above and below; ocellar line narrow; a dark spot in clypeus. Cervical shield blackish, shining, divided by dorsal and subdorsal pale lines. Body reddish-brown, finely marbled, somewhat paler below the spiracles. Two broad blackish shaded bands, the dorsal composed of segmentary diamond-shaped marks, faintly divided by the obscure dorsal line (as in *Carneades*, but less rounded); the lateral filling in the space between the subdorsal and substigmatal lines, or re-

duced to a series of oblique dashes above tubercle iii. These lines are pale, faintly traceable, the upper border of the substigmatal pale, bent down at the spiracles, the band itself obscure, defined, but scarcely paler than the subventral area, and not contrasting. Spiracles and feet blackish; tubercles in blackish areas; setæ minute.

"Found under wood." Dept. Agriculture, No. 2571.

12. *Mamestra detracta* Walker.

Head 3 mm., brown, shining, the bands and reticulations darker brown; vertical band faint below, ocellar band narrow. Cervical shield shining dark brown, divided by yellowish dorsal and subdorsal lines; anal plate brownish with central pale line. Body pale yellowish, finely marbled with red-brown; dorsal line nearly obsolete except anteriorly; subdorsal line more distinct, yellowish; below it the marblings are more dense. Feet pale, spiracles black ringed; tubercles and setæ minute.

"Found on leaf buds and at foot of hickory tree." Dept. of Agriculture, No. 3358.

13. *Mamestra rubefacta* Morrison.

Head 3 mm., shining brown, marked as in *M. detracta*. Cervical shield shining brown, divided by a central line and marked with pale on the lateral margins; anal plate brownish with central pale line. Body densely marbled with brown; dorsal line straight, narrow, distinct, slightly yellowish, more or less distinctly bordered by a diffuse dark shade. Substigmatal line broad, enclosing the spiracles, paler than the body but only slightly contrasted, the mottlings above it darker. Spiracles black ringed; tubercles brown, cornified; setæ distinct, pale. Feet pale.

Food plant not stated. Dept. of Agriculture, No. 2500.

14. *Mamestra quadrilineata* Grote.

Head 2 mm., brown, the reticulations darker, but broken; vertical band irregular, narrowed, a large patch behind vertex; surface dull, not shining. Body dark sordid brown, marks all obscured; a series of lateral darker patches below the pale, narrow, obscure, subdorsal line. The skin is densely roughened, granular, the tubercles somewhat enlarged, tubercle ii of joints 12 and 13 produced into distinct prominences with conical secondary spines. Setæ coarse, moderately long. Feet brown, concolorous with the body. Cervical shield and anal plate like the rest of the body, roughened.

Food plant not stated. Los Angeles Co., Cal. A. Koebele, No. 119.

15. *Mamestra quadrata* Smith.

Head about as high as wide, slightly bilobed, the area around clypeus and vertical dark bands somewhat translucent and poorly pigmented; reticulation brown, distinct on a pale ground; width 2.5 mm. Body sordid pale brownish, the lines mostly obscured by the fine, diffuse, dark brown reticulations. Dorsal line discernible, pale, most evident on the posterior parts of the segments, cutting the cervical shield. Oblique blackish sub-

dorsal shades, most distinct posteriorly, being somewhat curved on joints 11 and 12. Subdorsal line obsolete, a trace distinguishable, pale. Substigmatal line pale, rather broad, but nearly entirely obscured, touching the small spiracles which are white, black rimmed. Shields not cornified. Tubercles minute, setæ rather distinct, pale. Skin dorsally finely spinulose-pilose.

Placer Co., Cal. A. Koebele, No. 31. The moth is labelled 31?; other specimens bear the number 247.

16. *Hadena apamiformis* Guenée.

Head 3.2 mm., dark reddish-brown, shining, the reticulations and bands only a shade darker and not contrasted. Body rather pale brown; cervical shield large, semicircular, brown with pale central line and fainter subdorsal one; anal plate brown with central line. Dorsal line distinct, pale, joining the pale ground in the incisures and a little blotchy, bordered with a dark brown shade that is contracted at the incisures. Subdorsal line almost as distinct as the dorsal, separated from the pale area above by dashes of brown mottlings; lateral area filled in with dark mottlings. Substigmatal line broad, sharp edged above, completely enclosing the spiracles, continuous with the pale subventral area. Legs corneous brown; spiracles black ringed; tubercles in corneous areas; setæ minute.

Food plant not stated. Dept. of Agriculture, No. 2491.

17. *Hadena cuculliformis* Grote.

Head 3.2 mm., shining reddish-brown, the markings almost entirely obsolete. Cervical shield brown, blackish edged, a distinct central pale line and traces of a subdorsal line. Dorsal region heavily blackish strigose mottled; dorsal and subdorsal lines broad, pale, dotted and mottled with blackish. Stigmatal line broad, touching tubercle iii, centered by the spiracles, sharp edged, pale, but scarcely contrasted from the pale subventral region. Feet pale, the leg shields corneous brown. Spiracles black ringed; tubercles corneous; setæ rather distinct, pale.

Food plant *Elymus condensatus*. Santa Cruz Mts., Cal. A. Koebele, No. 637.

18. *Hadena relecina* Morrison.

Head 3.5 mm., large, scarcely at all retracted below joint 2, greenish, shaded with corneous brown, the mouth-parts darker. Body dull greenish, mottled with purplish without any markings, at least in the inflated specimen. Spiracles black, feet pale, tubercles and setæ minute.

"Food plants various." Placer Co., Cal. A. Koebele, No. 30.

19. *Hadena genetrix* Grote.

Head green without distinct marks; mouth brownish, ocelli black; width 1.5 mm. Body green with the lines white, conspicuous, widened almost into diamond shape in the middle of each segment. Dorsal line rather broad, white, narrowed in the incisures and greenish tinted on the segments, reaching the ends. Subdorsal line white, nearly broken in the

incisures and sharply, angularly widened in the center of each segment, edged above with brown, this color produced obliquely forward a little from the apices of the widened portions. The line reaches the anterior end, but is not distinct on joint 13. Substigmatal line white, strongly narrowed in the incisures, widest behind the spiracles, shaded with green in the centers of the segments; edged narrowly above and below with dark brown, the lower border widened into diffuse patches posteriorly on the segments. The line reaches the anterior end and the anal foot. Feet normal, spiracles small, white, black ringed. Tubercles minute; setæ moderate, pale.

Food plant, *Adenostoma fascicularium*. Alameda Co., Cal. A. Koeble, No. 409.

20. *Hadena adnixa* Grote.

Head 2.8 mm., pale brown, mouth concolorous, ocelli black. Body green, finely dotted and streaked with white. Dorsal line white, narrow, straight, distinct, a little widened in the incisures, not broken; subdorsal line narrower, dotted, white; substigmatal line narrow, equal to twice the height of the spiracle, which it partly encloses, the upper half dark red, the lower half yellow. Spiracles narrowly black rimmed; feet whitish; tubercles and setæ minute; cervical shield entirely uncornified; imperceptible.

Food plant, wild cherry. Placer Co., Cal. A. Koebele, No. 223.

21. *Oligia grata* Hübner.

Head 2 mm., shining brown-black, the curved vertical band, clypeus, and a patch above the eyes paler. Thorax (joints 3 and 4) and joint 12 distinctly swollen, the larva robust with small head. Dark brown to greenish gray, mottled, finely peppered with pale; dorsal line whitish, narrow, absent on thorax and joint 13, diffusely widened in the centers of the segments 6-12 or straight and red tinted. Subdorsal band broad, pale, obscured in dark specimens. Substigmatal area uniformly lighter, the white dottings more numerous, its upper edge sharp, waved, passing below the spiracles, grading below into the subventral area, not contrasted. A row of faint orange subventral shades. A blackish patch below tubercle i on joint 6. Thoracic feet black marked; abdominal ones spotted. Spiracles black; tubercles and setæ minute.

Food plant not stated. Washington, D. C. Dept. Agriculture, No. 2485.

22. *Macronoctua onusta* Grote.

Head roughened with creases, clypeus bulging, depressed on either side; dark mahogany brown, shading to black around the mouth, shining; width 4.5 mm. Body smooth, translucent sordid white, thin-skinned; dorsally shaded with dull red. Spiracles black; no markings. Cervical shield large, cornified, light brown, obscurely bisected, uniform; pre-spiracular tubercle also well cornified. Anal plate large, rather weakly cornified, but with large, sparse, black punctures. Leg shields very weak,

the feet rather slender, but equal. Thoracic feet small, brown. Tubercle *iii*a small, but rather distinct, situated before the upper corner of the spiracle. Tubercles and setæ minute, dark.

Bores in the roots of German lily. Charles City, Iowa. Dept. of Agriculture, No. 8145.

23. *Dargida procincta* Grote.

Head 3.5 mm., large, pale, the curved band, clypeus and reticulations light brown, dividing the lobes into a series of whitish spots, each composed of little confluent dots. Body olive brown, longitudinally strigose, dotted with pale. Dorsal line broad, pinkish, filled with brown strigæ, producing the effect of a rich pulverulent brown; subdorsal line broader (1 mm.), pale yellow, slightly olive dotted, edged above with dark velvety shades at anterior borders of segments, and also, more faintly, below. Lateral band broad, like the subdorsal, but a little narrower and fainter, not edged; substigmatal band as broad as the subdorsal, including the lower edges of the spiracles, whitish, but filled in with dull red, except its sharp upper and lower edges. Subventral region and feet paler. Spiracles white with a dark velvety shade above, narrowly black ringed. Cervical shield and anal plate slightly yellowish, marked by the subdorsal line, the shield also by a pale dorsal streak. Tubercles and setæ minute.

Food plant not stated. Placer Co., Cal. A. Koebele, No. 142.

24. *Caradrina miranda* Grote.

Head 1.8 mm., light brown, the curved vertical band distinct throughout and with the reticulations dark brown, but the latter are faint above. Body pale brown, mottled with gray, faintly marked, but almost exactly as in *Mamestra meditata*. Dorsal line obsolete except anteriorly, the gray shade bordering it constricted at the incisures; subdorsal line obsolete, the space between it and the stigmatal line shaded with gray; substigmatal band pale, indistinct, sharp edged above, straight and partly enclosing the spiracles, illy defined below except slightly by faint subventral orange patches. Spiracles black, tubercles and setæ minute; shield and anal plate scarcely perceptible.

Food plant not stated. Alameda Co., Cal. A. Koebele, No. 358.

25. *Caradrina extimia* Walker.

Head 2 mm., dark reddish-brown, faintly dotted above with darker brown. Body somewhat translucent, pale, mottled with gray with a reddish tint. Dorsal region broadly pale, containing very faintly the gray diamond-shaped marks; dorsal line obsolete except anteriorly, pale. Space between subdorsal line and spiracles dark. Other lines obsolete, the subventral region gradually paler below. Spiracles black; tubercles minute, but cornified, in pale areas; setæ rather large. Feet pale; cervical shield and anal plate slightly cornified.

"Found under boards." Santa Clara Co., Cal. A. Koebele, No. 169.

26. *Orthodes vecors* Guenée.

Head 2.3 mm., brown, the vertical band and reticulations paler, leaving dark spottings on the lobes. Body pale, mottled with brown gray, marked as in *Caradrina miranda*. The dorsal dark shade forms rather distinct diamond-shaped marks, cut by the narrow, pulverulent, pale dorsal line. Lateral area heavily brown mottled, dark, darkest just above the spiracles. Substigmatal line broad, defined, reddish, partly enclosing the spiracles, distinguished from the subventral area. Thoracic feet pale, leg plates dusky. Shields slightly cornified, cut by the dorsal line. Spiracles black, tubercles and setæ minute. Joint 12 rather distinctly enlarged, with a pale transverse line, connecting the subdorsal lines; joints 11 and 12 shaded distinctly with brown on the sides.

Food plant not stated. Dept. of Agriculture, No. 3501.

27. *Tæniocampa rufula* Grote.

Head 2.5 mm., light brown, vertical curved band and reticulations dark brown, distinct throughout. Body pale brown, somewhat reddish dorsally; cervical shield distinct, brown before, pink behind; anal plate pale except at the sides. Dorsal line pale, pulverulent, broken into a series of dashes centering the diffuse, dark, diamond-shaped, segmentary patches. Subdorsal line undulate, pale, not defined from the pale area bordering the dorsal patches. Sides darkly mottled, all the lines obsolete, the color becoming paler below, but marked with a double row of subventral brown patches (on tubercle v and before vi). Feet brown; spiracles black; tubercles in cornified areas, setæ black, rather distinct. On joint 12 the subdorsal line widens almost to the spiracle.

"Food plants various." Alameda Co., Cal. A. Koebele, No. 46.

28. *Tæniocampa pacifica* Harvey.

Head 3.3 mm., green, the vertical band and reticulations faintly brown. Body green, the segments rather distinctly 4-annulate, speckled with white. Dorsal line white, distinct, narrow; subdorsal line narrower, pulverulent, broken, the dottings tending to form a line between these; stigmatal band narrow, white, running just above the spiracles except on joints 2 and 12, slightly tinted with olive above on the thorax. Feet pale; spiracles white, narrowly black rimmed; tubercles and setæ minute.

Food plant *Æsculus californica*. Alameda Co., Cal. A. Koebele, No. 334. Exactly like the eastern *T. alia*.

29. *Orthosea purpurea* Grote.

Head 3.8 mm., pale, the vertical band and reticulations dark brown, distinct throughout. Cervical shield dull black, cut faintly by dorsal, distinctly by pale subdorsal lines. Body greenish, streaked and mottled with reddish-brown; dorsal line pale, very narrow and broken down between the segments; oblique shades olivaceous, distinct on joints 5 to 12, the pale subdorsal line broken into a series of dashes that partly border the shades behind. Substigmatal band broad, yellowish, partly enclosing the

spiracles, straight, defined above and below. Subventral area reddish; feet pale; spiracles black ringed; tubercles and setæ minute. On joint 12 the oblique shades join a medio-dorsal shade, forming a trifold mark that is rounded behind.

Food plant not stated. Alameda Co., Cal. A. Koebele, No. 583. Before the last stage the larva is green and differs considerably in appearance.

30. *Orthosia bicolorago* Guenée.

Head 2 mm., shining brown, vertical band and reticulations darker brown, distinct throughout. Body greenish, heavily mottled with red-brown; cervical shield brown, mottled, faintly divided by dorsal and distinctly by subdorsal lines. Dorsal line pale, narrow, pulverulent; oblique shades brown, each filled in before to the dorsal line, producing a series of dark segmentary triangles, the base in front and a little produced along the dorsal line. Subdorsal line pale, narrow, pulverulent, throwing off faint branches that partly border the oblique shades behind. Substigmatal line indicated by pale mottlings, obsolete. Spiracles black, in dark areas; feet pale, leg plates dusky; tubercles and setæ minute, in pale areas.

Food plant, maple. Dept. Agriculture, No. 3369.

31. *Glæa olivata* Harvey.

Head 3.6 mm., pale brown, the vertical band and reticulations distinct, but not very dark; reticulations fine. Body olivaceous, mottled with brown, and dotted with pale; shield more uniformly brown, cut by the lines. Dorsal line narrow, pale, straight; subdorsal pale, but nearly lost in the dots and mottlings. Substigmatal band broad, sharp edged, just touching the spiracles, but well below those on joints 2 and 12, yellowish, broadly centered with red-brown mottlings, edged above by a narrow dark brown line that partly encloses the spiracles. Feet pale; spiracles black ringed; tubercles and setæ minute.

Food plants oak and wild cherry. Dept. Agriculture, No. 3357.

32. *Glæa inulta* Grote.

Head 3.8 mm., pale brown, the usual markings nearly obsolete, but the tubercles, mouth, and sutures of clypeus dark brown, these sutures trisecting a faint orange-yellow band that extends across between setæ viii of the two lobes. (Seta viii is just above ix, both being above the base of antenna.) Body translucent, sordid whitish, immaculate, the tubercles, shield, and anal plate cornified, brownish. Spiracles black; legs with dark claspers; tubercles and setæ small.

Food plant *Viburnum nudum*. Dept. Agriculture, No. 3368. The head of this larva is marked curiously like that of *Charadra deridens*. Judging from this unusual marking and the thin skin, one would say that this was a concealed feeder, living in a spun-up leaf.

33. *Jodia rufago* Hübner.

Head 3 mm., light brown, the vertical band and reticulations darker brown, distinct; clypeus pale. Body light brown, finely mottled on a pale

ground; cervical shield contrasting, velvety black, divided only by the yellowish subdorsal line; anal plate pale. Dorsal and subdorsal lines narrow, pale, breaking down; tubercles in brown rings. Stigmatal band pale yellow, narrow, nearly enclosing the spiracles except on joints 2 and 12 where it passes below them, not wider than the height of a spiracle. Feet pale, except the tips of the thoracic ones; spiracles black rimmed; tubercles and setæ minute.

Food plant, oak. Dept. Agriculture, No. 3350. Before the last stage the cervical shield is not black.

34. *Xylina carbonaria* Harvey.

Head wider than high, scarcely bilobed, shining, pale brown marked with very dark brown; an even vertical band from the back of the head to the clypeus near apex; distinct reticulations all over the surface, the paraclypeal pieces and cheeks below ocelli also dark; clypeus centrally pale and somewhat translucent; width 2.8 mm. Body pale brown, heavily marbled-reticulate with red-brown. Dorsal line straight, narrow, pale, not cutting the anal plate and only faintly so the cervical shield. Substigmatal line rather narrow, pale, but overlaid by the red reticulations. Spiracles narrowly black edged. Leg plates uncornified, shields somewhat corneous, distinct, brown, not shining. Feet equal, tubercles and setæ minute, dark.

Food plant, willow (*Salix californica*). Los Angeles Co., California. A. Koebele, No. 144.

35. *Xylomiges ochracea* Riley.

Head rather small, wider than high, green, clypeus whitish; a diffuse brown vertical band to base of clypeus and two short side lines, the reticulations faint except toward the back of the head; labrum pale; width 2.5 mm. Body reddish-brown, dotted, mottled, the pale ground obscured except narrowly at the incisures. Dorsal line distinct, widening in the center of each segment, yellowish white, suffused with pink, reaching the extremities. Subdorsal line broad, sharp, yellowish white, narrowly vinous red in the incisures, edged above diffusely with velvety brown; lateral line present, narrow, yellowish white, the edges somewhat crenulate and breaking down, irregularly edged with velvety brown below. Both this line and the subdorsal reach the extremities. Substigmatal line broad, distinct, sharp edged, narrowed in the incisures, touching the lower edges of all the spiracles, reaching from joint 2 anteriorly to the end of the anal foot, yellowish-white, centered with diffuse vinous mottlings. Spiracles narrowly dark rimmed. Shields scarcely cornified, cut by all the lines; tubercles and setæ minute.

Food plant, *Artemisia californica*. Los Angeles Co., Cal. A. Koebele, No. 115.

36. *Xylomiges patalis* Grote.

Head 2.7 mm., pale around mouth and base of antennæ, heavily shaded with dark brown above, the vertical band distinct below. Body dark

brown, mottled with black crinkled lines and streaks, the ordinary lines obsolete. Dorsally there is a brown shading that fills in the triangular area marked out by the oblique shades when they are present; behind these areas the black linings prevail. On the sides the black lines produce diffuse patches laterally, and at the spiracles, on joint 12 forming a dorsal dash. Spiracles black; feet pale, leg plates dusky. Tubercles small, cornified, vi rather large; setæ minute. Substigmatal band very faintly outlined, broad, pale.

Food plant not stated. Alameda Co., Cal. A. Koebele, No. 248.

37. *Plusiodonta compressipalpis* Guenée.

Head 2.3 mm., not retracted below joint 2, pale brown with a darker brown spot behind the eyes which is circled by a similarly colored band that starts behind vertex, borders clypeus and covers ocelli; clypeus brown. Body purplish brown, the ordinary lines reduced to obscure pale mottlings; a large white blotch on joint 5 covering the back to the spiracles, narrowed dorsally; another blotch on joints 7 to 9, oblique, starting in a point dorsally on joint 7, covering most of 8 except ventrally anteriorly, and ending at the foot on joint 9. Dorsal area of joints 9 to 11 slightly tessellated with white to a pinkish white subdorsal patch on 11 and 12, that narrowly reaches the dorsum on 12 and covers the spiracle. A black lateral dash on joints 5, 7 and 9 to 11. Spiracles white, black ringed. Thoracic feet pale; abdominal ones purplish, entirely absent on joints 7 and 8. Tubercles and setæ minute.

Food plant *Menespermum canadense*. Dept. Agriculture, No. 2760. This larva mimics the excrement of birds.

38. *Thalpochares carmelita* Morrison.

Head 1.4 mm., black. Body somewhat thickened centrally; abdominal feet of joints 7 and 8 entirely absent. Setæ from very small tubercles, i short, ii and iii very long, pale, iv short, v moderate, vi and vii short but the hairs of vii longer on the legless segments. Body uniformly brown without marks; shields not differentiated. Skin shagreened, with large, clear, not contiguous granules. Thoracic feet black, the abdominal ones with black plates. Spiracles minute, entirely pale.

Food plant, *Gnappalium*. Dept. Agriculture, No. 4554. Bluffton, S. C. J. H. Mellichamp. A curious little larva, feeding concealed in the flower heads.

39. *Euclidia cuspidata* Hübner.

Head 3 mm., pale with numerous parallel brown stripes running toward the mouth from occiput. These form a broad shade over the centers of the lobes, leaving the sutures and clypeus yellowish, with narrow central brown shades. Behind the eyes the stripes are reddish and mottled. Body long and slender, feet of joint 7 absent, those of 8 small and short. Light brown, finely lined with many longitudinal dotted streaks both dorsally and ventrally. Dorsal line rather broadly pale, containing a double

reddish line; subdorsal region dark, mottled and paler on joints 8-10; sides pale to below spiracles; subventral region dark, reddish below, the center of the venter again pale. Feet pale, mottled; a ventral brown spot before the feet of joint 8. Spiracles brown, black ringed; tubercles and setæ small in blackish spots. There are about thirteen lines on each side of the body, each obscurely double.

Food plants, clover and grass. Dept. Agriculture, No. 2823.

40. *Catocala illecta* Walker.

Head 3.5 mm., purplish brown, mottled, a pale stripe behind base of eyes; three vertical black lines on each lobe, not attaining the summit and a line in the clypeus. Body finely transversely banded with purplish white and black, cut by a broad, white, substigmatal band and quadrate deep pink spots at the tubercles. There are about sixteen transverse black lines on each segment, irregularly in pairs, forming a dorsal rectangle above the spot at tubercle i, less distinctly so above ii and on the sides between these tubercles and iii. The pink spots of iii and iv are adjacent to the spiracle and rest on the white substigmatal band. Subventrally the black lines reappear, but the venter is uniformly pale reddish, except for a row of mid-ventral blackish blotches. Feet brown, plates blackish; cervical shield and anal plate reddish; spiracles black, very narrowly pale centered; tubercles and setæ minute. Feet almost equally developed.

Labelled in Dr. Riley's handwriting, but I find no record of the food plant or collector; possibly it was from J. Boll. This larva somewhat resembles the *Agaristidæ*.

41. *Catocala amestris* Strecker.

Head 3.4 mm., whitish with six vertical black lines on each lobe and one in the clypeus, broken at vertex by a yellowish spot, somewhat dotted on the sides of head. Body slender, purplish white, longitudinally lined with black. Medio-dorsal line narrow, purple; between it and the spiracles six narrow black lines on each side, the lower ones somewhat more closely spaced, all a little dotted, the lowest one broad and crossing the spiracles. A white substigmatal band, succeeded by a broken black line and another white band over tubercle vi; a black band along the bases of the feet; venter heavily black blotched. Feet and spiracles black; tubercles distinct, sordid yellow with pale setæ. Feet about equally developed.

Food plant, *Amorpha fruticosa*. Texas. J. Boll.

42. *Catocala hermia* Hy. Edwards.

Head 4 mm., large, scarcely retracted, the lobes somewhat bulging above before; red-brown, mottled, a black line from ocelli to vertex, the pair meeting above behind the bulgings of the lobes; clypeus somewhat sunken, a brown central line. Body slightly roughened, tubercles produced especially ii; a transverse dorsal ridge between ii on joints 9 and 12. Along subventral margin a fringe of secondary, root-like white processes. Brown, all the lines obsolete, reduced to a series of black

dots which are spread sparsely over the surface. Feet pale, the abdominal ones almost equally developed; setæ minute. Spiracles pale, black rimmed. A series of large, brown-black, medio-ventral blotches.

"Bred on willow." Placer Co., Cal. A. Koebele, No. 165. This larva resembles the bark of a tree.

43. *Siavana repanda* Walker.

Head 3.8 mm., full, thick, the clypeus small; green, slightly shagreened; ocelli pale. Body smooth, robust, green, finely uniformly peppered with red-brown. Tubercles and setæ minute; spiracles and feet pale. Feet about equal. The specimen is not as admirably prepared as Koebele's later work, but I think there were no other markings present.

Food plant, live oak. Florida. A. Koebele.

44. *Eubolina integerrima* Walker.

Head 4 mm., full, thick, not retracted; brownish-white with many black dots, segregated around the sutures and lower two-thirds of sides, leaving the apices of the lobes pale with a separated spot in front. Body slender, but large, tubercles ii of joints 12 and 13 smoothly, conically produced; the feet of joints 7 and 8 rudimentary. Gray, a whitish ground, dotted and blotched with black. The numerous small round dots are sparser dorsally in the incisures of joints 5-6, 6-7 and 7-8, contrasted with a large black patch on each side, the remains of a subdorsal line that is traceable posteriorly, waved. Sides without distinct lines, dotted, some of the dots dull red. Venter paler, with medio-ventral dark blotches. Tubercles minute; setæ rather coarse, white; spiracles black; feet pale.

Food plant, live oak. Florida. A. Koebele. This larva resembles the bark of a tree.

45. *Hyamia perditalis* Walker.

Head 1.5 mm., pale brown, darker on the faces of the lobes, a little mottled. Body green with a broad, diffuse dark red dorsal stripe more or less distinct. Spiracles small, brown; tubercles minute, setæ pale; feet green, equally developed.

Food plant, *Cephalanthus*. Dept. Agriculture, No. 2849.

46. *Megachyta lituralis* Hübner.

Head 1.5 mm., pale brown, faintly reticulate with darker; a double brown band in clypeus, meeting above and a short band above each antenna, not contrasted. Body light yellow-brown, reticulated with dark red which forms distinctly a rather broad dorsal line and more narrowly oblique side stripes up from the spiracle reach forward to above the level of tubercle iii. Tubercles large, brown, in the pale parts of the surface; setæ short, pale. Feet pale, equal; spiracles black.

Food plant, dead leaves. Dept. Agriculture.

47. *Pityolita pedipillalis* Guenée.

Head 1.5 mm., greenish brown, finely reticulated with brown; sutures of clypeus brown. Body greenish, neatly reticulated with red-brown,

which forms a diffuse dark dorsal shade not strongly contrasted, and oblique lines as in the preceding species. Tubercles brown, in the pale parts of the surface; setæ short, pale. Feet pale, equal; spiracles black.

Food plant, dead leaves. Dept. Agriculture, No. 2585.

48. *Zanclognatha obscuripennis* Grote.

Head 2 mm., pale yellowish with brown reticulations, no distinct bands. Body yellowish with fine dark red reticulations crinkled and broken, forming no bands. Tubercles large, brown, in the pale parts of the surface; setæ short, pale. Feet equal; spiracles dark brown with very narrow paler centers.

Food plant, dead leaves. Dept. Agriculture, No. 2807.

49. *Bomolocha caducalis* Walker.

Head 2.3 mm., green, tubercle i black with a little dark blotch below the setæ is broken off in the specimen, so I cannot tell whether it was pathulate). Body slender, green, a faint white subdorsal stripe below tubercle ii. Tubercles large, a little elevated, reddish; setæ dusky. Feet pale, about equal; spiracles brown rimmed.

Food plant, walnut. Dept. Agriculture, No. 2841.

50. *Hypena modesta* Smith.

Head 1.6 mm., green, faintly brown dotted, rather prominent; tubercles distinct, brown. Body long and slender, the feet of joint 7 entirely wanting. Green, without perceptible lines. Tubercles large, conic, white, centrally dark with long, slightly dusky setæ. Feet pale; spiracles small, brown rimmed.

Food plant, nettle. Nevada Co., Cal. A. Koebele, No. 194.

From the species recorded in Bulletins 35 and 44 of the U. S. National Museum, it appears that only a fraction over 10 per cent. of the described species of North American Noctuidæ (exclusive of the Acronyctæ) have had their larvæ made known. The present article brings this proportion up to 13 per cent., but this is still too small to make the recognition of species from the larva alone feasible, so that a synoptic table of Noctuid larvæ would be of little use at this time. I have, therefore, simply thrown the species here described into synoptic form, to indicate the general lines on which our Noctuidæ may be separated when they are better known. This synopsis is also in part supplementary to the descriptions, as several of the more general characters here given are not repeated separately under each.

- 1. Tubercle iv (joints 7 to 10) behind the center or upper edge of spiracle 2
- Tubercle iv (joints 7 to 10) below the center of spiracle or lower. 32
- 2. Mottled with brown, the ground usually a lighter shade of brown, rarely greenish 3
- Green, lined with white, without brown shades.... 29

3. No pale lines between subdorsal and substigmatal lines..... 5
 A distinct pale lateral line 4
4. Subdorsal and substigmatal lines uniform.....23. *Dargida procincta*
 Lines narrow and blotched in incisures35. *Xylomiges ochracea*
5. With blackish subdorsal oblique shades..... 6
 With whitish oblique shades..... 3. *Rhynchagrotis crenulata*
 Dorsal space broadly pale with blackish shades diamond-shaped
 or rounded or filling in all the space 10
 Dorsal space not dark shaded 24
6. Joint 12 enlarged with a black patch behind,
 1. *Rhynchagrotis rufipectus*
 Joint 12 not unusually enlarged..... 7
7. Cervical shield concolorous, obscure 8
 Cervical shield more distinct, dark, pale lined 9
8. Tubercles i pale, contrasted; body dark...2. *Rhynchagrotis alternata*
 Tubercles i dark; body light brown4. *Eueretagrotis signoides*
 Tubercle i in pale area, not contrasted; body uniformly obscured,
 15. *Mamestra quadrata*
9. Substigmatal line broad, pale yellow.....29. *Orthosia purpurea*
 Substigmatal line obsolete, covered by brown mottlings,
 30. *Orthosia bicolorago*
10. Dorsal space at least in part pale 11
 Dorsal space all blackish 22
11. Markings in dorsal space diamond-shaped..... 12
 Markings rounded, linear or obscure..... 15
12. Cervical shield distinct..... 13
 Cervical shield obscure, concolorous 16
13. A double row of subventral dark spots.....27. *Taniocampa rufula*
 Subventral region all pale..... 14
14. Cervical shield with lateral margin straight, incised,
 6. *Feltia vancouverensis*
 Cervical shield with lateral margins oblique ..11. *Mamestra meditata*
15. Cervical shield obscure, concolorous..... 17
 Cervical shield distinct, shining..... 19
16. Head pale brown, all shining.....26. *Orthodes vecors*
 Head darkly reticulated, only the clypeus shining,
 36. *Xylomiges patalis*
17. Dorsal shades elliptical, a dark superstigmatal band,
 5. *Noctua bicarnea*
 Dorsal shades diffuse; no contrasting superstigmatal band..... 18
18. Opaque; head with lines and reticulations....24. *Caradrina miranda*
 More translucent; head nearly uniformly red-brown,
 25. *Caradrina extimia*
19. Opaque, dark shaded, dorsal shades linear...15. *Hadena apamiformis*
 More translucent, dorsal shades obscured..... 20
20. Head shagreened, dull..... 8. *Carneades brunneigera*
 Head smooth, shining 21

21. Markings rather distinct, head and cervical shield dark red-brown,
 9. *Carneades perexcellens*
 Translucent, marks obscured; head and cervical shield black
 lined..... 10. *Carneades divergens*
22. Body roughened, uniformly blackish14. *Mamestra quadrilineata*
 Body smooth, normal..... 23
23. Subdorsal line obscured, dorsal line pale.....13. *Mamestra rubefacta*
 Subdorsal line as distinct as dorsal one, spaces shaded,
 17. *Hadena cuculliformis*
24. Thorax and joint 12 enlarged; a black subdorsal spot on joint 6,
 21. *Oligia grata*
 Thorax and joint 12 not unusually enlarged..... 25
25. Substigmatal line absent..... 26
 Substigmatal line distinct 27
26. Red-brown and yellowish; subdorsal line distinct,
 12. *Mamestra detracta*
 Green with brown mottlings; no lines18. *Hadena relecina*
 Translucent, sordid, no marks..... 28
27. Substigmatal line broad, filled in with red mottlings 30
 Substigmatal line narrow, yellow.....33. *Fodia rufago*
28. Head red-brown, dorsum red shaded.....22. *Macronoctua onusta*
 Head pale brown, body uniform.....32. *Glæa inulta*
29. Substigmatal line broad, white.....7. *Carneades wilsonii*
 Substigmatal line narrow, white or yellow..... 31
 Substigmatal line sharply narrowed in incisures, white, partly
 green tinted.....19. *Hadena genatrix*
30. Substigmatal line broad, its edge sharp.....31. *Glæa olivata*
 Substigmatal line moderate, diffused, not sharp.34. *Xylina carbonaria*
31. Substigmatal line below spiracles, red edged above,
 20. *Hadena adnixa*
 Substigmatal line above spiracles centrally, not red edged,
 28. *Tæniocampa pacifica*
32. Feet absent on joints 7 and 8 33
 Feet absent on joint 7..... 34
 Feet all present, though anterior ones often small..... 35
33. Green with white lines (see species of *Plusia*).
 Purple brown with white blotches.....37. *Plusiodonta compressipalpis*
 Uniformly brown without marks.....38. *Thalpocharis carmelita*
34. Pale brown with dark lines; feet of joint 8 small,
 39. *Euclidia cuspidata*
 Green; feet of joint 8 like 9 and 10.....50. *Hypena modesta*
35. Feet on joints 7 and 8 small; marked like bark of tree,
 44. *Eubolina integerrima*
 Feet all about alike..... 36
36. Green with white or red lines..... 37
 Olivaceous, brown mottled, substigmatal line red centered..... 27

- Green, the white lines widened diamond shape. 29
 Green with brown dottings43. *Siavana repanda*
 Not green..... 38
37. A white subdorsal line; skin smooth.....49. *Bomolocha caducalis*
 A dorsal red band only.....45. *Hyamia perditalis*
38. White substigmatal line distinct 39
 No white substigmatal line..... 40
39. Black lines transverse..... 40. *Catocala illecta*
 Black lines longitudinal41. *Catocala amestris*
40. With subventral fringe; resembling bark.....42. *Catocala hermia*
 Without subventral processes, small..... 41
41. Dorsal line present..... 42
 Dorsal line absent, reticulations broken,
 48. *Zanclognatha obscuripennis*
42. Yellow and brown; dorsal line strong.....46. *Megachyta lituralis*
 Greenish and brown; dorsal line diffuse.....47. *Pityolita pedipillalis*

A discussion followed of the structural features of the larvæ used in their classification, participated in by Messrs. Ashmead, Marlatt, and Dyar.

JUNE 2, 1898.

Vice-President Gill in the chair, and Messrs. Patten, Ashmead, Pollard, Marlatt, Benton, Sherman, Currie, Sanderson, Motter, Pratt, Johnson, Howard, and Heidemann also present.

—Under the head of “Short Notes and Exhibition of Specimens,” Mr. Pratt exhibited specimens of *Borus unicolor*, taken under bark of *Pinus inops* at Rosslyn, Va. The species had been found near Washington many years ago, but Mr. Schwarz had considered it to be practically extinct. He also showed specimens of *Orchestes ephippiatus*, taken on willow near Tennallytown, D. C. Apropos to extinct species, Dr. Gill spoke of the supposed extinction of *Lophelatelus chameleonticeps*, formerly very abundant, and which for years was never seen, even in a single specimen. Within the last three years, however, it has become abundant once more in the old region. Mr. Ashmead instanced *Cynips notha* O. S., a species which for 35 years had not been taken. The present spring it was re-discovered by Dr. Dyar and shown to belong to the genus *Neuroterus*.