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DESCRIPTION OF A PECULIAR NEW LIPARID GENUS FROM MAINE.

BY B. NEUMOEGEN, NEW YORK.

DYARIA, *nov. gen.*

Head prominent, with a high vertical tuft. Front nearly square, rather higher than broad; slightly convex. Vertex small, with a low, conical central projection. Ocelli absent. Eyes large, naked, reaching as far as the front and above the vertex. Antennæ inserted far apart, close to the margin of the eyes. In ♂ lengthily bipectinate, the pectinations diminishing gradually, the distal third being bare. To judge from the fragments of a ♀ specimen with broken off antennæ (only 6 joints left to judge from), the ♀ antennæ are apparently simple. Palpi exceeding front by two-thirds their length; second joint very large, third small. Tongue weak, but moderately long, coiled. Thorax robust, about as broad as long.

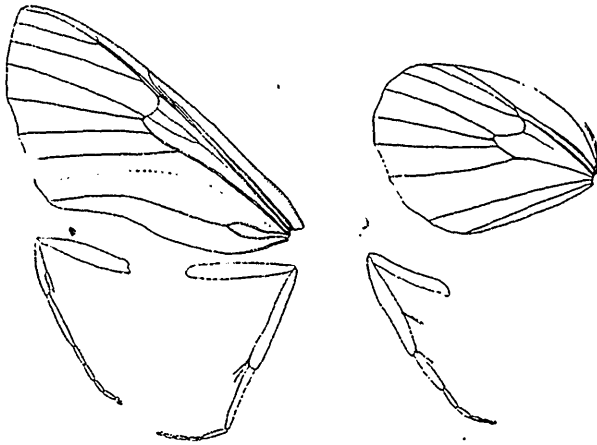


DYARIA SINGULARIS,

Neum. ♂.

(Enlarged about double its size.)

Primaries well drawn out, about twice as long as broad. Costa straight, apices pointed and exterior margins well rounded. Vein 1 free and straight, furcate at base. Median four branched. Vein 2 arising very much beyond middle of cell; 4 and 5 approximate at their origin, at lower angle of cell. Cell closed, rather narrow and near to the costal edge. Cross vein bent inwardly at centre. A long, very narrow accessory cell, reaching from the apex of discal cell more than half way to apex of wing, its sides in apposition except at the two extremities, so that it is closed for the greater part of its length. Vein 6 from the under side of accessory cell, near its origin; 7 and 10 from the end of accessory cell, on each side of a stalk, which becomes furcate very close to the apex of wing, thus forming veins 8 and 9. Vein 11 from the subcostal beyond the middle of the discal cell. Vein 12 free from base.



Venation of wings and legs of *DYARIA SINGULARIS*, Neum, ♀.
(Greatly Enlarged.)

A furcate, false discal vein in discal cell, and a distinct submedian fold.

Secondaries about as broad as long; exterior margins well rounded, bluntly pointed at angle. Anal margins straight. Two internal veins. Median four branched, as in primaries. Vein 3 arising near lower angle of cell; 4 and 5 close together from the lower angle of cell, which is pointedly drawn out. Cell closed. Cross vein angulated, its lower, longer limb obliquely drawn out; its upper approximately at right angles to the subcostal. Veins 6 and 7 from the upper angle of the cell, 7 united to 8 at a point about one-fifth of its length from origin, then free to exterior margin. Vein 8 free from base, except at its junction with 7, nearly straight, but slightly bent at the junction, not sinuate. Traces of a discal vein.

Frenulum present; in ♀ a long double spine; in ♂ a long spine fastened into a loop on the subcostal vein of primaries.

Abdomen long and slender, exceeding secondaries by about one-fourth, thickest centrally, gently tapering; slightly tufted. Legs long and slender; the middle pair the longest, the others subequal. Anterior tibiae unarmed, short, not longer than the first tarsal joint, with an epiphysis less than its own length, projecting with conical tip. Tarsi feebly spinulated, with terminal claws. Middle tibiae with a pair of long, sharp apical spurs. Hind tibiae slightly enlarged centrally, quite long and thick, with submedian and apical pair of long spurs.

Dedicated to my faithful co-labourer and friend Mr. H. G. Dyar.

This is a very queer genus; although not a typical Liparid, I do not see any other way but to place it among the Liparidæ of our fauna. DYARIA SINGULARIS, *nov. spec.*

Eyes black. Head, as well as hairy tuft on latter, yellowish-gray. Vertex between the stems of antennæ blackish. Thorax yellowish-gray interspersed with black hair.

Wings thickly scaled, whitish-gray with the following maculations in black or light brown:—

Primaries: Three transverse lines in black. The t. a. line curving outwardly at centre. The basal space enclosed by it, densely scaled with blackish-brown hair from costa to interior margin. The t. p. line undulating, dented inwardly between median vein and interior margin. The cellular, as well as median space enclosed by the t. a. and t. p. lines, is whitish, densely dotted with black granules. A prominent black discal spot, tufted with yellowish hair. A subterminal line of black dots; space between the latter and the t. p. line of light brown. Subterminal space gray, with blackish shades along veins, and a terminal line of black dots at intersection of veins. Yellowish-brown fringes.

Secondaries: An undulating mesial line, and a subterminal line of subtriangular dots, both of blackish colour. Mesian space light brown, subterminal space gray with black granules. A blackish terminal line, and a heavy tuft, along anal margin, of yellowish-gray. Fringes of the same colour. The basal space whitish with black grains. In the centre a distinct black discal spot, heavily tufted. Abdomen yellowish-gray, with black segmentary lines and white dorsal hair along latter.

Below, both wings of lustrous yellowish-gray, showing blackish tints in apical part of submedian space of primaries, as well as faint traces of the t. p. line. Very faint indications of transverse lines on secondaries. Lower part of thorax blackish. Legs yellowish-gray. Fore tibiæ and tarsi blackish, the latter dotted with yellowish at sections.

Expanse of wings, 26 mm.

Length of body, 8 mm.

Habitat: Bangor, Maine.

Type: ♂, coll. B. Neumoegen.

Caught at electric light by Prof. Carl Braun, who also sent me the fragments of a ♀ just good enough to make out the venation and to lead me to the belief that the ♀ antennæ are probably simple.

This is one of the most singular little Bombycids of our fauna, easily distinguished by its heavy scales and the hairy tufts on collar and discal dots. It resembles West Indian genera, as Prof. Smith rightly remarked to me, but Prof. Braun assured me of its Maine origin.

THE SPECIES OF EUCOPTOCNEMIS.

BY A. R. GROTE, A. M., BREMEN, GERMANY.

In 1874 I proposed the generic term *Eucoptocnemis* for the *Heliophobus fimbriaris* of Guenée, Noct. I., 172, whose statement that the species had two terminal spines on the anterior tibiæ rendered its reference to the genus *Heliophobus* of Boisduval improbable. In reality our species appears not congeneric with the European *Heliophobus hispidus*. At the time of proposing the genus I had no material. Later on I examined two or three specimens taken near the coast of Massachusetts, but they were so worn that I could not satisfactorily identify the species, while they probably belonged to Guenée's *fimbriaris*. In a considerable collection from New York, which I have identified for the Bremen Museum, I find, however, quite a number of specimens which I determine as Guenée's *fimbriaris*; the material is generally well preserved, most of the insects are quite or sufficiently perfect, and both sexes are represented. An examination gives us the following structural characters:—The abbreviated anterior tibiæ show two longer terminal spines and a row of shorter spinules on each side. Besides the pair of calcaria, the inner spur of which is shortest, the middle tibiæ are also provided with spinules; the hind tibiæ, with two pair of spurs, are also armed. The testaceous legs are sparsely clothed with pale hair (allowing the armature to be easily studied), and in this respect showing affinity to our Western *Cladocera niveivenosa*, Grt. The antennæ are long, in the male finely bipectinate, the pectinations gradually decreasing to the tips, in the female simple. The front is smooth, without tubercle. The palpi are somewhat divaricate, with short terminal article. The thorax is short and square, somewhat densely clothed with hair-like scales, pilose. The abdomen is comparatively short, not exceeding the secondaries, untufted, thinly scaled and rather weak. Wings broad, with the fringes long and even, unicolorous. Eyes naked, adorned with a variable pattern of black markings, unlashd.

EUCOPTOCNEMIS FIMBRIARIS, Guen., V., 172 (*Heliophobus*).

Grt. Bull. B. S. N. S. I., (13), 1874.

9 ♂s, 4 ♀s. Forewings broad, triangulate, silky, of a more or less determinate grayish-red, in some specimens the red is quite clear, somewhat brickish in tint; this is the case in all the females examined. Maculation subobsolete. Orbicular reduced to a dark or blackish spot, which in one or two individuals shows a few central pale scales. Reni-

form upright, elongate, narrow, slightly constricted medially, yellowish, followed by a blackish arc and a more or less obvious blackish shading. Under the glass, the black scales are seen to extend along the folds and veins between the reniform and the t. p. line, while the surface of the wing, generally, is seen to be sparsely peppered with black scales. The reniform is also preceded by a curving black outline and the yellowish colour spreads a little above and below, so that Guenée's comparison of its total shape to an elongated letter x becomes intelligible, though by no means obvious. These black markings tend to be lost in the rubbed examples. The lines are seldom continuous and tend to become dotted or wholly lost, or are merely marked on costa. The t. p. line consists apparently of pale venular spots preceded by black dots. The t. a. line is in some specimens indicated, indented above and below, medially rounding outwardly. In one specimen the base of the wing shows a slight gathering or patch of black scales. Noticeably in the female specimens, which are perhaps fresher, the median lines appear as faint continuous black shades. The subterminal line is indicated by the slight difference in shade between the paler terminal and darker subterminal fields, the latter of which is marked on costa by a darker shading. A more or less obvious terminal line, sometimes well marked by interspaceal disconnected lunular marks. Hind wings variable in colour, usually quite pale with faint diffuse terminal shading, silky, in on. male quite dark; terminal line variable, occasionally absent. Palpi blackish outwardly, and behind the eye usually some blackish scales. Thorax like forewings; front and collar somewhat paler. Abdomen quite pale or whitish. Beneath, the forewings are darker, the hind wings pale, the colours even, all markings lost. The male specimens vary in expanse from 28 to 36 mil.; Guenée gives 35 mil. The females average 33 mil., as near as may be.

Var. SORDIDA.

5 ♂s, 4 ♀s. The colour is entirely sordid grey, without trace of red. Under the glass I have, however, detected about costa a faint reddish tinge in some of the paler specimens. The yellow tinge of the reniform is less obvious. The lines are generally more distinct and continuous, and even the median shade line is often evident running near the reniform, which latter seems to indicate in this species the closure of the median cell, and is always the most prominent mark of *fimbriaris*. In one specimen of *sordida*, the basal patch is marked. There can be no doubt that this is

an extraordinary and easily recognizable colour variety of *fimbriaris*, although at first sight it might be taken for a distinct species. From the present collection it would seem to be as common as the typical reddish form. Types in Mus. Brem.

Eucoptocnemis fimbriaris would seem to be a local insect, since I have, with the one exception above noted, never before met with it in any collection submitted to me, nor have I ever collected it myself. It would seem to be not only quite variable, but its scanty markings are also easily removed by attrition, when it presents a vague and pale appearance, only the reniform being indicated. The insect is best known by its bipectinate male antennæ, its pilose thorax and weak body parts, the armature of its thinly clothed legs, the well-developed fringes, silky and comparatively wide wings. Superficially it rather resembles some of the red species of *Agrotis*. It is probable that the median lines, if fully developed, would be double, with pale included shade, judging from those specimens in which they are marked on costa. They would then correspond with the yellowish reniform, which appears as a broad abbreviated line or bar, edged with black. But, in the specimens before me, the lines are usually obliterate and, even in one fresh male, their location can be barely made out, though with the help of the microscope. I trust before long some locality will be found for this interesting noctuid, and its history be fully made out.

NORTH AMERICAN THYSANURA.—III.

BY ALEX. D. MACGILLIVRAY, ITHACA, N. Y.

Synopsis Family JAPYRIDÆ.

The family *Japygidae* has representatives in almost all parts of the world. Nearly a dozen species have been described, the majority of which are from Europe. The species are local and rare, and not usually found north or south of about 40° of latitude. Only a single genus is known—*Japyx*.

JAPYRIDÆ.

Antennæ multiarticulate; prothorax minute; tarsi biunguiculate; claws equal; abdomen with ten segments; segments one to seven with bristle-like rudimentary abdominal appendages; caudal appendages unsegmented, horny, pincer-like.

The characters of the single genus are the same with those of the family.

The species can be easily separated by means of the following key :—
 A.—Right arm of the forceps with a single large tooth.

B.—Antennæ with forty-five to forty-eight segments.....

.....*Saussurii*, Humbert.

BB.—Antennæ with about thirty segments.....*subterraneus*, Pack.

AA.—Right arm of the forceps with two large teeth; antennæ with
 twenty-four segments.....*americana*, MacG.

Japyx Saussurii, Humbert.

Head quadrangular, not broader than long; antennæ 45-48-jointed, segments cylindrical; prothorax very little more than half as broad as the head, truncate in front; abdomen broader behind, segments immaculate, segments one to four rounded on the sides behind, fifth and sixth with their hind angles obtuse, the seventh slightly broader than sixth, much broader and overtopping the eighth, emarginate behind, the posterior angles produced in long, slender spines, lateral margins broadly rounded, seventh and eighth subequal in length, the eighth broadly, deeply, acutely emarginate before, the posterior angles not produced, the sides straight, ninth one-third the length of the eighth, posterior angles not produced, tenth slightly shorter than the forceps, the tenth and forceps together slightly longer than the four preceding segments; right arm of the forceps slightly broader than the left, inner margin concave, a large tubercle at middle, two smaller rounded tubercles before the larger tubercle, equidistant from the larger tubercle and from each other; beyond the larger tubercle the inner margin is slightly convex, with smaller tubercles, which become smaller and smaller, from the large tubercle for two-thirds the remaining length of the arm, the remaining third smooth; the left arm is broadest at base, with a large tubercle just before the middle, a smaller tubercle midway between the base and the large tubercle, beyond the large tubercle for a short distance there are small rounded tubercles, beyond which the inner margin is crenulate, the apical half beyond the large tubercle is smooth; the antennæ, underside of the legs, body and forceps covered with stiff yellow bristles; segments 1-7 with rudimentary appendages, the apical bristle long, stout, apical half brown.

Length, 20 mm.; length of the antennæ, 8 mm.; length of the abdomen, 13 mm.; length of the last abdominal segment and forceps, 5 mm.

Habitat—Orizaba, Mexico (Lawrence Bruner).

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americana, MacG.
 1893.—*Japyx*, MacGillivray, CAN. ENT., XXV., 174.

A NEW SPECIES OF HYPOPTA.

BY HARRISON G. DYAR, NEW YORK.

An interesting species of Hypopta has been sent to me by Mr. T. D. A. Cockerell, from Las Cruces, New Mexico. It appears to be undescribed.

HYPOPTA THEODORI, n. sp.

White; head white, the large eyes black; pectinations of antennæ blackish; collar white; thorax clothed with light gray hairs, mixed with white; legs heavily clothed, obscurely annulate with gray near the tips. Abdomen banded with clouded pale gray above, white below. Forewings white, the basal half immaculate except for a few minute black dots along the costal edge and internal margin. These dots become more distinct toward the apex on costa. In the interspaces, and beyond the cell from vein 2 to apex of wing, is a series of diffusely clouded, strigose, pale purplish-gray patches, separated by a white space along the veins, and divided also transversely in a somewhat irregular manner. Along the discal cross-vein and near the origin of the discal and subcostal venules, the colour of these markings shades into blackish, where they abruptly terminate. Terminally, they become more obscure and strigose, leaving the fringe white. Hind wings similarly marked, but the markings are entirely pale purplish-gray, and form a series of intervenular clouded spots in three or four indistinct rows between middle of wing and margin. Beneath the markings are repeated in a somewhat leaden gray, rather more diffusely than on upper surface. Costæ of both wings with a row of gray dots and terminal dots on both. Fringe white, as above. Expanse, 29 mm. Length of body, 15 mm.

Described from a single example taken July 16, at Las Cruces, New Mexico, "a dry, flat, sandy locality, with hardly any trees but cottonwood and cultivated fruits. Its altitude above the sea is 3,800 feet." I have named the species in honour of Mr. Cockerell, whose labours in the entomological field are worthy of general recognition.

A NEW LECANIUM FROM CANADA.

BY T. D. A. COCKERELL, LAS CRUCES, NEW MEXICO.

In a box of Canadian Coccidæ lately sent to me by Mr. J. Fletcher, there are several species of *Lecanium*, including one which appears to be new, and is described herewith.

Lecanium Fletcheri, n. sp.

Belongs to subg. *Eulecanium*.

♀ Scale dark reddish-brown, hemispherical, shiny, not at all elongate, more or less wrinkled or with depressions; posterior cleft short, with one or two filaments of white secretion protruding from it. Length, 2 two-thirds mm., breadth nearly the same; height, $1\frac{1}{2}$ mm. (apex depressed).

Derm yellowish-brown (prepared by boiling in caustic soda); distinctly reticulate, reticulations mostly hexagonal and pentagonal. Gland pits distinct towards the margin, numerous, large, sometimes in pairs. Margin with short simple spines, not very numerous.

Legs very small, ordinary; femur longer than tibia; tibia about $\frac{1}{4}$ longer than tarsus. Tarsal knobbed hairs very long and slender, with distinct though small knobs.

Antennæ 7-jointed; 1 longer than broad, 2 shorter than 1 or 3, 3 and 4 about equal, hardly equal to 1; 5 and 6 equal, and much shortest; 7 about or nearly as long as 5 + 6, and about as long as 2, or a little shorter. Formula 1 (34) (27) (56). The seventh joint has a false joint about its middle, which in one antenna was so distinct that it was difficult not to believe it a true joint. First joint with a long hair, second with two hairs, 4 and 5 each with a hair, 6 with two, 7 with three distinct hairs.

Larva: Of the usual shape, pale-yellowish; caudal filaments nearly straight but with an outward curve, the ends usually bending inwards and crossing. Each side of the abdomen with 7 short hairs. Last joint of antennæ emitting four long hairs. Legs with clubbed digitules about twice as long as the claw, and long tarsal clubbed hairs.

Food-plant: The specimens are labelled, "on Thuja, 'cedar.'"

Hab.: No locality is given by Mr. Fletcher; very probably the specimens were on a cultivated tree at Ottawa.

L. Fletcheri differs decidedly from any species hitherto found on coniferous plants, and seems most nearly allied to *L. quercitronis*, which it much resembles. Mr. Fletcher sent me some scales on *Quercus Coccinea*, which I believe to be *L. quercitronis*, Fitch. *L. Fletcheri*, compared with these, is shorter and more globose, and the posterior cleft is decidedly shorter.

Parasite: In a scale of *L. Fletcheri* I found three specimens of a Chalcidid parasite. I have not identified the species (very likely it is undescribed), but the following descriptive notes will probably suffice for its recognition:—

Head and thorax dark metallic green; abdomen brown, shovel-shaped; ovipositor just projecting. Eyes hairy. Antennæ brown, with the two joints before the club white. Tarsi 5-jointed, first joint of middle tarsus longer than $2 + 3 + 4$, last longer than $3 + 4$. Middle tibia with a very stout, straight spur, but front tibiæ with a smaller curved spur. Front femora brown, with the end white; middle femora whitish tinged with brown; hind femora all brown. Front tibiæ brown, with the end white; middle tibiæ white, with a brown cloud on proximal half; hind tibiæ brown, with both ends white. Tarsi all white. Wings hyaline; stigmal club bifid. A hairless line springs from near stigmal vein and proceeds obliquely downwards and inwards. Three long hairs spring from a point on the side of the abdomen.

SYNOPSIS OF THE DIPTEROUS GENUS PSILOCEPHALA.

BY D. W. COQUILLET, LOS ANGELES, CAL.

The following table contains all the species of *Psilocephala* known to me as occurring in America, north of Mexico, with the addition of one species from Jamaica, West Indies. The *Thereva crassicornis*, Williston (Trans. Am. Ent. Soc., XIII., 293, non Bellardi), is a true *Psilocephala*; California specimens collected by Mr. O. T. Baron were submitted to me by Mr. J. M. Aldrich, of Brookings, South Dakota, who kindly placed his Therevidæ at my disposal. The *Thereva tergissa*, Say, is also a *Psilocephala*; specimens from Florida, the habitat of Say's original specimens, were contained in a very interesting collection of Therevidæ sent me by Mr. C. W. Johnson, of Philadelphia, Pa., who had identified the specimens in question as probably belonging to Say's species. As I cannot find that Say's name had previously been used in this genus, I have adopted it in preference to the later one, *corusca*, proposed by Wiedemann. *Psilocephala erythrura*, Loew, is evidently a synonym of *pictipennis*, Wied.

The *Thereva nigra* of Say, although placed in *Psilocephala* by Osten Sacken (Catalogue of the described Diptera, page 95), is a true *Thereva*; in his original description, Say distinctly says: "Hypostoma and all beneath with gray minute hair." I have a *Thereva* from Southern California which agrees in all respects with Say's description, and as other species

of this family are known to extend across the continent (I have examined specimens of *Thereva comata* from California and New Hampshire, *Psilocephala haemorrhoidalis* from New Jersey to Arizona), there is strong reason for believing that this is the true *Thereva nigra* of Say. For the species that has hitherto borne Say's name in collections, I have adopted Macquart's name of *haemorrhoidalis* (described under *Thereva*), since it is very probable that this author had specimens of the present species before him when drawing up the description to which the above name is attached.

Psilocephala melampodia, *platancala*, *variegata* and *levigata* are unknown to me except from the descriptions ; of the remaining species I have seen only males of *melanoprocta* and *notata*, and only females of *rufiventris* and *scutellaris*.

The table of species is as follows :—

- 1. Fourth posterior cell open ; front wholly opaque and covered with pollen 2
 Fourth posterior cell closed and usually petiolate 10
- 2. Femora black, or blackish-brown 3
 Femora and knob of halteres yellow } *Slossoni*, n. sp.
} *montivaga*, n. sp.
- 3. Wings destitute of blackish spots, except sometimes on the cross-veins 4
 Wings marked with over a dozen blackish spots, many of which are not situated on the cross-veins ; abdomen wholly opaque ; antennal style nearly half as long as the third joint *tergissa*, Say.
- 4. Knob of halteres blackish-brown 5
 Knob of halteres, and hypopygium of male, yellow ; first and third antennal joints subequal in length, the style nearly half as long as the third joint *morata*, n. sp.
- 5. Thorax marked with light and dark coloured vittæ 6
 Thorax not vittate 8
- 6. Tibiæ yellow 7
 Tibiæ black, abdomen of female largely shining . *melampodia*, Loew.
- 7. First joint of antennæ much longer than the third, and extremely robust ; California species *crassicornis*, Will.
 First joint of antennæ much shorter than the third and not unusually robust ; Florida species *festina*, n. sp.
- 8. Tibiæ black, cross-veins of the wings not bordered with brown ;

- California species 9
- Tibiæ yellow, cross-veins of wings bordered with brown ; Eastern species *variegata*, Loew.
9. Third joint of antennæ scarcely longer than broad, pile in front of the halteres, and on the abdomen and legs, wholly white *baccata*, n. sp.
- Third joint of antennæ twice as long as broad, pile in front of the halteres, and on the abdomen and legs, largely black. *pavida*, n. sp.
10. Scutellum black 11
- Scutellum orange-red, wings beyond the middle marked with two dark gray cross-bands *scutellaris*, Loew.
11. Abdomen black 12
- Abdomen largely orange-red, wings beyond the middle marked with two dark-gray cross-bands *rufiventris*, Loew.
12. Wings destitute of dark-gray cross-bands 13
- Wings beyond the middle marked with two dark-gray cross-bands, much abbreviated in the male ; two widely separated thoracic vittæ, and the apex of the scutellum, deep velvet black *pictipennis*, Wied.
13. Front wholly opaque and covered with pollen, tibiæ largely yellow 14
- Front partly shining 16
14. Knob of halteres, proboscis and palpi, yellow 15
- Knob of halteres, proboscis, palpi and hypopygium of the male, black ; eastern species *melanoprocta*, Loew.
15. Antennæ yellow ; California species *marcida*, n. sp.
- Antennæ black ; Jamaica species *obscura*, n. sp.
16. Tibiæ largely or wholly yellow 17
- Tibiæ and marginal cell wholly black ; California species. *costalis*, Loew.
17. Knob of halteres blackish 19
- Knob of halteres and hypopygium of male yellow, front shining except on its lower corners 18
18. First joint of antennæ three-fourths as long as the third, wings hyaline, the veins never clouded with brown *Aldrichii*, n. sp.
19. Femora blackish 21
- Femora yellow 20
20. Pollinose spots on lower corners of the front contiguous ; wings nearly hyaline *notata*, Wied.

- Pollinose spots separated by a wide interval; wings smoky-brown.....*Johnsoni*, n. sp.
21. Front shining except on each lower corner.....22
 Front having the lower third opaque pollinose.....*munda*, Loew.
22. Costal cell blackish-gray, veins bordered with brown..*platancala*, Loew.
 Costal cell hyaline, veins not bordered.....23
23. Pollinose spots on lower corners of the front contiguous..*notata*, Wied.
 Pollinose spots separated by a wide interval..*haemorrhoidalis*, Macq.

Psiloccephala festina, n. sp.—♂ Black, the abdomen brownish, the tibiae and base of tarsi yellow. Front and face silvery-white pollinose, eyes narrowly separated by a white pollinose interval; first antennal joint two-thirds as long as the third, style slender, cylindrical, nearly half as long as the third joint, the latter one and one-fourth times as wide as the second joint; bristles of antennae and of upper part of occiput black, pile of lower part of occiput and of the mouth parts white. Thorax lightly white pollinose and with three grayish-black vittae, pile very short, mixed white and black, bristles black, pleura and scutellum white pollinose, scutellum bearing only two bristles. Abdomen wholly silvery-white pollinose and sparse white pilose, that on the hypopygium and on the fourth and following segments of the venter largely black; wings hyaline, apex of subcostal cell yellowish, fourth posterior cell broadly open.

♀ Same as the ♂, except: Front grayish-white pollinose. Abdomen shining, except a white pollinose spot on each side of the first, fifth and sixth segments and a crossband on the posterior margin of the second and third segments. Length, 6 to 7 mm. Florida (Johnson).

Psiloccephala morata, n. sp.—♂ Same as *festina*, with these exceptions: Palpi, knob of halteres and hypopygium yellow; upper third of the front brown pollinose, eyes not separated by a white interval; first antennal joint nearly as long as the third, the latter nearly twice as wide as the second. Thorax opaque, grayish-black pollinose. Scutellum bearing four bristles. Pile of entire venter white.

♀ Same as the ♂, except: Lower third of front white pollinose, the remaining portion blackish brown pollinose. Abdomen shining black, first segment and posterior margins of the second, third, fifth and sixth segments white pollinose, the narrow hind margins of the first three segments white; sparse pile of abdomen and venter largely black, except that of the first segment, which is light-coloured. Wings grayish-hyaline,

the stigma yellowish. Length, 6 to 7 mm. New Jersey, Florida (Johnson).

Psilocephala baccata, n. sp.—♂ Wholly black, including the tibiæ, halteres and hypopygium; posterior margin of the second and third abdominal segments, both dorsally and ventrally, sometimes narrowly white. Pollen of face grayish-white, that on the lower half of the front somewhat brownish, on the upper half black; pile of head white, a few on the front and vertex black, bristles of occiput and of antennæ black. First joint of antennæ nearly twice as long as broad, the third joint once and a-half as broad as, but not quite as long as, the first, being scarcely longer than broad. Thorax very lightly gray pollinose, not vittate, the pile and bristles black, the surface sparsely covered with appressed light-yellow tomentum. Pleura, abdomen and venter densely silvery-white pollinose and white pilose, pile of abdomen appressed. Pile of femora and coxæ white, the bristles, as well as those of the tibiæ and tarsi, black. Wings hyaline, stigma brown; fourth posterior cell open.

♀ Same as the ♂, with these exceptions: Pollen on upper three-fourths of front brownish-gray, that on the lower fourth white and with a round black spot next each eye at the junction of these two colours. Abdomen and venter shining black, the posterior margin of the second, third and fifth segments silvery-white pollinose, broadest on the fifth.

Length, 5 to 7 mm. Los Angeles and San Bernardino Counties, California. Twelve males and two females, in May.

Psilocephala pavidata, n. sp.—♂ Differs from the above description of *baccata* only as follows: Third joint of antennæ twice as long as broad. Pile in front of halteres largely black; pollen of abdomen black, that on posterior margin of the second and third segments light-gray; pile of abdomen black, that on the first segment and apices of the remaining segments whitish. Pile of coxæ and femora largely black.

Length, 6 mm. Los Angeles County, California. A single specimen; in April.

Psilocephala montivaga, n. sp.—♀ Black, the knob of the halteres, femora, tibiæ, and base of the tarsi, yellow. Front brown pollinose, that next the antennæ yellow, a spot on each side next the eyes and a median triangle, black pollinose; face yellow pollinose; pile and bristles of antennæ, pile of front and bristles of occiput, black, pile of occiput and of mouth parts white. Antennæ of nearly an equal width, the third joint tapering slightly to the apex, first joint three-fourths as long as the third,

style one-fifth as long as the third antennal joint. Thorax yellow pollinose, that each side more gray, marked with three broad black stripes; pile of thorax short, sparse, mixed black and yellow, the bristles black; pleura gray pollinose, its pile white. Scutellum black pollinose, that on the margin grayish-yellow, its pile sparse, yellow, the four bristles black. Abdomen shining, except the first segment, base of the second and sides of the first four segments, which are gray pollinose; pile of the first four segments mixed yellow and black, that on the remaining segments wholly black. Wings grayish-hyaline, stigma yellow, fourth posterior cell broadly open.

♂ Same as the ♀, except that the abdomen is wholly silvery-white pollinose, its pile wholly yellow; hypopygium yellow, its pile yellow and black. Length, 10 to 13 mm. Los Angeles County, Cal. One male and two females, in June.

Psilocephala Slossoni, n. sp.—♀ Black, the palpi, halteres, femora, tibiae, and base of tarsi, yellow. Face and front grayish-brown pollinose, front with two velvet black spots at its middle adjacent to the eyes; pile of front, occiput, mouth parts and of antennæ whitish, bristles of antennæ and of upper part of occiput black; third antennal joint three-fourths as long as the first, scarcely wider than the second, first joint nearly twice as wide as the second, the style one-third as long as the third joint. Thorax brownish-gray pollinose, marked with two narrowly separated median grayish-black vittæ and with a much broader lateral one; pile of thorax light-yellow, the bristles black; pleura whitish pollinose and white pilose. Scutellum brownish-gray pollinose, white pilose, its four bristles black. Abdomen grayish-brown pollinose, that on apex of each segment broadly light-gray, the pile whitish. Wings gray, lighter in the middle of the cells, leaving a dark-gray border to the veins; stigma brown, fourth posterior cell broadly open.

Length, 10 mm. New Hampshire (Johnson). A single female specimen, collected by Mrs. A. T. Slosson, after whom the species is named.

Psilocephala Aldrichii, n. sp.—♂ Black, the knob of the halteres, hypopygium, tibiae and base of tarsi yellow, posterior margin of the second and third abdominal segments white. Front shining, its lower corners, not extending halfway to base of antennæ, white pollinose, like the face. Pile of mouth parts and of occiput white, that of the cheeks largely black, bristles of upper part of occiput and of the antennæ also black. First joint of antennæ three-fourths as long as the third, the

latter narrowly lanceolate, six times as long as the style. Thorax somewhat shining, marked with two white pollinose vittæ scarcely half as wide as the interval between them, and sometimes indistinct; pile of thorax and of scutellum whitish or yellow, that of the pleura white; scutellum bearing four black bristles. Abdomen lightly white pollinose, its sides, except on the first segment, shining, the pile white, that near the apex below and on the hypopygium sometimes partly black. Wings hyaline, the veins and stigma light-yellow; fourth posterior cell closed and petiolate.

♀ Same as the ♂, except that the abdomen is not wholly pollinose, and its pile is largely black. Length, 7 to 8 mm. New Jersey (Johnson), Montana, Wyoming (Aldrich), and California. Four males and one female, in July. I take pleasure in naming this species in honour of Mr. J. M. Aldrich, from whom one of the specimens was received.

Psilocephala Johnsoni, n. sp. — ♀: Black, the femora, tibiæ, base of tarsi, and posterior margin of the second, third, fourth and fifth ventral segments, yellow. Front shining, each lower corner and the face white pollinose; bristles of antennæ and of upper part of occiput black, pile of lower part of occiput and of the mouth parts white; first antennal joint slightly longer than the third, the latter one-fourth wider than the second, style one-fifth as long as the third joint. Thorax grayish-brown pollinose, marked with two widely separated light-gray pollinose vittæ, the sides broadly shining; pile of thorax short, and like the bristles, black; pleura white pollinose, its pile white. Scutellum shining, except the gray pollinose margin, its bristles black. Abdomen shining, the first segment lightly white pollinose, posterior margins of the second and third segments white, a large white pollinose spot on each side of the fifth segment, the two spots almost contiguous; pile of abdomen mostly black; venter white pollinose, pile of the first three segments white, the rest black. Wings smoky-brown, the middle of some of the cells lighter, stigma darker brown, fourth posterior cell closed and petiolate.

Length, 9 mm. Florida. A single specimen received from Mr. C. W. Johnson, to whom it gives me pleasure to dedicate this interesting species.

Psilocephala marcida, n. sp. — ♂ Black, the antennæ, proboscis, palpi, halteres, hypopygium, femora, tibiæ except apex of each, and base of tarsi, yellow, the femora and abdomen sometimes brown; posterior margin of the second, third, fourth and fifth abdominal segments, both dorsally

and ventrally, white. Head (usually) and entire body densely white pollinose, but that of the head sometimes yellow; the pile white. Antennæ having the first joint once and a-half as long as broad, slightly shorter than the third joint, the latter nearly as broad as long. Wings whitish hyaline, stigma yellow; faint clouds are perceptible on the cross-veins; fourth posterior cell closed and petiolate.

Length, 8 mm. Los Angeles and San Diego Counties, California. Two specimens.

Psilocephala obscura, n. sp.—♀ Black, the palpi, proboscis, tibiæ, base of tarsi, knob of halteres, posterior margins of the second, third and fourth abdominal segments, and the greater portion of the three following segments, yellow. Front and face brownish-gray pollinose, short pile of front, bristles of antennæ and of upper part of the occiput, black, pile of lower part of occiput and of the mouth parts white; first and third antennal joints subequal in length, style one-third as long as the third joint, the latter nearly twice as wide as the second joint. Thorax grayish-brown pollinose and with two widely separated light-gray pollinose vittæ; pile of thorax mixed yellow and black, the bristles black; pile and pollen of pleura white, scutellum grayish-brown pollinose, that around the margin light-gray, the four bristles black. Abdomen shining, the first segment lightly pollinose, posterior margins of the second, third and fourth segments, and greater portion of the fifth and sixth, white pollinose; pile of first two segments yellowish, that on the remaining segments and on the venter largely black. Wings hyaline, stigma yellow, fourth posterior cell closed in the margin.

Length, 7 mm. Kingston, Jamaica (Johnson). A single specimen.

ON SOME LEPIDOPTEROUS LARVÆ ON ALFALFA.

BY C. H. TYLER TOWNSEND, KINGSTON, JAMAICA, W. I.

During the last two years a considerable number of rather small lepidopterous larvæ have been found on alfalfa (*Medicago sativa*) in Southern New Mexico. In the material collected there are nine distinct species represented. None of them have been bred. These larvæ are of considerable economic importance, as they occasion a certain amount of injury to the alfalfa crop, which is the surest and most paying crop of the Mesilla valley. They are of some scientific interest also, since hardly anything is recorded of alfalfa insects. It is therefore thought advisable to publish the following descriptions of these larvæ, which were made

some time ago, and which will serve to identify them on the alfalfa plant hereafter, besides giving an idea of the forms which occur on alfalfa in this locality. They were all collected in Las Cruces. The figures in parentheses refer to the alcoholic specimens of the species in the entomological collection of the New Mexico Agricultural Experiment Station.

(a).—SMALL, BROWNISH AND BRISTLY LARVA.

Stage 2.—Length, 2 to 2½ mm. Brownish or blackish. Five pairs of prolegs on segments 7 to 10 and 13. Head distinct, chitinous, shining polished black; dorsum of prothorax also chitinous, emarginate behind, blackish. Rest of larva brownish, each segment with twelve circular dot-like raised blackish papillæ in an irregular transverse row, each papilla bearing a black hair. Rows on thoracic segments straighter. Head and prothorax also hairy. It is barely to be perceived that the whole integument is covered with microscopically short, bristly pubescence. Ten specimens.

Stage 3.—Length, 3 to 4 mm. Head black, variegated with brownish, or wholly very light, even pale-yellowish. Proscutum black. Ground colour of larva about same as in preceding stage; tubercles a little more conical in form, black. The spiracles must not be mistaken for tubercles, the former being smaller and showing on most of the segments in all the stages. Microscopic bristly pubescence of integument slightly more evident. Seventeen specimens.

Stage 4.—Length, 5 to 5½ mm. Head usually very light, with four faintly mottled areas of brownish; prothorax rather light, but oftener of the brown colour of rest of body. Tubercles more strikingly conical. The integument shows very plainly the short, stubby, whitish and brownish bristles, usually in longitudinal whitish and brownish rows. Nine specimens.

Stage 5.—Length, 5½ to 7 mm. Head large, very pale-yellowish, only three of the mottled faint brownish areas, the one near oral margin being more or less obsolete. Black tubercles or papillæ very conical; hairs longer and stouter, the larva therefore appearing somewhat more bristly. The stubby, bristly growth of integument is very apparent in its narrow, longitudinal, alternating white and brown rows. Eight specimens.

Stage 6.—Length, 7½ to 9 mm. Head about same as preceding stage. Prothorax darker. The white longitudinal rows of stubby bristles showing most plainly in the median region, and on each side. Five specimens.

Stage 7.—Length, $9\frac{1}{2}$ to 10 mm. Larger, brownish in general colour, broadly whitish laterally on sides, and the stubby bristles of integument showing very plainly, the white rows mostly on median region. Three specimens.

The above stages have been separated solely by examination, but are probably approximately correct. Described from alcoholic specimens, swept from alfalfa May 28, 1891. Specimens of the same larva, from 3 to 7 mm. long, had been previously swept from alfalfa, May 9 to 12. General colour noted in life. (Nos. 18, 30.)

(b).—YELLOWISH LARVA, WITH BLACK WARTS OR TUBERCLES.

Length, nearly 7 mm. Five pairs of prolegs, on usual segments. Hardly any hairs above, rather long hairs on sides and below, all these hairs directed downward. Head black, with a yellow triangular area in middle, and with yellowish oral region and antennæ. Prothorax with six black spiniferous tubercles in a transverse row, and two blackish markings on posterior border. Other thoracic segments with the same six black tubercles, and also with two similar but somewhat smaller yellowish tubercles, one on each side of the median pair of black ones. All the abdominal segments, except the anal, with the same tubercles as last two thoracic segments, but each in addition with a median anterior pair of small blackish tubercles situated between and slightly anterior to the median large pair.

One specimen, swept from alfalfa May 12, 1891. Colour noted in life. (No. 79.)

(c).—PALE GREENISH, NEARLY BARE LARVA.

Length, 8 mm. Light-greenish, inclining to brownish posteriorly, with a whitish stripe on each side of the body. Five usual pairs of prolegs. Integument bare and without hairs, except on venter. Head and feet light coloured, pale-yellowish. Methorax with a pair of black spots on dorsum, each spot just inside the lateral white stripe. Fifth (first abdominal) segment with a pair of larger black spots, one on each side just outside or below the lateral whitish stripe. Each of the lateral whitish stripes with two narrow brown lines running its whole length and more approximated to lower border. The greenish median portion has three lighter narrow longitudinal lines, one being median, and the outer ones very closely approximated to the lateral whitish stripes.

One specimen, swept May 9, 1891. Colour noted after a few days' immersion in alcohol. (No. 29.)

(*d*).—PALE-YELLOWISH, RATHER STOUT AND QUITE HAIRY LARVA, WITH BROWNISH STRIPES.

Length, 10 mm. Ground colour very pale-yellowish or whitish. Five usual pairs of prolegs. Head, prothorax, anal segment and whole ventral surface especially pale. A lateral rather wide stripe on each side encloses the spiracles; each section of it, corresponding to an abdominal segment (except on anal), marked by the spiracle in the centre, and extended into a sharp prolongation dorsad, ventrad and caudad (especially the first two), bearing a small dark papilla from which springs a long hair; a similar papilla below the sections bears a similar hair. Dorsum of larva with three pairs of brownish longitudinal lines, a median and two lateral ones. Between these are whitish and pale-brownish lines, the dorsal integument being covered with short, stubby bristles of these colours; and each segment with two pairs of light, smooth and naked tubercles, each bearing a rather long hair, the anterior pair of tubercles more approximated to each other than the hind pair. The head and prothorax also bear hairs.

One specimen, swept May 28th, 1891. (No. 228)

(*e*).—GREEN LARVA, WITH A WHITISH LINE ALONG EACH SIDE OF BODY.

Length, 14 mm. Venter light. Usual five pairs of prolegs. Whole surface of body, both above and below, evenly and quite thickly clothed with fine, short hairs. Head concolorous, similarly clothed with hairs. Hairs arising each from a small, black, dot-like tubercle, which occupies the centre of a circular naked areole, the rest of the epidermis being covered with microscopic black spines which appear only as closely approximated minute specks under a high power lens. These areoles are particularly distinct on dorsal regions, somewhat less so on sides of venter, the median ventral region and head not showing the microscopic epidermal specks. The dots from which the hairs arise are also absent on median ventral region. The principal segments show five transverse wrinkles or folds above, dividing the dorsum of the segment into six transverse sections; each section usually bears a row of areoles, though some have additional ones irregularly interspersed, which are usually smaller. These transverse wrinkles stop at the whitish lateral line on each side, which defines the lateral edge of dorsum.

One specimen, swept May 12, 1891. Colour noted in life. (No. 78.)

(*f*).—GREEN LARVA SIMILAR TO PRECEDING.

Length, about 23 mm. This exactly resembles the preceding (*e*), except in one or two details, which may indicate its distinctness, or may

indicate only a greater number of moults. If it is not the same, it is a very closely allied species. Colour is green, with two lateral longitudinal narrow whitish stripes, one marking the lateral edge of dorsum on each side and enclosing the spiracles, and in addition a median dorsal pair of similar stripes. Head is lighter than dorsum, approaching more nearly the colour of the stripes; venter light. The same microscopic black epidermal specks or spines are present, and the same naked areoles with dot-like tubercles in the centre, but the portion of the integument covered by the dorsal stripes has lost both apparently. These are shown, however, to be lost only in colour, the microscopic spines being apparent in the stripes where the integument is transversely folded, but they are colourless instead of black. Their colour is also nearly lost on anal segment. Dot-like hair tubercles of head brown.

One specimen, swept Oct. 24, 1892. General colour noted in life. (No. 365.)

(g).—VERY SLENDER AND ELONGATED BROWNISH SPAN-WORM.

Length, 9 mm. Two pairs of proportionally large prolegs, on segments 12 and 13. Colour brownish, with a somewhat lighter ventral line, and a pale lateral stripe or line on each side. Head, prothoracic segment and anal extremity light. Abdominal segments very elongated, almost bare, with some sparse minute tubercles giving rise to hairs. The main abdominal segments are more noticeable for being divided by minute transverse constrictions or wrinkles extending completely around the body into something like thirty or more transverse sections to the segment.

One specimen, swept May 28, 1891. Colour from alcoholic specimen. (No. 229.)

(h).—PALE COLOURED FALSE SPAN-WORM.

Length, 4 mm. Three pairs of prolegs, on segments 9, 10 and 13. Light or pale coloured, with small brownish warts and hairs. Somewhat elongate, and rather slender. Segments not elongate. Head nearly colourless, slightly more yellowish and polished. About twelve small, flattened-conical tubercles to each abdominal segment, each tubercle bearing a hair, and some smaller ones on ventral surface below. Tubercles in an irregular transverse row. Except the tubercles, the integument is apparently naked under the lens.

One specimen, swept May 28, 1891. Colour noted in life. (No. 230.)

(i).—LIGHT GREEN FALSE SPAN-WORM.

Length, 7 to 8 mm. Three pairs of prolegs, on segments 9, 10 and 13. Elongate and rather slim, light green in colour. Segments not longer than wide; with but very few short hairs, each arising from a minute pale brownish dot in centre of a rather indistinct tubercle, a dozen or so to each principal segment. Head likewise with hairs, which arise from less plain dots. In addition to these, there is on each side of segments 5 to 11 a conspicuous black tubercle bearing a hair, these tubercles being of same form as the others, but appearing much more conspicuous and larger because of the black pigment they possess.

Two specimens, swept May 12, 1891. (No. 80.)

NOTE.—The measurements given above were made from the alcoholic specimens, and are somewhat (usually a millimeter or so) less than what the same specimens measured in life.

CORRESPONDENCE.

REARING SPHINX CHRYSALIDS.

Sir: On the 30th of July, 1892, I saw a *Sphinx* larva digging into the ground at the foot of an ash tree, evidently with the intention of burying itself preparatory to transforming. I put it into a box I had in my satchel, and forgot it until three days after. When I opened the box there was a perfectly formed chrysalid instead. I placed it on the same bed that the *Quinquemaculata* of my former record had matured upon (CAN. ENT., Vol. 24, p. 237), and paid no further attention to it. On the 20th of June, 1893, that chrysalid gave forth a *Sphinx chersis*, Hub., large in size, perfect in form and rich in colouring. This surely proves that moisture is not an absolute necessity for the maturing of *Sphinx* pupæ, of these kinds at least.

In my earlier efforts to obtain moths from *Sphinx* pupæ I had no success. Being under the impression that moist soil was necessary for their maturing, all the careful attention I could give them was unavailing; they invariably died. Observing that soil getting between the segments of the abdomen irritated them greatly, and kept them constantly wriggling, I got some growing moss, put it on a plate, placed the chrysalids on it, moistening it slightly, when all my troubles with them disappeared,—no more moulding or drying up, they matured without fail, and the moths emerged in perfect condition. This simple method was to me a most gratifying success. I could now obtain the moths with no special attention required for the chrysalids.

In nature, the larva makes a cavity in the soil to transform in, pressing the soil firm and making the inside of the cavity as smooth as that of a silken cocoon. So that the pupa lies perfectly free, which will account for the fact that when placed in soil they always work themselves to the surface. Freedom from irritating matter is then, I suspect, one of the principal factors for successful maturing of them. And to those that have passed the winter in natural conditions, moisture may be another, but those that have begun their pupal existence in unnatural conditions do not seem to feel the need of it.

We know that it is comparatively an easy thing to get the pupa from a sphinx larva, besides getting the imago from the pupa; if, then, such pupæ can be matured without the labour and care required to get up and maintain "natural conditions," with the probability of a disappointing failure at the end of it all, what an inducement it would offer to many to undertake the rearing of them who are now prevented from attempting it by the elaborate preparations that seem required to ensure success. Whilst, if safety and a soft bed is all that is required for success, many a valuable chrysalid that is now rejected or neglected, under the impression that it would be hopeless to attempt to rear it with the means they have on hand, might be reared to add rare forms to a collection, or even to aid in the identification of earlier stages of some of the species. An experiment on an extensive scale in this direction is well worth the making.

J. ALSTON MOFFAT.

BOOK NOTICE.

BRIEF GUIDE TO THE COMMONER BUTTERFLIES OF THE NORTHERN UNITED STATES AND CANADA: by S. H. Scudder. Henry Holt & Co., 12mo., pp., XI + 206., 1893.

It has been known for some time that Mr. Scudder has in preparation a Manual of the Butterflies of the Northern United States and Canada, similar to Gray's Manual of Plants, and all must agree that such a work is much needed. The present "Brief Guide" has, however, been produced in the meantime to meet a demand for something even less technical, by means of which boys and girls might be tempted to enter the ever charming fairy-land of science by having an easy way laid open before them. There are few objects in nature which so soon thrust

themselves upon the notice of young people as flowers and insects, and of these none have been so useful as a first stepping-stone or allurement to the realms of Natural History as butterflies,—“ those winged creatures of beauty which add such a charm to the summer landscape.”

There was not, however, until now any work which could be placed in the hands of boys or girls who had caught a common butterfly, by means of which they could identify and find out something of the life-history of their newly-found treasure. This want Mr. Scudder has filled with his Brief Guide, in which he treats chiefly of “ those butterflies—less than a hundred of them—which would almost surely be met with by any industrious collector in the course of a year's or two years' work in the more populous Northern States and in Canada.” Should a young collector, therefore, be lucky enough to capture a butterfly not mentioned in the book, he may be sure that he has taken a rarity, which, as the author remarks, is “ a discovery not always distressing to the amateur.” The introductory chapters, upon some of the points which will at once present themselves to a beginner, are excellent—concise, clearly expressed and accurate, and treat of such subjects as :—What are butterflies? their structure, habits, variations, and life-histories. There are three keys for identification, based on the perfect insect, the caterpillar and the egg, and pages 63 to 174 are taken up with short accounts, systematically arranged, of the insects treated of. There is a short glossary and an appendix giving instructions for collecting, rearing and studying butterflies.

On the whole this is a very useful little work, well prepared, convenient in size, well printed and well got up. It is, of course, arranged after the same system as Mr. Scudder's great work, “ The Butterflies of the Eastern United States and Canada,” and many of the views there expressed are repeated here. The nomenclature is also the same, but the names more frequently used by other authors are also given. A good feature of the work is that the proper pronunciation of every name is shown by accents, and a popular English name is given for each species. The author's observations on dimorphism of some species, as of *Colias Eurytheme* and *Papilio Ajax*, do not seem quite to agree with those published by Mr. W. H. Edwards. It would be difficult, however, to treat such subjects fully in the space allotted to each species in this Brief Guide, which, we think, all who use it will agree is too brief, and they would like much more of it, of the same style.—J. F.