

CONTRIBUTIONS TOWARD A MONOGRAPH OF THE NOCTUIDÆ
OF BOREAL AMERICA—REVISION OF THE GENUS CUCULLIA.

BY
JOHN B. SMITH, SC. D.

(With Plate II.)

CUCULLIA Schrank.

1802. Fauna Boica, II, 2, 157.

Eyes naked, fringed at the margins with rather short hairy lashes, quite variably distinct and sometimes feeble. Tongue long and strong. Head large, not prominent, somewhat retracted. Front smooth, vestiture even, woolly. Palpi moderate, scarcely exceeding the front in the males, usually reaching the middle of front in the females. Antennæ simple in both sexes, except in *serraticornis*, in which the joints are laterally produced and bristled in the male. Thorax stout, quadrate, collar greatly developed, in perfect specimens forming a sharp keel and projecting hood-like over the head. Vestiture consisting of long, flattened hair. Patagiæ distinct. A variable, never prominent, posterior tuft. Legs moderate, stout, well clothed with hair and scales, not spinose. Abdomen long, conic, much exceeding secondaries, with a series of dorsal tufts very prominent and distinct in *convexipennis*, moderate only in all our other species. These tufts are easily dislodged, and specimens otherwise perfect may be deficient here. Primaries comparatively small, narrow, with acute apices, lanceolate or nearly so. Secondaries proportionate to primaries, small as compared with the body; a slight excavation in the outer margin opposite the cell.

The species are comparatively few in number, and I am inclined to believe that most of them are known. The high western plateaus and the Pacific coast may yet yield a few additional species, but not many, I think. They are closely allied and yet not difficult to separate when care is taken, because there is little variation, and small characters prove constant in large series.

The narrow, lanceolate primaries, hood-like collar, and long abdomen, combined with the lashed eyes and unarmed legs, make the genus an easily distinguished one.

The species, except *convexipennis*, are very similar in color, all of some shade of ashen gray, sometimes with a brown suffusion. In all, the

veins are more or less obviously black-lined, and there is a strigate appearance, varying in degree. The ordinary lines are never complete, and the t. a. is often wanting altogether except in the submedian interspace. No detailed reference is made in the descriptions to these common characters, more emphasis being put on those characters which really distinguish the species.

A few only of the forms are really common; but some species, usually not represented in collections, are undoubtedly missing because their distinctness has not been recognized. *Postera* and *florea* as distinct from *asteroides* are examples, and probably the three will be found to have the same distribution.

The t. a. line is, in most of the species, traceable in the submedian interspace, where it forms a long outward projection or tooth, nearly reaching the middle of wing. Quite usually, where this is discernible, there is also a fine, black longitudinal line from the base to the end of this tooth. At first sight this outline has a strong resemblance to a claviform; but in the few species in which that feature is found, it is attached at the end of the tooth and reaches the t. p. line. Usually this same line is again marked on the inner margin by a black dash or line extending outwardly.

It is quite notable that we have no species common to both sides of continent, but that, except *convexipennis*, every one of the eastern species has a close ally in Colorado. Thus *asteroides*, *postera*, and *florea* are represented by *montana*, *similaris*, and *obscurior*; *speyeri* and *intermedia* by *dorsalis* and *cinderella*. *Serriaticornis* is the only Californian form known to me, though Dr. Behr has named a *C. solidaginis* which can not be recognized from the description.

Lætifica is from Arizona and Texas, and is the only southwestern form known to me.

Easily distinguished from all the other species known to me is *serraticornis*. The antennæ in the male are distinctly toothed, the lateral processes furnished with a bristly tuft. This character is a remarkable one for the genus, and is accompanied by an equally divergent sexual structure. Should the species find strictly congeneric allies it may be eventually separated from *Cucullia*. In color it is ash gray, quite strongly resembling a small *speyeri*, or yet more nearly a small *lætifica*. I have seen no female, and Dr. Lintner in his original description had only males before him. As already stated, it is the only Californian species known to me.

Of the species with simple male antennæ, *convexipennis* differs in color from all the others. Through the center of the primaries the shade is a peculiar yellow ash-gray; from the middle of the costa to the outer margin at vein 4, a leather-brown shade suffuses the wing and darkens decidedly toward costa. A similar shade extends from the middle of the inner margin to the outer margin at vein 3, cut by the pale s. t. line, which is elsewhere marked on the costa only.

The abdominal tufts are larger, more dense and more prominent than in any other of the species, and are of a rich brown with a carmine admixture.

The balance of the species offer no unique characters, and are separable into two series, containing quite closely related species. In the first of these series the t. p. line is marked in the submedian interspace by a lunate pale line, preceded and followed by a dusky or black line or shade. In the second series the t. p. line is black or dusky, single, toothed in the submedian interspace, and without the pale lunule. In none of our species is it at all questionable to which series it is referable.

The first series contains six species, all with the same type of maculation, and closely related. The sexual characters are practically alike, and offer little aid in separating species. The harpes are long, quite narrow beyond the middle, somewhat widening to the oblique tip, which is acute at the superior angle, and inwardly fringed with spinules. The clasper is single, stout, short, arising from a broad corneous base, extending obliquely outward and upward, and rarely exceeding the lateral margin of the harpe. The exceptions to this type are exceptional in other characters, and are aberrant as members of this genus.

Three of the species are western—Colorado and Montana—and as a whole they differ from the three corresponding eastern species by the usually more distinct maculation, and by a peculiar roughness in vesture, the eastern forms being quite smooth and even. There is a tendency in all the species to a dotted maculation of the ordinary spots, two round dots in the orbicular and four in the reniform being normal.

Montana is the best marked of all the species. It is gray in color, the basal space yellow, a deeper shade extending through the cell and beyond it to the outer margin. In the median space the costal region is very dark gray. Beyond the lunule the submedian interspace is also yellow brown, with a darker, sometimes blackish, curved streak. The ordinary spots are large, well defined, paler in color, with the brown dots usually distinct. The secondaries are white at base, with a well-defined outer dark band, broader in the female.

Similaris has exactly the same maculation as *montana*, but lacks all the yellow shadings. The costal region is darker gray, and there is a blackish shade along the internal margin. Beyond the lunule in submedian interspace there is a distinctly defined curved black streak. The ordinary spots are very distinct and the defining lines are broken into dots, much as in the European *absynthii*. The secondaries are whitish at base, darkening outwardly to blackish, without having a defined band, as in *montana*. I consider the species a fairly distinct one, and have both sexes.

Obscurior is another species of the same series; but it is very dark gray, even in color, with the markings ill defined. The ordinary spots are as in the preceding; but not at all distinct. The secondaries are fuscous, slightly paler only, toward base. I have females only.

The three eastern species are as closely related as are the western; but diverge in a somewhat different way, so that they are less nearly allied to each other than to some of the western forms.

Asteroides is the eastern representative of *montana* without the distinct maculation, and without the yellow coloring at base of primaries. It has the same costal shading and the same markings beyond the lunule in submedian interspace. The ordinary spots are much less prominent, and the contained dots are vague. The secondaries are whiter, the marginal shade better defined and narrower.

Postera is much more intensely colored, much darker bluish gray, and the brown shading is much deeper. All the markings are much more distinct. The secondaries are smoky fuscous, only a little paler basally. Both sexes agree in these characters, and the species has no exact representative in the western series. It is nearest to *obscurior*, but is yet nearer in appearance to the European *asteris*.

Florea averages smaller in expanse than the preceding species, and is more gray without the brown shadings. The ordinary spots are fairly distinct, the orbicular smaller and more irregular than in any other of the series. The secondaries are whitish fuscous at base, darkening to smoky outwardly, intermediate in this character between *asteroides* and *florea*; but differing from both in the primaries. This species stands nearest to *similaris* in the western series. There is no apparent difference between the sexes.

The second series also contains six species, as a whole as closely related as those of the first. They have a type of sexual structure which, except in *bistriga* does not differ essentially from that of the preceding. The harpes are perhaps somewhat more parallel and the tip is not so acute superiorly. The clasper is rather longer, more slender, acute, and in *latifica* and *speyeri*, curved, hook-like.

Four of the species have the secondaries white at base, with a fairly well-marked smoky or blackish outer margin.

Latifica is the palest of the species, the dusky margin of secondaries very narrow in the male, much more distinct and broader in the female. The t. p. line sends a rather narrow loop-like tooth, rounded at tip, into the submedian interspace, the black streak beyond it reaching into the sinus to the line itself. Preceding the sinus is an indefinite white patch (the claviform), always distinct in the males, but much less obvious and sometimes wanting in the females. The latter are also darker as a rule. These points are characteristic of the species and are found in none other known to me. *Cita* Grt. and *hartmanni* French, are synonyms.

Speyeri is a larger and somewhat darker species, much the same in general type of marking. It lacks the white patch preceding the sinus of the t. p. line, and the sinus itself is very different, being rather a broad tooth or angle, broken in its course by a small tooth in the line to the apex of the angle. The curved streak to outer margin does not extend

to the end of the angulation, which is acute at tip. The thoracic dorsum is dusky.

Dorsalis is very like the preceding and is its western representative. It differs in the clearer gray color without fuscous admixture and the dorsum of thorax is concolorous and not darker.

Bistriga is an intruder here, and may eventually, if it finds allies, get another genus. It is smaller than any other of the species and the abdomen does not much exceed the secondaries. In other characters it does not differ essentially, and a new genus would be premature. It is a rather even gray, somewhat coarsely black-powdered along the costa. There is a distinct black streak along inner margin from base, and another broader streak from the t. a. line to outer margin through the submedian interspace. The secondaries have the dusky outer margin much less definite, and as a whole the species can not be mistaken.

The remaining two species have the secondaries smoky fuscous, and the primaries deep bluish ash-gray.

Intermedia has the median lines indicated on the costa, and generally traceable, sometimes distinct, for the remainder of the course. It is an eastern species.

Cinderella is smaller, the forewings narrower, more pointed, and immaculate save for a series of terminal black lunules, preceded by short black lines. It is from Colorado.

This last species, at first sight, looks doubtful, and yet I would be surprised if even large material proved it a form of *intermedia*. In a genus in which the species are less closely related I would not have described it, nor would I have described it at all save in a revision like the present, where its position and rank can be compared and such differences as exist brought out. The genitalia closely resemble those of *intermedia*, but are noticeably different, and emphasize the probability of specific distinctness.

The present revision is based very largely on material received from the U. S. National Museum through the courtesy of Dr. Riley, the honorary curator, and all the old species are represented in that collection. I have added all the species described by myself, so that of the known species the Museum contains a full series. The species described as *luna* by Mr. Morrison is an *Heliothid*.

I have seen the types of *postera* and *florea* in the British Museum, so that I am certain of the correctness of the identification of these species.

To Dr. J. A. Lintner I owe thanks for a copy of his Entomological Contributions, No. III, containing two photographic plates of *Cucullia*, European as well as American. The plates are among the finest of their kind known to me, and the species are distinctly and clearly shown in all the details of maculation. Dr. Lintner there points out some of the relationships of our species to European forms, and his paper should be consulted on that point. To Mr. Bruce I owe a fine series of Colorado

material, which has enabled me to describe the species of that region and compare them with the eastern forms. Mr. Neumögen kindly loaned me such specimens as I needed for comparison from his fine collection.

In tabular form the arrangement of the species would be as follows:

- | | |
|--|---------------|
| 1. Antennæ simple in both sexes. | 2 |
| Antennæ of male serrate, brush-like. | 9 |
| 2. Bright luteous gray; a yellow brown shade extends outward from middle of costa to outer margin at vein 4; a similar shade from inner margin near base to outer margin at vein 3. | CONVEXIPENNIS |
| Ash gray with a bluish tinge. T. p. line distinct in submedian interspace, where it forms a pale lunule, preceded and followed by a blackish line and shade; a curved streak or shade also extending to the outer margin. | 3 |
| Ash gray, variable in shade. T. p. line variably distinct, single, black, never forming a pale lunule in submedian interspace. | 6 |
| 3. Western species: Colorado, Montana. | 4 |
| Eastern species. | 5 |
| 4. Costal region much darker, suffused with a dull yellow shade; base yellow; curved shade over anal angle diffuse, yellow-brown. | MONTANA |
| Costal region scarcely darker, without yellow shade; base not yellow; curved marks over anal angle black, sharply defined. | SIMILARIS |
| Costal and inner margin dusky; color darker blackish gray, maculation all obscure. | OBSCURIOR |
| 5. Secondaries white with a broad outer dusky band. Costal region much darker, with a dull yellowish tint. | ASTEROIDES |
| Secondaries dusky fuscous, basally somewhat paler. | |
| Primaries dark slate gray, costal region darker, with a brown suffusion. | |
| | POSTERA |
| Primaries paler, ashen gray, costal region somewhat darker, but without a brown suffusion. | FLOREA |
| 6. Secondaries white at base, with a fuscous outer margin, narrow in the ♂, wider in the ♀. | 7 |
| Secondaries smoky fuscous, only a little paler at base. | 8 |
| 7. Paler ash gray; inward tooth of t. p. line in submedian interspace single, narrow, rounded at tip. | LÆTIFICA |
| Darker gray; inward tooth of t. p. line in submedian interspace double, broadly open outwardly, the tooth acute at tip. | |
| Dorsum of thorax dusky; habitat eastern. | SPEYERI |
| Dorsum of thorax concolorous; habitat western. | DORSALIS |
| Rather dark ash gray; a distinct black streak along inner margin to t. p. line, and a broader streak through submedian interspace from claviform to the outer margin. | BISTRIGA |
| 8. Size larger, median lines vaguely traceable; habitat eastern. | INTERMEDIA |
| Size smaller, all maculation wanting; habitat western (Colorado). | CINDERELLA |
| 9. Maculation vague, color gray; habitat California. | SERRATICORNIS |

Cucullia convexipennis G. & R.

1868. Grt. and Rob., Tr. Am. Ent. Soc., II, 201, Pl. 3, Fig. 76, *Cucullia*.

1869. Beth., Can. Ent., I, 86, *Cucullia*.

1874. Lint., Ent., Cont., III, 138, 170, *Cucullia*.

Head brown with a carmine tinge, palpi paler in front, two little white-tipped tufts between the antennæ. Collar with narrow black,

broader white, and still wider brown transverse lines; a double set of each. Thorax with patagiæ gray, with brown powderings and brown margins. The dorsal tufts are very distinct, thick, and brown, continued without break on the dorsum of the abdomen. Primaries gray, with a yellow-brown shading through the center of the wing. Basal and t. a. lines marked as short brown dashes on the costa, the latter with the long median tooth traceable. The median shade line is marked by a distinct brown line from the middle of costa, outwardly oblique over reniform to the middle of the cross vein of cell. Beyond that along costa, and to vein 4 on the outer margin, the wing is shaded with leather brown, darker at the margins. T. p. line marked by a geminate black line crossing costal region, the intervening line pale gray. From this gray line a gray streak extends outwardly to outer margin between veins 6 and 7, and curved upward to the apex of the wing. The veins through this darker brown shade are pale marked, and there are four more or less distinct gray costal dots. A double blackish line with brown interspace extends along inner margin from near base to t. p. line. The t. p. line becomes obvious in the submedian interspace as a narrow pale line with brown defining margins. It is slightly curved to the submedian vein, and thence makes a long inward bend to the hind margin. From this point a leather-brown shade extends obliquely to the outer margin, which it reaches on vein 3. Thence the shade extends narrowly along the margin, connecting with the costal shade. On veins 3 and 4 a white line cuts the fringes. Fringes with a pale yellow line at base, a blackish central line, and broader, dull gray outer shade. Orbicular reduced to two small black dots. Reniform indicated by from two to four dots, indicating the upper margin. Secondaries yellowish white at base, with a broad fuscous outer margin, narrower in the male. Veins dark marked. Fringes yellow at base, white tipped. Beneath smoky, primaries darker, paler toward base along inner margin. Secondaries paler, whitish basally.

Expands 45 to 49 millimetres=1.70 to 1.95 inches.

HABITAT: Canada; New York, Sharon Springs (in July), Long Island; New Jersey; Pennsylvania; Northern, Middle, and Eastern States.

The species is a strongly marked one, and has been already sufficiently compared with others. It does not vary to any appreciable extent, so far as I know.

The harpes of the male are elongate, narrow, widening at tip, which is oblique, the upper angle produced, margin inwardly fringed with spinules. The clasper is quite close to base, and is a single, nearly straight, corneous process, quite slender, and terminating acutely. It exceeds the lateral margin of the harpe by one-third its own length.

Both sexes are in the Museum collection.

Dr. Lintner has described the larva on *Solidago*.

Cucullia montanæ Grt.

1882 Grt., Can. Ent. XIV, 175 *Cucullia*.

Head blackish gray, front with black and pale transverse lines; palpi paler in front. Collar inferiorly luteous shaded, else rather pale, ash gray, with several indistinctly marked transverse lines and a black tip. Patagiæ pale gray with a few prominent black scales intermixed. Dorsum of thorax dark brown, as are also the distinct abdominal tufts. Primaries bluish ash gray with a broad costal region washed with yellow-brown, darker in the median space. Base yellow, shading into the ground color half way to the t. a. line. T. a. line in most cases distinct through the dark costal space, traceable over the long median tooth and distinct again on the hind margin along which also a blackish gray shade extends. T. p. line pale through the dark costal space, very faint or wanting through the center of the wing, distinct as a pale incurve margined by blackish, in the submedian interspace; thence from vein 1 to internal margin, inwardly oblique. A dusky shade precedes the pale lunule, and a yellowish-brown shade extends beyond it to the outer margin, superiorly marked by a darker brown streak. A series of black, terminal lunules. A more or less obvious series of brown interspaceal streaks along the course of the s. t. line. Fringes gray, cut with pale, and with a pale line at base. Ordinary spots large, well defined, usually paler, more yellow. Orbicular with two brown inner dots, one above the other, sometimes connected to form a central line. Reniform with four brown dots, sometimes partly connected; but usually distinct. Secondaries whitish, subhyaline at base, with a narrow dark outer margin, broader in the female. Veins darker marked. Beneath, primaries blackish, secondaries white, the margins broadly blackish.

Expands, 47 to 50 millimetres=1.88 to 2 inches.

HABITAT: Montana, Colorado.

Ten specimens, all of them collected by Mr. Bruce, are before me, five of them from the collection of the U. S. National Museum. They are practically all alike, varying only a little in relative distinctness of maculation. I have seen others, none offering distinctive features. It is the most distinctly marked of the species. The pale ordinary spots are prominent, and the yellow base of primaries is characteristic. The dark costal margin is powdery and the insect has a rough or "squammose" appearance. It is intermediate in some respects between *postera* and *asteroides* and, while most nearly related to the latter, is amply distinct from either.

The harpes are only moderate in length, widening basally, the tip oblique, somewhat drawn out superiorly and inwardly spinulose. The clasper is short, stout, rather obtuse at tip, from a broad chitinous base along inner margin, extending obliquely upward and forward, and not reaching beyond the upper margin.

It seems to be common and is attracted to the electric lights.

Cucullia similaris sp. nov.

Head dusky gray, with darker transverse lines. Collar pale gray, with a distinct black line at base, a less evident double line at middle, and a blackish tip. Patagiæ pale gray with a few black dots. Dorsum narrowly blackish, as are the small basal tuft and the dorsal tuftings of the abdomen. Primaries pale ash gray, somewhat darker, black powdered along the costa, but without any luteous shading or suffusion, and not yellow at base. A faint yellowish shade over the ordinary spots. A black streak along hind margin to the t. p. line. T. a. line sometimes evident through the dark costal region. The long median tooth very faintly indicated. T. p. line vaguely marked on costa, distinct through the submedian interspace as in *montana*, preceded and followed by a small blackish shade and followed also by a curved black streak below vein 2. A series of black terminal lunules. Ordinary spots only slightly paler, yellowish tinged, the defining lines broken into distinct black dots and streaks, four in the orbicular, six in the reniform. The orbicular has two black inner dots, the reniform four. In shape they are as in *montana*. Secondaries in the male whitish at base, with a moderate smoky outer border, in the female darker, more yellowish fuscous, the marginal band broader. Beneath, primaries blackish, secondaries whitish with black powdery borders.

Expands 47 to 50 millimetres=1.88 to 2 inches.

HABITAT: Colorado, Platte Canon on flowers, 6,500 feet.

This species is exactly like *montana* in ornamentation; but is much more even, paler gray without any of the yellow or brown shadings. The ordinary spots and their marginal rings are distinctly black dotted, much as in the European *absynthii* and the markings are black, not brown. The secondaries have the outer border less defined than in its ally, and they are darker throughout.

In sexual structure of the male there is very little difference from *montana*, and such as exists is better seen by a comparison of the figures herewith given.

Three specimens, 2 ♂ and 1 ♀, have been examined and no variation detected.

Cucullia obscurior sp. nov.

Head brownish gray, with pale and dark transverse lines. Collar dark blue-gray, yet darker tipped, with a distinct basal and a vague median transverse line. Patagiæ dark ash-gray; dorsum blackish, as are also the small dorsal tufts of the abdomen. Primaries dark bluish gray, with none of the maculation distinct; costal region scarcely darker, and the blackish streak along internal margin inconspicuous. T. a. line faintly indicated on costal space and on the median tooth. T. p. line indicated only in the submedian interspace, preceded by the usual blackish patch, but followed only by a curved black streak below vein 2. Ordinary spots as in *montana*, but vague, only inferiorly

outlined, the lines not distinct; a broken, slightly lunulate, terminal line; a pale line at base of fringes; the latter fuscous gray. Secondaries smoky fuscous, paler at base, the veins marked. Beneath blackish, powdery; secondaries a very little paler centrally.

Expands 46 to 47 millimetres=1.84 to 1.88 inches.

HABITAT: Colorado (Bruce).

Two female specimens are before me. They are entirely alike, and differ from all the preceding in the deep blue-gray primaries, in which the maculation is very indistinct, and the dark, smoky-fuscous secondaries. So far as the markings are traceable, they are exactly as in the preceding species.

At first sight, this form resembles *intermedia* more nearly; but the character of the t. p. line at once refers it here. I have no doubt the sexual characters will be found to be very like those already described.

The species is not unlike *postera* without the reddish shades.

Cucullia asteroides Gn.

1852. Gn., Sp. Gen., Noct., II, 133, *Cucullia*.

1857. Wlk., C. B. Mus., Lep. Het., XI, 656, *Cucullia*.

1874. Lintn., Ent. Cont., III, 139, 169, *Cucullia*.

Head dark-brown, with pale and dark transverse lines. Collar pale bluish gray, blackish tipped; a distinct black line at base and two vague transverse lines at middle. Patagiae pale-gray, sometimes a little yellowish. Dorsum blackish, as are also the small abdominal tufts. Primaries a very even, smooth bluish gray; costal region with a luteous shade extending through the cell, and intensified in the ordinary spots; the costa itself yet darker, sometimes blackish. A blackish and yellow-brown shade along internal margin. T. a. line sometimes traceable across the costal space and in the submedian interspace; but more usually it is entirely wanting. T. p. line obvious only in the submedian interspace, where it forms a pale incurve, margined by blackish defining lines. This is preceded by a small dusky or blackish patch, and followed by a yellow-brown shade to outer margin, emphasized above by a blackish-brown curved streak. A broken, black terminal line. Fringes gray, with a yellowish line at base. A fine black longitudinal line extending from base of wing to the tip of the long tooth of t. a. line. Sometimes both line and streaks are obsolete. Ordinary spots large, pale, usually void, sometimes with two brownish spots in the orbicular; four in the reniform. There is no real defining line, the difference in shade between the macula and its surroundings being sharp enough for distinction; but sometimes this is intensified by brown dots. Secondaries white, with a well-marked blackish outer border, narrower in the male. Beneath, primaries smoky, secondaries whitish, with powdery margins. Expands 44 to 51 millimetres=1.64 to 2.05 inches.

HABITAT: Canada; New York, Kendall, Long Island, Albany May 30 and June 6; New Jersey, New Brunswick, May 21; Washington,

D. C., August 10; Nebraska, West Point, in May; Northern, Eastern Middle and Central States.

This is the most common of our eastern species, and it is either double brooded or the hibernating imago flies for a long period. Dr. Lintner reports the larva on *Solidago* September 1 and 24.

A long series of specimens, largely from the collection of the U. S. National Museum, is before me, and shows little variation. The costa is sometimes a little darker, the yellow shading sometimes more intense, the ordinary spots occasionally a little more marked; but otherwise there are no noteworthy differences. The secondaries are whiter and more hyaline than in any others of the first series, *montana*, its nearest ally in this particular, being quite distinctively different in maculation of primaries.

The harpes of the male are longer and narrower than in the preceding species, the tip more oblique and superiorly more produced. In type characters it does not differ in the least.

Cucullia postera Gn.

1852. Gn., Sp. Gen. Noct., II, 133, *Cucullia*.

1857. Wlk., C. B. Mus., Lep. Het., XI., 656, *Cucullia*.

1874. Lintn., Ent. Cont., III, 169, *Cucullia*.

Head dark brown, palpi paler in front, a black, followed by a pale line on vertex. Collar deep, somewhat carneous gray, with a black transverse line near base. Patagiæ deep bluish ash gray. Dorsum blackish, with a black-tipped, truncate, posterior tuft. Dorsal tufts of abdomen small, but distinct, dark brown or blackish. Primaries deep bluish gray, with a carneous tinge, costal region from base to apex suffused with brown, extending inward to the median vein. Median lines vaguely marked on costa; the median tooth of t. a. line fairly evident. T. p. line pale through the submedian interspace, preceded by a distinct, followed by a less evident black line. It is incurved to vein one, thence very oblique inwardly to the hind margin. A blackish streak extends inward along inner margin, nearly to base. Preceding the s. t. line in the submedian interspace is a small blackish or brown shade, and following it to the outer margin is a brown shade which fills the interspace and extends to the outer margin, superiorly emphasized by a black streak. A broken series of vague interspaceal dashes along the course of the s. t. line. A series of black terminal lunules. Fringes concolorous or fuscous. A fine black basal streak. Ordinary spots variably distinct, always traceable, sometimes concolorous, more usually paler. They are defined by a very narrow black line, inside of which is sometimes a broad gray annulus; in that case the center is brown. Secondaries yellowish fuscous, smoky outwardly, darker in the female, veins dark marked. Beneath, smoky or blackish, powdery, somewhat paler at the base of the secondaries.

Expands 45 to 50 millimetres=1.7 to 2 inches.

HABITAT: New Hampshire, July 21; New York, Sharon, July 7; New Jersey.

The New Hampshire specimen is in the collection of the U. S. National Museum (collection of C. V. Riley) and was taken by Dr. Thaxter. The Sharon Springs example is from Dr. Lintner's collection, taken by Mr. Meske. Two other examples before me are from New Jersey without date or exact locality. It is certain that the distribution covers the middle and eastern States, and probably it is coextensive with that of *asteroides*. With the latter species, *postera* is almost certainly confused in collections, though its deeper primaries and fuscous secondaries should readily distinguish it.

There is some variation in the relative distinctness of the markings, but none otherwise. The ordinary spots are sometimes defined only by a slight difference in shade, and sometimes by a distinct continuous line, a pale annulus, and a brown center. The little series before me shows this range, the Sharon Springs example being the best marked, though not the most contrasting.

The sexual characters are as in the western species rather than as in *asteroides* and somewhat intermediate. The differences are shown by the figures given on the plate.

Cucullia florea Gn.

1852. Gn., Sp. Gen. Noct., II, 133, *Cucullia*.

1857. Wlk., C. B. Mus., Lep. Het., XI, 656, *Cucullia*.

1874. Lintn., Ent. Cont., III, 169, *Cucullia*.

Head gray to brown, with gray and black transverse lines. Collar gray, with a distinct black line at base and a less evident dark line above middle. Patagiæ rather pale gray, black powdered. Dorsum blackish brown, contrasting, basal tufts small, as are also the dark dorsal tufts of the abdomen. Primaries rather pale ash gray, even in color, costal region only slightly darker beyond the middle, without red or brown shades. T. a. line vague, less distinct even than in *postera*. A blackish streak along the inner margin to the t. p. line. T. p. line pale marked through the dark costal region, then obsolete to the submedian interspace, where it is of the gray ground color, defined by blackish marginal lines and exactly as in *asteroides* and *postera* in course. The preceding dusky patch is sometimes wanting, but is usually fairly distinct. The following shade to outer margin is vague; but the black streak below vein 2 is distinct. The ordinary spots are distinct in all specimens, concolorous, sometimes with a dusky center, defining lines incomplete, very little marked. The orbicular is somewhat narrower and more irregular than in the other species. A series of vague interspaceal dashes indicate the course of the s. t. line. A series of small black terminal lunules, degenerating into a broken terminal line in some specimens. Secondaries soiled whitish at base, smoky fuscous

outwardly, forming a broad, not defined outer marginal band. Beneath blackish, powdery, pale at base of secondaries.

Expands 42 to 47 millimetres=1.68 to 1.88 inches.

HABITAT: New York, Sharon Springs, July 6 and 8, Newburg; Pennsylvania.

This is the smallest in average expanse of the three closely allied eastern species. Three of the specimens before me are from the U. S. National Museum (collection of O. Meske and C. V. Riley), one, from Mr. Neunmoegen and the other from Dr. Lintner. This is also almost certainly confused with *asteroides*, from which it differs in the even gray color, the costa hardly darker and without reddish or brown shades. The secondaries are also much darker, with a broader outer border; but not so dark as in *postera*, from which the present species differs widely in maculation of primaries.

The sexual characters are essentially as in *asteroides*, but there is considerable difference in detail, better shown by the figure. The clasper in the specimen from which the drawing was made was turned the wrong way, and bearing this in mind its resemblance to *asteroides* is marked.

Cucullia laetifica Lintn.

1875. Lintn., in Grote's Check list, 24, *Cucullia*.

1878. Lintn., Ent. Cont. IV, 89, *Cucullia*.
cita Grt.

1883. Grt., Papilio III, 75 *Cucullia*.
hartmanni French.

1888. French, Can. Ent., xx, 69 *Cucullia*.

Head dusky gray, with pale gray and black transverse lines; palpi paler in front. Collar ash-gray with a basal black, and a median dusky transverse line. Patagiæ gray, dorsum dark brown, as are the very small dorsal tufts of the abdomen. Primaries very pale whitish gray in the male, distinctly darker, ashen gray in the female. The costal region is very little darker, the median lines sometimes indicated by darker geminate dots. T. p. line marked in the submedian interspace by a narrow black line, sending inward a long narrow sinus, rounded at tip. A narrow black line runs centrally through this sinus, broadening to a curved black streak beyond it. This streak reaches the outer margin below vein 2, and in the interspaces between 2 and 3, and 3 and 4, are usually two black sagittate marks basing on the outer margin. Preceding the end of the sinus in the submedian interspace is an indefinite white patch, representing the claviform spot. This is usually distinct in the male; but very indefinite and sometimes wanting in the female. A more or less evident black streak along inner margin near base. A fine black longitudinal line at base reaching the end of the long tooth of t. a. line, which is rather feebly marked. Ordinary spots obsolete, the inferior margin of reniform sometimes vaguely outlined. In the male there is usually

a faint luteous shade indicating the location of the spots; but this is as usually wanting in the female. A broken, black terminal line. Secondaries white, subhyaline, with a smoky outer margin, very narrow in the male, darker and a little broader in the female. Beneath, whitish, powdery, the primaries darker.

Expands 43 to 45 millimetres=1.72 to 1.80 inches.

HABITAT: Arizona; Texas, Columbus, Bastrop County April 3 to 30, Harris County.

The Arizona specimen is the type of *cita* Grt., from Mr. Neumoegen's collection. The type of *latifica* from Bastrop County, placed by its side, discovers absolutely no difference in any feature. The description of *C. hartmanni* French fits to these specimens perfectly, and fits nothing else known to me. Seven other specimens are before me, most of them from the Belfrage material in the U. S. National Museum (collection of C. V. Riley) and show a somewhat greater range of variation than usual in the genus. There is quite a decided difference in the ground color in the sexes, the males being quite pale, while the females are sometimes nearly as dark as in *intermedia*, and look like small *speyeri*. The essential character, which is marked in all the specimens, is in the sinus of the t. p. line in the submedian interspace, and this will enable the species to be recognized in all its forms.

The sexual characters are much as in *speyeri*. The clasper is shorter and stouter, and the angles of the tip of harpes are more rounded. Otherwise there is little difference. The figure given herewith shows the clasper turned the wrong way out. It is so on the slide and the figure was made from a camera drawing. Normally it projects outward and a little upward. In mounting, the pressure applied turned the hook the wrong way and it was not noticed until too late to rectify readily.

Cucullia speyeri Lintn.

1874. Lintn., Ent. Cont., III, 168, *Cucullia*.

Head fuscous brown with gray and black transverse lines. Collar pale gray, a distinct black line at base, and a geminate brown transverse line at middle. Patagiæ pale gray, dorsum brown, as are also the rather distinct abdominal tufts. Primaries pale ash-gray, with a more or less obvious fuscous shading, most evident along the costa and internal margin. T. a. line vaguely indicated on costa, the long outward tooth in submedian interspace fairly evident, a shorter, more acute tooth fairly distinct between vein 1 and the margin. T. p. line vaguely indicated on costa, becoming evident on vein 2, oblique inwardly to the claviform which indents it a little before the end of the tooth, then outwardly in an acute curve over vein 1. A narrow, broken, black terminal line, wanting altogether in the female. An oblique black streak below vein 2 from the t. p. line to outer margin. Claviform

fairly outlined in the specimens before me, somewhat paler, but not white as in *letifica*. Ordinary spots vague, only the inferior margin of reniform at all distinct. Secondaries white basally with a rather indefinite dark outer border, much broader in the female. Beneath, primaries smoky in the ♂, blackish in the ♀. Secondaries white, with a few marginal powderings in the male, with broad outer borders and dark powderings in disk in the female.

Expands 48 to 52 millimetres=1.92 to 2.08 inches.

HABITAT: New York, Albany June 6, Sharon Springs August 15; Nebraska, West Point in May; Canada to Pennsylvania, west to Nebraska.

This species is easily separated from *letifica* by the darker color of primaries as well as the course of the t. p. line, to which attention has been already called. There is also a series of fairly distinct interspaceal pale streaks extending in from the terminal space, which is not found in *letifica*.

The harpes of the male are quite long, nearly parallel to tip; the latter is obliquely and acutely drawn out at upper angle, rounded at the inferior; its inner margin is spinulated as usual. The clasper is quite long, slender, acutely pointed, curved, and exceeds the margin of harpe.

This species seems not common and there are not many in collections. The specimens before me are from the collection of the U. S. National Museum.

Cucullia dorsalis sp. nov.

Head ash-gray, with darker and paler lines on front. Collar bluish-gray, with a black basal, and double brown median transverse lines. Patagiæ and dorsum gray, concolorous, dorsal tufts of abdomen inconspicuous, gray. Primaries a rather deep bluish-gray, without any fuscous admixture or shade; but with rather distinct black powdering. T. a. line much as in *speyeri*, but much more broken and less obvious. T. p. line evident only in submedian interspace, and there indistinct and broken, in course as in *speyeri*. The usual black streak below vein 2 is distinct, and above it, in the two following interspaces, are small sagittate black dashes, all that remains of the terminal line. Fringes gray, with a very narrow basal line. Claviform quite distinctly outlined by black scales, concolorous. Ordinary spots obsolete, save for a curved black line that may indicate the inferior margin of the reniform. Secondaries white at base, with a narrow and rather well-defined dusky outer border. Beneath primaries smoky, secondaries white, outer borders blackish.

Expands 46 to 50 millimetres=1.84 to 2 inches.

HABITAT: Colorado (Bruce).

Two females are before me, and compared with the same sex of *speyeri* they are purer blue-gray, lacking all trace of the fuscous shading. The markings are more powdery, black, and yet less complete.

The entirely concolorous dorsum of thorax gives the most obvious feature. The secondaries are like the ♂ of *speyeri* or the ♀ of *latifica*, and, judging from these species, the male has a much narrower pale border to secondaries.

The sexual structures of the male will probably differ little from those of *speyeri*.

Cucullia bistriga sp. nov.

Ground color bluish ash-gray. Frontal vestiture with a considerable admixture of black scales. A black line at base of collar and a brownish line near its tip. Patagiæ with a submarginal dusky line. A brown, quite prominent, discolorous, metathoracic tuft. Primaries with all the veins narrowly black-marked, a dusky shade over the costa, and short, narrow interspaceal black lines in terminal space. T. a. line single, dusky, giving a long tooth into the median cell, a second into the submedian interspace, and a third to margin. T. p. line single, blackish, even, outcurved over cell and then parallel to outer margin. Reniform vague, dusky, moderate in size. A distinct black streak along the inner margin from base to t. p. line; another from the angulation of t. a. line in submedian space along the fold to s. t. space, then obliquely upward to outer margin between veins 2 and 3. A small subapical brown shade. Secondaries whitish basally, with an indefinite outer dark border; fringes whitish. Beneath grayish-white, powdery, primaries with a vague, dusky discal spot.

Expands 35 millimetres=1.40 inches.

HABITAT: Colorado (Bruce).

A very distinct species, differing from all the others at a glance. Two males, both taken by Mr. Bruce, one of them from Mr. Neumoegen's collection, are before me. The sexual characters are unique. The harpes are parallel, the superior angle of tip slightly produced. A chitinous ridge extends from the superior margin, near base, diagonally along and across the harpe, reaching the inferior angle of tip and there somewhat elevated and produced.

Cucullia intermedia Speyer.

1870. Speyer, Stett. Ent. Zeit. XXXI, 10-12, *Cucullia*.

1872. Lintn. Ent. Cont. I, 81, 85, pl. VIII, ff. 5, 7, *Cucullia*.

1874. Lintn. Ent. Cont. III, 170, *Cucullia*.

1878. Lintn. Ent. Cont. IV, 125, *Cucullia*.

umbratica† Gn.

1852. Gn., Sp. Gen. Noct. II, 147, *Cucullia*.

1870. Speyer, Stett. Ent. Zeit. 31, pr. syn.

Head fuscous, brown or dark gray, with blackish and white lines. Collar whitish inferiorly, dark gray superiorly, the difference less marked in the males. A black line through the white portion, and a double gray line separating the two shades. Thorax dull gray, with a fuscous admixture, dorsum very slightly darker, abdominal tufts loose,

dusky. Primaries dark bluish ash-gray with a fuscous admixture, all the markings obscure. In some specimens the median lines are traceable as follows: t. a. line as a broad, fuscous oblique shade over costa, outwardly toothed in the cell and there reduced to a fine black line, outwardly angulate again in the submedian interspace forming the usual long tooth, then again toothed below vein 1. The usual black basal line is evident in most specimens. The median shade is indicated by a broad, oblique fuscous streak across the reniform from costa. T. p. line single, fuscous, evenly outcurved over cell, then evenly oblique inward into the submedian interspace, where it forms an acute angle and is outcurved over vein 1. The ordinary spots are obsolete, in one specimen only the outer and inferior margin blackish-lined. Usually all the above-described maculation is incomplete and sometimes entirely wanting, save for the oblique dusky shades in costal region and the fragment of the t. p. line in the submedian interspace. A broken, black terminal line, sometimes sending in a small sagittate black dash in the second and third interspace, and often entirely wanting. Secondaries yellowish fuscous, somewhat paler at base, darker in the female. Beneath smoky on primaries, whitish powdery on secondaries; a more or less obvious discal lunule, sometimes a mere line, more usually a distinct ovate macula.

Expands 45 to 50 millimetres = 1.80 to 2 inches.

HABITAT: Canada; New York, Kendall, Sharon, August 8 to 16; Michigan; New Hampshire, Franconia; New Jersey; Illinois; Washington, D.C.; Northern, Eastern, Middle, and Central States.

This is the most common Eastern species of the second series, and seems as abundant as *asteroides*. It is very readily distinguishable from all others by the very dark gray primaries, in which usually all the markings save the oblique costal streaks are obscure, and by the yellow fuscous secondaries, which on the under side have a discal spot. There is little variation, only a relative distinctness or obscurity of maculation.

The harpes of male are long, narrow, slightly constricted centrally, the tip oblique, somewhat curved, inwardly fringed with spinules, upper angle acute. The clasper is a slender, upright corneous process with acute tip.

Dr. Lintner has described the larva on *Mulgedium leucophæum*.

Cucullia cinderella sp. nov.

Head fuscous gray with pale and darker transverse lines. Collar deep ash gray, with an inferior black and a median double gray line. Patagiæ and dorsum dark gray, concolorous. Primaries deep bluish gray, immaculate save for a narrow linear basal streak and a broken black terminal line. Secondaries smoky, basally paler. Beneath, primaries smoky; secondaries white, powdery, and with a faint discal lunule.

Expands 41 millimetres = 1.64 inches.

HABITAT: Colorado (Bruce).

This is a close ally of *intermedia*, than which it is smaller, all the maculation of primaries obsolete, the dorsum of thorax not dusky. The characters are obscure and would not be considered of specific value, were it not that none of the species thus far known inhabit both sides of the continent and that slight differences have proved permanent.

The sexual characters are very much as in the preceding; but the clasper is decidedly shorter and there is some difference in the form of the harpe, better seen in the figure than described.

I have only a single male for examination.

Cucullia serraticornis Lintn.

1874. Lintn., Ent. Cont., III, 174, *Cucullia*.

1875. Lintn., in Grote's Check List, pl. f. 10, *Cucullia*.

1883. Grt., Pr. Am. Phil. Soc., XXI, 161, *Cucullia*.

matricaria Behr.

1874. Behr., in Streck., Lep. Rhop. et Het., 94, *Cucullia*.

1875. Grt., Buff. Bull., II, 218 pr. syn.

"Antennæ biserrated; the serratures, which are less conspicuous at the base and tip, as seen from above, consist apparently of a row on each side beneath of conical projections, bearing rows of curved whitish cilia on their lateral margins beneath, which increase in length from the base to the apex. Palpi nearly horizontal, gray, with brown scales, third joint short and rounded. Front gray, with some black scales. Collar yellowish brown below the prominent black transverse line; above gray, with the usual paler line bordered with darker scales, and still darker ones on the upper margin of the collar. Tegulae concolorous with the wings. Thorax fuscous; an abdominal series of similar colored tufts on the first four segments. Abdomen gray, paler basally. Primaries straight costally or slightly concave from the folding over of the marginal nervure, gently curving to the apex, which is obtuse; outer margin entire, sloping moderately to the inner margin, which is long and nearly straight. Color pale ash-gray, darker on the inner margin. Anterior median line blackish, teeth acute, preceded by a white shade, beyond which some blackish lines almost geminate it. Posterior median line obsolete, except in cell 1 b, where it is bidentate; the teeth preceded by an elongate oval, brown bordered, white spot on the submedian fold, extending to the anterior median line; followed by a white angulate line (the "tooth" of the internal angle), from the concavity of which a black streak (the usual interspaceal streak of the internal angle) runs obliquely to the first median nervule (vein 2). Costal margin over the place of the orbicular, with a diffuse brown shade and two oblique brown streaks at the inception of the posterior median. Basilar line black, fine; a slender black line on the internal margin. Reniform indicated by a row of black dots anterior

to the discal cross-vein; orbicular only visible as a central pale shade and four outer brown dots. Nerves and nervules clothed with black scales; on the interspaces intermediately are brown scales, with a whitish streak centrally, beneath which, on the subterminal margin, are the usual black streaks in all the interspaces, the most conspicuous of which is that in cell 4 (farther removed from the margin than the others). Fringes white, cut with brown on each side of the nervules, opposite the interspaceal lines of brown scales; these brown ciliary scales of each interspace joined by a brown marginal line. Secondaries acute, excavated opposite the cell, slightly dentate; white, hyaline. Nerves and nervules heavily marked with black scales, especially toward the margin; no distinct marginal border, but in place thereof the extreme margin is brown, with some brown scales extending a short distance therefrom, and farther in cells 1 b and 4; some brown scales on the costal nervure apically. Beneath, primaries pale brown, with an aeneous reflection; a conspicuous brown spot on the discal cross vein. Secondaries, with brown scales on the nerves and nervules and marginally as above, though less abundantly; sprinkled with brown scales costally and in the cell above the fold; cellular fold and discal cross vein above it broadly covered with brown scales, diffuse on the latter, giving a conspicuous cellular spot; these features seen in transparency from above.

“Described from two ♂s, differing materially in size; the larger and better specimen, from which the features are mainly drawn, measures 2 inches expanse of wings, length of body 0.86 inch; the other, 1.70 inches expanse, length of body 0.72 inch.

“In addition to disparity in size, the two examples differ somewhat in shape of wings, those of the smaller being narrower and more acute, to the degree that the male usually varies from the female in the several species of this genus; yet the two examples are undoubtedly males, as is shown by their frenelum examination. In all other particulars, so far as they are traceable, the two are identical. They are, unfortunately, in poor condition, and the description above given may require correction.”

HABITAT: California.

I have quoted Dr. Lintener's description of this species because I have only a single male, not in the best condition, before me. It is marked “Sauz., Mch. 23, 1878,” and belongs to the U. S. National Museum.

The sexual characters are as distinctive and aberrant as is the antennal structure. The harpe narrows from a moderately broad base, very gradually, to an acute, corneous tip, which is a little curved and beak-like. The clasper is a stout, moderately long corneous process, with a spoon-shaped tip.

The insect seems rare, and it is rather strange that no females have been thus far received.

Cucullia solidaginis Behr.

1874. Behr., in Streck., Lep. Rhop. et Het., 94, *Cucullia*.

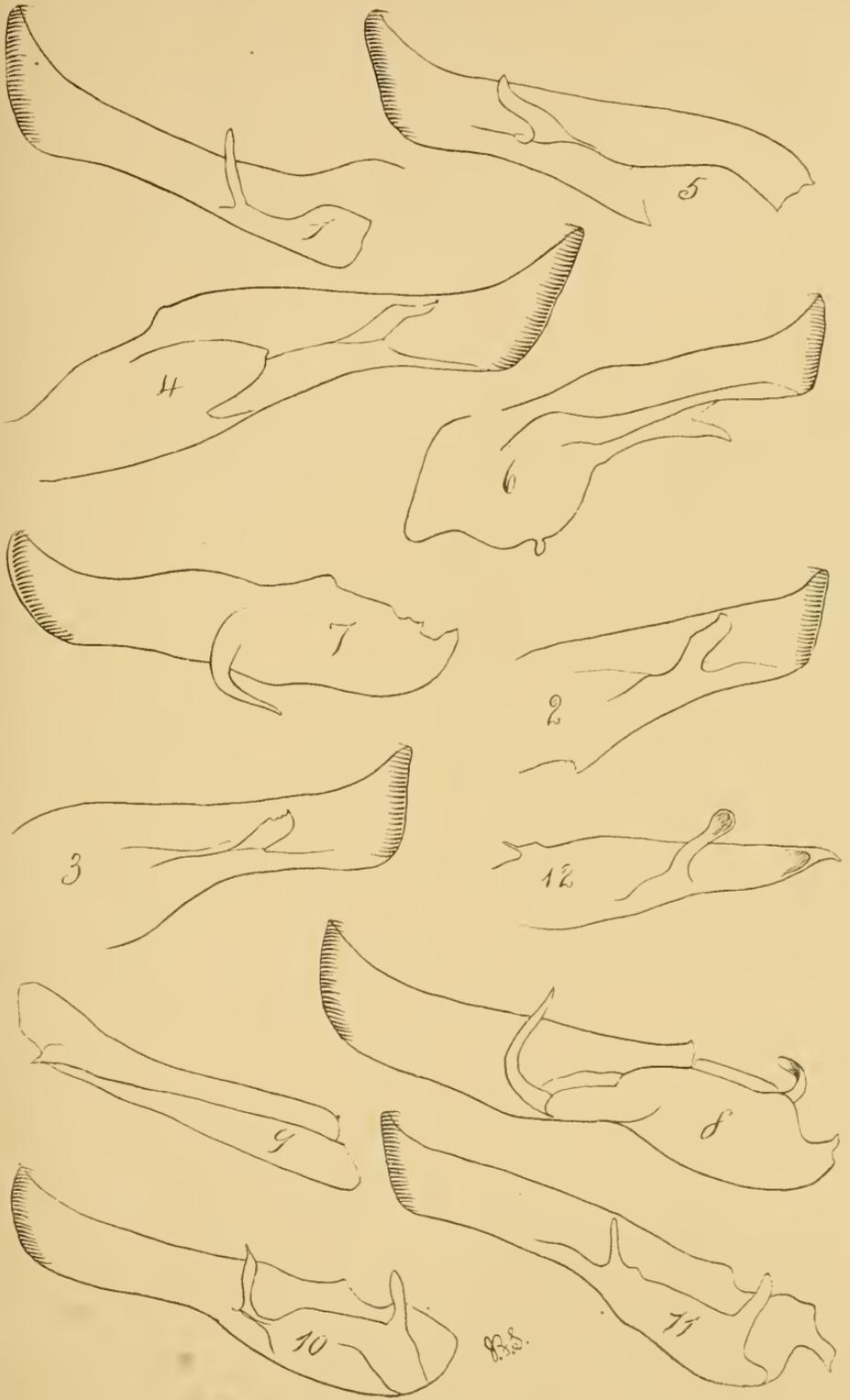
“Expands $1\frac{3}{4}$ to 2 inches. Head and tegulae ashen, thorax between the latter dark gray with a brown dorsal line. Primaries gray, the median space suffused with darker color, which in one example tends to the base; it comes nearer in the markings to *lactuæ* Esp., but is entirely distinct from that or any other species known of. Secondaries smoky.”

“California.”

This description I can not apply. I have no material in the genus from California, and what little information is given excludes or includes any of our species, just as it happens to be interpreted. Such characterizations as the above are positive stumbling blocks to knowledge and are inexcusable. They exhibit an absolute ignorance of the intent of a description and a deplorable want of consideration for those who may be compelled to try to apply it.

EXPLANATION OF PLATE.

1. Harpe and clasper of *Cucullia convexipennis*.
2. Harpe and clasper of *Cucullia montanae*.
3. Harpe and clasper of *Cucullia similaris*.
4. Harpe and clasper of *Cucullia asteroides*.
5. Harpe and clasper of *Cucullia postera*.
6. Harpe and clasper of *Cucullia florea*.
7. Harpe and clasper of *Cucullia lætifica*.
8. Harpe and clasper of *Cucullia speyeri*.
9. Harpe and clasper of *Cucullia bistriga*.
10. Harpe and clasper of *Cucullia intermedia*.
11. Harpe and clasper of *Cucullia cinderella*.
12. Harpe and clasper of *Cucullia serraticornis*.



GENITALIA OF CUCULLIA.

