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NORTH AMERICAN NOCTUIDÆ.

REVISION OF THE SPECIES OF *XYLINA* Ochs.

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The species of *Xylina* are characterized by rather narrow, subequal primaries, the costal and inner margins parallel, of nearly the same length, the outer margin only a little oblique, sometimes stumpy, often with a cut at the anal angle, the outer margin or fringes a little dentate. In general habitus the species look depressed or a little flattened, and when at rest the primaries are laid flat over the abdomen, not sloping or rooflike.

Head small, closely applied to the thorax, but not retracted; vestiture of front mixed with bristly hair so that it projects straight forward, forming more or less evident, superimposed flat tufts. There are no protuberances, plates or processes. Antennæ moderate in length, about two-thirds the length of the primaries, in the female simple, or ciliated; in the male ciliated or with lateral tufts of hair or bristles, not serrated or pectinated in any case. Between the antennæ there is sometimes a brush of rough hair and scales. Palpi short, reaching only the front in most cases, sometimes reaching almost half way to the vertex. Terminal joint short and obtuse. Tongue short, functional. Eyes naked, fringed with long, overhanging lashes. Thorax quadrate, small or quite moderate, depressed, vestiture hairy, or with a mixture of scales and broad hair, usually flattened down, but sometimes a little roughened. Collar a

little produced centrally, excavated on each side of the middle to the base of the primaries where it is shouldered. Behind the collar there is a central thoracic crest which is usually divided and may extend to the thorax, though much reduced and not there divided. Abdomen extending to and usually much beyond the anal angle of the secondaries, untufted, slightly tufted or with prominent dorsal tufts, obtusely terminated, sides parallel, a little flattened. The general form of the primaries has been already described, the secondaries have the outer margin a little excavated below the apex, in other respects proportionate to the primaries. Legs stout, moderate or rather long, spurs well developed, otherwise unarmed and the tibiae not spinulate. Vestiture of the under side dense woolly.

The venation is normal, secondaries with vein 5 from the cross vein remote from 4, ranging from obsolete to fairly developed, but always much weaker than any of the others.

The genus is readily recognized and fairly well defined, none of the characters varying widely. Such differences as occur are mentioned under specific headings.

The moths usually make their appearance in Fall, hibernate as adults and again fly a short time in early Spring. Some of the species are commonly found at night in or around the sap pails in the "bush" when maple sugar is made.

In geographical distribution the species range northwardly, but extend from the Atlantic to the Pacific. None are southern and none are peculiar to the plains—so far as known.

In studying this genus I have had before me, besides my own material, all that belonging to Drs. Barnes and Ottolengui, a selection of specimens from the U. S. National Museum and a few examples from Mr. Doll. I have also compared and looked carefully over the material in the Strecker and Neumogen collections as well as that in the American Museum of Natural History and the American Entomological Society.

Two color divisions are readily recognized, accompanied by a certain difference in habitus which is obvious enough, but impossible of strict definition.

The first of these divisions varies from creamy white to luteous and to bright red-brown; the second is of some shade of ash gray, ranging from almost white to dark blue gray or to greenish. In the first division the species are as a whole somewhat smaller, the markings better defined, and there is a dusky patch in the submedian

interspace between the median shade and the t. p. line. This spot is actually present in every species except *semiusta*, but not in every specimen. It is sometimes obscured by darker shadings as in *ferrealis* and sometimes washed out; but with a good series at hand it will be found in all except as above noted. There is also a more obvious dentation on fringes of the primaries, and the excavation below the apex of the secondaries is well marked. *Semiusta* is again an exception.

Added to these superficial characters the vestiture is uniformly hairy, and there is a very uniform type in the male genitalia. The harpes are rather long, in a general way parallel, the tip oblique and furnished with a small series of spinules, which may be at the extreme point only, or may occur along the entire oblique edge. Near the base at the upper margin is attached a moderately long, curved, corneous hook or clasper, and from this a corneous ridge extends diagonally to the tip. It extends even beyond the tip in the form of a mere point or as a slender curved process, varying in the species, and at about the middle of the ridge there is a broad tooth or spur of varying form. This description is general of course, and each species shows its own peculiar combination of these characters. It justifies the association of the species placed in the first series on color characters alone.

Semiusta is somewhat pale, rusty red-brown, without contrasts in maculation; all the lines even, and all the usual markings traceable. It is easily recognizable by the even fringes and the absence of the dark patch in the submedian interspace. The harpes of the male are rather narrow; the clasper is moderate in length, stout, curved, obtuse at tip; the tooth from the oblique ridge is long and sharply pointed, while the process extending beyond the tip is also long, slender and a little curved to the acute tip. There are only a few spinules at the extreme outer tip of the harpe.

Hemina and *disposita* are of a soft creamy gray color, the latter with a reddish or brownish shading that lightens it throughout and relieves the markings. In both there is a longitudinal black line at the base; both have the ordinary spots of good size, outlined in black, and both have a long tooth from the t. a. line, almost reaching the t. p. line in the submedian interspace. In fact, so far as maculation is concerned, the two may be considered alike, the uniform soft creamy gray, free from any admixture of reddish, serving

well to distinguish *hemina*. In sexual structure the two differ obviously, though the resemblance between them is sufficiently close to indicate their near relationship.

In *hemina* the tip is somewhat irregular and spines extend for half its length. The hook or clasper is rather small and stout; the tooth from the oblique ridge is short, broad at base, narrows abruptly to a sharp point, and the extension beyond the tip tapers evenly and without curve.

In *disposita* the tip is even, and there are a few spinules at the extreme point only. The hook or clasper is, proportionally, longer and more slender; the tooth from the oblique ridge is long, square at base, with lateral projections at one-third of its length, thence a little curved to the tip. The extension beyond the tip is long, rather broad at base, then drawn out into a long point which is a little curved.

Bethunei, *patefacta* and *innominata* are pale species, ranging from whitish to luteous yellow or reddish. The markings are all fairly obvious, not strigate, the t. p. line for the most part broken into a series of geminate, venular dots. The s. t. line is marked by a preceding series of darker spots or shadings, or the terminal space is darker. The median shade is oblique from the costa between the ordinary spots to below the reniform, forming a sort of **V** shaped patch about that spot which is quite characteristic. There is no longitudinal black line at base; but in some very well marked specimens there is a false appearance of such a line caused by a series of black scales below the median vein.

Bethunei is the palest species, the ground being almost whitish in some examples, washed or mottled with luteous, the shadings of a deeper tint of this same color or of a silvery gray. As a rule the median shade is the most conspicuous portion of the wing; but in some cases the shadings before and beyond the s. t. line are also contrasting. The harpes of the males are long, the tips very long and oblique, with a series of small spinules along the edge from the point to the extension of the corneous ridge. The hook or clasper is moderate, stout. The tooth from the middle of the oblique ridge is very broad at base and narrows very abruptly to a slender point. The extension beyond the tip is an evenly narrowing spur of moderate length.

Patefacta resembles a darker, washed out *bethunei* with blackish secondaries and with an unusually prominent dark spot in the sub-

median interspace before the t. p. line. The species has been and can easily be confused with its ally; but the darker secondaries distinguish it readily. The male genitalia differ markedly. The clasper is shorter, broader and tapers irregularly to a small rounded tip almost from the base. There is a small patch of spinules on the surface of the tip and not at its edge only. The clasper or hook is rather small and stout. The oblique ridge is broad, its edge irregular, the tooth at its middle small, three pronged. The extension beyond the tip is rather short, irregular and drawn to a long point. Altogether this is totally different from the corresponding parts of *bethunei*.

Innominata, which is the species erroneously determined by Mr. Grote as *signosa* Wlk., differs at once by the reddish shading of the primaries and the blackish secondaries. The maculation of the primaries is almost exactly like that of *bethunei*, and some washed out examples are apt to be confusing until the uniformly darker secondaries and abdomen are noted. The male organs differ from the two last preceding. The harpes are narrow, elongate and taper along the lower edge toward a small, nearly pointed tip, edged with a few spinules. The clasper is much longer and not so stout as in the allied species. The edge of the oblique ridge is serrated, not produced into an obvious tooth, and it extends beyond the tip in a long, curved, pointed process.

Oriunda is a bright red-brown species, the median lines lost, but the s. t. line prominent and marked with white scales. The extreme base and the costal region of the primaries are marked with white. The reniform is filled with white, and the narrow, long, oblique orbicular is ringed with white. Altogether it is a very distinctly marked as well as rather a rare species. The harpes are moderate in length and narrow to a rather small oblique tip which is fringed at the edge with spinules. The hook or clasper is small and very stout, the oblique ridge has a rather long pointed tooth at about the middle and it extends beyond the margin in a short point a little before the tip.

Gausapata comes in here; but the species is known to me by the type only, which is in the American Museum of Natural History. Mr. Grote speaks of it as allied to *ferrealis*, but it is of a dull purple red, the primaries with a gray bloom. The median lines are indistinct and the reniform is a rusty yellow stain. There is no difficulty in recognizing this species, which is from California.

Ferrealis has the costal region, including the ordinary spots a reddish gray or yellow, while the rest of the wing is dull rusty brown, the lines all lost. There is no difficulty in separating off this form, which is the most strongly contrasted of this series. The male genitalia resemble those of *innominata* most nearly; but the clasper is shorter, there is a slender tooth from the oblique ridge, and the extension beyond the tip is stouter, the point blunt and less drawn out.

Amanda is a much lighter reddish gray than any of the other species, the transverse maculation obsolete, tending on the whole to become strigate. The ordinary spots are not defined and there is a reddish luteous shade through the median cell, extending beyond it to the margin. Flown specimens have an indescribable faded tinge that is characteristic. The male genitalia differ markedly from all the preceding. The harpes are broad, the tip is oblique, its extreme point with a very few marginal spinules. The clasper is rather small and very slender. The oblique ridge does not start at the clasper and ends before the tip. At its base there is a moderate, rather narrow process, pointed at the tip, and at its extremity it is produced into a slender, curved process, longer than the width of harpes.

Of the series of ashen gray species, there are a few that have no black longitudinal line or streak at base. This is a character that must be used with some caution, because it sometimes happens that a species which normally has such a line or streak loses it by fading, or, on the other hand, in some dark examples of the present series the black scales on the median vein may simulate a basal line. Nevertheless, with a reasonable series of normal specimens, there is no danger of confusion.

Contenta, *itata*, *fagina* and *longior* are the species belonging here, and the absence of this basal line is about the only thing that holds them together. Yet there is a similarity in the general type of genital structure, and it does not differ very markedly from that of the preceding series.

Contenta is a species of moderate size, the veins black marked, and the interspaces with more or less evident black lines. The distinctive feature is a series of four or more small black dots along the margins of the ordinary spots, resembling in that particular certain species of *Cucullia*. Everything is confused; but the ordinary

spots have a somewhat luteous shading that renders them obvious if not contrasting. The harpes of the male genitalia are very broad at base, narrow abruptly at about the middle, then broaden a little and are roundedly oblique to an acute superior tip, no part of which is set with spinules. The clasper is at the middle of the harpe, long, slender, very strongly curved. The corneous median ridge has a rather short, stout, flat, pointed central tooth and a somewhat longer and broader process at the lower angle of the tip.

Itata is a much smaller species, of a soft powdery gray which obscures, while it leaves traceable, most of the ordinary markings. There are no contrasts, and the only features that are at all relieved are, a little diffuse black spot in the lower portion of the reniform, and a similar patch in the submedian interspace where the t. p. line should be. No male has been seen.

Fagina is larger than either of the preceding and is a much paler gray; white powderings over the primaries and especially in the costal region, giving it a brighter appearance than usual in the genus. The veins are very narrowly black marked, and in the interspaces are blackish teeth, forming disconnected parts of the usual lines. The ordinary spots are practically lost, though the orbicular may be defined as an oblique and very irregular concolorous spot in some examples. The harpes of the male are long and narrow, tapering from outer fourth to an elongate narrowly rounded tip, which is not set with spinules. The clasper is at the middle, rather moderate in length and only a little curved. The oblique ridge has a broad tooth at the middle and a long, curved, pointed process extending from the middle of the oblique ridge, narrowing to a little beyond the rounded tip.

Longior equals the preceding in size, but is broader winged and seems larger, more robust. It is darker gray, much more strigate, and here a black basal streak is sometimes indicated. There is, indeed, a black streaking throughout the wing, the most obvious being through the submedian interspace and obliquely from below the reniform to below the apex. The latter is usually accompanied by a smoky brown shade which may extend throughout the centre of the wing. The male genitalia differ markedly from all previous forms. The long, narrow harpes have the upper edge broadly corneous, and at tip this is broadened and irregularly emarginate.

The clasper, arising behind the middle, is long, slender and well curved.

The following seven species, *emarginata*, *holocinerea*, *georgii*, *puella*, *oregonensis*, *winnipeg* and *unimoda*, have a slender black longitudinal line, which extends beyond the basal half line and is not turned into it to form an oval paler patch at the costal area of base.

Of these, three—*emarginata*, *holocinerea* and *georgii*—are so closely allied that their separation is in some cases a matter of tact rather than based on positive characters. They are local or Darwinian species and agree in a strigulate maculation of primaries, on which the median transverse lines are either lost or marked on the costal region only. The male genitalia are of one type, and while there are differences in each case they are not beyond the reach of individual variation supplemented by distortion in mounting. This last factor deserves mention here as it must be taken into consideration in all the following species of the genus. The structures are actually and proportionally large, strongly curved and convex, and the clasper not only curved into a hook, but also twisted inwardly and at an angle from the harpe. Flat mounting on a slide is therefore impossible without distortion; mounted in a cell no two specimens are so exactly in the same position, that seen at the same plane they give exactly the same figure. As all the sketches are made with the camera lucida, differences could be made to appear even where none exist. Wherever possible several mounts have been made for each species, and the one selected for figuring has been that which best gave what seemed to be the characteristics of the species.

In the three species under consideration the harpes are long, rather narrow, curved and convex; the tip is emarginate, the lower angle drawn out into an acute point, the upper into a narrow, blunt angle. The upper margin near the tip is serrated, and there is a curved enlargement almost at the base of the clasper, which is also toothed. The clasper is a long, curved and twisted corneous hook.

Emarginata is very whitish gray, the longitudinal streakings along the veins very narrow and inconspicuous, and the ordinary spots obsolete or only feebly marked. The s. t. line is indicated in all the specimens by a slightly darker shade, but it is not at all prominent in any sense or case. The species is quite as pale as any *fagina*, but has the black basal line obvious in all cases. The fig-

ures on Plates I and II should be referred to for the differences between the species here.

Holocinerea is decidedly deeper, more bluish gray, the ordinary spots being relieved, the reniform often with a faint reddish or brownish tinge. The streakings are evident throughout the primaries, and there is an obvious series of smoky or blackish spots preceding the s. t. line. There is no case where any doubt has arisen as between this and the preceding species.

Georgii is a little paler gray, less strigate than *holocinerea*, darker, better marked and with a more obvious s. t. shading than in *emarginata*. The median lines are better marked than in either of the preceding, and as a whole the size averages a little smaller than its allies. The two last mentioned species are much more closely allied than either is to *emarginata* and I hesitated as to their distinctness. There is, however, a certain habital difference which will, I feel convinced, justify the species when both forms have been studied in large series.

Puella is a bright species in which the maculation is neatly defined on a very pale ashen ground. The median lines and the median shade cross the wing, and the ordinary spots are completely defined by narrow black lines. All the specimens before me are females, but the superficial characters are, in this case, sufficient to place the species beyond all reasonable doubt.

Oregonensis is a near ally, but is smaller and the maculation is not nearly so well defined. The t. a. line is complete, but neither t. p. line nor median shade get much below the costa, while the basal space above the black streak is paler and the reniform has a slight reddish shade. The harpes of the male resemble those of *laticinerea*, but both angles of the tip are extended, the lower not nearly so much as the upper.

Winnipeg and *unimoda* are very obscurely marked forms which may become troublesome. Both are rather dull ashen gray, *unimoda* being the paler of the two. The black line at the base is often very obscure, so that it would seem almost referable to the series in which that distinction is wanting, but the orbicular is here well defined and there is no tendency to the strigate or denticulate type of maculation. Other specimens have the basal space above, a little paler, and in such cases resemble the *antennata* group very closely, but they are more evenly colored, the median shade is scarcely marked and the reniform is very imperfectly defined.

Winnipeg is the darker of the two and a little smaller. There are no contrasts in maculation and the orbicular is scarcely paler than the rest of the wing. The genitalia of the male are characteristic and tend to combine features of both the *oregonensis* and the *antennata* type. The harpe is large, curved and convex, the upper angle of the emarginate tip produced, the upper margin with a rounded protuberance, the edge of which is dentate. The clasper is a very long curved hook of moderate thickness.

Unimoda is larger and paler gray, the orbicular better defined and distinctly more whitish than the rest of the wing, so that it is, obviously, the most conspicuous feature of a very inconspicuously marked form. The male harpes are altogether different from any others, the tip being acutely notched, the margins even, though not parallel. The clasper is a very long, curved and twisted hook.

In all the remaining species the black basal dash extends only to the basal half line, usually making a junction with it so as to inclose a paler patch on the costal portion of the base. This feature is variably distinct, of course, but traceable in even the most obscurely marked *grotei* that I have seen.

Some of the species have the median lines connected by a black longitudinal line, either crossing the entire median space or extending from the claviform to the t. p. line. Most of the species have no connection of this kind and these will be first considered.

Laticinerea and *grotei* agree in dull, ashen gray color; primaries with the space between the ordinary spots not at all darker, and the reniform without a trace of reddish or brown shade or flush.

Laticinerea is the larger and darker of the two, the fore wing having a peculiar rough appearance as from uplifted black scales. Out of this the orbicular is relieved by whitish powderings, and the s. t. line is marked by contiguous, black, sagittate preceding spots. In the male the harpes are larger and convex, narrowing rather regularly to an obliquely excavated tip, the upper angle of which is long drawn out. The lateral margins are even, but there is a triangular flat process arising toward the middle, which is rough and irregularly set with smaller hair. The clasper is a long, slender, curved and somewhat twisted hook.

Grotei is smaller and of a more even gray throughout. The vestiture is comparatively smooth, and the orbicular does not stand out in contrast to the ground, though it may be as pale as in the preceding species. The dusky shade before the s. t. line is rarely contrast-

ing. Line for line, mark for mark and shade for shade, the two species here grouped may be made to agree, and it is not surprising that they have been considered identical. Yet with the two forms separated out in a good series of each, their difference is obvious. With single examples there may be difficulty unless reference be had to the male genitalia.

In *grotei* the harpes are very broad at base, constricted a little before the middle at the origin of the clasper, where also they curve inward and upwardly, enlarged from the inferior margin, where there is a crescent of saw teeth, and again narrowed to an irregularly broken tip.

It may be said here that Mr. M. V. Slingerland has bred these species as well as *antennata* which immediately follows, and, while they are similar, the larvæ yet bear out the distinctness of the species.

All the other species in this series, in which the median lines are not connected, have the reniform more or less flushed with reddish or brown, and the space between the ordinary spots darker, excepting only *viridipallens*, which is recognizable by its peculiar greenish gray primaries.

Antennata tends to the preceding species, but is smaller and shorter winged, besides being much brighter in color. In comparison with its associates it is less contrastingly marked, the median lines more or less incomplete and the reniform narrow, centrally a little constricted. The median shade is not prominent and the primaries have a reddish rather than a bluish flush. The harpes of the male are moderately broad and narrow irregularly from both sides to a long, bluntly rounded, very narrow tip. The inferior margin has two irregularly toothed excrescences. The clasper is a short, stout, curved hook. This species has also been confused with *grotei*, but is abundantly distinct.

Torrida is blue gray, except for the reddish flush in the reniform. It is longer winged than any other in this group and finds its nearest ally rather in *antennata* than in *tepida* to which the brightness at first seems to ally it. This is carried out by the fact that the orbicular extends below the median vein into a suborbicular, as is uniformly the case in the species allied to *grotei*. The genitalia of the male resemble those of *unimoda* in the notched tip, and those of *grotei* in the toothed, irregular extension from the lower margin of the harpe. The clasper is long, slender, curved and twisted.

Tepida is again smaller and shorter winged. It is somewhat less blue in tint, the median shade prominent, reniform broad, the sides rounded, and the orbicular not extending below the median vein. The harpes of the male narrow from both sides to the tip, where they are drawn out into a long, slender, acute process. The clasper is moderately long, only a little curved and tapers to a point.

Querquera has much the same ground color, but the maculation is not contrastingly written. The black markings at base are prominent; the space between the ordinary spots is black; the reniform is brownish, and there are two black patches preceding the s. t. line. All else is subdued or lost and the species looks odd as well as distinctive. It is probable that this species on a lichen covered tree is practically invisible so long as it remains quiescent. In genital structure it resembles *tepida*; but the clasper is much stouter and is bluntly terminated at tip. At the base of the clasper is a two-pronged corneous process which seems to serve as an accessory to it.

Viridipallens is of a uniform greenish gray and all the maculation is present, but it is all smoky or of a darker gray, without obvious contrasts of any kind and without a distinct black point anywhere in the wing. This form would be invisible on the trunk of a beech or poplar, or on a lichen covered stone. The species is very rare and I have no male for dissection.

Pexata and *dilatocula* are large, smoky brown species, with large reniform and a black line extending from the tip of the claviform to the t. p. line, thus connecting with the t. a. line. The transverse maculation is complete, and the s. t. space is somewhat paler than the rest of the wing before the s. t. line. They differ from all the rest of the species in the prominent abdominal tufts.

Pexata is the darker of the two and has a rough, squamose appearance. The ordinary spots, though large, are not contrasting or prominent, and there are no smooth shadings in the fore wings. The harpes of the male are moderate and narrow somewhat to an obtusely rounded tip, which is inwardly fringed with spinules. The upper margin near the tip has two prongs, arising from a corneous ridge, the outer shorter and pointed, the inner longer, more even and rounded at tip. The clasper is a short, thick, blunt, corneous process. In this structure the insect is nearer to the type of the first series than to those with whom its ornamental features associate it here.

Pexata has been considered as a form of the European *ingrica* and has a superficial resemblance to it. But the male characters of *ingrica* are entirely different and the two are not even closely related.

Dilatocula has somewhat broader, more trigonate wings, the apices a little more pointed. The vestiture of the primaries is smooth, more bright, the ordinary spots contrasting. The orbicular is round and clear gray. The reniform is very large, almost as broad as long, with a bright reddish flush and no smoky filling. It has a close general resemblance to *pexata*, but is larger, and owing to the wing form, has a different habitus. The harpes are broad and taper to a narrow, squarely cut-off tip which is fringed at the edge with spinules. Along the upper margin is a corneous thickening from which arise two large, thick, pointed thumbs or processes; the inner being the thicker and tapering abruptly to a blunt tip. The clasper is a short, thick, slightly curved process, cut off at tip.

Lepida and *thaxteri* are totally different in appearance from all the other species, seeming mottled and with a black bar between the median line in the submedian interspace.

Lepida is deep blue-gray, without reddish shadings on primaries, the markings not greatly contrasting. The secondaries have a distinct reddish tinge. The male genitalia are very simple; the harpes are broad at base, nearly even to about the middle, whence they narrow evenly to a pointed tip. The clasper is moderate in length and thickness and is curved, sickle shape.

Thaxteri is shaded with reddish and has the maculation prominently contrasting, so that it seems marbled. The chief reddish shades are at the base, along the internal margin and over the reniform. It is somewhat difficult to describe the genitalia of the male. The harpes narrow abruptly at about the middle, the tip is small, oblique, set with spinules along the edge. Obliquely across this harpe extends a broad, corneous plate, which develops in one direction a curved, toothed process, and in the other a long, somewhat scoop shaped spur. The clasper is moderately long, not much curved and pointed at tip.

Of the other species heretofore referred to *Xylina*, *capax*, *denticulinea* and *carbonaria* belong to other genera, leaving none that I have not actually seen.

While, in several series, the species are closely allied, yet, as a whole, they are fairly marked. Arranged in tabular form, it requires a little tact to place and recognize the species; but if the character of the basal streak be not too strictly interpreted the following table should serve to identify the species:

- A smoky shading through the center of the primaries; irregular interspaceal black lines and teeth; an oblique smoky subapical shading; ordinary spots visible in most specimens and sometimes defined....**longior.**
9. Maculation obscured, strigulate; median lines lost or traceable only in the costal region.....10.
Maculation not strigulate; median lines at least traceable throughout or distinct.....11.
10. Ashy white, powdery; veins black streaked, markings obsolete or only feebly marked.....**emarginata.**
Bluish ash-gray; veins black streaked, s. t. line distinctly marked by sagittate spots.....**holocinerea.**
More even, less strigate, ashen gray; t. a. line feebly traceable across the wing.....**georgii.**
11. Maculation clearly written on a whitish gray ground, not strigate; t. p. line and median shade complete; reniform without reddish shading, not strigate; basal black line distinct, the space above it not in any way contrasting.....**puella.**
Maculation less clearly written; t. p. line and median shade not obvious below middle of wing; reniform with a faint reddish shading; basal streak distinct, space above it paler, contrasting....**oregonensis.**
Maculation obscurely written on a powdery, dull ashen ground; basal black line faintly marked, sometimes hardly traceable.....12.
12. Smaller, darker, more powdery; reniform broader, orbicular less contrasting.
winnipeg.
Larger, paler, less powdery; reniform narrow, orbicular somewhat contrasting.
unimoda.
13. A black bar connects the median lines in the submedian interspace; maculation marbled.....22.
A black line extends from the tip of the claviform to the t. p. line; reniform very large and broad.....21.
No connection between the median lines; ordinary spots normal.....14.
14. Primaries more elongate, dull ashen gray; space between ordinary spots not darker; reniform not marked with reddish.....15.
Primaries shorter, brighter in color, more contrasting; space between ordinary spots always darker, sometimes contrasting; reniform more or less obviously shaded with reddish.....16.
Primaries uniform greenish gray.....20.
15. Powdered with black scales so as to give a rough, squamose appearance; orbicular white powdered, oblique, contrasting; s. t. line made prominent by distinct sagittate black spots.....**laticinerea.**
Paler gray, not or not so much powdered, smoother; orbicular not contrasting; s. t. line not prominently marked.....**grotei.**
16. Median lines not well marked; t. p. line partly obsolete; reniform narrow, constricted centrally.....**antennata.**
Median lines complete, well marked; reniform large.....17.
17. Ground color ashen gray.....18.
Ground color greenish gray.....19.
18. Larger, longer winged; median shade not prominent; reniform with sides subparallel; suborbicular present.....**torrida.**

- Smaller, short winged; median shade prominent; reniform almost as broad as long, sides rounded; no suborbicular.....**tepida.**
19. All the lines well marked; s. t. line preceded for its full length by black spots.....**baileyi.**
- All the lines indistinct; s. t. line marked by a geminate black spot opposite anal angle and by another opposite cell.....**querquera.**
20. All the lines and marks present, none of them in the least contrasting.
viridipallens.
21. Dark, blackish brown; vestiture very rough, squamose; orbicular oblong, oblique, not contrasting; reniform reddish and smoky filled.
pexata.
- Color as before; vestiture more even; orbicular round, clear gray; reniform very large, contrasting, reddish, without smoky filling...**dilatocula.**
22. Maculation not prominently contrasting, no reddish shadings in primaries; dark blue-gray.....**lepida.**
- Maculation prominently contrasting, with reddish shades at base, along internal margin and over reniform.....**thaxteri.**

Xylina semiusta Grote.

1874, Grt., 6th Rept. Peab. Ac. Sci., 34, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 228, *Xylina*.

General color of head, thorax and primaries a powdery, rusty red over a luteous base. Secondaries and abdomen more yellowish. Head and thorax immaculate. Primaries with the normal maculation all traceable, marked rather by paler included shades, than by defining lines. Basal half line marked on costa, yellowish. T. a. line geminate, the included space yellowish, defining lines diffuse, scarcely darker than ground. In course outwardly oblique, a little outcurved in the interspaces, most obviously so below the median vein. T. p. line rather evenly and slightly sinuate, a little drawn in opposite the anal angle; inner defining line obscure, a little lunulate, the outer a series of black, white centered venular dotlets; included space broad and a little yellowish. S. t. line paler luteous, defined by the darker, smoky, terminal space. There is a series of small, blackish interspaceal terminal spots. Median shade a little darker red or brown, diffuse, darkening the outer portion of the median space, but not markedly. Orbicular moderate, oval, oblique, narrowly outlined in yellow and a little lightened by yellowish scales. Reniform moderate in size, upright, little or not at all constricted centrally, annulate with yellowish, filled with smoky shadings above and below which give it in some instance a figure-8 appearance. Secondaries immaculate, save that the veins are little darker and the fringes a little paler. Beneath powdery, all wings with a discal spot, primaries with terminal space usually a little paler, secondaries with usually an extra median dusky line.

Expands 33-35 mm. = 1.32-1.40 inches.

Hab.—Canada, New England States, northern New York.

This species differs from all the others by its color, its very even ornamentation lacking all contrasts, by the even fringes of the primaries and by the entirely hairy vestiture. It is not a common form, and I have not had it from any point in New Jersey. The

antennæ of the male are closely ciliate, the edges of the joints a little marked. Four males and females are under examination, showing no evidence of notable variation. Nor have I seen any appearance of such in other collections.

Xylina hemina Grote.

1879, Grt., Bull. U. S. Geol. Surv., v, 202, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 227, *Xylina*.

Ground color of head, thorax and primaries a dull, creamy gray, powdered with smoky or black scales. Abdomen and secondaries smoky, the fringes pale, contrasting. Head with a black line across the middle of the front. Collar with a black line below the tip. Primaries with all the maculation present, fairly well written, median lines geminate, all the lines well marked on the costa. Basal half line rarely complete, but sometimes it meets a black basal streak, inclosing a somewhat paler basal blotch. This basal black streak becomes somewhat diffuse inferiorly and sometimes extends almost to the t. a. line. T. a. line broken, the defining lines very slender, inner often obsolete, included space concolorous, strongly dentate, the outward tooth in the submedian interspace reaching nearly to the t. p. line and joined to it by a black shade spot. T. p. line rather even, well outcurved over the cell and a little sharply drawn in below vein 2, leaving a wide s. t. space. A series of geminate venular dots forms the outer margin of the t. p. line. S. t. line pale, irregularly sinuate, preceded by small blackish shadings opposite the cell and anal angle, and followed by larger blotches at the same points. There is a broken, black terminal line. Median shade usually evident and sometimes distinct, always darkening the space between the ordinary spots and usually marked from the lower margin of reniform to the margin. Orbicular irregularly oval, oblique, outlined in black, sometimes concolorous, sometimes smoky filled and then annulate with gray. Reniform upright, a little oblique, larger superiorly, black ringed, sometimes concolorous, sometimes smoky filled and then annulate with pale. Secondaries smoky or blackish, with a darker discal lunule, fringes whitish. Beneath, primaries with disk blackish, terminal space gray, powdery; secondaries gray, powdery, with an extra median blackish line. All wings with a large black discal spot.

Expands 35-40 mm. = 1.40-1.60 inches.

Hab.—Canada; New England; Northern New York in September; Volga, South Dakota; Decatur, Illinois, April 8th; Cartwright, Manitoba; Winnipeg, Manitoba.

Five males and one female are under examination. The maculation is nowhere at all contrasting, and there is a tendency to a blackish suffusion, which is strongly marked in the specimen from Cartwright, Manitoba. The vestiture is mixed, fine and flattened hair, the anterior divided crest very distinct. The male antennæ are ciliated, joints a little marked.

Xylina disposita Morrison.

1874, Morr., Bull. Buff. Soc. Nat. Sci., ii, 116, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus. 227, *Xylina*.

Ground color of head, thorax and primaries stone gray, with a reddish tinge

throughout. Secondaries smoky, the fringes paler or even whitish. Head with superimposed tufts obvious, forming—in good examples—two shelves, between which the antennæ arise. A deep brown line crosses the middle of the front and below this there is a brownish shade. Sides of the palpi blackish. A narrow black line just below the tip of the collar, sometimes only extending around the base of the divided crest. Patagiæ with a blackish line at the base of the primaries. Abdomen with loose hair at base and little scale tufts on the dorsum, of which that on the third segment is a little prominent in good specimens. A black streak at base, extending to the basal half line and a little diffuse inferiorly. Basal line geminate, brown, very oblique, broken, terminating in a blackish blotch on the basal streak. T. a. line geminate, brown or black, broken, very irregular, the long tooth in the submedian interspace in some cases actually reaching the t. p. line so that the median shade crosses the loop instead of between the two lines. T. p. lines with a long outcurve over cell, drawn in below reniform, inner portion slender, denticulate, the outer a series of venular dots. S. t. line of the ground color, irregularly sinuate, preceded by a broken, rusty brown shading, best marked opposite the cell and anal angle, followed by blackish shadings at the same points. These shadings are usually prominent, and sometimes fill a large part of the terminal space. A series of small, black, terminal marks. Fringes interlined with dark brown. The median shade is distinct on the costa, brown or smoky, extends obliquely and darkens the space between the ordinary spots—then is broken, a little diffuse, and runs parallel close to the t. p. line, becoming blackish at the point where the two lines almost touch, and thus connecting them. The orbicular is moderate in size, black ringed, oval, oblique, the centre usually a little dusky. Reniform of good size, broad, a little oblique, upper portion a little larger, black ringed, centre a little dusky. Secondaries with veins a little darker and the discal spot of under side visible above. Beneath, primaries smoky to a pale, powdery terminal space; secondaries with an extra median smoky line. All wings with a large discal spot.

Expands 35-40 mm. = 1.40-1.60 inches.

Hab.—Canada; New England States; Northern New York; Wayne Co., Pennsylvania; Fort Madison, Iowa.

Sixteen males and one female show little variation. The shade of the ground color differs a little, as does the relative distinctness of the markings; but on the whole the specimens are very much alike. The antennæ of the male are ciliated, and there is a series of raised black scales along the inner side toward base. The thoracic vestiture is mostly flattened hair.

Xylina bethunei Grote and Robinson.

1868, G. and R., Trans. Am. Ent. Soc., i, 354, pl. 7, f. 56, *Xylina*.

1869, Bethune, Can. Ent., i, 86, *Xylina*.

1874, Grt., 6th Rept. Peab. Ac. Sci., 33, *Lithophane*.

Ground color of head, thorax and primaries creamy white, shaded with luteous and powdered with black atoms. Abdomen and secondaries smoky, with a yellowish tinge, often fading to gray, fringes white or nearly so. Head with superimposed tufts; front with a brown transverse line below the middle. Collar with a narrow brown or blackish line below the tip, but this is often obsolete.

Patagiæ with a smoky tinge at base of primaries. A series of small abdominal tufts is found in perfect examples. Primaries more or less yellow shaded, the triangular space between the outwardly bent median shade and the t. p. line being the darkest portion of the wing. Basal line geminate, luteous, marked in the costal space only. T. a. line geminate, marked by black dots on the veins, luteous and with outward teeth in the interspaces. T. p. line abruptly bent on the costa, then as a whole very nearly parallel with the outer margin, best marked by a geminate series of small venular dotlets. S. t. line of the ground color, a little irregular, preceded by a continuous, though somewhat irregular luteous or brownish shading. Terminal space more or less completely gray powdered. A series of small, black, terminal crescents. Median shade luteous or a little brownish, forming with the t. p. line a V-shaped space, which is a little darker than the rest of the wing. A blackish blotch unites the median lines in the submedian interspace. Orbicular oblique, irregular, not well defined. Reniform large, upright or a little oblique, larger superiorly, outlined in rusty brown and sometimes filled with brownish or pale gray, leaving a concolorous annulus. Beneath pale, powdery, varying a little in tint, all wings with a more or less obvious, outer, dusky line and a distinct, blackish discal spot.

Expands 35-40 mm. = 1.40-1.60 inches.

Hab.—Canada, west to Winnipeg, Manitoba; New England, Middle and Central States; Columbus, Ohio; Central Missouri; Berkeley, Colorado.

Fourteen males and five females are under examination and show little variation. There is a little difference in the amount of yellow, dependent somewhat upon whether the specimen was taken in Fall or in Spring, and so there is a variation in the amount of black powdering, especially in the terminal space. The antennæ in the male are ciliated.

This is the most abundant and widely distributed form of this pale series, extending as it does to the Rocky Mountains, westwardly, and to the District of Columbia and Missouri on the South. It will probably be found in all except the South Atlantic and Gulf States, as far west as the Rockies at least.

Xylina patefacta Walker.

1858, Wlk., Cat. Brit. Mus., Het., xiv, 1733, *Xylina*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 231, *Xylina*.

Head, thorax and primaries reddish gray; abdomen and secondaries deep smoky or blackish, fringes pale, with a reddish tinge. Head with superimposed tufts, below which is a black frontal line. Collar with a traceable black line below the tip, around the divided crest. The maculation of the primaries is all obscured. The usual lines are marked by geminate spots on the costa and by geminate black venular dots, indicating a course similar to that in the allied species. Median shade distinct, from the costa oblique to the lower part of reniform, then lost in the very distinct blackish patch before the t. p. line in the submedian interspace. S. t. line of the ground color, a little irregular, preceded

by a narrow, rusty brown shade which is not continuous, and followed by a vague gray powdering, which sometimes darkens the terminal space. A broken, brown, terminal line is fairly evident. Orbicular practically obsolete, *i. e.*, it is traceable by the general character of the shadings, but not in any way outlined. Reniform a little paler than the surrounding shade, not outlined. large, upright, the upper portion larger than the lower. Beneath powdery, reddish gray, primaries except terminal space a little darker, secondaries with a vague exterior line; all wings with a blackish discal spot.

Expands 32-35 mm. = 1.28-1.40 inches.

Hab.—Canada; Monroe Co., New York; Gloucester Co., New Jersey, March 16th.

Three male specimens only. Examples of this species may be mixed with *bethunei* or *signosa*; but I do not remember seeing any in the collections recently examined. The male antennæ are ciliated.

***Xylina innominata* Smith.**

1893, Smith, Bull. 44, U. S. Nat. Mus., 227, *Xylina*.

signosa Grt. not Walker.

1874, Grt., 6th Rept. Peab. Ac. Sci., 33, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 227, pr. syn.

Head, thorax and primaries reddish luteous, with a rusty red powdering. Abdomen reddish gray, the dorsal tufts minute at best and present only in perfect examples. Head with a brown line below the usual tufts. Collar with an indefinite brown or blackish line—which may be obsolete—below the tip, at the base of the rather low divided crest. Primaries with the maculation imperfect, yet all easily recognizable. Basal line geminate, oblique, brown, marked on the costa and by dots on the median vein. T. a. line marked by geminate, black, venular dots, and in exceptional specimens by brown, interspaceal, outward angles. T. p. line marked by geminate black, venular dots, parallel with outer margin, a curved black line in the submedian interspace marking the limit of the prominent brown or blackish patch connecting with the t. a. line. S. t. line concolorous, preceded by a rusty shade, which is more or less broken and followed by black powderings in the terminal space, which may darken the veins only, may group into geminate spots opposite anal angle and cell, or may, rarely, darken the entire terminal space. A series of black or brown terminal lunules. The median shade is obvious in all specimens and prominent in some; broad, oblique from costa between the ordinary spots, lost in the blackish patch in the submedian interspace, and traceable below this as a narrow, diffuse, brown line. Orbicular not defined, usually traceable by its slightly paler tint, large, oblique, oblong. Reniform large, broader above, a little constricted centrally, outlined in rusty brown, usually with a little dark filling inferiorly. Secondaries dark smoky, with a yellowish tint, fringes yellow, a darker discal lunule and a broken, darker terminal line feebly visible. Beneath reddish, powdery, disc of primaries often blackish; secondaries often with an exterior dark line, all wings with a discal spot.

Expands 35-40 mm. = 1.40-1.60 inches.

Hab.—Quebec to Vancouver; New England and Middle Atlantic States; Colorado; Seattle, Washington.

Eleven males and seven females are under present observation. The species is not rare and is very widely distributed. I have no record of its occurrence south of Northern New Jersey; but it extends through British America and the Northern United States, from the Atlantic to the Pacific, with very little variation.

The antennæ of the male are ciliated, but not much more so than in the female. The thoracic vestiture is mixed, fine and flattened hair, with the latter somewhat predominating.

Xylina oriunda Grote.

1874, Grt., Bull. Buff. Soc. Nat. Sci., ii, 160, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 228, *Xylina*.

Head, thorax and primaries red-brown. Abdomen and secondaries smoky, with a brown tinge, the fringes concolorous except at the tip, where they are whitish. Head with a black line below the ordinary tufts; antennæ with yellow scales at base, and in the male with black, elevated scales thickening the basal third on the inner side. Collar tipped with yellow scales, below which, at the base of the rather low, divided crest, there is a narrow black line. Primaries with the costal region yellowish white to the t. p. line, interrupted by shades of the ground color and by the geminate median lines. There is a small, black, longitudinal line at base extending to the basal half line, and above this the basal space is whitish. T. a. line marked in the pale costal space and then lost, except for the black tooth in the submedian interspace, which is connected by a black patch with the t. p. line. T. p. line marked on the costa, thence indicated by geminate white dots on the veins, except in the submedian interspace, where a curved black line limits the blackish patch which extends from the outward tooth of the t. a. line. S. t. line whitish, slender, irregularly though not strongly sinuate, emphasized by a fragmentary, somewhat more rusty brown shade and by a slightly darker terminal space. Black, followed by pale scales base the concolorous fringes, which are narrowly cut, opposite the veins, by pale lines. The median shade is marked across the costal space only. Orbicular narrow, oblique, oblong, white ringed. Reniform moderate in size, a little enlarged above, white ringed and superiorly white powdered. Beneath primaries smoky, terminal space brown, powdery, as is the entire costal region; discal spot obvious. Secondaries powdery, reddish brown in the costal region, becoming more yellowish inwardly, with a smoky exterior line and a distinct, smoky discal spot.

Expands 34-37 mm. = 1.36-1.48 inches.

Hab.—Canada; Pennsylvania; Wisconsin.

There is only a single male before me at present and I have seen, perhaps, half a dozen others, recently; none of them differing in any important particulars from the description just given. There seems to be a little variation in the depth of the ground color, and in the extent of the pale powdering along the costa; but there is no chance of mistaking the species. The antennæ of the male are ciliated and a little scale thickened at the base.

The thoracic vestiture is a mixture of fine and flattened hair.

Xylina gausapata Grote.

1883, Grote, Papilio, iii, 77, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 227, *Xylina*.

Allied to *petulca*. Entirely of a dull purple-red, the primaries showing a gray bloom. Fore wings with the two mesial lines brown, subparallel, outwardly oblique from costa, more or less fragmentary and indistinct. Reniform a rusty yellow stain. Claviform indicated in pale, with a small, brown, following mark. Hind wings and abdomen dull red. Beneath, a brown discal spot on secondaries. Frontal tuft a little darker beneath.

Hab.—Soda Springs in October (Behrens).

One bred specimen, the wings on the left side a little unexpanded. The markings are simple and the species readily detached. It is much darker and more richly colored than its eastern allies, *petulca*, *ferrealis*, etc.

The above is, in essentials, Mr. Grote's description.

The type is in the Edwards collection, and unlike any other of the species in color, hence easily recognizable. The "claviform" referred to in Mr. Grote's description is the long tooth of the t. a. line characteristic of this series, and the brown following mark is as in *ferrealis* and the allied forms. The thoracic crest is very prominent but not so obviously divided. The abdominal tuftings are not obvious in the specimen.

Xylina ferrealis Grote.

1874, Grt., 6th Rept. Peab. Acad. Sci., 32, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 227, *Xylina*.

Head, thorax and primaries dull red-brown, powdered with gray scales. Head with a deep brown line below the ordinary tufts, the space between them gray. Collar gray tipped, a more or less obvious black line bordering this gray tip below. Thoracic crest prominent in good examples and gray powdered. Patagiæ also gray powdered, the vestiture fine hair and flattened scales. In many specimens the collar inferiorly is of the same color as the costal region of primaries, and the thoracic disc agrees with the disc of primaries. Primaries with costal region more or less gray from base to apex, a dark brown shade extending through the centre of the wing. A slender, obscure, black longitudinal line margins the pale costal space basally. Basal half line marked by geminate, brown, oblique lines across the basal space. T. a. line marked by geminate, oblique brown lines on costa, and thereafter chiefly by pale included shades, thus defining the usual long outward tooth in the submedian interspace. T. p. line geminate, brown across the pale costal space, punctiform and geminate where traceable on the veins below this point. S. t. line yellowish red, diffuse, incomplete, irregular, lost in the costal space. Median shade marked between the ordinary spots, and sometimes across the costal region. A series of black terminal lunules and a pale line at the base of the fringes. Orbicular narrow, oblique, ringed with luteous, centre grayish or reddish, sometimes concolorous with costal region, approaching close to and sometimes touching the reniform. Reniform

moderate, larger superiorly, a little contracted at the middle, pale ringed, of the pale costal shade, except inferiorly, where it is brown shaded. The pale outward tooth of the t. a. line at first sight resembles a claviform spot. Beneath powdery, disc of primaries blackish, costal and terminal region reddish gray; secondaries with a smoky extra median line; all wings with a smoky discal spot.

Expands 34-42 mm. = 1.36-1.68 inches.

Hab.—Canada; New England; Northern New York; Hopatcong, New Brunswick, New Jersey.

Six males and seven females are at hand and vary only in the amount of contrast between the costal and central portions of the wing. The ordinary spots are extensions of the pale costal space and are usually well relieved.

In the males the antennal joints are ciliated, and the basal third is a little thickened by black scales on the inner side.

***Xylina signosa* Walker.**

1857, Wlk., Cat. Brit. Mus., Het., xi, 627, *Xylina*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 227, *Xylina*.
petulca Grote.

1874, Grt., 6th Rept. Peab. Ac. Sci., 31, *Lithophane*.

1891, Butler, Entomologist, xxiv, 242, pr. syn.

1893, Smith, Bull. 44, U. S. Nat. Mus., 227, pr. syn.

Head, thorax and primaries reddish gray, streaked and shaded with rusty brown, sparingly powdered with black. Abdomen paler, uniform, the dorsal tuftings well marked, that on the third segment prominent. Secondaries smoky, with a yellowish tint, the fringe smoky. Head with a brown line below the usual tufts, or entirely brown. Collar with a black line, above which it is gray tipped at the base of the well-marked divided crest. Patagiæ powdered and marked with gray, and with a gray patch at base of primaries. Primaries with the markings incomplete, tending to appear strigate, the veins being darker brown. A slender, longitudinal black line at base. Basal line geminate, brown, very oblique across the costal paler space. T. a. line brown, geminate, very strongly dentate in the interspaces, marked by small, black venular dots. T. p. line marked by geminate, black venular dots, except in the submedian interspace, where the usual blackish patch connects the two lines. S. t. line of the ground color, narrow, irregular, not well or completely defined, preceded by small, rusty brown spots, best marked opposite the anal angle and the cell, an oblique smoky shade extending through the terminal space at these points. There is a series of small, black, terminal lunules in the interspaces, and of small black dots on the veins. Median shade usually distinct across the costal space and oblique between the ordinary spots, sometimes suffusing the space between median lines at the middle, and narrow, indefinite, below that point. The orbicular is long, oblong, oblique, narrowly outlined in brown and often attached to or connected with the reniform. The latter is large, a little paler or annulate with paler, not outlined, a little enlarged above. Beneath reddish, powdery, disc of the primaries darker; secondaries with a complete, primaries with an incomplete outer dusky line; all wings with a large discal spot.

Expands 37-43 mm. = 1.48-1.72 inches.

Hab.—Canada; New England States; New York; Northern New Jersey; Central Illinois; Washington, D. C.

Seven males and thirteen females are at hand, differing considerably in shade of brown and the amount of contrast. Some are distinctly gray, while others lack all trace of this shade and are obviously brown. In all of them the strigulate character of the maculation is apparent, and this, with the ground color, will distinguish the species. The male antennæ are as in *ferrealis*, as is the thoracic vestiture.

***Xylina amanda* n. sp.**

Head, thorax and primaries reddish gray, usually more or less washed out, strigate. Abdomen more even, varying from reddish to almost whitish. Secondaries smoky, with a yellowish tinge, sometimes much paler, fringes paler than the ground. Head gray at the base of the antennæ between the tufts, a brown or black line below. Collar gray tipped above a black line at the base of the prominent divided crest. Patagiæ gray powdered, a whitish line above the insertion of the primaries, where also there is a white spot. Primaries with a slender black streak at base, above which, to the costa, is a somewhat paler gray shade. Basal line barely indicated by geminate costal spots—in one example only. T. a. line geminate, marked on costa by small black venular dots, and by a long blackish tooth in submedian interspace. An even, luteous or reddish shade extends through the cell and obliterates all, save the lower portion of the reniform which is brown. T. p. line marked by a more or less complete series of geminate, venular black dots, which are unusually close to the outer margin. S. t. line marked only by a pair of preceding rusty brown spots opposite anal angle and cell, and from these an oblique brown shade extends through the terminal space. A series of black terminal lunules, the veins also being black marked toward the margin. Beneath powdery, primaries with terminal space paler; secondaries with a smoky exterior line; all wings with a large, smoky discal spot.

Expands 39–42 mm. = 1.56–1.68 inches.

Hab.—Franconia, New Hampshire; Calgary, Canada; Winnipeg, Manitoba; Vancouver, British Columbia; Pullman, Washington; California.

Four males and two females are under examination. Three of them bright reddish gray and three of them faded and washed out, with a mere trace of reddish. As the latter lack fringes and are otherwise flown I assume that they are faded; yet it is not beyond the bounds of possibility that two species may be represented. The pale tints, the lost markings and the yellowish shade through the cell, obscuring the ordinary spots, make this an easily recognizable species.

The male antennæ are shortly ciliated, no scale thickening perceptible at base in any example.

This is the species that I had erroneously identified as *contenta* Grote from a faded example, the real species being afterward re-described by me as *pomona*.

Xylina contenta Grote.

1880, Grt., Can. Ent., xii, 216, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 228, *Xylina*.

pomona Smith.

1899, Smith, Journ. N. Y. Ent. Soc., vii, 230, *Xylina*.

Ground color a dirty bluish gray, with a slight admixture of red. Head a little darkest between the antennæ; collar inferiorly with reddish tinge, a black line just above the centre, emphasized by a surmounting series of whitish scales. The thoracic crest is not prominent and not divided. The primaries are irregularly mottled with smoky brown and none of the marking are distinct. The t. p. line is geminate, the defining lines black, the very narrow included space a little paler gray. It is very strongly zigzagged, forming long teeth in the interspaces. The t. p. line is not sufficiently evident to be described in either of the specimens before me. The s. t. line is broken and consists of a series of sagittate black spots, which are outwardly marked by reddish or whitish scales. Just below the apex is a dusky terminal shade that emphasizes the line at that point. There is a series of blackish terminal marks on the veins and an appearance of pale terminal lunules. The ordinary spots are vaguely traceable. The orbicular is a little paler than the ground color, without defining line, but with four black dots arranged almost in a square. The reniform is large, a little dilated inferiorly, yellowish brown centered, and the lower margin marked with blackish scales. Secondaries silky, reddish gray, with a discal lunule. Beneath with reddish tinge, powdery, somewhat smoky gray, both wings with an outer line and a discal spot.

Expands 35-42 mm. = 1.40-1.68 inches.

Hab.—Alameda County, California, July, larva on apple; Central California; Olympia, Washington; Northwest British Columbia.

One male and three females, two of the latter in excellent condition, are now before me. The species is readily recognizable by the blackish dots emphasizing the ordinary spots, the lower margin of the reniform being even somewhat prominent in one specimen. The male antennæ are lengthily ciliated, the joints a little marked.

This is the species described by me as *pomona*. I had named what I supposed was a faded example of *contenta* by comparison with the type in the Edwards collection, and afterward received under the same name fresh examples of the identical species, elsewhere in this essay named *amanda*. Hence, when I received good examples of the real *contenta* I did not recognize it. There are four examples in the Edwards collection.

Xylina itata Smith.

1899, Smith, Journ. N. Y. Ent. Soc., vii, 231, *Xylina*.

Ground color a dull ashen gray, with very fine blackish powderings. All the

markings obscured. Head and thorax without ornamentation, except an obscure frontal line. The thoracic crest prominent, divided. Primaries with the markings extremely vague, in one specimen showing only a smoky median shade, which is brightest on the costa, is bent at the end of the cell and is a little emphasized by a short blackish dash in the submedian interspace. In the best marked specimen the ground color is a little brighter. T. a. line is traceable, very narrow, black, irregular, strongly bent outward, so that at the submedian interspace it forms a sharp tooth whose apex is about at the middle of the wing. Above that point it is outcurved between the veins; below that point it makes a long inward angulation and is hardly traceable below the internal vein; a few whitish scales may emphasize this blackish line. The t. p. line is brownish, very slender, barely traceable over the cell where it is crenulate, a little better marked below that point, becoming black in the submedian interspace where a short black dash connects it with the t. a. line. The median shade is broad on the costa, filling the outer part of the median space, narrowing toward the middle of the wing and less evident toward the inner margin. The s. t. line is marked by two triangular dusky shades, the first of which leaves the apex clear, and has its point at a black spot which almost touches the t. p. line between veins 4 and 5. The second of these comes to a point at a blackish spot which is just below vein 2. The ordinary spots are just traceable, the orbicular is elongate, oval, of the gray ground color, vaguely outlined in brown. The reniform is upright, rather narrow, with a blackish point inferiorly, the outline a trifle paler than the surrounding tint. The fringes have a pale interline. Secondaries a somewhat silky brownish gray, the veins a trifle more dusky, and a vaguely marked discal spot. There is a smoky terminal line at the base of the whitish fringes. Beneath smoky gray, powdery. the secondaries with a small discal spot.

Expands 35-37 mm. = 1.40-1.50 inches.

Hab.—Colorado.

Two females only are before me. The species is rather readily recognizable by its small size for this series, and by the soft powdery ashen gray, in which the maculation is almost entirely lost. A somewhat dusky cloud through the centre indicates a median shade.

***Xylina fagina* Morrison.**

1874, Morr., Bull. Buff. Soc. Nat. Sci., ii, 115, *Lithophane*.

1887, Grt., Can. Ent., xix, 54, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 228, *Xylina*.

Head, thorax and primaries light, bluish, ashen gray. Abdomen and secondaries light smoky, with a reddish tinge, fringes almost white. Head with a whitish line between the antennæ, separating the otherwise ill-marked frontal tufts; below this point is a brown line or the entire front is darker. Collar with a narrow black line surmounting a reddish line a little above the middle and not extending to their margin. Thoracic crest prominent, obtuse but not divided at tip. No dorsal abdominal tuftings. Primaries paler, more whitish along the costa, veins narrowly black lined, some narrow black interspaceal teeth, else practically no maculation. Most specimens have a series of small, obscure, smoky s. t. spots, but these are often wanting. The ordinary spots are completely lost in most specimens and only indicated by paler shadings at best.

Expands 42-47 mm. = 1.68-1.88 inches.

Hab.—Canada; New England States; Northern New York; Northern New Jersey.

Seven males and seven females, practically alike, except for a slight difference in the shade of gray. The color is bright, clear and does not give the impression of softness.

The antennæ of the male are shortly ciliated and not thickened by scales toward the base. The species seems rather abundant.

***Xylina longior* Smith.**

1899, Smith, Journ. N. Y. Ent. Soc., vii, 230, *Xylina*.

Ground color a bright bluish ash gray, with a more or less obvious admixture of reddish. Head with black scales between the antennæ and the front also blackish or smoky. Collar with a distinct reddish shade crowned by a short blackish line, above which the scales are white tipped at the base of the prominent crest. The thorax has some reddish scales intermingled, and there is a distinct black line at the sides of the patagiæ covering the base of the wings. The primaries are, in most cases, quite distinctly marked. There is a blackish basal streak which extends below the median vein and reaches a little beyond the inner fourth of the wing. The tendency of this streak is to become lost. The t. a. line, when present, is very narrow, black, but shaded with smoky and emphasized by a few preceding white scales. It is strongly bent outwardly, irregularly in the interspaces and forms an acute tooth at the middle of the submedian interspace, where it touches a short and prominent black dash. It is then bent inward, so that it reaches the internal vein just about as far from the base as is the inception of the line on the costa. The tendency of this line is also to disappear and to leave only a black streak extending from the internal vein about one-fourth from base to middle of the submedian interspace. This portion of the line is distinctly present in all the specimens seen by me. The t. p. line is not complete in any specimen. It is traceable in one example as a lighter shading through the darker powderings in the costal region. It is marked by black points below the cell and by blackish scales which connect it with the short black dash already described as attached to the tooth of the t. a. line. Below that point it is not traceable in any specimen. The s. t. line is indicated only by two oblique, triangular, blackish or brown shades. The first of these starts from a blackish point between veins 4 and 5 and reaches the external margin just below the apex. The second of these shades is more brownish and starts from a point below vein 2, reaching the external margin just below vein 4. The ordinary spots, at least the reniform, are traceable in most cases. The orbicular is large, oval, oblique and is outlined by a few paler scales. The reniform is large, broad, a little constricted in the centre, extending inward inferiorly, so that it touches and may become connected below the orbicular. It is marked inferiorly by a reddish shading and is outlined by whitish scales, which, at the latter margin, are preceded and followed by a black shade that makes this part of the wing characteristic. All the veins are somewhat marked by black scales. The secondaries are smoky brown, the fringes a little paler and with a pinkish tinge. Beneath smoky gray, powdery, the disc a little darker, both wings with discal spots.

Expands 39-47 mm. = 1.56-1.88 inches.

Hab.—Glenwood Springs, Colo., March, April, May and October.

Four males and eight females; all except one from Dr. Barnes. There is quite a range of variation from almost uniformly gray examples in which the black streak through the submedian interspace is the only obvious marking, to the brightly marked type with sharp basal and subapical streaks and a reddish tinge over the reniform or through the middle of the wing. All the latter are October examples, and all of the former type have hibernated and are more or less flown.

The antennæ of the male are very feebly ciliated and scarcely thicker than those of the female.

Xylina emarginata n. sp.

Ground color of head, thorax and primaries very pale, ashen gray, almost whitish. Head with a smoky brown line across the front, the tuftings not well marked. Collar with a narrow black transverse line, surmounting a narrower reddish line. Thoracic crest low, not divided. Patagiæ with a black line at base of primaries. Primaries with the veins very narrowly smoky. There is a narrow black longitudinal line at base, extending deep into a tooth of the t. a. line. Basal line obscurely marked on the costa only. T. a. line marked by geminate, smoky, oblique lines on the costa, and below that traceable in some examples by a narrow paler line, obscurely edged by darker scales, indicating lengthy teeth in the interspaces. T. p. line lost, except as a pair of smoky, oblique marks on the costa. No obvious median shade. S. t. line vaguely marked by a series of small interspaceal smoky spots, which tend to become obsolete. A slightly darker terminal line, which may be broken into dots on and between the veins and may be altogether wanting. Ordinary spots traceable, with smoky, scarcely relieved outlines. Orbicular moderate in size, oval, oblique, in some examples with an extension or suborbicular below the median vein. Reniform rather large, incompletely defined, a little constricted centrally, larger inferiorly, the middle with a small reddish tinge. Secondaries very pale yellowish gray or smoky, veins a little darker, discal spot obvious. Beneath whitish, powdery, with dusky discal spots.

Expands 40-45 mm. = 1.60-1.80 inches.

Hab.—Colorado Springs and Glenwood Springs, Colorado, April, August, October.

Two males and two females, very much alike and recognizable in this series by the practically obsolete ornamentation. The ordinary spots can be fairly well made out; but the transverse lines are so lost that only one who knows exactly what to seek can make them out. Superficially the insect resembles *fagina*; but the ordinary spots are obvious and this species has a distinct basal dash. The antennæ of the male are shortly ciliated.

Xylina holocinerea n. sp.

Head, thorax and primaries deep bluish gray. Head darker in front, with a

blackish frontal line; tufts not evident. Collar with a black subapical transverse line above a series of red scales, and in turn surmounted by white scales at the base of the thoracic crest. The latter is of moderate size and obscurely divided. Primaries with veins black marked, giving them a somewhat strigate appearance. Basal black streak evident in all the specimens before me, a paler shading extending to costa but not well marked. Basal line smoky, geminate, marked on the costa only. T. a. line smoky, geminate, very strongly toothed in the interspaces, never well marked, always incomplete, sometimes obsolete. T. p. line geminate, marked through the costal region only. S. t. line marked by a series of black, sagittate, distinct, interspaceal spots. There is a series of small black terminal lunules. Median shade blackish, oblique from costa to lower part of reniform, then much less distinct, inwardly oblique to the middle of the inner margin. Orbicular small or moderate, round or oval, rarely extending below the median vein, black ringed, sometimes pale annulate or paler filled, not contrasting. Reniform moderate, upright, a little constricted, obscurely pale ringed, narrowly edged with blackish, inferiorly darkened by the median shade. Secondaries smoky, with a yellowish tinge, fringes paler, veins and a discal lunule darker. Beneath powdery, primaries with disc smoky, else gray with a rosy tinge, secondaries with a more or less obvious exterior line, all wings with discal spots.

Expands 40-45 mm. = 1.60-1.80 inches.

Hab.—Winnipeg, Manitoba; N. W. British Columbia; Vancouver; Pullman, Washington; Sierra Nevada, California.

Six males and two females, differing from *georgii* chiefly in the darker blue ground color, less evident maculation and thicker, more lengthily ciliated male antennæ. There is very little variation save such as is due to the condition of the specimens, except in the form of the orbicular. This varies in size from small to moderate, from round to oval or oblong, and rarely it extends below the median vein, indicating a suborbicular.

Xylina georgii Grote.

1875, Grt., Can. Ent., vii, 188, *Lithophane*.

1887, Grt., Can. Ent., xix, 55, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 228, *Xylina*.

Head, thorax and primaries ashen gray, a little smoky. Front with a broad smoky band across the middle. Collar with a black line above the middle, surmounting a very feebly marked reddish shade. Patagiæ with a black line at base of primaries. Thoracic crest low and not divided. No evident abdominal tufts. Primaries with a distinct longitudinal line at base, surmounted by a clear white line. Basal line geminate, smoky, oblique across the costal region. T. a. line geminate, broken, traceable across the wing, very strongly dentate. T. p. smoky, geminate, marked in the costal region only. The median shade is broad, diffuse, smoky, not relieved, oblique from costa between ordinary spots to the inferior portion of reniform, then forming a right or slightly acute angle to within the middle of the inner margin. S. t. line a series of smoky or blackish spots, beyond which the terminal space is a little darker. Veins a little darkened

throughout. Orbicular subquadrate, oblique, not extending below the median vein in my examples, sometimes narrowly outlined by black scales, sometimes marked by the slightly paler color. Reniform of moderate size, constricted centrally, larger inferiorly and dusky filled by the median shade, not well defined, obscurely annulate with a somewhat paler shading. Secondaries very pale smoky with a faintly reddish tinge, fringes whitish, veins and a discal spot larger. Beneath gray, powdery, with discal spots, of which those on the secondaries are the larger.

Expands 39-45 mm. = 1.56-1.80 inches.

Hab.—Canada; New England States; Northern New York and Pennsylvania; Colorado.

Both sexes are at hand and similar in appearance, male antennæ thickened and obviously ciliated. The variation consists in the amount of smoky shading and the consequent distinctness of the markings. In the paler forms the median shade is quite obvious, in the darker forms it is lost.

***Xylina puella* n. sp.**

Head, thorax and primaries very pale gray, almost whitish. Secondaries pale smoky, with a yellowish tinge, the fringes white. Abdomen with an obscure suggestion of reddish. Head with smoky frontal line. Collar with a blackish line below the tip, surmounting a slightly reddish tint. Thoracic crest low, not divided. Patagiæ with blackish line at base of wings. Primaries with the markings cleanly written. A slender black streak at base through a dusky shading, above which the space is almost white to costa. Basal line geminate, marked on the costa only. T. a. line geminate, the outer defining line black, inner smoky, as a whole nearly upright, irregular, with moderate teeth in the interspaces. S. t. line geminate, inner portion lunate, black or blackish, outer portion even, smoky, as a whole nearly parallel with outer margin after the usual outcurve over cell. S. t. line marked by a series of trigonate smoky spots and by a smoky costal shading. A series of smoky terminal lunules. Median shade smoky or blackish, diffuse, outwardly bent between the ordinary spots, slightly darkening the lower part of reniform, then close to and parallel with t. p. line to hind margin. Claviform small, black ringed, concolorous. Orbicular black ringed, oval, extending well below the median vein. Reniform black lined, upright, of good size, oblong, a little heel extending backward toward the orbicular. There is a yellowish or reddish central flush, else both spots are paler than the ground. Beneath whitish, powdery, primaries a little darker centrally, all wings with a large, blackish, discal spot.

Expands 42-44 mm. = 1.68-1.76 inches.

Hab.—California.

Two female examples without more definite locality. From all the immediately preceding forms it differs in the tolerably even median lines and in the obvious claviform, while from the *antennata* series, to which the general maculation refers it, the slender black streak will serve to distinguish it.

***Xylina oregonensis* Harvey.**

1876, Harv., Can. Ent., viii, 55, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 228, *Xylina*.

Ground color a rather pale ashen gray, flown specimens darker, as the overlay of white scales disappears. Head with a smoky frontal line. Collar with a black subapical line above a series of reddish scales. Patagiæ with a black lateral line. Thoracic crest evident, feebly divided. Primaries with basal black streak extending well toward t. a. line, the space above it white and contrasting to the costa. T. a. line geminate, blackish, included space paler than ground, very strongly dentate in the interspaces. T. p. line geminate, obscure, with paler included space, lost below the cell. S. t. line marked by a series of black spots and a few following paler scales. A series of black terminal lunules. Orbicular large, extending well below the median cell, tending to divide off, black edged and paler filled, forming an obvious if not marked contrast. Reniform large, upright, a little constricted centrally, lower portion somewhat larger and tending to a heel toward the orbicular, black margined, annulate with pale, centre dusky, with red scales intermixed. The median shade darkens the space between the ordinary spots, but is not otherwise marked below that point. Secondaries pale, smoky gray, the fringes white, veins and a discal lunule darker. Beneath whitish, powdery, a discal spot on all wings, disc of primaries blackish.

Expands 37-45 mm. = 1.48-1.80 inches.

Hab.—Oregon; Glenwood Springs, Colorado; Volga, South Dakota.

One male and two females are at hand. The type in the Edwards collection is so remarkably close to the *georgii* of the same collection that, until I secured the examples now before me, I was tempted to consider them as identical. As it is, while well marked pale examples of *georgii* may closely resemble certain forms of *oregonensis*, the question will rarely arise in actual practice. Dr. Harvey has pointed out the form of the orbicular and the reddish scales in the reniform as distinctive, and to this may be added the pale costal region above the basal streak. The antennæ of the male are rather shortly ciliated. The size given by Dr. Harvey, 45 mm., exceeds by 3 mm. the largest example in my possession.

***Xylina winniipeg* n. sp.**

Head, thorax and primaries dull, powdery, dark ashen gray. Secondaries and abdomen smoky. Head with a black frontal line, the tufting scarcely marked. Transverse line of collar obscure. Thoracic crest scarcely marked and not divided. Vestiture fine and flattened hair. No abdominal tuftings. Primaries powdery, all the markings traceable, but none sharply defined. Basal line geminate, marked on the costa only. A very fine black line is traceable from the base half way to the t. a. line. T. a. line blackish, geminate, outwardly oblique and irregularly toothed in the interspaces, incomplete and hardly defined. T. p. line obscurely traceable, geminate on the costa, lunulate in the interspaces, in course parallel to the outer margin below vein 6. S. t. line is a series of pale

scales, preceded by blackish irregular spots. A faint, darker terminal line. Claviform small, pointed, black edged, not prominent. Orbicular oval, oblique, moderate in size, pale powdered; suborbicular ringed with whitish, centre concolorous. Reniform moderate, upright, somewhat constricted centrally, black edged inferiorly, narrowly annulate by paler scales, a few reddish scales in centre. A median darker shade is traceable, oblique between the ordinary spots and darkening the reniform a little inferiorly. Beneath, primaries dusky except along costa and in terminal space where it is whitish, powdery. Secondaries whitish, powdery, with a dusky exterior line and a distinct discal spot.

Expands 41-43 mm. = 1.64-1.72 inches.

Hab.—Winnipeg, Manitoba.

Two males in good condition, received from A. W. Hanham. The two are much alike and resemble reduced examples of *laticinerea*, with the maculation more obscure and the basal black streak of primaries so much reduced as to be scarcely distinct. The antennæ are thickened, the joints marked and laterally fringed with tufts of fine hair. In a way the species is intermediate in appearance between *unimoda* and *laticinerea*, falling in with the former because of the lack of an obvious longitudinal black line at base.

Xylina unimoda Lintner.

1878, Lintner, Ent. Cont., iv, 96, *Xylina*.

Head, thorax and primaries an even, soft, dark ashen gray, in which all the markings are lost. Head with the usual frontal line barely indicated, the tuftings not obvious. Collar with the usual black line wanting or barely indicated. Thoracic crest small, not divided; vestiture hairy. Abdomen without dorsal tufts, soft, pale mouse gray. Secondaries smoky, with a yellowish tinge, fringes tipped with white. Primaries a little whitish at extreme base, where the basal line is indicated on the costa in some specimens. T. a. line lost in most cases; when present slender, moderately toothed in the interspaces, in one example preceded by a few white scales. T. p. line barely traceable by a very slightly paler shade. S. t. line whitish, preceded by smoky spots, sometimes united into a continuous shade. A feebly marked, broken terminal line present in some specimens. Median shade vaguely traceable in some examples. Orbicular round or oval, whitish, rarely defined, sometimes continued below the median vein into a suborbicular. Reniform upright, of moderate size, a little constricted centrally, incompletely annulate by a somewhat paler gray, else concolorous. Beneath, primaries dusky, except that the terminal space is whitish powdered. Secondaries whitish, powdery, with a blackish outer line and discal spot.

Expands 40-45 mm. = 1.60-1.80 inches.

Hab.—Canada; New England States; Northern New York.

This species is recognizable by the uniform, dull, yet soft, dark gray, the paler orbicular offering the only point of relief, and the s. t. line the only bit of obvious transverse maculation. Some specimens are almost immaculate. The male antennæ have the joints marked, and at the sides tufted with fine ciliæ of moderate length.

It is not unusual to find washed-out examples of *antennata* doing duty as *unimoda*, and occasionally a well-marked *unimoda* gets into the *antennata* series. The latter species, when it has lost the basal black streak is sometimes difficult to distinguish; but it always has a certain rough, powdery appearance that marks it a stranger at once to the smooth soft tint of the present species.

***Xylina laticinerea* Grote.**

1874, Grt., Bull. U. S. Geol. Surv., ii, 27, *Lithophane*.

1882, Riley, Papilio, ii, 102, an var. *antennata*.

1883, Hy. Edw., Papilio, iii, 135, larva.

1891, Butler, Entomologist, xxiv, 242 = *antennata*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 229, *Xylina*, sp. dist.

Head, thorax and primaries powdery, dark, ashen gray. Abdomen and secondaries pale smoky, the former without dorsal tuftings, the latter with paler, white-tipped fringes. Head with the usual blackish line, tuftings not well defined. Collar with black or blackish line below tip. Thoracic crest low, but in good examples obviously divided. Primaries with all the marking present, blackish, diffuse and not contrasting. A blackish line from base to basal half line, inclosing a paler or whitish costal patch. Basal line geminate, usually complete or broken only on the subcostal vein. T. a. line geminate, oblique, a little outcurved in the interspaces, inner line more even and a little diffuse. T. p. line geminate, exserted over the cell, a little drawn in below, more or less denticulate, especially opposite the cell, outer line more even and diffuse, included space a little paler. S. t. line pale, not contrasting, broken, preceded by sagittate spots, which usually form the most prominent feature of the wing maculation. A series of blackish terminal lunules, the veins being also black marked. The median shade is not prominent, rarely even well marked, but it is usually obvious, diffuse, angulated in the lower portion of the reniform. Claviform outlined by black scales, small, pointed, often lost in the powdering, never prominent or discolored. Orbicular round or oval, oblique, distinctly paler than the remainder of the wing and therefore a little contrasting. Suborbicular well marked in most specimens, of good size, annulate with paler scales. Reniform obscure, moderate in size, upright, with an interrupted pale annulus, inferiorly better defined and tending to form a heel toward the base. Beneath, primaries dusky, except along costa and terminal space where it is gray, powdery, an obscure discal spot present in most cases. Secondaries pale, powdery, with a blackish exterior line and a large discal spot.

Expands 43-48 mm. = 1.72-1.92 inches.

Hab.—Canada; New England States; Northern New York; New Jersey; Illinois; Volga, South Dakota.

Twenty specimens, representing both sexes, are before me and form an aggregation separable with comparative ease from *grotei*, by the absence of all red scales on the primaries, by the more diffuse and more obvious maculation and by the somewhat contrasting, pale orbicular. There is not much real variation save that due

to fading or flight. There is some difference in the amount of black powdering which affects the relative distinctness of the parts, but nothing else of account. The antennæ of the male have the joints well marked and laterally furnished with tufts of moderately long, soft hair.

Xylina grotei Riley.

1882, Riley, Papilio, ii, 102, an var. *antennata*.

1887, Grt., Can. Ent., xix, 54, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 229, *Xylina*.

cinerosa || Grt.

1879, Grt., Bull. U. S. Geol. Surv., v, 202, *Lithophane*.

1882, Riley, Papilio, ii, 102, *nomen bis lectum*.

Head, thorax and primaries dull, dark ashen gray. Head with an admixture of white, and with a blackish frontal line. Thorax with the transverse line very obscure or altogether wanting. Thoracic crest low, in very rare instances feebly divided. Vestiture flattened hair mostly. Abdomen a pale mouse gray, without obvious dorsal tufts. Primaries with a slender black line at base, extending to the geminate basal half line, the included costal region paler, but rarely contrasting. T. a. line geminate, included space a little paler, defining lines somewhat diffuse, not much darker than the ground color, as a whole a little outwardly oblique, rather regularly outcurved in the interspaces. T. p. line geminate, included space paler, inner portion crenulate, outer even, very little darker than the ground, its course as a whole evenly outcurved over the cell, well drawn in below and with a little outward tooth on the internal vein. S. t. line obscure, pale, broken, preceded by continuous, irregular blackish spots, sometimes marked by a few reddish scales. A series of slightly darker terminal lunules which may be entirely obsolete. Median shade usually traceable, sometimes fairly evident, often absent, oblique between the ordinary spots to the lower portion of reniform, there forming almost a rectangle toward the inner margin. Claviform small, outline diffuse, often obsolete, rarely dark filled. Orbicular oval, oblique, paler. Suborbicular transversely oval, pale ringed, usually separated from the orbicular. Reniform moderate in size, a little constricted, lower portion somewhat larger than upper and somewhat darker; centre with a brownish shading. Secondaries smoky, with a faint reddish tinge, the fringes paler. Beneath gray, with a reddish tinge, powdery, disc of primaries blackish, secondaries with an exterior line, all with a blackish discal spot.

Expands 40-46 mm. = 1.60-1.84 inches.

Hab.—Canada, south to the District of Columbia, west to Nebraska, Dakota and Manitoba.

This is at once the most common and widely distributed species of this group. In fresh examples all the ordinary maculation is traceable, and there is no difficulty at all in separating the species from its allies. Spring specimens, especially when flown, lose their characteristic appearance and may become difficult to distinguish from *unimoda*. From *antennata* this species differs obviously by its

larger size, different wing form and much darker, dull ground, lacking the brightness and clear definition of the ordinary spots. Indeed, with a series of these two forms, side by side, their difference is obvious.

This is the species that I have been calling *antennata* of late years, and have, erroneously, determined as such for my correspondents. In consequence, all that Mr. Slingerland says of *antennata* in Bulletin 123, of the Cornell Station, really applies to this form. Further references to this matter will be found under *antennata*.

From *laticinerea* this species differs in being much less powdery, and having the median shade much less evident. The specimens average smaller on the whole and the wings are more parallel. Yet, with flown examples, there is sometimes a chance for doubt.

The antennæ of the male in this and the two following species are practically alike under the hand lens. The joints are a little marked, and they are laterally tufted with bunches of soft hair.

***Xylina antennata* Walker.**

1858, Wlk., Cat. Brit. Mus., Het., xv, 1738, *Xylina*.

1883, Saunder's Fruit Insects, 138, f. 138, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 228, *Xylina*.

cinerea Riley.

1871, Riley, 3rd Rept. Ins. Mo., 135, f. 57, *Xylina*.

1874, Grt., 6th Rept. Peab. Ac. Sci., 34, *Lithophane*.

1879, Grt., Bull. Geol. Surv., v, 201, pr. syn.

1881, Riley, Index to Mo. Repts., 74, *Lithophane*.

1882, Riley, Papilio, ii, 43, 101, an sp. dist. ?

1882, Fernald, Papilio, ii, 63, pr. syn.

1891, Butler, Entomologist, xxiv, 242, pr. syn.

Head, thorax and primaries rather bright ashen gray, with a purplish tinge. Head whitish, with a dusky frontal line, antennæ white at the base. Collar with a blackish line near tip, surmounting a reddish shade, which may extend throughout the lower portion, may merge into a whitish gray, or may form a scarcely traceable line. Patagiæ with black submarginal lines, sometimes white shouldered at the base of the primaries. Anterior crest low, not divided in any specimen before me; vestiture mostly flattened hair. Abdomen very light smoky gray, without obvious dorsal tufts. Primaries with black basal streak extending to basal half line, margined above with reddish scales, and including toward costa a paler, sometimes whitish patch, which is usually a prominent feature in the wing. Basal line geminate, not well marked. T. a. line almost upright, irregularly dentate in the interspaces, best marked by the pale included shade, the defining lines being scarcely darker than the ground color. T. p. line geminate, outcurved over the cell, almost equally incurved below it, included space a little paler, defining lines hardly visible in most cases except as venular dots. The line is therefore poorly marked and often hardly traceable. S. t. line marked by a series of cuneiform, contiguous black spots, outwardly edged with

brown or gray scales. There is a series of small black terminal spots. Median shade traceable in most specimens and obvious in some; oblique from the costa, darkening the space between the ordinary spots and the inferior portion of the reniform, then evenly oblique inwardly to the inner margin. Claviform small, pointed, black ringed, distinct in most specimens; black filled and prominent in some. Orbicular round or oval, oblique, usually with an extension or suborbicular below the vein, narrowly edged with black scales, annulate with pale gray, usually light filled. Reniform moderate, upright, a little constricted centrally, inwardly extending toward the orbicular on the median vein; centre with a reddish filling, defining line usually distinct, black. Secondaries pale, dirty yellowish or smoky, fringes lighter. Beneath, primaries smoky, except along costa and in terminal space, discal spot blackish. Secondaries with an exterior line and a smoky lunule.

Expands 35-42 mm. = 1.40-1.68 inches.

Hab.—Canada; New England States; New York; Burlington Co., New Jersey; Central Illinois; Minnesota; Central Missouri.

Sixteen examples, representing both sexes, are before me and show very little variation. The amount of white in the basal space differs, as does the intensity of the median shade and the prominence of the reniform. In other respects they agree.

The species here described is quite generally labeled *grotei* in collections largely on my authority, and Mr. Slingerland's remarks on *grotei* in Bulletin 123, of the Cornell Experiment species really apply to this species.

Walker in his original description gave no locality for his species, and it was not recognized as American until Dr. Fernald saw the type in the British Museum. Mr. Grote's original reference of *cinerea* to *antennata* was made on the basis of this comparison. As a matter of fact Riley's description covers *cinerosa* and *laticinerea* as well as *antennata*, but his figure and the specimens actually labeled by him are clearly this form.

I saw Walker's type and properly labeled the specimens in the National Museum collection, but in some way failed to straighten out my own set, so that, for ten years last past, I have uniformly named the species here described as *grotei*. The real *grotei* = *cinerosa* Grt. is what I have called *antennata*. This matter should be especially noted in the application of Mr. Slingerland's descriptions of the early stages, the mixture of species being chargeable to me. The *laticinerea* has been correctly named throughout.

***Xylina torrida* Smith.**

1899, Smith, Journ. N. Y. Ent. Soc., vii, 228, *Xylina*.

Ground color bluish gray. Antennæ white basally, else brown. Head with a

black line across the middle of the front, the vertex usually a little smoky. Collar as a rule paler than ground color, sometimes whitish, usually with a reddish flush toward a subapical black line, which in some examples is almost obsolete. Thorax more or less white powdered, not definitely marked, patagiæ black edged at the base of the wings. Abdomen with a reddish flush in well preserved specimens. Primaries more or less powdered, with smoky or blackish scales, varying in tint and often clouding the median space. Basal line geminate, blackish, marked through the costal cell only. A black longitudinal line extends from the base through the submedian interspace half way to the t. a. line, and is then obliquely extended by a black or blackish shade to the costa within the origin of the t. a. line. The space included in this boundary at the base of the wing is whitish or much paler than the rest of the wing, further emphasized by a rusty shading just above the black streak. T. a. line geminate, black, the outer portion most sharply defined, outcurved in the interspaces and quite sharply toothed inwardly on the veins, as a whole a little outwardly oblique. T. p. line lunulate, geminate, outer line smoky, indefinite and quite even, lines black, often disconnected and tending to obsolescence; as a whole the line is outwardly exerted over the reniform and almost upright below that point. S. t. line marked by a series of triangular black, preceding spots, except at the costa where a smoky shade precedes it. This series of spots is in a way the most prominent and certainly the most constant feature of the wing. A series of terminal spots which are not at the extreme edge of the wing and which are elongate though not connected into a line. A more or less diffuse median shade, almost or quite filling the space between the ordinary spots, parallel with and close to t. p. line below the reniform. Claviform black ringed and sometimes almost black filled, small, pointed, not reaching the middle of the median space. Orbicular upright, oval, of good size, as pale as any other part of the wing, black ringed except superiorly; below the median vein there is attached to it a smaller, less prominent, suborbicular, which is usually smoky centered and may become entirely obscured. Reniform large, oval, only a little kidney shaped, black ringed, centered with smoky in which is a reddish shading. The veins are more or less smoky. Secondaries smoky, with a reddish tinge, sometimes quite pale. Beneath with a reddish flush, powdery, both wings with an outer smoky line and round discal spot.

Expands 40-46 mm. = 1.60-1.80 inches.

Hab.—Pullman, Washington, October, March and April (C. V. Piper); Garfield County, Colorado, 4000 feet (Bruce); Glenwood Springs, Colorado, October, March, April (Barnes); N. W. British Columbia (Ottolengui); Soda Springs, California, October 16th (Hy. Edwards).

Twenty specimens, representing both sexes, are at present before me and I have seen others. They vary in the amount of contrast and the relative brightness of the maculation. In some everything is clear cut, every line and shade recognizable at a glance, in others, all, save the ordinary spots and the s. t. line, is obscured, and between these extremes the others range. In wing form the species is

most nearly like *laticinerea*; but in brightness of maculation it equals *tepida*.

The antennæ of the male are practically like those of *antennata*. The thoracic vestiture is mostly flattened hairs, the anterior crest low, but in perfect specimens a little divided. Abdomen without obvious dorsal tufts in any of the examples before me.

Xylina tepida Grote.

1874, Grt., Bull. Buff. Soc. Nat. Sci., ii, 27, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 229, *Xylina*.

Head, thorax and primaries bright, pale bluish gray. Head with a whitish admixture in most cases, and with a smoky frontal line. Collar usually paler below, a black line just below the tip, surmounting a vague reddish shading. Thoracic vestiture flattened hair and scales, anterior crest very obscure, not divided in any example before me. Abdomen mouse-gray, with a reddish tinge, without obvious dorsal tuftings. Primaries with the markings brightly defined. A distinct black basal mark, curved to meet the geminate basal line, superiorly margined by reddish scales, above which is a white line from which a whitish shade tends to fill the included space to costa. T. a. line geminate, blackish, inner portion a little diffuse, nearly upright, a little outcurved in the interspaces, sometimes considerably below the internal vein. T. p. line geminate, broken, lunulate or crenulate, incomplete and obscurely marked, outcurved over the cell, abruptly drawn in so as to almost touch the inferior part of the reniform, then straight or nearly so to the inner margin. S. t. line pale, broken, a little irregular, preceded by contiguous blackish spots. A series of distinct, lunate, black terminal spots. Median shade blackish, broad, a little diffuse, obvious in all and prominent in most specimens, a little outwardly oblique, direct from costa close to reniform and the t. p. line below it to the inner margin. Claviform broad, concolorous, outlined in blackish, varying in length, but never extending to the centre of the median space. Orbicular complete, narrow, irregularly lunate, with the convexity inward, narrowly defined by black scales, broadly annulate in white, the centre narrowly gray. Reniform large, almost as broad as long, almost rectangular, with the corners rounded, narrowly defined by black and black scales, inwardly obscured by the median shade, centrally flushed with reddish. Secondaries smoky, with a carmine flush, the fringes a little paler. Beneath reddish gray, powdery, primaries with disc smoky, secondaries with an exterior dusky line, all wings with a dark discal spot.

Expands 36-42 mm. = 1.44-1.68 inches.

Hab.—Canada; New England States; New York; Northern Pennsylvania.

Eight examples, six of them males, are at present before me. There is a little difference in the relative brightness of the maculation, but nothing else of note. The form of the orbicular here is constant and characteristic, the broad white annulus forming one of the most obviously contrasting marks. The antennæ in the male are not much thicker or more lengthily ciliated than in the female.

Xylina baileyi Grote.

1877, Grt., Can. Ent., ix, 86, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 229, *Xylina*.

Head, thorax and primaries a very pale, greenish gray. Head with the frontal superposed tufts distinct, and with a frontal blackish line. Collar with a brown or black line below tip, variably evident and sometimes obsolete. Patagiæ tipped and laterally margined with deep umber brown. Thoracic vestiture flattened hair and scales; anterior crest hardly elevated and not divided. Abdomen mouse-gray, with a carmine tinge and without dorsal tufts. Primaries with the maculation clearly written, and in part contrasting. A black basal streak curved toward the costa at the end of the geminate, broken basal line, inferiorly and outwardly diffuse, darkening this region so that the costal base seems paler by contrast. T. a. line geminate, broken, brown, not well defined, in course a little outwardly oblique and outcurved in the interspaces. T. p. line geminate on the costa, thence outer portion lost, inner lunulate or crenulate, brown, broken and partly lost, outcurved over cell, abruptly drawn in to the inferior margin of reniform, then even to the inner margin. S. t. line concolorous, a little irregular, preceded by a series of contiguous brown or black spots, which may become separated and partly lost, those in the submedian interspace and opposite the cell remaining constant. A series of brown or blackish interspaceal, terminal lunules. Median shade obvious in all specimens and prominent in most, brown or blackish, broad, diffuse, oblique from costa between the ordinary spots, darkening the lower part of reniform, then a little bent and parallel with t. p. line. Claviform broad, varying in length, concolorous, incompletely defined by black scales. Orbicular oblong, oblique, of good size, open to the costa, else black edged, concolorous or a little paler. Reniform large, almost as broad as long, ringed with black, centered with reddish. Secondaries smoky, with a carmine tinge, fringes paler tipped. Beneath gray, with a reddish tint, powdery; primaries with disc black, secondaries with a broken exterior line, all wings with a somewhat obscure discal spot.

Expands 35-40 mm. = 1.40-1.60 inches.

Hab.—New Hampshire; Northern New York; Northern Pennsylvania; probably all of the New England States and Canada.

Four males and seven females are under observation. The variation is largely in the relative prominence of the median shade, which is usually the most conspicuous feature of the ornamentation. The blackish spots preceding the s. t. line also range from a continuous shading to broken patches. Occasional specimens become powdery, obscuring the greenish tinge of the ground. The male antennæ are not much thicker nor much more lengthily ciliated than the female.

Xylina querquera Grote.

1874, Grt., 6th Rept. Peab. Ac. Sci., 34, *Lithophane*.

1874, Grt., Bull. Buff. Soc. Nat. Sci., II, pl. i, f. 5, *Lithophane*.

1882, Grt., Ill. Essay, 57, pl. 2, f. 21, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 229, *Xylina*.

Head, thorax and primaries a rich creamy gray, with a faintly green or bluish

tinge—usually the former. Head with superimposed tufts distinct, and with a brown frontal line, below which it is reddish. Collar unlined, thoracic crest hardly marked, vestiture flattened hair and scales, patagiæ tipped and laterally margined with chocolate brown. Primaries with curved black streak at base, diffuse inferiorly, strongly contrasting. All the lines geminate, little darker than the ground, tending to become lost, always marked on the costa. T. a. line nearly upright, a little outcurved in the interspaces. T. p. line with inner portion slender, even, not lunulate or crenulate, a little dentate or angulate on some of the veins, occasionally lost, outer portion diffuse, usually lost below the out-curve over cell. S. t. line marked only by a pair of black contrasting spots in the submedian interspace and opposite the cell. A series of distinct, black, terminal lunules in the interspaces. The median shade extends as a contrasting brown or black shade from the costa between the ordinary spots, is then lost or traceable as a slightly darker shade only, until it gets below the internal vein, where it forms a black or brown patch on the inner margin. Claviform barely indicated in one example. Orbicular large, concolorous, open to the costa, sides more or less obviously marked by black scales. Reniform large, almost as broad as long, incompletely black ringed, more or less brown and black filled. Secondaries smoky, with a purplish tinge. Beneath powdery, with a carmine shading, a more or less obvious outer dark line, and on all wings a blackish discal spot.

Expands 38–42 mm. = 1.56–1.68 inches.

Hab.—New Hampshire; Massachusetts; New York; Missouri.

One pair only is at present before me, but I have recently compared several others which do not greatly differ. The species is distinct in many ways and can always be recognized by the contrasting, square, dark brown or black patch between the ordinary spots and partly including the reniform. Other ornamental features have been elsewhere noted. The thorax seems to be unusually short, almost square, depressed and with collar and patagiæ much less marked than usual. The male antennæ are very shortly ciliated, the joints scarcely more marked than in the female.

***Xylina viridipallens* Grote.**

1877, Grt., Can. Ent., ix, 215, *Lithophane*.

1878, Grt., Bull. Geol. Surv., iv, 180, *Lithophane*.

1882, Grt., Ill. Essay, 57, pl. ii, f. 22, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 229, *Xylina*.

Head, thorax and primaries a dull, pale, greenish gray. Head white below the usual tuftings. Collar with an obscure blackish line below tip. Thoracic vestiture scales and flattened hair, the crest indicated by a little tuft of discolored scales. Primaries with all the markings blackish, fairly evident, but not in the least contrasting. Basal streak traceable. Basal line geminate, marked on the costa only. T. a. line geminate, inner portion lost or very feebly marked, outwardly oblique, a little outcurved in the interspaces. T. p. line geminate, broken, outcurved over the cell and then almost upright to inner margin. S. t. line marked by a series of partly contiguous blackish spots, indicating an irregularly bisinuate course. A series of interspaceal terminal lunules. Median shade diffuse, almost evenly oblique from costa to inner margin between the ordinary

spots and darkening the inner portion of the reniform. No claviform. Orbicular large, a little paler than the ground, somewhat lunate, the convexity toward base, concavity distinctly black edged, else margin not well defined. Reniform large, almost as broad as long, basal half darker, outer half a little paler than ground; inner margin black edged, else not well defined. Secondaries and abdomen smoky, with a reddish tint, the former with pale tipped fringes, the latter without dorsal tufts. Beneath reddish gray, powdery; primaries with disc smoky; secondaries with an outer line; all wings with discal spots better marked on the secondaries.

Expands 37 mm. = 1.48 inches.

Hab.—Massachusetts; Long Island, New York.

Only one female is before me and I have seen only one or two others aside from the type. The species is distinctly rare and absolutely unmistakable. It intensifies the thoracic characters noted in *querquera* and has practically no crest at all.

Xylina pexata Grote.

1874, Grt., 6th Rept. Peab. Ac. Sci., 35, *Lithophane*.

1878, Graef, Bull. Bkln. Ent. Soc., i, 10, = *ingrica*.

1883, Grt., Proc. Am. Phil. Soc., xxi, 160, ? = *ingrica*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 230, *Xylina*.

washingtoniana Grote.

1883, Grt., Papilio, iii, 74, *Lithophane*, var. *præc*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 230, *Xylina*.

Head and thorax dark, blackish brown, head more reddish inferiorly, tuftings fairly marked. Thoracic vestiture scales and flattened hair, anterior crest prominent, divided, posterior tuft obvious and truncate. In well preserved specimens the patagiæ have an admixture of white tipped scales and are white margined at the insertion of the primaries. The fore wings have an ashen gray base, over which is a red-brown shade and a dense powdering of black. In rubbed examples the gray is evident and the shadings are localized. A short, slender, curved, black basal mark, diffuse inferiorly, margined by contrasting yellow or white above. Basal line geminate, black, marked on the costa only. T. a. line black, outwardly oblique, a little outcurved in the interspaces, almost lost in the darker examples. T. p. line geminate, blackish, broken, incomplete, lunate, not well defined, except in the submedian interspace where it is followed by white or yellow scales; a few such scales also occur in some examples below the internal vein. S. t. line pale, distinct, irregular, preceded by a reddish, brown or black shading, which is sometimes broken up into spots. A gray shade extends through the s. t. space from the apex close to the defining shade of the s. t. line. There is a series of black, interspaceal, terminal lunules. A median shade is traceable in some specimens between the ordinary spots, but in most examples this is lost in the dark powdering. Claviform short, broad, concolorous, or with a gray shade, and from its tip a black line extends to the t. p. line. Orbicular oblong, oblique, black margined, annulate with white or yellow, brown centered. Reniform very broadly kidney shaped, in some specimens almost a rectangle, reddish filled, annulate by a narrow ring of white or gray, marked by black scales. Secondaries yellowish smoky, fringes paler, with a reddish tint. Abdomen smoky gray, with a prominent black dorsal tuft on segment 3, and smaller tufts on the two

segments following. Beneath smoky, powdery, with a carmine flush; secondaries paler, with an exterior line; all wings with a discal spot.

Expands 38-45 mm. = 1.25-1.80 inches.

Hab.—Canada; New England States; Northern New York; Manitoba; Washington; probably throughout the Northern United States from the Atlantic to the Pacific

A long series of both sexes, varying a little in brightness of color, but not markedly in any other way. The type of Mr. Grote's variety *washingtoniana*—in the Neumogen collection—is nothing more than a somewhat dark, intensely colored example, of which I have an almost exact duplicate from Connecticut.

The species is altogether different from any of those preceding and should be easily recognized. In the male the antennæ have the joints marked and the lateral tuftings well developed.

Xylina dilatocula n. sp.

Head black above, lightening through brown to red at the base of the palpi. Collar brown to a black transverse line just below the brown tip. Thoracic disc deep, blackish brown, the patagiæ with gray tipped scales intermixed. Anterior crest evident, divided, posterior tufting truncate. Abdomen reddish gray, with dorsal tufts, of which that on the 3rd segment is the most obvious. Primaries black and brown shaded over a blue-gray ground. A black curved basal streak, above which is a brown shading which becomes gray on the costa. Basal line geminate, black. T. a. line geminate, blackish, inner portion obscure, included space gray; in course outwardly oblique, even, a little outcurved. T. p. line geminate, inner part lunulate, black; outer even, smoky, lost over the outcurve; included space gray, in course it curves over the cell and is then deeply drawn in to the middle of the reniform. S. t. line pale, sinuate, irregular, preceded by a brown shade which becomes reddish, then gray before merging into a dark shading that follows the t. p. line. Apex gray, the narrow terminal space gray and black shaded to the lunulate, narrow, terminal line. Median shade black, diffuse, oblique, darkening the space between the ordinary spots and the outer portion of the median space. Claviform large, gray, not contrasting, incompletely outlined, a black line from its tip to the t. p. line. Orbicular round or nearly so, large, gray, contrasting. Reniform very large, almost square, with rounded corners, reddish brown, with a central yellowish tinge. Secondaries pale, powdery, dirty yellowish, with a slight reddish tint, veins, a discal lunule and a terminal line smoky. Beneath reddish gray, powdery, with more or less obvious outer line and discal spots best marked on the secondaries.

Expands 45-48 mm. = 1.80-1.92 inches.

Hab.—Seattle, Washington; Sierra Nevada, California.

Two males and one female before me and I have seen others. The species resembles *pexata*, and I had, from the description, identified this as Mr. Grote's *washingtoniana*; but the type is really *pexata*. The present species differs obviously in the very large, discolored, ordinary spots and in the brown collar. The antennæ of the male are laterally tufted with moderately long ciliæ.

Xylina lepida Lintner.

1878, Lint., Ent. Cont., iv, 95, *Xylina*.

1878, Grt., Bull. Geol. Surv., iv, 181, *Lithophane*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 230, *Xylina*.

Head, thorax and primaries deep blue-gray. Head darker, with a gray line between the antennæ. Collar smoky brown, with white tip at the base of the distinct, divided thoracic crest. Patagiæ with a lateral white line at base of primaries. Vestiture mostly flattened hair. Abdomen reddish gray, untufted. Primaries somewhat mottled with smoky brown shades, irregularly distributed. Basal line geminate, black, broken, outcurved, connected with a short blackish streak. T. a. line geminate, outer portion blackish, inner smoky and not relieved. The line is unusually distant from base, outwardly oblique to the submedian interspace, is then inwardly bent and forms an inward tooth on the internal vein. T. p. line denticulate, very irregular, closely approaching the t. a. line in the submedian interspace and there connected with it by a black bar. S. t. line concolorous, a little irregular, marked by irregular smoky preceding spots of varying sizes. Fringes cut with smoky. A smoky, diffuse median shade through the centre of the wing. No claviform. Orbicular large, oblique, gray, open to the costa, with a smoky outline. Reniform of moderate size, gray, centrally constricted, with a smoky outline. Secondaries pale, transparent carneous gray, the fringes white tipped. Beneath reddish gray, powdery, with an obscure outer line and a smoky discal spot on all wings.

Expands 40 mm. = 1.60 inches.

Hab.—Canada; New England States; Northern New York.

Only the female is before me at present and I have not had many examples of this species under examination. It is so unlike any other, however, that there can be no question as to its identity. I have not noted any variation save in the amount of the smoky shading.

Xylina thaxteri Grote.

1874, Grt., Bull. Buff. Soc. Nat. Sci., ii, 196, *Lithophane*.

1875, Grt., List Noctuidæ, pl., f. 3, *Lithophane*.

1876, Speyer, Stett. Ent. Zeit., 203, an var. *lambda*.

1878, Lint., Ent. Cont., iv, 127, an var. *lambda*.

1882, Grt., Proc. Am. Phil. Soc., xxi, 160, ? an var. *conformis*.

1891, Butler, Entomologist, xxiv, 263, = *lambda*.

1893, Smith, Bull. 44, U. S. Nat. Mus., 230, an sp. dist. ?

Head, thorax and primaries bright blue-gray. Head with a brown frontal line, below which it is reddish. Collar with a narrow but clear black transverse line, margined above with white scales. Thoracic crest distinct, divided, not very high. Patagiæ with a deep brown line at the sides. Primaries with a black streak at base, curved up toward the costa at the basal half line, which is there marked by geminate spots. Superiorly the streak is margined by a white line. Below and beyond it is diffuse and becomes brown shaded. T. a. line geminate on the costa, then the inner portion is lost and the outer is black, even, oblique to the submedian interspace, thence inward to form an acute tooth on the internal vein. T. p. line geminate, smoky, outer portion becoming lost over the cell, included space clear gray, inner line lunulate, more or less incomplete, as a whole

the line is not well marked and often lost in part. A prominent black bar connects the lines in the submedian interspaces and this is diffuse superiorly, with a brown tinge. S. t. line defined by a series of black marks which form a prominent inward tooth between 4 and 5, and another on vein 3, this latter almost reaching the t. p. line. Beyond this the terminal space is often reddish or brown shaded, but it sometimes remains of the normal ground color. There is a series of very small terminal brown marks which are often wanting. The median shade is brown or black, outwardly oblique from costa to the black streak connecting the median lines, then always brown from the middle of this line to the inner margin. Inwardly this shade is sharply defined to form the outer margin of the orbicular, outwardly it is diffuse, obscures the reniform and darkens the median space to the t. p. line. Orbicular large, oval, oblique, open to the costa, inferiorly broadly outlined in black. Reniform large, upright, centrally constricted, shaded with reddish, undefined except inferiorly, where it is prominently black margined. Secondaries smoky, with either a purplish, red or yellow shading. Beneath smoky, with carmine powderings, a more or less complete outer line and a smoky discal lunule.

Expands 39-43 mm. = 1.56-1.72 inches.

Hab.—Canada; New England States; New York; Northern New Jersey; Pennsylvania; probably also along the northern boundary, at least as far west as Illinois.

Twelve examples, representing both sexes, are before me. This is the most striking species in our fauna, hence easy of recognition. The variation is almost entirely in the amount of the brown shading and its richness; this in turn being dependent upon the freshness of the specimen. The male antennæ are shortly ciliated.

Typical *lambda* has not been before me for comparison, but both varieties have been compared and the characters studied. Unless the specimens seen by me are not *lambda*, that species is distinct from *thaxteri*. Until a much closer study has been made of the typical form I do not feel warranted in referring our American form as identical with the European species.

LIST OF THE SPECIES.

XYLINA Ochs.

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|---------------------------------|----------------------------------|
| 1. <i>X. semiusta</i> Grt. | 10. <i>X. signosa</i> Wlk. |
| 2. <i>X. hemina</i> Grt. | <i>petulca</i> Grt. |
| 3. <i>X. disposita</i> Grt. | 11. <i>X. amanda</i> Smith. |
| 4. <i>X. bethunei</i> G. and R. | 12. <i>X. contenta</i> Grt. |
| 5. <i>X. patefacta</i> Wlk. | <i>pomona</i> Smith. |
| 6. <i>X. innominata</i> Smith. | 13. <i>X. itata</i> Smith. |
| <i>signosa</i> Grt. | 14. <i>X. fagina</i> Morr. |
| 7. <i>X. oriunda</i> Grt. | 15. <i>X. longior</i> Smith. |
| 8. <i>X. gausapata</i> Grt. | 16. <i>X. emarginata</i> Smith. |
| 9. <i>X. ferrealis</i> Grt. | 17. <i>X. holocinerea</i> Smith. |

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| 18. <i>X. georgii</i> Grt. | 26. <i>X. torrida</i> Smith. |
| 19. <i>X. puella</i> Smith | 27. <i>X. tepida</i> Grt. |
| 20. <i>X. oregonensis</i> Harv. | 28. <i>X. baileyi</i> Grt. |
| 21. <i>X. winnipeg</i> Smith. | 29. <i>X. querquera</i> Grt. |
| 22. <i>X. unimoda</i> Lint. | 30. <i>X. viridipallens</i> Grt. |
| 23. <i>X. laticinerea</i> Grt. | 31. <i>X. pexata</i> Grt. |
| 24. <i>X. grotei</i> Riley. | <i>washingtoniana</i> Grt. |
| <i>cinerosa</i> Grt. | 32. <i>X. dilatocula</i> Smith. |
| 25. <i>X. antennata</i> Wlk. | 33. <i>X. lepida</i> Lint. |
| <i>cinerea</i> Riley. | 34. <i>X. thaxteri</i> Grt. |

EXPLANATION OF PLATE I.

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| 1. Harpe and clasper of male <i>Xylina semiusta</i> . |
| 2. " " " " " <i>hemina</i> . |
| 3. " " " " " <i>disposita</i> . |
| 4. " " " " " <i>bethunei</i> . |
| 5. " " " " " <i>patefacta</i> . |
| 6. " " " " " <i>innominata</i> . |
| 6a. " " " " " <i>innominata</i> —different view. |
| 7. " " " " " <i>oriunda</i> . |
| 8. " " " " " <i>ferrealis</i> . |
| 9. " " " " " <i>signosa</i> . |
| 10. " " " " " <i>amanda</i> . |
| 11. " " " " " <i>contenta</i> . |
| 12. " " " " " <i>fagina</i> . |
| 13. " " " " " <i>longior</i> . |
| 14. " " " " " <i>emarginata</i> . |
| 15. " " " " " <i>holocinerea</i> . |

EXPLANATION OF PLATE II.

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| 16. Harpe and clasper of male <i>Xylina georgii</i> . |
| 17. " " " " " <i>winnipeg</i> . |
| 18. " " " " " <i>unimoda</i> . |

The last two structures are nearer in actual size ; f. 17 was drawn with a two-inch objective ; f. 18 with a three. As a matter of fact *unimoda* is larger than *winnipeg*.

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| 19. Harpe and clasper of male <i>Xylina laticinerea</i> . |
| 20. " " " " " <i>grotei</i> . |
| 21. " " " " " same—another view. |
| 22. " " " " " <i>antennata</i> . |
| 23. " " " " " <i>torrida</i> . |
| 24. " " " " " same—another view less magnified. |
| 25. " " " " " <i>tepida</i> . |
| 26. " " " " " <i>baileyi</i> . |
| 27. " " " " " <i>querquera</i> . |
| 28. " " " " " <i>pexata</i> . |
| 29. " " " " " <i>ingrica</i> . |

30.	"	"	"	"	"	<i>dilatocula</i> .
31.	"	"	"	"	"	<i>lepida</i> .
32.	"	"	"	"	"	<i>thaxteri</i> .

EXPLANATION OF PLATE III.

1. *Xylina semiusta* Grt.
2. " *hemina* Grt.—melanic form.
3. " *disposita* Grt.—normal.
4. " *disposita*—a little suffused.
5. " *bethunei* G. and R.
6. " *bethunei* G. and R.
7. " *patefacta* Wlk.
8. " *innominata* Smith—dark form.
9. " *innominata*—light form.
10. " *oriunda* Grt.
11. " *ferrealis* Grt.—dark form.
12. " *ferrealis*—light form.
13. " *signosa* Wlk.
14. " *itata* Smith—type.
15. " *itata*—suffused.
16. " *amanda* Smith.

EXPLANATION OF PLATE IV.

17. *Xylina contenta* Grt.—normal.
18. " *contenta*—small, dark form.
19. " *fagina* Morr.
20. " *longior* Smith—normal.
21. " *longior*—much suffused.
22. " *emarginata* Smith.
23. " *holocinerea* Smith.
24. " *georgii* Grt.
25. " *puella* Smith.
26. " *oregonensis* Harv.
27. " *winnipeg* Smith.
28. " *unimoda* Lint.

EXPLANATION OF PLATE V.

29. *Xylina laticinerea* Grt.
30. " *grotei* Riley.
31. " *torrida* Smith.
32. " *antennata* Wlk.
33. " *tepida* Grt.
34. " *baileyi* Grt.
35. " *querquera* Grt.
36. " *viridipallens* Grt.
37. " *peziata* Grt.
38. " *dilatocula* Smith.
39. " *lepida*.
40. " *thaxteri*.



Smith, John Bernhard. 1900. "Contributions toward a Monograph of the North American Noctuidæ. Revision of the Species of *Xylina* Ochs." *Transactions of the American Entomological Society* 27, 1–46.

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