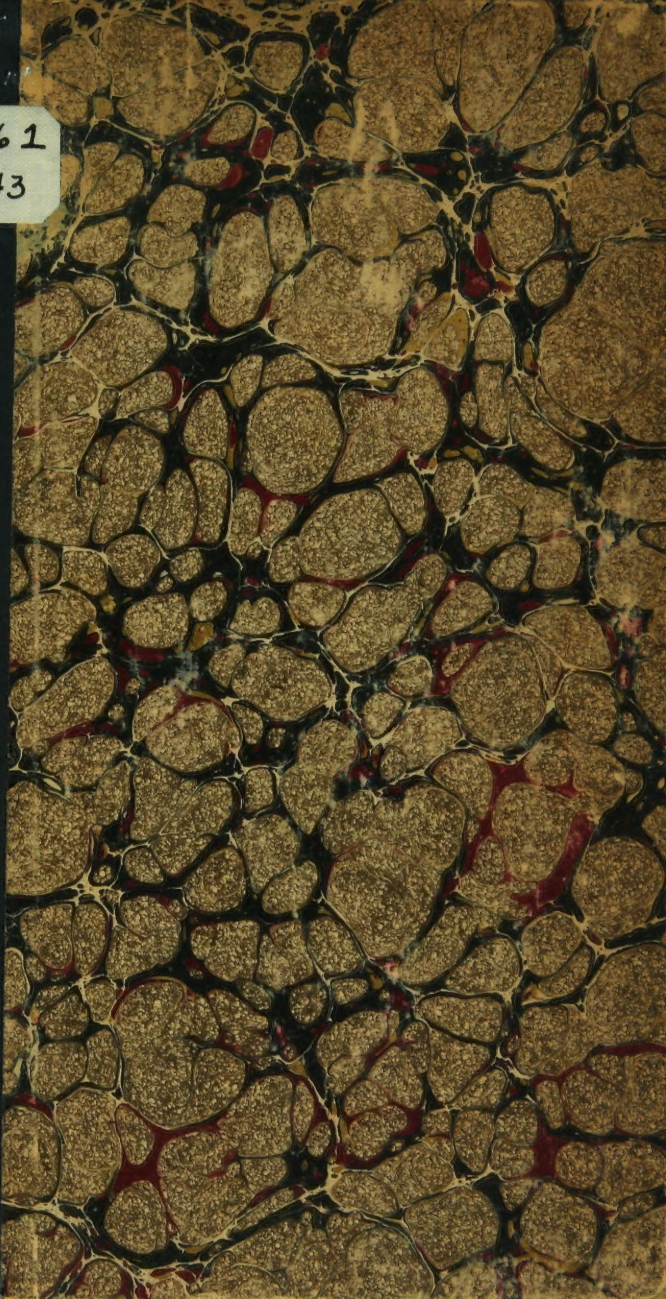


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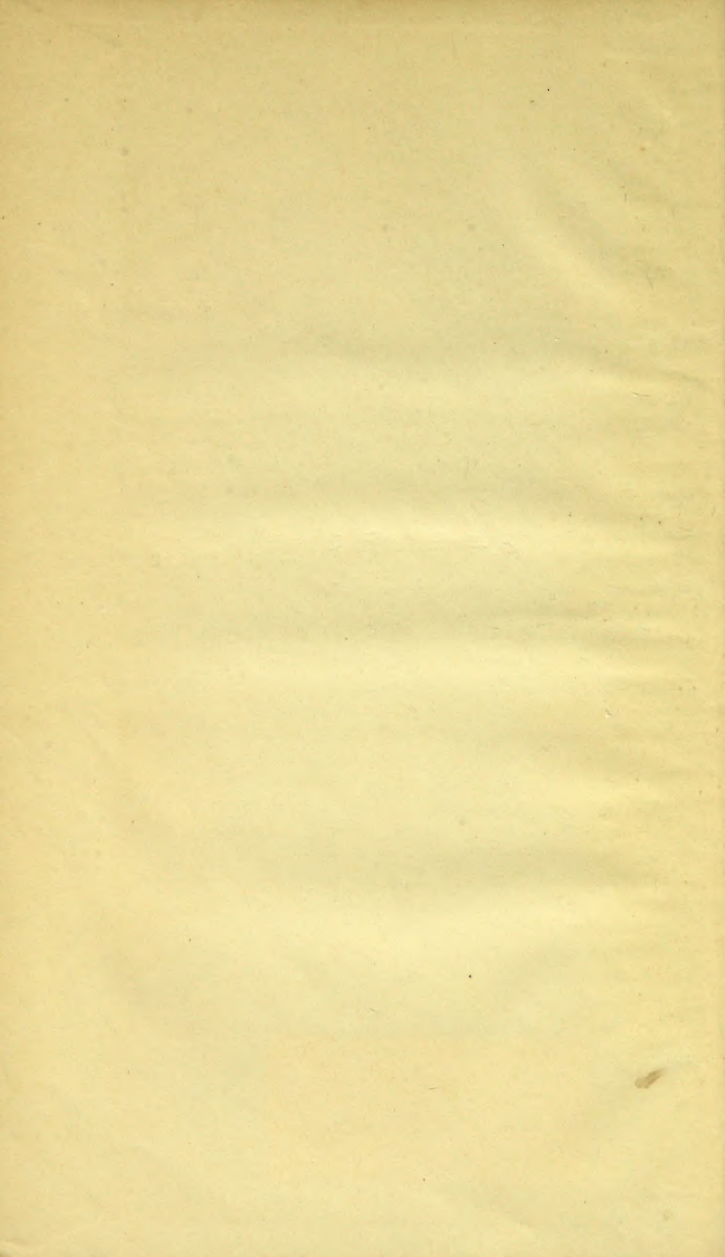
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country, which is principally composed of masses of igneous origin. We shall pass over the consideration of the question, whether this original elevation took place in a fluid or solid state, that is, whether in earlier times these masses rose suddenly and continued to rise more and more slowly as they gradually cooled, or whether this gradually decreasing ratio has always existed. We may, however, be allowed the remark, that the slow elevation which still continues when the operation of the vapor, as an elevating power, has long ceased, may be regarded, according to what has been stated above, as the result of an expansion produced by the caloric disengaged from the vapor during its condensation. For example, let us assume that the solid crust of the earth in *Scandinavia* was 139,840 feet thick, that the expansion of this crust by heat takes place in the same ratio as in earthen ware; then, an average increase of heat of $2^{\circ}.9$ R. during the space of 1000 years, would be sufficient to effect an expansion of 4.26 feet in a stratum of the above-mentioned thickness. And this is the average ratio of the rising of that country.

Be the cause of the elevation of *Scandinavia* what it may, this circumstance is remarkable, that in the southern part of *Sweden*, where the country, according to Nilson's statement, sinks, secondary formations, viz. chalk, occur in great abundance, while in the north of *Sweden*, as well as in *Finland*, the gneiss-granite formation predominates. We must not, however, attach too much importance to the connexion which appears to exist between the elevation of the northern part of *Sweden* and the prevalence of the latter formation, as Nilson* says, the chalk also lies on gneiss, and less frequently on greywacke. It is nevertheless remarkable that the granite island of *Bornholm*, which is situated opposite to the sinking coast of *Schonen*, is still in the act of rising, according to the observations of Forchhammer above alluded to.

As regards the sinking of countries, there is no difficulty in regarding it as the result of an elevation of neighboring countries. Yet we can imagine many causes, independent of such elevations, which may produce depressions. It does not, however, lie within the scope of these remarks to enumerate these causes.

* *Petrificata Suecana Form. Cretaceae, &c.* 1827, p. 81.

It remains to consider the elevations of whole systems of rocks, events which must have taken place prior to the existence of our records. There is doubtless no difficulty in also explaining these phenomena through the agency of steam. Elie de Beaumont,* however, is of opinion, that these elevations are a consequence of the inequality between the cooling of the interior and exterior of the earth. We shall examine this subject, after pointing out the laws that prevail during the cooling of large masses of fused matter.

To be continued.

ART. III.—*Descriptive Catalogue of the North American Insects belonging to the Linnæan Genus SPHINX in the Cabinet of* THADDEUS WILLIAM HARRIS, M. D., Librarian of Harvard University.

THE insects belonging to the order Lepidoptera have peculiar claims to our attention. In the adult or winged state they are among the most beautiful, and in their previous or caterpillar state are the most injurious of insects. Living while young principally on the leaves of plants, they are at all times more or less exposed to our observation, and too often obtrude themselves on our notice by their extensive ravages. While it is comparatively easy to discover these insects and observe their transformations, the determination of their names and their places in a scientific arrangement is rendered in many cases impossible, and in all exceedingly difficult, to the American student, from the want of suitable descriptive works on this branch of entomology. Having overcome these difficulties myself only at a great expense and much loss of time, it has occurred to me that a descriptive catalogue of our Lepidoptera might be useful to others, while it would serve to confirm the names given to these insects in my cabinet, and transmitted in return for specimens to my friends. My own collection has now become quite extensive, and contains a large number of undescribed species from various parts of the United States. Passing by our Butterflies, nearly all of which have been

* Poggendorff's *Annal.* vol. xxv, p. 55.

figured and for the most part described in Dr. Boisduval's "Histoire et Iconographie des Lepidoptères de l'Amérique Septentrionale," I propose, at the present time, to offer for publication descriptions of the native insects in my collection belonging to the second grand division of the order Lepidoptera, comprising the Sphinges of Linnæus. Should these be favorably received, they may hereafter be followed by descriptions of our *Phalænæ* or moths. The larvæ or caterpillars of many of the species are described partly from my own observations, and partly from the figures given by Mr. Abbot in his great work, on the Lepidoptera of Georgia, edited by Sir James E. Smith. My obligations to the gentlemen who have favored me with specimens will be found recorded on almost every page of this catalogue, and I beg leave to tender to them my most grateful acknowledgments, and to solicit from them, and from others, a continuation of similar favors.

Linnæus was led to give the name of *Sphinx* to the insects in his second group of the Lepidoptera, from a fancied resemblance which some of their larvæ, when at rest, have to the *Sphinx* of the Egyptians. The attitude of these larvæ is indeed very remarkable. Supporting themselves by their four or six hind-legs, they elevate the fore-part of the body, and remain immovably fixed in this posture for hours together. In the winged state the true Sphinges are known by the name of humming-bird moths, from the sound which they make in flying, and hawk-moths, from their habit of hovering in the air while taking their food. These humming-bird or hawk-moths may be seen during the morning and evening twilight flying with great swiftness from flower to flower. Their wings are long, narrow, and pointed, and are moved by powerful muscles, to accommodate which their bodies are very thick and robust. They delight most in the honeysuckle and scarlet *Bignonia*, from the tubular blossoms of which they extract the honey, while on the wing, by means of their excessively long maxillæ or tongue. Other Sphinges fly during the day-time only, and in the bright sunshine. Then it is that our large clear-winged *Sesiæ* make their appearance among the flowers, and regale themselves with their sweets. The fragrant *Phlox* is their especial favorite. From their size and form and fan-like tails, from their brilliant colors, the swiftness of their flight, and the manner in which they take their food, poised upon

rapidly vibrating wings above the blossoms, they might readily be mistaken for humming-birds. The *Ægeriæ* are also diurnal in their habits. Their flight is swift, but not prolonged, and they usually alight while feeding. In form and color they so much resemble bees and wasps as hardly to be distinguished from them. The *Smerinthi* are heavy and sluggish in their motions. They fly only during the night, and apparently take no food in the winged state, their maxillæ or tongues being so short as to be useless for this purpose. The *Glaucopididæ*, or Sphinges with feathered antennæ, fly mostly by day, and alight to take their food like the *Ægeriæ*, to which some of them bear a resemblance, while others have nearly the form of *Phalænæ* or moths, with which also they agree in their previous transformations.

SYNOPSIS OF THE FAMILIES AND GENERA.

It was not my intention originally to give here the characters of the genera, but to refer the student for them to the works of Latreille and other entomologists. Upon further consideration, however, I have thought that the labor of determining our Sphinges by means of the catalogue would be much abridged, if a synopsis of the families and genera were to be prefixed to it.

Class Insecta.

Animals with jointed bodies, breathing through lateral holes or spiracles, produced from eggs; while growing subject to a transformation of three stages; in the first stage called larvæ, caterpillars, grubs, or maggots; in the second pupæ, nymphs, or chrysalids; in the third stage provided with wings, a body composed of three distinct parts, the head, thorax or trunk, and the abdomen, and having two compound eyes, two antennæ, from two to six palpi or feelers, and six legs.

Order Lepidoptera.

The young, called larvæ or caterpillars, are provided with jaws, and from ten to sixteen legs. They feed principally upon vegetable substances. The pupæ take no food, are incapable of moving about, are apparently without legs, these parts with their other members being folded up and firmly soldered to the body. In the third stage they are, with few exceptions, provided with four wings, which, with the body, are more or less covered with little colored branny scales, lapping over each other like the scales of fishes; their jaws are transformed to a tongue, more or less long, and, when not in use, spirally rolled and concealed between the palpi.

Section I.—Papiliones.

Antennæ threadlike and knobbed or thickened at the end. Wings not confined by a bristle and hook; all of them, or the first pair at least, elevated perpendicu-

larly, and turned back to back when at rest. Only one pair of spurs to the hind-legs in the greater number. Thorax moderate; abdomen rather slender. Flight diurnal. Larvæ with sixteen feet; transformation in the open air. Pupæ angulated, and fastened by silken threads, or ovoid, and enclosed in an imperfect cocoon.

Section II.—Sphinges.

Antennæ thickened in or just beyond the middle, tapering at each end, and most often hooked at the tip; more rarely slender and nearly setaceous, with a double row of slender teeth or hairs on the under side in the males. Wings confined by a bristle or bunch of stiff hairs on the front edge near the shoulder of each hind-wing, which is retained by a hook on the under side of each fore-wing; when at rest horizontal, or inclined on the sides of the body, the fore-wings covering and concealing the hind pair. Two pairs of spurs to the hind-legs. Thorax thick and robust; abdomen mostly conical. Flight of some in the morning and evening twilight, of a few nocturnal, and of others during the day. Larvæ with sixteen legs; transformation in or upon the ground, or in a silken cocoon. Pupæ elongated ovoid.

Section III.—Phalænaæ.

Antennæ (never knobbed at the end or thickened in the middle) slender and tapering to a point, in some pectinated or feathered, in others simple or bristle-formed. Wings confined together by bristles and hooks, the first pair covering the hind-wings and horizontal or sloping when at rest. Two pairs of spurs to the hind-legs. Flight for the most part nocturnal. Larvæ with from ten to sixteen legs, transforming in a silken cocoon or in the ground. Pupæ ovoid.

The Sphinges may be divided into two tribes.

Tribe I.—Sphinges legitimæ.

Larvæ colored, naked, for the most part horned on the tail, and feeding on the leaves of plants; or whitish, slightly hairy, not horned, and living on woody matter within the stems of plants. Antennæ of the winged insects tipped with a minute bristly tuft.* Palpi (except in the *Ægeriadæ*) with the third joint minute and indistinct.

Tribe II.—Sphinges adscitæ.

Larvæ always colored, more or less hairy, never horned, feeding on leaves, and transforming in a silken cocoon, which is fastened to the plants on which they live. Antennæ of the winged insects not tufted at the end. Palpi distinctly three-jointed.

The first tribe, or Sphinges legitimæ, may be divided into three families.

Family I.—Sphingiadæ.

Antennæ fusiform and prismatic; ending in a hook, and, in the males, transversely biciliated beneath; or, more rarely, curved, and, in the males, bipectina-

* This little tuft is obsolete or wanting in the *Smerinthi*.

ted beneath. Palpi pressed close to the face, short, thick, and obtuse, with the third joint minute and concealed. Body thick; abdomen conical and not tufted at the end. Flight crepuscular. Larvæ colored, naked, with a caudal horn, which is sometimes obsolete and replaced by a callous spot; they devour the leaves of plants, and go deep into the earth to transform, or conceal themselves upon the surface, under leaves, in an imperfect cocoon.

The North American genera in this family are six.

Genus I.—*Smerinthus*.

Wings more or less angular and indented, the front margin of the hind-wings projecting beyond the upper or fore-wings when at rest. Antennæ short, prismatic and fusiform, arcuated or curved near the tip, transversely biciliated or bipectinated beneath in the males. Tongue obsolete. Larvæ granulated, with the head triangular, horned on the tail, obliquely banded on each side, and transforming in the earth.

Genus II.—*Ceratomia*.

Wings entire. Antennæ elongated, abruptly ending in a short and slender hook, transversely biciliated beneath in the males. Palpi horizontal and nearly cylindrical. Tongue moderate. Abdomen longitudinally striped. Larvæ with horns on the fore-part of the body, a row of little teeth on the back, a long caudal horn, and oblique bands on each side; it transforms in the earth.

Genus III.—*Sphinx*.

Wings entire. Antennæ long, abruptly ending in a short and slender hook, and transversely biciliated beneath in the males. Palpi rising and enlarged at the end. Tongue long. Abdomen spotted or transversely banded at the sides. Larvæ with oblique bands on the sides and a caudal horn, and transforming in the earth.

Genus IV.—*Philampelus*.

Wings sinous. Antennæ long, attenuated at the end, with a long terminal hook, and transversely biciliated beneath in the males. Tongue moderate. Abdomen not transversely banded or spotted at the sides. Larva short, thick, with the head and first three segments rather small and capable of being drawn more or less within the fourth segment; when young with a long, slender, recurved caudal horn, which subsequently disappears and is replaced by a callous spot; sides with oblique spots sloping backwards and downwards; transforms in the earth.

Genus V.—*Chærocampa*.

Wings sinous or angulated. Antennæ rather short and slender, generally arcuated, tapering, and ending in a long hook; more rarely straight, with a short terminal hook; transversely biciliated beneath in the males. Tongue moderate. Abdomen immaculate, or longitudinally striped, but never transversely banded at the sides. Larvæ elongated, the fore-part of the body tapering and retractile; with from one to three eye-like spots, or a series of oblique bands on each side; caudal horn short, sometimes obsolete and replaced by a callous spot; transforms on the surface of the ground, under leaves, in an imperfect cocoon.

Genus VI.—*Deilephila*.

Wings entire, upper ones acute. Antennæ rather short, straight, gradually thickening nearly to the end, which suddenly terminates in a small and short hook; in the males transversely biciliated beneath. Tongue moderate. Abdomen conical, pointed, and transversely banded at the sides. Larva elongated, not tapering before, and the head and first three segments not retractile, with a series of nine or ten round spots on each side, and a long caudal horn; transforms in the earth.

Family II.—*Macroglossiadæ*.

Antennæ fusiform, prismatic, ending with a hook, and transversely biciliated beneath in the males. Palpi pressed close to the face, with the third joint minute and concealed; short, thick, and obtuse at the end in some; slightly elongated and subacute in others. Body short and thick, or flattened a little; abdomen tufted at the end. Flight diurnal. Larvæ colored, naked, with a caudal horn, which is sometimes obsolete and replaced by a callous spot; they devour the leaves of plants, and enter the earth to transform, or conceal themselves upon the surface in an imperfect cocoon under leaves.

In this family we have three genera, *Pterogon*, *Thyreus*, and *Sesia*.

Genus VII.—*Pterogon*.

Wings angulated and indented. Antennæ long, arcuated, tapering at the end, with a long, terminal hook. — Tongue as long as the body. Abdomen short and conical. Larvæ attenuated before, with a series of spots, on each side, sloping obliquely backwards and downwards, and a caudal horn, which is frequently obsolete and replaced by a callous spot: they transform in an imperfect cocoon under leaves.

Genus VIII.—*Thyreus*.

Wings angulated and indented. Antennæ long, and ending with a long hook. Palpi short, thick, and obtuse at the end. Tongue moderate. Abdomen ovoid. Larvæ elongated, not attenuated before, longitudinally striped on the back, obliquely banded at the sides, with a long and straight caudal horn: they transform in the earth.

Genus IX.—*Sesia*.

Wings entire, upper ones acute, all of them transparent in the middle. Antennæ short, straight, gradually thickened towards the end, with the terminal hook obsolete, and obliquely biciliated beneath in the males. Palpi somewhat elongated, subacute, and forming a conical beak. Tongue long. Abdomen short ovoid, slightly flattened. Larvæ not attenuated before, longitudinally striped on the back, with a short, slightly recurved caudal horn: they transform in an imperfect cocoon under leaves on the surface of the ground.

Family III.—*Ægeriadæ*.

Antennæ arcuated; either thickening to beyond the middle, attenuated and curved but not hooked at the end, and biciliated beneath in the males; or very slightly fusiform and almost threadlike, and simple in both sexes. Palpi elongated, slender, distinctly three-jointed, prominent, separated and not pressed close to the head, nearly cylindrical, covered with very small scales and almost naked ex-

cept at the base, which is hairy, and pointed at the tip. Wings more or less transparent. Abdomen with a caudal tuft. Flight diurnal. Larvæ whitish, soft, slightly downy, living within the stems of plants, and generally transforming in a cocoon made of fragments of wood and bark cemented by a gummy matter. Pupæ with the edges of the abdominal segments armed with transverse rows of small teeth.

The American species in this family may be disposed in the genera *Trochilium*, *Ægeria*, and *Thyris*.

Genus X.—*Trochilium*.

Wings narrow, entire, all of them, or the hind-pair at least, transparent. Antennæ short, stout, arcuated, gradually thickened nearly to the end, which is curved but not hooked; underside generally fringed with a double row of very short bristles in the males. Tongue very short. Body thick; abdomen slightly tufted at the end.

Genus XI.—*Ægeria*.

Wings narrow, entire, all of them, or the hind-pair at least, transparent. Antennæ mostly elongated, sometimes short, arcuated, gradually thickened nearly to the end, which is curved but not hooked; underside generally fringed with a double row of short bristles in the males. Tongue long. Body slender; abdomen nearly or quite cylindrical, ending with a flat or trilobed tuft.

Genus XII.—*Thyris*.

Wings broad, subtriangular, more or less angulated and indented, opaque, with small semitransparent spots. Antennæ fusiform, but slender and only slightly thickened in the middle, arcuated, and simple in both sexes. Tongue moderate. Body short and thick; abdomen conical, and tufted at the end.

Tribe II.—*Sphinges adscitæ*.

The species described in this catalogue may be disposed in three families, *Agaristiadæ*, *Zygæniadæ*, and *Glaucopididæ*.

Family IV.—*Agaristiadæ*.

Antennæ straight, slightly thickened in or beyond the middle, and curved at the tip. Palpi elongated, slender, not pressed to the face, hairy at base, with the terminal joint cylindrical, scaly or almost naked. Wings broad, subtriangular. Tail hairy or tufted. Flight diurnal. Larvæ elongated, cylindrical, or enlarged a little behind, slightly hairy, transversely banded or spotted, and without a caudal horn.

Genus XIII.—*Alypia*.

Wings broad, subtriangular, entire, and opaque, with large whitish spots. Antennæ somewhat elongated and slender, thickened very gradually from beyond the middle nearly to the tip, which is slightly curved, obtuse, and not tufted. Palpi long, porrect, separate, with the first two joints very hairy, and the third joint cylindrical, scaly, and obtuse. Tongue moderate, and spirally rolled. Abdomen somewhat elongated, nearly cylindrical, fringed at the sides and tip with short hairs. Anterior and intermediate tibiæ thickly clothed with hairs. Posterior tibiæ with two pairs of pretty long unequal spurs.

Family V.—*Zygæniadæ*.

Antennæ arcuated, abruptly thickened and curved beyond the middle. Palpi generally elongated, sometimes short, not pressed to the face, hairy at base, with the terminal joint scaly or almost naked. Wings narrow, opaque, often spotted, the hind-pair rather small. Abdomen more or less cylindrical, obtuse, and not tufted at the end. Flight diurnal. Larvæ short, contracted, variegated with spots, slightly hairy, and not horned on the tail.

Genus XIV.—*Mastigocera*.

Wings long, narrow, entire, opaque, the hind-pair quite small. Antennæ simple in both sexes, filiform at base, suddenly thickened and fusiform beyond the middle, very much attenuated towards the tip, and ending in a long curved point. Labial palpi somewhat curved, extending considerably beyond the clypeus, separated, well covered with hairs beneath the base; the penultimate joint longest, cylindrical, and scaly; the last joint also cylindrical, obtusely rounded at the end, and covered with small, close scales. Maxillæ (tongue) nearly as long as the body. Abdomen nearly cylindrical, obtusely rounded at the end, longitudinally grooved at the sides before, with the basal segment strongly marked, and swelling on each side into a little tubercle. Legs long and slender; posterior tarsi laterally compressed, and hairy on the outside, in the males.

Family VI.—*Glaucopteridæ*.

Antennæ slender, almost setaceous, or very slightly thickened in the middle, and distinctly bipectinated beneath in the males. Palpi slender, more or less elongated, not pressed to the face. Wings sometimes narrow, and sometimes widened, entire, and for the most part opaque. Abdomen nearly cylindrical, and frequently tufted at the end. Flight diurnal. Larvæ cylindrical, hairy, without a caudal horn.

Genus XV.—*Procris*.

Wings narrow, elongated, opaque, and immaculate. Antennæ slender, tapering at each end, and bipectinated beneath in the males. Palpi small, short, pendent, and nearly naked. Tongue short, but distinct, and spirally rolled. Abdomen slender and nearly cylindrical in the males, thicker in the females, and tufted at the end. Spurs of the hind tibiæ two in number, and very minute.

Genus XVI.—*Glaucoptis*.

Wings narrow in some, broad in others, entire, for the most part opaque, and with the body more or less glossed with blue, sometimes spotted or partially transparent. Antennæ feathered or bipectinated in both sexes, the pectinations elongated in the males, and short in the females. Palpi more or less elongated and recurved. Tongue moderate, spirally rolled. Caudal tuft minute or wanting in the greater number. Posterior tibiæ with three or four spurs of moderate size.

From this Synopsis it will be seen that the divisions and arrangement which I have adopted, differ somewhat from those of the entomologists of the present time. The affinities or resemblances of the *Lepidoptera*, in their different states, are so various, that it is impossible to preserve a natural connection between them in a linear series. After repeated trials, I have concluded still to adhere to the views of our great masters in Entomology, Linnæus and Fabricius, especially as modern entomologists are by no means agreed upon the limits of the larger divisions of the *Lepidoptera*, and the order of the genera.

ORDER LEPIDOPTERA. L.

SPHINGES. L.

Crepuscularia. Latr. *Clostrocères*. Duméril. *Hétérocères*.
Boisduval. (Part.)

Tribe I. SPHINGES LEGITIMÆ. L.

Family I. SPHINGIADÆ. II. *The Sphingians*.

§ *Alis angulatis*. L.

Genus I. SMERINTHUS. Latr.

* *Antennæ transversely biciliated beneath in the males*.

1. *S. excæcata*. Smith-Abbot.

Fawn-colored; fore-wings deeply scalloped and toothed on the outer edge, clouded and banded with brown; hind-wings rose-colored in the middle, with a large round eye-like black spot, having a pale blue centre, near the anal angle; fringes narrow, white; thorax with a central lance-shaped chestnut-colored spot, the point of which extends upon the head. Expands two and a half to three inches and a half. *Larva* granulated, apple-green, with two short pale lines before, seven oblique yellowish white lines on each side, and a bluish caudal horn. It feeds upon the leaves of the apple-tree, and upon those of *Rosa Carolina* also, according to Abbot, who (in his *Insects of Georgia*, p. 49, pl. 25,) has represented a variety of the larva of a yellow color, and greenish at the sides, which are obliquely banded with yellow, and have two longitudinal rows of rust-red spots upon them. It enters the earth to undergo its transformations. *Pupa* chestnut-brown, with a short obtuse anal spine.

2. *S. Astylus*. Drury. = *integerrima*. II. Catalogue Ins. Mass.*

Cinnamon-colored; fore-wings angulated but entire, tinged with rosy white at base, with whitish wavy bands near the tip, a bluish mark along the inner margin, and a tawny yellow spot on each outer angle; hind-wings tawny yellow at base, with a round black eye-like spot, having a pale blue centre, near the anal angle; middle of the thorax cinnamon-red, shoulder-covers paler

* Catalogue of the Insects of Massachusetts, by T. W. Harris; appended to Prof. Hitchcock's Report on the Geology, &c. of Massachusetts.

with a rosy white tinge, and a brown edge above; abdomen with a longitudinal dorsal brown line. Expands from two and a half to two inches and three quarters.

My specimens, a male and a female, were captured at Cambridge on the *Azalea viscosa*.

3. *S. Myops*. Smith-Abbot. = *Rosaccarum*. Boisd.

Chocolate-brown; fore-wings sinuated and angulated on the outer edge, varied with wavy whitish and brown bands, with a white Z at tip, and a tawny yellow spot on each of the outer angles; hind-wings with abbreviated whitish and brown bands upon the front edge, ochre-yellow next to the body, with a round black eye-spot having a pale blue centre near the anal angle; head and shoulder-covers glossed with bluish white; a rusty brown stripe in the middle of the thorax; abdomen with a few tawny yellow spots on each side. Expands from two inches and three lines to two inches and six lines. *Larva*, as figured by Abbot, (Ins. Georg. p. 51, pl. 26,) apple-green, the head margined with yellow, and two rows of rust-red spots with six oblique yellowish bands on each side of the body. Abbot says that it eats the leaves of the wild cherry-tree, and buries itself in the ground to undergo its transformations. *Pupa* deep brown.

M. Boisduval has named and figured but has not described this species, in the first volume of his *Species Général des Lépidoptères*, pl. 15, fig. 4; moreover the name given by him is subsequent to that of Sir J. E. Smith, which is an additional reason why it cannot be adopted.

* * *Antennæ pectinatus on both sides in the males.*

4. *S. geminata*. Say.

Rosy ash-gray; fore-wings angulated and with a sinuous outer margin, varied with transverse wavy rosy gray and brown lines, a brown spot and angulated band near the middle, and a deep brown semioval spot at tip; hind-wings rose-colored in the middle, with a large semioval black spot including two pale blue spots near the anal angle; thorax with a large central semioval brown spot. Expands from two and a quarter to more than two inches and a half.

I am indebted to the Rev. L. W. Leonard, of Dublin, N. H., for my specimens, both of which are males. The figure of *S. ocellatus Jamaicensis*, in Drury's Illustrations, Vol. II, pl. 25, fig. 2, 3, very nearly resembles the *geminata*, but it has only one blue pupil in the eye-spot of the hind-wings. Mr. Kirby's *S. Cerisii*,

(Faun. Bor. Amer. IV, p. 301, pl. 4, fig. 4,) is probably identical with Drury's species.

* * * *Antennæ*, in the males, with the joints distinct and doubly bipectinated.

5. *S. Juglandis*. Smith-Abbot.

Rosy gray, drab, or dusky brown; wings indented on the outer edges; fore-wings with a dusky outer margin, a short brownish dash near the middle, and four transverse brown lines converging behind and enclosing a square dark brown spot adjacent to the middle of the inner margin; hind wings with two narrow transverse brown lines between two brownish bands; thorax with a central brown line; abdominal segments plaited and prominent at the sides. Expands from two and a quarter to three inches. The females are much larger and of a lighter brownish gray color than the males, with the square spot on the fore-wings less distinct. *Larva* with the head small, and the body attenuated before and behind, pale blue-green, with a long caudal horn, and seven oblique white bands on each side. When disturbed it makes a creaking noise by rubbing together the joints of the fore-part of its body. It eats the leaves of the black walnut, and enters the earth to undergo its transformations. Mr. Abbot (Ins. Georg. p. 57, pl. 29) has figured a remarkable variety of the larva, which is of a crimson color, with the fore-part of the body and the oblique bands yellow. *Pupa* deep chestnut-brown, granulated, with six little tubercles on the head-case, a transverse row of acuminate granules on the hinder edges of the abdominal segments, the last three of which segments are flattened beneath and angularly dilated at the sides, with the tip broad, truncated, and externally bidentate.

The antennæ of the males of this species differ from those of the preceding in having the joints distinct to the naked eye, and each joint furnished with two teeth or short pectinations on each side. Mr. Doubleday presented me with specimens, from Florida, which differ from our northern specimens only in being of a darker color.

* * * * *Antennæ*, in the males, ———.

6. *S. modesta*. H.

Drab-colored; fore-wings scalloped, with a transverse dusky band before the middle; hind-wings purplish-red in the middle, deeper red next to the base, and with a blackish spot near the anal angle. Expands four inches and one quarter.

I have never seen but one specimen, which was much rubbed before it came into my possession. It is a female, with a very thick and robust body, and simple antennæ, and probably is the North American representative of *S. Tiliæ* and *Quercus*.

§ *Alis integris, ano simplici.* L.

Genus II. CERATOMIA. H.

I have been induced to propose a new genus for the reception of a single species, presenting characters, in the larva and winged state, which do not allow it to be included in the genus *Sphinx* as now received. The larva of this species, in the possession of horns on the fore-part of the body, exhibits a peculiarity which hitherto appears to have been unnoticed or undescribed among the Sphinges. The name of the genus, derived from *νεγαρα*, horns, and *επιτα*, the shoulder, alludes to this peculiarity. An analogous and still more imposing form is found in the larvæ of the *Phalaenæ*, belonging to the genus *Ceratocampa*.

C. quadricornis. H. June 24th 1842 collected.

Light brown; fore-wings with zigzag and wavy brown and whitish bands, dusky in the middle to the inner margin, the anterior edge whitish, and a large white dot near the middle; hind-wings with three dusky transverse bands, and a broad blackish hind-border; fringes dotted with white; head and a broad line on each side of the thorax to the shoulders white; shoulder-covers with three and abdomen with five longitudinal brown lines. Expands four and a half to nearly five inches. Larva pale blue-green, longitudinally wrinkled, with a pair of short denticulated horns on the second segment, a similar pair on the third, two parallel series of little teeth on the first four segments, a dorsal row of larger teeth extending to the tail, a long bluish caudal horn, and seven narrow oblique white lines on each side of the body. It feeds upon the leaves of *Ulmus Americana*, and transforms in the earth.

Genus III. SPHINX. L.

* *Tongue-case of the pupa detached from the breast.*

1. *S. cingulata.* F. = *Convolvuli.* Smith-Abbot.

Dark ash-gray, variegated with brown, body beneath white; middle of the hind-wings pink, with three or four black bands; fringes of the wings spotted with white; and five pink-colored spots separated by short transverse black lines on each side of

the abdomen. Expands about four inches. Larva, as represented by Abbot, (Ins. Geog. p. 63, pl. 32) dark brown, with a double chain-like rust-red dorsal line, a paler lateral line, a series of eight hook-shaped yellowish spots on each side enclosing the spiracles, and a short curved horn on the tail. Eats the leaves of the sweet potato (*Convolvulus batatas*), and enters the earth to undergo its transformation. Pupa with a long hooked tongue-case spirally recurved at its extremity. Inhabits the Middle and Southern States.

I am indebted to Dr. J. E. Holbrook, of Charleston, S. C., for a specimen.

2. *S. Carolina*. L. *same sub. coll. 20/44*

Ash-gray; fore-wings with blackish wavy lines; hind-wings whitish in the middle, with four black bands, the two central ones narrow and jagged; fringes spotted with white; five orange-colored spots encircled with black on each side of the abdomen; and the tongue excessively long. Expands about five inches. Larva apple-green, transversely wrinkled, with seven oblique white lines on each side, and a rust-colored caudal horn. Commonly known by the names of *potato-worm* and *tobacco-worm*, from the plants on which it is found; transforms deep in the earth. Pupa with a long tongue-case, curved near the head, straight and touching the breast only at the end, representing the handle of a vase.

3. *S. Drupiferarum*. Smith-Abbot.

Pale reddish-gray; fore-wings with a dark brown band extending from the inner margin to the tip, and crossed by slender black lines between the nervures;* hind-wings with two transverse blackish bands; thorax dark chestnut, with the sides and the head white; abdomen dark brown above, with a slender dorsal black line and about five whitish lateral spots margined with black. Expands three and a half to four inches. Larva, according to Abbot, (Ins. Geog. p. 71, pl. 36) apple-green, with seven oblique lateral bands, which are violet above and white below, a line on each side of the head and the caudal horn violet. Feeds on the leaves of the *Celtis* and plum, and is transformed in the earth. Pupa, like that of *S. Ligustri*, with a short tongue-case detached from the breast.

* The veins, or elevated and branching lines on the wings of insects, are called *nervures* by Mr. Kirby.

4. *S. Kalmia*. Smith-Abbot.

Rusty-buff; fore-wings streaked with light brown, and with a narrow whitish band near the outer margin; hind-wings with a narrow central and a broad marginal blackish band; fringes brown spotted with white; shoulder-covers white edged with brown; abdomen with a slender dorsal black line and short transverse bands alternately black and white at the sides; beneath dull reddish white. Expands three and a half to four and a quarter inches. *Larva*, according to Abbot, (*Ins. Georg.* p. 73, pl. 37) pale green, with seven oblique yellow bands, edged above with violet, on each side, the caudal horn and a line on each side of the head blue, and the hinder pair of legs yellow. Feeds on the leaves of *Kalmia latifolia*, and transforms in the earth. *Pupa* with a short detached tongue-case.

5. *S. Gordius*. Cramer.

Brownish ash-gray; fore-wings streaked with black between the nervures, with the anterior and inner margin dusky-brown, a white dot near the middle, and a large gray spot at base; fringe spotted with white; hind-wings with a narrow central and a broad marginal dusky brown band, and a white fringe; thorax deep chestnut, with the sides and the head above whitish; abdomen with a central black line, and the sides ash-white transversely banded with black. Expands three to three inches and a half. *Larva* apple-green, with seven oblique white lateral bands, slightly edged above with violet, a rust-red caudal horn, and a brownish line on each side of the head. It lives on the apple-tree, and enters the earth to be transformed. *Pupa* with a very short detached tongue-case.

6. *S. cinerea*. H.

Ash-gray; fore-wings long, narrow, and entire, with five short oblique lines between the nervures; hind-wings with two blackish bands; shoulder-covers slightly edged with black above; abdomen with a narrow dorsal black line, and short alternate bands of black and dirty white on the sides. Expands four and a half to five inches and a quarter.

The specimens from which this description is taken were raised many years ago from larvæ, which, at the time, I neglected to figure and describe. To the best of my recollection, these larvæ were found on the lilac, and, with the pupæ, corresponded very nearly in form, color, and size, to those of the European *S.*

Ligustri. The present species is remarkable for the length and sharpness of the wings, which are of a fine neutral gray tint, and for the prominence of the head and palpi.

* * *Tongue-case of the pupa not detached, but buried, and soldered to the breast.*

7. *S. sordida*. H. *Prinos sordida*

Dark gray; fore-wings variegated with dark brown, dashed with a few blackish lines, and with a whitish dot near the middle; hind-wings with a blackish basal spot, and two broad black bands; a dark brown line on each shoulder-cover; abdomen with a dorsal black line, and alternate black and light gray bands on the sides. Expands two inches and three quarters.

Although the larva and pupa of this species are unknown to me, I judge from analogy that it belongs to this division of the genus *Sphinx*.

8. *S. Hylæus*. Drury. = *Prini*. Smith-Abbot.

Rusty brown; fore-wings mottled with white, banded with jagged dark brown lines, with a white dot near the middle, and a spot of the same color at tip; hind-wings whitish with a narrow indented brown band across the middle, and a broad one on the outer margin; fringes spotted with white; a whitish line above the eyes extending on each side of the thorax; two longitudinal rows of white dots on the top of the abdomen, and a series of short narrow white bands on each side. Expands two and a quarter to two inches and three quarters. *Larva* pea-green, with six or seven oblique lateral whitish bands edged above with pink, a purple caudal horn, and a pale blue line on each side of the head. It feeds on the leaves of *Prinos glaber* and various species of *Vaccinium*, and enters the earth to be transformed.

This insect is much like the *Brontes* of Drury, which, however, is a much larger species, more distinctly banded with white, &c.

9. *S. Plebeja*. F.

Gray; fore-wings with a white dot near the middle, and five or six short oblique blackish lines between the nervures; hind-wings sooty black, dirty white at base; fringes white, spotted with dark brown; abdomen with three black lines, one dorsal, and two on each side, the latter enclosing a longitudinal series of dirty white spots. Expands three inches. Inhabits the Southern States.

The only specimen which I have seen was taken by Prof. Hentz in North Carolina, and now belongs to the Boston Society of Natural History.

10. *S. Coniferarum*. Smith-Abbot.

Gray; fore-wings with about three narrow and indented brownish bands, a spot near the middle, one or two streaks beyond the middle, and the nervures near the outer margin brown; hind-wings dusky or blackish gradually fading into gray towards the base; fringes spotted with brown and white; abdomen gray with brownish incisures. Expands one inch and three quarters to two inches and three quarters. *Larva*, as figured by Abbot, (Ins. Georg. p. 83, pl. 42,) chequered with brown and white spots, with a dorsal whitish line, and a short caudal horn. It eats the leaves of various kinds of pine, and enters the earth to transform. Mr. Leonard informs me that the tongue-case of the *Pupa* is short, and buried so as not to rise above the leg-cases.

For my specimen I am indebted to the Rev. L. W. Leonard, who raised it from a larva found on the pine in Burlington, Vt. In the cabinet of the Boston Society of Natural History there is a larger specimen, which was taken in North Carolina by Prof. Hentz; the bands on the wings in the latter are less distinct than in my specimen.

11. *S. Ello*. L.

Gray; fore-wings slightly indented on the outer margin, with a few irregularly scattered black dots, and a blackish stripe extending from the base to the tip; hind-wings rust-red, with a broad black hind-border; thorax with five longitudinal black lines, and abdomen on each side banded with black. In the female the blackish stripe on the fore-wings and the lines on the thorax are usually wanting or indistinct. Expands three and a quarter to four inches. Inhabits the Southern States, the West Indies, and South America.

In the cabinet of the Boston Society of Natural History there is a specimen of this tropical insect, which was captured by Prof. Hentz in the interior of North Carolina, where eventually the species may become common. According to Madam Merian (Insectes de Surinam, page and plate 61) the *larva*, in Surinam, lives on the leaves of a species of *Psidium* or Guava, is of an obscure brown color, with a black dorsal line, some small irregular white spots on the sides, and the head and caudal horn purple.

The tongue-case of the *pupa*, from the figure, seems to be short and soldered to the breast. From the shape of its body and wings, this insect must belong to a very distinct group in the Linnean genus *Sphinx*; but, without knowing more of the larva and its transformations, I do not feel authorized to separate it from the present genus.

Genus IV. PHILAMPELUS. H.

The insects belonging to this genus cannot with propriety be included in the genus *Chærocampa* of Duponchel, or *Metopsilus* of Duncan, to which they approach the nearest; and, therefore, I have considered it proper to institute a new genus for their reception. They, indeed, seem to form a characteristic and typical group, peculiar to the New World, being found only in the United States, Mexico, the West Indies, and the tropical parts of South America. The larvæ feed chiefly on the vine and the plants allied to it, which suggested the name of the genus, derived from *φιλω*, *I love*, and *ἀμπελος*, *a grape-vine*. In those species whose transformations have passed under my own observation, the larvæ when young were furnished with a long slender caudal horn, recurved over the back like the tail of a dog; when about half grown, the caudal horn is shed with the skin, and is replaced by a prominent, eye-like, polished spot. The oblique spots on the sides of these larvæ slope downwards and backwards; this is also the direction of the bands in the larvæ of *Pterogon*; but in those of all the other *Sphinges* the oblique lateral bands slope upwards and backwards. The *pupa* is elongated, attenuated at the fore-part, with a pretty long, robust, rough, anal horn, notched at the tip; the tongue-case is buried and soldered to the breast, and slightly longer than the wing-cases; and the fore-part of the abdominal rings is roughened with deep punctures. In the perfect state, the fore-wings are entire, acute, slightly emarginated below the tip in the males, and almost falcated, with a sinous inner margin, and well-marked hind-angle; the outer margin of the hind-wings is undulated or slightly crenated; the shoulder-covers are large; and the abdomen is short, thick, conical, and usually immaculate. Madame Merian in her *Insectes de Surinam*, plates 34 and 47, has represented the transformations of three species of this genus; and two are also figured by Mr. Abbot in the *Insects of Georgia*, plates 40 and 41.

1. *P. Vitis*. L.

Grayish flesh-colored; fore-wings, except the anterior and outer margins, dark olive, with a broad stripe from base to tip, crossed by another from the middle of the inner margin, a small hook-shaped spot near the middle, and the nervures behind, of a pale flesh-color; hind-wings pale green at base, with the inner and hinder margins rose-red, a black spot near the middle and a black transverse band behind; a longitudinal line on the head and thorax, the shoulder-covers, two broad stripes on the abdomen, and a round spot on each side of its base of a dark olive color. Expands about four inches. Larva, as represented by Abbot, (Ins. Georg. p. 79, pl. 40,) pale pea-green, longitudinally striped on the top of the back and transversely at the sides with brown, and with seven oval, oblique, cream-colored spots on each side. According to Linnæus and Mad. Merian, it lives on the grape-vine; but Mr. Abbot has represented it upon *Jussiaea erecta*. Inhabits the Southern States, South America, &c.

This insect fades very much by age, which changes the flesh-colored portions to a pale reddish buff or naukin color. My specimens were received from Dr. J. E. Holbrook, of Charleston, S. Carolina.*

2. *P. Satellitia*. L. = *Licaon*? Cramer.

Light olive, variegated with dark olive; fore-wings with an abbreviated band beyond the middle, an oblong patch on the basal half of the hind margin including a square darker spot, a semi-oval spot near the tip, and a triangular one near the hind angle, of a dark olive color, and two approximated brownish dots near the middle; hind-wings with a black spot near the middle of the inner margin, and a transverse blackish band behind, obsolete near the anal angle and ending there in a few small black spots;

* I have received from Dr. H. B. Hornbeck, King's physician, in the island of St. Thomas, W. I., a species which is closely allied to *P. Vitis*; and, as it is not described in any of my books, I am happy to describe it here under the name of

P. Hornbeckiana.

Above olive gray; fore-wings dark olive, with two silvery white stripes crossing each other in the middle of the wing, the longest stripe toothed near the base of the wing and obsolete thence to the middle, three of the nervures and a band on the outer margin whitish, and two approximated black dots near the middle; hind-wings on the inner margin pink, with a large square olive-colored spot, dusky behind with a black transverse band; an olive-colored line on the head and thorax; the shoulder-covers and first segment of the abdomen olive, bordered with white; upper part of the abdomen olive, with a central gray line; outer sides of the legs and antennæ white. Expands about four inches. Inhabits St. Thomas, W. I.

a slender line on the head and thorax, the shoulder-covers, and a transverse patch on the top of the first abdominal segment, dark olive. Expands from four to four inches and three quarters. *Larva*, when young, pea-green, with a slender recurved caudal horn, and of the same color or of a clear light brown and without a tail afterwards, with six oblique broad oval cream-colored spots on each side of the body; feeds on the leaves of indigenous and exotic grape-vines, and on those of *Ampelopsis hederacea*, and enters the earth to transform.

3. *P. Achemon*. Drury. = *Crantor*? F.

Red-ash colored; fore-wings with a few short transverse brown lines, and shaded with brown from the middle to the hind margin, with a square spot near the middle of the inner margin, another near the tip, and a triangular spot near the hind angle, of a deep brown color; hind-wings pink, with a deeper red spot near the inner margin, a dusky hind border, and a transverse row of small black spots; palpi and a large triangular spot on each shoulder-cover deep brown. Expands from three to four inches. *Larva* pea-green with a slender recurved tail when young, of the same color or light brown and without a tail subsequently, with six oblique oblong oval scalloped cream-colored spots on each side. It eats the leaves of grape-vines and of the common creeper or *Ampelopsis*.

This and the preceding species, in the larva state, are very injurious to our cultivated grape-vines.

GENUS V. *CHÆROCAMPA*. Duponchel.

Metopsilus. Duncan. *Deilephila*. (section.) Boisduval.

This genus was established, in 1835, by M. Duponchel,* to receive certain European Sphinges the larvæ of which have the head and fore-part of the body retractile, the head being very small, and the first three segments abruptly diminishing in size from the fourth, which gives to the fore-part of the body a resemblance to the head and snout of a hog. Hence the French name of these larvæ, *cochonnnes*, and the generic name proposed by Duponchel, which is derived from *χοίρος*, a hog, and *κάμπη*, a caterpillar. This peculiarity in the form of the larvæ seems to have suggested to Linnæus the names that he has given to two

* Godart and Duponchel. Lepidoptères de France. Supplément. Tome II, p. 159. (1835.)

of the species, to wit, *porcellus*, the pig, and *Elpenor*, the name of one of the companions of Ulysses, who was changed to a hog by Circe. In the year 1836, Mr. Duncan,* probably not aware of the previous establishment of this genus, pointed out its characters under the name of *Metopsilus*, derived from *μετροσιλος*, the front, and *ψιλος*, slender, in allusion to the form of this part of the larva. These naturalists, in separating this new group from the genus *Sphinx*, or rather from *Deilephila*, seem to have had only European insects under consideration; but in America there are several species, which, so far as similarity of form and habits, in all their states, indicates a natural affinity, ought certainly to be included in the same generical group, from which, however, they will be excluded unless the characters of the genus are somewhat modified to receive them. Believing the genus to be a good one, and susceptible of modification, I have changed the characters of it in the synopsis prefixed to this catalogue, so as to admit our American species. In *C. Pampinatrix*, *Chærilus*, and *versicolor*, the antennæ are rather short and slender, arcuated, and end in a very long slender hook; the fore-wings have the outer and inner margins sinuous, so as to exhibit prominent outer and hinder angles; the hind-wings have a sinuous hind-margin, and a prominent angle near the tail; and the abdomen is rather short, and conical at tip. The *larvæ* of the first two of these species have the eleventh segment conically prolonged above, forming a base for a very short slightly curved caudal horn, and the sides of the body are marked with oblique bands sloping upwards and backwards. They transform above ground, under fallen leaves, or slightly covered with grains of earth, connected by a few threads, so as to form a loose imperfect cocoon. The pupa is short, thick, obtusely rounded before, with the tongue-case imbedded, indistinct, and nearly as long as the wing-cases; the tail is rather blunt, and ends in a long, slender point, which, under a magnifier, is found to be rough, and notched at the tip.

1. *C. Pampinatrix*. Smith-Abbot.

Light olive-gray above, shaded with olive; fore-wings with a dot near the middle, a transverse band near the base, a broader band beyond the middle and a large triangular spot adjacent to each acute angle and almost forming a third band, of an olive color; hind-wings rust-colored, dusky behind, and gray next the

* Jardine's Naturalist's Library. Entomology. Vol. iv, p. 154. (1836.)

anal angle; head and shoulder-covers dark olive; and a white line on each side of the thorax at the origin of the wings. Expands two and a half to two inches and three quarters. *Larva* pale green, with a longitudinal series of six triangular orange-colored spots on the top of the back and a darker green lateral line; sides below this paler, almost white, sprinkled with rusty dots, and with six oblique green bands; caudal horn short, bluish green. It varies in being of a clear light brown color, with the back bounded on each side by a darker longitudinal line, meeting at the origin of the caudal horn, the sides tinged with pink, and obliquely banded with brown. Feeds on the leaves of the grape-vine. *Pupa* clay-colored, sprinkled and punctured with black, and with the incisures of the abdomen black.

Mr. Abbot, on plate 28 of his *Insects of Georgia*, has represented this larva with the caudal horn too long and too much curved, and the eleventh segment not so much produced behind as it ought to be. This species, in the winged state, comes very near to Cramer's *Sphinx Myron*, which, from the figure, seems to want the spot in the middle of the fore-wings, and, according to Cramer, has a very short tongue, a character that does not apply to the *Pampinatrix*. The larva, above described, is one of the most injurious to our cultivated grape-vines; for, not satisfied with devouring the leaves, it nips off the fruit-stalks when the grapes are not more than half grown. I have gathered under a single grape-vine above a quart of unripe grapes which had been detached thus during one night by these larvæ.

2. *C. Chærilus*. Cramer. = *Azaleæ*. Smith-Abbot.

Rust-colored; fore-wings rusty gray tinged with blue, with a dot near the middle, a few spots between it and the base, and a very broad band beyond the middle, rust-colored; hind-wings rust-colored, dusky near the anal angle, with a whitish fringe; a spot at the sides and a slender line on the top of the thorax, the edges of the shoulder-covers and of the abdominal segments white. In the male the broad band of the fore-wings is marked by a pale and a dark zigzag line so as nearly to divide it into two bands. Expands two and a half to three inches. *Larva*, as represented by Abbot, (*Ins. Georg.* p. 53, pl. 27,) varying in color, being either pale green, with a narrow dusky dorsal line, a greenish line on each side, a blue-green caudal horn, and the sides obliquely banded with green; or clear pale red, with the lines and bands brownish, and the horn chestnut-colored. Mr. Abbot

says that it lives on *Azalea nudiflora*, and that it spins itself up in a thin web on the leaves. *Pupa* like that of *C. Pampinatrix*.

3. *C. versicolor*. H.

Light olive, variegated with olive-green and white; fore-wings with narrow curved bands of white and olive-green, and a zigzag white line at tip; hind-wings rust-colored, with the inner and hind margin olive-green; tips of the palpi, a line on each side of the head above the eyes, a longitudinal dorsal line from the front to the tail, and the edges of the collar and of the shoulder-covers, white; two spots on the metathorax and the abdominal segments on each side of the dorsal line tinged with dark buff. Expands about three inches.

Although the larva and pupa of this species are unknown to me, I have ventured to place it in the genus *Charocampa*. The palpi are rather thicker towards the tip than those of the two preceding species; the fore-wings are not quite so much emarginated, and consequently, their angles are not quite so prominent. The under-side is quite as prettily variegated as the upper-side; that of the fore-wings being pale olive, tinged with deep buff near the hind-angle, with rust-red in the middle, and mottled and streaked with olive-green and white; that of the hind-wings olive-green, banded with white, dark olive, and buff. My specimen was taken sitting upon the leaves of *Azalea viscosa*; it was quite fresh, and seemed to have been recently transformed.

Dr. Hornbeck has presented to me a species, from St. Thomas, resembling the *versicolor* very nearly in color and form; but the palpi are more prominent, the antennæ are not so much arcuated, and the terminal hook is much shorter. It evidently leads to the genus *Deilephila*.

4. *C. tersa*. L.

Grayish olive above; fore-wings streaked from base to tip with numerous narrow dusky and pale lines, and with a minute black dot near the middle; hind-wings black, paler round the edges, with the anal angle and the fringe cream-colored, and a transverse row of small wedge-shaped cream-colored spots near the hind-margin; a reddish white line on the sides of the head and thorax; shoulder-covers slightly edged above with rust-red; sides of the abdomen, and the body and wings beneath, rusty buff, streaked and sprinkled with dusky olive-gray. Expands two and three quarters to three inches. *Larva*, according to Abbot, (Ins. Georg. p. 75, pl. 38,) pea-green or brown, with seven white eye-

like spots having a red centre and a black margin and connected by a longitudinal white line, on each side of the body, and a red caudal horn. It lives on *Spermacoce Hyssopifolia*, and, like the other species, is transformed in an imperfect cocoon which it spins above ground. *Pupa* clay-colored, freckled with dusky spots. It inhabits the Southern States, the West Indies, and South America.

I am indebted to Dr. J. E. Holbrook of Charleston, S. C., and to Dr. H. B. Hornbeck, of St. Thomas, W. I., for specimens. The antennæ are straight, with a shorter terminal hook than in the three preceding species; the outer margin of the fore-wings is not so sinuous, and the abdomen is much more elongated, slender and pointed. It may be necessary, hereafter, to institute a new genus for the reception of this and several other closely allied West-Indian and South-American species.

GENUS VI. DEILEPHILA. Ochsenheimer.

1. *D. lineata*. F. = *Daucus*. Cramer.

Olive-brown; fore-wings with a pale buff-colored stripe from the base of the inner margin to the tip, crossed by six white lines on the nervures, the outer margin ash-gray, the fringe and edge of the inner margin white; hind-wings rose-pink, with a white spot near the inner margin, a black band at base, another near the hind-margin, and the fringe, white; a white line on each side of the head above the eyes, and six lines, of the same color, placed in pairs, on the thorax; two rows of small black spots and a slender dorsal white line on the top of the abdomen, the sides reddish, with a short transverse black band on each side of the first abdominal segment, and a white band behind it, followed by a lateral series of alternately black and white spots. Expands from three to four inches. *Larva* pea-green, with a longitudinal series of nine or ten orange-colored oval spots encircled with black, on each side, and an orange-colored caudal horn. Feeds upon the leaves of the purslane and turnip, and of various other humble plants, and buries itself in the ground to undergo its transformations. *Pupa* light brown.

Contrary to what is usual among our Sphingæ, there are two broods of this species in the course of one summer. This is the true *Sphinx lineata* of Fabricius, described by him as an American insect in his "Systema Entomologia." His description of the thorax, "*striis tribus albis duplicatis*," applies exactly to our insect, and not to the *Livornica* of Europe, with which it is often

confounded, and which has only four white lines instead of six, on the thorax. The larva of the latter, moreover, differs from that of our *lineata*. Dr. Hornbeck has sent to me from St. Thomas, W. I., specimens which vary a little, but are not specifically distinct from the *lineata* of the United States.

2. *D. Chamænerii*. H. = *Epilobii*. H. (Catalogue.)

Olive-brown; fore-wings with a sinuous buff-colored stripe, indented before, beginning near the base of the inner margin and extending to the tip, and a dark olive-brown tapering stripe behind it, a black spot at base, a white dash and a diamond-shaped blackish spot before the middle; hind-wings dark brown, with a transverse rose-colored band, including a white spot near the body and a deep red one before the anal angle; inner edge of the fore-wings and fringe of the hind-wings whitish; palpi white below; a white line above each eye extending on the sides of the thorax, where it is bounded above by a black line; abdomen with a dorsal series of white dots, two black and two alternating white bands on each side of the base, and two narrow transverse white lateral lines near the tip; segments beneath edged with white. Expands from two and three quarters to three inches. Larva green, somewhat bronzed, dull red beneath; with nine round cream-colored spots, encircled with black, on each side, and a dull red caudal horn. It lives on the *Epilobium angustifolium*, and (as Mr. Leonard informs me) transforms in the ground, without making a cocoon. Inhabits New Hampshire.

The larva very closely resembles that of *D. Galii*, as figured by Roesel, III, Tab. VI, Fig. 1, 2. For a specimen of it, and for the insects in the winged state, I am indebted to Mr. Leonard, by whom they were raised. This species is the American representative of *D. Galii*, and is also allied to several other European species, such as *D. Epilobii*, *Esulæ*, *Amelia*, *Tithymali*, *Dahlii*, *Euphorbiæ*, &c.; but I am satisfied that it is perfectly distinct from all of them; and the long description which I have given of it will render it easy to discover in what respects it differs from them. Moreover it is a legitimate species, which is more than can be said of all of the above-named European insects, some of which are now admitted to be hybrids. Mr. Kirby (Fauna Boreali-Americana, IV, p. 302,) describes a North American species, under the name of *D. intermedia*, which, according to him, has the stripe on the fore-wings of a pale rose color, and wants the

dorsal series of white dots on the abdomen; in other respects it seems nearly allied to the *Chamænerii*. When my Catalogues of the Insects of Massachusetts were published I was not aware that the specific name *Epilobii* had been previously appropriated; for the species to which I then applied it I have now substituted that of *Chamænerii* derived from Tournefort's name for the genus *Epilobium*.

§ *Legitimæ* — *ano barbato*. L.

Family II. MACROGLOSSIADÆ. II. *The Macroglossians.*

Sesiidæ. Stephens. *Sesiadæ*. Kirby.

* *Wings angulated and indented; antennæ tapering at the end, with a long terminal hook.*

Genus VII. PTEROGON. Boisduval.

P? inscriptum. H.

Ash-gray; wings angularly indented; first pair with two dusky bands near the base, connected on the inner margin by a blackish line, a few undulated and zigzag transverse lines beyond the middle, a dusky outer margin, a half-oval brown spot at tip, and a small deep brown patch including a white I near the tip; hind-wings reddish gray, with a dusky hind-margin; collar edged with brown; abdomen with two dorsal series of black dots. Expands two inches. Inhabits Indiana.

Of this species I have seen only two individuals, both females, having rather long slender and simple antennæ, attenuated and curved so as to form a hook at the end. In the shape of the wings and distribution of the colors this insect nearly resembles some species of *Smerinthus*, from which genus it is excluded by the length of the tongue, which nearly equals that of the body. *Pterogon Gauræ*, which I suppose to be the only legitimate species of the genus that has yet been discovered in the United States, is known to me only by Mr. Abbot's figure.

Genus VIII. THYREUS. Swainson.

1. *T. lugubris*. L.

Brown; wings sinuated and slightly angulated on the outer edge; first pair with an oblique streak and an eye-like dot before

the middle, and a large triangular brown patch near the tip; hind-wings with two or three obscure transverse brown lines; male with a triple-tufted tail. Expands two and a half to three inches. Inhabits the Southern States. *Larva* pale green, with three darker longitudinal dorsal lines, nine oblique yellowish bands on each side, and a long, slender, nearly straight caudal horn. Mr. Abbot, from whose figure (*Ins. Geog.* p. 59, pl. 30) this description of the larva is taken, says that it feeds on Virginian creeper, *Ampelopsis Hederacea*, and that it enters the earth to transform. The *pupa* is elongated, chestnut-brown, with a short anal point.

My specimen of this insect was presented to me by Dr. J. E. Holbrook. It is closely allied to several South American species, figured by Cramer, such as his *Fegeus*, *Gorgon*, &c.; and, indeed, the *Fegeus* may prove to be identical with it.

M. Boisduval (*Icones Hist. des Lépidoptères d'Europe nouveaux*, Vol. II, p. 15) refers the *Gorgon* of Cramer [?] to his genus *Pterogon*; but, in my opinion, the genus *Thyreus* of Swainson, besides having the priority in point of time, is entitled to rank as a distinct genus. Is the European *Gorgon* of Esper, Hübner, and Ochsenheimer, quoted in Mr. Children's Abstract of the Characters of Ochsenheimer's Genera (*Philos. Mag. N. S.* Vol. V, p. 37), the same as the Surinam species named *Gorgon* by Cramer? And if not, is M. Boisduval's citation of Cramer's name correct?

2. *T. Abbotii*. = *Abbottii*. Swainson.

Chocolate-brown; wings very much indented on the outer edge; first pair with wavy and oblique blackish brown streaks, and a black dot near the middle; hind-wings yellow, with a broad blackish brown hind-border; edge of the collar and a transverse stripe across the thorax black; abdomen banded with black at base, tufted at the sides of the hinder segments, and terminated by a triple-tufted rust-colored tail. Expands from two and one third to nearly three inches. *Larva*, as figured by Abbot, (*Swainson's Zoological Illustrations*, Part I, pl. 60) pea-green, with narrow dorsal brown lines, nine lateral oblique yellowish bands broadly bordered above with brown, and a long slender slightly curved caudal horn. It feeds on the grape-vine. *Pupa* chestnut-brown, with two yellowish abdominal incisures.

This species is not uncommon in the Southern States, and I have one specimen which was taken in Cambridge, Mass.

3. *T? Nessus*. Cramer.

Dark brown; fore-wings with a sinuous and angular outer edge, a blackish brown band across the middle, another near the outer margin, and a small rust-red spot near the tip; hind-wings rust-red, with a dark brown hind-border; abdomen with two pale yellow bands behind the middle, four rust-red spots on each side, and a triple-tufted tail. Expands from two to two inches and a quarter.

Of this species I have seen only females, in which the antennæ are similar to those of the same sex in *T. Abbotii*. The palpi, however, are more acuminate, and approach in form to those of *Sesia Pelasgus*, &c. It ought, perhaps, to be included in a new genus, which, without a knowledge of the larva and pupa, I shall not venture to propose.

* * *Wings entire; antennæ thickened towards the end, with a minute terminal hook.*

Genus IX. *SESIA*. F. (Syst. Gloss.)

1. *S. Pelasgus*. Cramer.

Wings transparent and iridescent, with a broad purple-brown border and nervures; antennæ and palpi, above, blue-black; head and thorax olive; breast and legs cream-white; abdomen purple-brown below, ochre-yellow above, with the two middle segments and a spot behind them purple-brown, and three lateral white spots; tip with a central fan-shaped brown tail, and two black tufts on each side of it. Expands from two to two inches and one quarter.

2. *P. diffinis*. Boisduval. = *fuciformis*. Smith-Abbot.

Wings transparent and iridescent, with a narrow blackish border and nervures, and a rust-red spot at tip; antennæ and palpi black above; thorax and breast covered with pale yellow hairs; abdomen black above, with two longitudinal patches of yellow hairs, the two middle segments black, the next two covered with yellow hairs, and the tip with a fan-shaped tail, which is yellow in the middle and tufted with black on each side. Expands from one inch and three quarters to two inches. *Larva*, according to Abbot, (Ins. Georg. p. 85, pl. 43.) pale pea-green, reddish beneath, with a longitudinal dorsal line, a lateral pale yellow stripe, and a

short recurved caudal horn. In Georgia, it feeds upon the *Tabernæmontana Amsonia*, and forms an imperfect cocoon on the surface of the ground. *Pupa* brown with the abdominal incisures ochre-yellow.

My specimens were presented to me by Mr. Leonard, who captured them in New Hampshire, where the *Tabernæmontana* does not grow. The larva must, therefore, be sought upon some other plant; perhaps it may be found upon the *Apocynum*. M. Boisduval has named and given a figure of this species in his *Hist. Nat. des Insectes Lépidoptères*, Vol. I, pl. 15, fig. 2; and, as it is evidently distinct from the European *fusciformis*, I have retained the name proposed by M. Boisduval, although he has not established a claim to it by any description of the insect. Mr. Kirby's *S. ruficaudis* (Faun. Bor. Amer. IV, p. 303,) is evidently different from this species, and comes nearer to the *Pelagus*, to which, however, the description does not very well apply, in many respects.

Family III. ÆGERIADÆ. II. *The Ægerians.*

Genus X. TROCHILIUM. (Scop.) Stephens.

Sesia. F. (Entom. Syst.) Latr. Boisd. *Ægeria*. F. (Syst. Glossat.)

1. *T. marginatum*. H.

Black; wings transparent; first pair with a broad border, the tip, and a transverse band beyond the middle pale brown; hindwings with a broad black fringe; antennæ black; two longitudinal lines on the thorax, hind margins of the abdominal segments, orbits, palpi, and legs, except at base, yellow. Expands rather more than one inch and a quarter.

This insect was taken in New-Hampshire, and presented to me by the Rev. L. W. Leonard.

2. *T. tibiale*. H.

Brownish; wings transparent; first pair with a narrow border and an abbreviated band beyond the middle pale brown; hindwings with a narrow brownish fringe; antennæ black; orbits, two lines on the thorax, edges of the abdominal segments, and tibiæ yellow; hindmost tibiæ thickly covered with yellow hairs. Expands one inch and a half. The yellow bands on the abdomen are much narrower and less bright than in the *marginatum*.

Found in New-Hampshire on the *Populus candicans*, and presented to me by Mr. Leonard.

3. *T. denudatum*.

Chestnut-brown; fore-wings opaque, with a large triangular transparent spot adjacent to the outer hind-angle, a rust-red spot at base and another near the middle; hind-wings transparent, with the margin and fringe brown, and a rust-red costal spot; orbits, edges of the collar, incisures of the abdomen, tibiæ, and tarsi dull yellow; antennæ brownish above, rust-yellow at tip and beneath. Expands from one inch and a quarter to more than one inch and a half. The transparent spots at the tips of the fore-wings have the appearance of being caused by the removal of the colored scales.

The specimens, from which the descriptions of these three species are drawn up, had become somewhat oily, and it is possible that some of their characteristic markings may have become obliterated.

GENUS XI. *ÆGERIA*. F. (Syst. Glossat.)

Sesia. F. (Entom. Syst.) Latr. Boisd. *Trochilium*. Scopoli.

1. *Æ. tricineta*. H. (Catalogue.)

Blue-black; fore-wings opaque; hind-wings transparent, with the border, fringe, and a short transverse line near the middle black; palpi at tip, collar, a spot on each shoulder, and three bands on the abdomen yellow; antennæ short, black; four posterior tibiæ banded with orange; tarsi yellow, tipped with black; tail flat, with two longitudinal yellow lines. Expands from one inch to one inch and two lines.

This species seems to come near to the European *Asiliformis*; but the male has only three yellow abdominal bands; while in the *Asiliformis* there are five bands in the male sex. The antennæ are shorter and thicker than in the following species, and are furnished beneath with a double row of short pectinations or teeth, which are thickly fringed with hairs. The sexes were captured together upon the common tansy.

2. *Æ. Cucurbitæ*. H. (New-England Farmer.)

Fore-wings opaque, lustrous olive-brown; hind-wings transparent, with the margin and fringe brown; antennæ greenish black; palpi pale yellow, with a little black tuft near the tip; thorax olive; abdomen deep orange, with a transverse basal black band, and a longitudinal row of five or six black spots; tibiæ and tarsi of the hind-legs thickly fringed on the inside with black, and on

the outside with long orange-colored hairs; spurs covered with white hairs. Expands from thirteen to fifteen lines. *Larva*, similar in form and color to those of other species of the genus, lives in the pith of squash and pumpkin vines, which it leaves at the root, and forms in the ground a cocoon composed of grains of earth cemented by a gummy matter. *Pupa*, by the aid of the abdominal denticulations, almost entirely excluded from the cocoon during the last transformation.

The sudden death of the squash-vines, during midsummer, is occasioned by the ravages of the larva of this insect. For further particulars relating to it, a communication, by the author, in the New-England Farmer, Vol. VIII, p. 33, for 1828, may be consulted. This species seems to be closely allied to, but sufficiently distinct from the *tibialis* of Drury, and the *Bombiliformis* of Cramer.

3. *Æ. caudata*. H. = *fulvicornis*. H.* (Catalogue.)

Brown; *male* with the fore-wings transparent from the base to the middle; hind-wings transparent, with a brownish border, fringe, and subcostal spot; antennæ, palpi, collar, and tarsi tawny yellow; hind-legs yellow, end of the tibiæ and first tarsal joint fringed with tawny yellow and black hairs; tail slender, cylindrical, nearly as long as the body, tawny yellow, with a little black tuft on each side at base. The *female* differs from the male in having the fore-wings entirely opaque; the hind-legs black, with a rusty spot in the middle of the tibiæ, and fringed with black; caudal tuft of the ordinary form and size. Expands from one inch to one inch and three lines. *Larva* inhabits the stems of our indigenous currant, *Ribes Floridum*.

The *Zygæna caudata*, of Fabricius, has a somewhat similar tail, but does not belong to the genus *Ægeria*.

4. *Æ. Syringæ*. H.

Brown; fore-wings with a transparent line at base; hind-wings transparent, with a brown border, fringe, and subcostal spot; antennæ, palpi, collar, first and second pairs of tarsi, and middle of the intermediate tibiæ rust-red; middle of the tibiæ and the tarsi of the hind-legs yellow. Expands one inch and two lines. *Larva* lives in the trunks of *Syringa vulgaris*, the common lilac.

* Credited to Mr. Say, in the Catalogue of the Insects of Massachusetts, by mistake.

5. *Æ. exitiosa*. Say.

Steel-blue; *male* with the wings transparent, the margins and fringes, and a band beyond the middle of the first pair steel-blue; palpi, collar, edges of the shoulder-covers and of the abdominal segments, two bands on the tibiæ including the spurs, anterior tarsi, and lateral edges of the wedge-shaped tail pale yellow; *female* with the fore-wings opaque; the hind-wings transparent, with a broad opaque front-margin and the fringe purple-black; antennæ, palpi, legs, and abdomen steel-blue, the latter encircled in the middle by a broad saffron-colored band. Male expands from nine to thirteen lines; female from fifteen to seventeen lines. *Larva* inhabits the trunks and roots of the peach and cherry trees, beneath the bark.

The larva is the well-known peach-tree borer, which annually injures to a great extent or destroys numbers of these trees. For the means of preventing its ravages, see Say's Entomology, Vol. II, and my communication in the New England Farmer, Vol. V, p. 33. The insects above described, though very dissimilar, are really the sexes of one species. I have raised many of them from the larvæ, and have also repeatedly captured them, in connection, on the trunks of peach and cherry trees.

6. *Æ. fulvipes*. H. (Catalogue.)

Blue-black; wings transparent, margin and fringes, and a transverse band beyond the middle of the first pair blue-black; antennæ black, yellowish at the end; palpi beneath, a spot on the thorax under the origin of the wings, intermediate and hindmost tibiæ, all the tarsi, and the basal half of the underside of the abdomen orange-colored; hindmost tibiæ somewhat thickened by a covering of tawny hairs. Expands thirteen lines.

7. *Æ. Tipuliformis*. L.

Blue-black; wings transparent, with the margin and fringes blackish; the first pair with a transverse blue-black band beyond the middle, and a broad one at tip streaked with copper-color; antennæ black; palpi beneath, collar, upper edges of the shoulder-covers, a spot on each side of the breast, three narrow rings on the abdomen, ends of the tibiæ and the spurs pale golden yellow; tail fan-shaped, blue-black. The male has an additional transverse yellow line between the second and third abdominal bands. Expands from seven and a half to nine inches. *Larva* lives in the pith of the currant-bush.

This destructive insect is not a native, but has been introduced from Europe with the cultivated currant-bush.

8. *Æ. scitula*. H.

Purple-black; wings transparent, with the margins golden yellow; the first pair with a narrow purple-brown band beyond the middle and a broad one at the tip ornamented with golden yellow lines; fringes blackish; front and orbits covered with silvery white hairs; antennæ black; palpi, collar, upper edges of the shoulder-covers, a narrow band at the base of the abdomen, a dorsal spot behind it, a broad band around the middle, the lateral edges of the fan-shaped tail, anterior coxæ, sides of the breast, tibiæ and tarsi except at the joints, with the spurs golden yellow. Expands about eight lines.

This beautiful little species is easily distinguished by the prevalence of yellow on the under-side of the body and legs.

9. *Æ. Pyri*. H. (New-England Farmer.)

Purple-black; wings transparent, with the margins, a narrow band beyond the middle of the first pair, and a broad one at tip purple-black, the latter streaked with brassy yellow; antennæ blackish; palpi beneath, collar, edges of the shoulder-covers, a broad band across the middle of the abdomen, a narrow one before it, an indistinct transverse line at base, the posterior half of the abdomen beneath, the sides of the breast, anterior coxæ, legs except the joints of the tibiæ, and the lateral edges of the wedge-shaped tail golden yellow. Expands six lines and a half. *Larva* lives under the bark of the pear-tree.

For some further particulars respecting this species, see my communication in the New-England Farmer, Vol. IX. p. 2, 1830.

Mr. Edward Doubleday presented me with a new species of *Ægeria* which he captured in Florida, and Dr. J. W. Randall has still another which was taken in Massachusetts. To these gentlemen belongs the right of first naming and describing these species which they have discovered, and I do not feel myself authorized to anticipate them.

Genus XII. ΤΗΥΡΙΣ. Illiger.

T. maculata. H. (Catalogue.)

Brownish black, sprinkled with rust-yellow dots; hind-margins of the wings deeply scalloped, with the edges of the indentations white; each of the wings with a transparent white spot,

which in the fore-wings is nearly oval and slightly narrowed in the middle, in the hind-wings larger, kidney-shaped and almost divided in two; palpi beneath, a spot before the anterior coxæ, the tips of the tarsal joints above, and the hind-edges of the last three or four abdominal segments white. Expands from six to eight lines.

This species comes very near to the *fenestrata* of Europe, but is sufficiently distinct from it.

Mr. Doubleday has presented to me a much larger species of *Thyris*, which was captured by him in Florida, and was new to my collection. There is a figure of it in M. Boisduval's Hist. Nat. Ins. Lépidopt. Vol. I, pl. 14, where it is named *T. lugubris*. This name has not yet received the proper sanction of a description; but, taking into consideration the circumstances under which this nondescript came into my possession, I do not think proper to describe it myself at this time.

Tribe II. SPHINGES ADSCITÆ. L.

Family IV. AGARISTIADÆ. H. *The Agaristians.*

Hesperis-Sphinges. Latr. *Agaristides.* Bois. *Zyganida.* Kirby.

Genus XIII. ALYPIA. (Hübner.) Kirby.

Zygena and *Sesia.* F. *Agarista.* Latr.

A. octomaculata. F.

Black; with two sulphur-yellow spots on the fore-wings, and two white ones on the hind-wings; shoulder-covers and front sulphur-yellow; first and second pairs of tibiæ thickly covered with orange-colored hairs. Expands from eleven to fifteen lines. *Larva*, as represented by Abbot, (Ins. Georg. p. 8, pl. 44,) cylindrical, elongated; yellow, with transverse rows of black points, slightly hairy, and without a caudal horn. It lives on the grape-vine, and encloses itself in a cocoon in the earth.

In some individuals there is a white spot near the end of the abdomen, and the inner white spots of the hind-wings are enlarged and cover the whole base of the wings. Mr. Kirby (Fauna Bor. Amer. IV, p. 301, pl. 4, fig. 5,) has described another species of *Alypia*, a native of Nova Scotia and Canada, and names it *A. MacCullochii*.

Family V. ZYGÆNIADÆ. H. *The Zygænians.**Zyganidæ.* Stephens. *Zygénides.* Boisd.

Hitherto I have not met with any insects in the United States belonging to this family; but Dr. Hornbeck has sent to me, from St. Thomas, a species which not only seems to be undescribed, but must constitute a new genus, the characters of which are given in the Synopsis, and those of the species in the note below.*

Family VI. GLAUCOPIDIDÆ. H. *The Glaucopidians.*

Procrides and *Zygénides.* Boisd. *Zygæniadæ.* H. Cat. *Ctenuchidæ.* Kirby. *Callimorphæ.* Westwood.

Genus XV. PROCRIS. F.

Ino. Leach.

P. Americana. = *Aglaope Americana?* Boisd. = *dispar.*
H. (Cat.)

Blue-black; with a saffron-colored collar, and a fan-shaped, somewhat bilobed, black caudal tuft. Expands from ten lines to one inch. *Larva*, according to Prof. Hentz, hairy, green, with black bands. It is gregarious, and devours the leaves of the grape-vine, and undergoes its transformations in an oblong-oval, tough, whitish cocoon, which is fastened to a leaf.

* Genus XIV. MASTIGOCERA. H.

From *μάστιξ*, a whip or thong, and *κέρα*, horns; the antennæ being thickened in the middle and tapering at each end like a whip lash. In the West Indian insect to which I have applied this name, the antennæ agree, in the main, with those of *Megocera*, as described by Latreille and other authors; but most of its other characters disagree, and it has an entirely different form from that of the type of the genus. These characters are so very striking, that I have ventured to propose this new genus, although the transformations of the species are unknown to me.

M. vespina. H.

Light rust-brown; wings immaculate; collar, first abdominal segments above, third below, and a triangular spot on each side, white; head, thickened part of the antennæ, edge of the thorax behind the collar, and a large triangular spot on each side of the second abdominal segment, black; breast black, spotted with white; first and second pairs of thighs, except at base, middle of the hind-pair, and extremity of the tibiæ, black. Expands from one and a half to one inch and three quarters. Inhabits the island of St. Thomas, W. I.

The *Zygnæa Eunolphus* of Fabricius, and the *Pretus* of Cramer are probably congenerical and closely allied to this species.

This insect appears to be the same as the one figured in Guérin's *Iconographie* and in Griffith's *Cuvier*, under the name of *Aglaope Americana*, Boisduval; but it is not an *Aglaope*, for it has a distinct, spirally-rolled tongue.

GENUS XVI. GLAUCOPIS. F.

The insects which, at present, I refer to this genus, belong to *Zygæna* of the *Entomologia Systematica* of Fabricius; whose *Z. Glaucopis*, if it was not actually the type, furnished the generic name which this author gave, in his last work, the *Systema Glossatorum*, to this group of his former *Zygæna*. Several of the insects, which Mr. Westwood, in his edition of Drury's *Illustrations*, refers to the genus *Callimorpha*, without doubt belong to the family *Glaucopididæ*. Mr. Kirby has placed one species, after *Lithosia*, in a family which he names *Ctenuchidæ*. These insects seem to me much more nearly allied to the *Sphinges adscitæ* than to the *Phalænæ* of Linnæus, with which also they agree in their diurnal flight, and in their transformations, so far as the latter are known. Although they do not appear to be strictly congeneric, I prefer to arrange them, for the present, under the genus *Glaucopis*, in groups or subgenera, which, when the larvæ and their transformations are better known, it may be proper to raise to the rank of independent genera.

Subgenus *Syntomeida*. II.

Antennæ bipectinated, tapering at each end. Tongue moderate, spirally rolled. Palpi short, not extending beyond the clypeus, slightly curved and hairy at base, covered with short close scales; terminal joint somewhat acuminate. Wings elongated, hind-pair small, with the discoidal cell closed behind by an acute-angled nervure, the anterior branch of which crosses the subcostal nervure and ends near the tip of the wing. Body cylindrical, rounded and not tufted behind, and with a rounded tubercle on each side of the first abdominal segment. Spurs of the posterior tibiæ four, small, and approximated.

1. *G. (S.) Ipomœa*. = *Sesia Ipomœa*. Oemler, in letters.

Fore-wings greenish black, with three yellowish white dots near the front margin and two others close together beyond the middle; hind-wings violet-black, with a transparent colorless spot at base; body tawny orange; antennæ and head black, the latter spotted with orange; a broad stripe on the shoulder-covers, a transverse spot on the thorax behind, and the incisures of the abdomen, black; legs violet-black; coxæ beneath, and a spot on the thighs, orange-colored. Expands one inch and three quarters.

I received this species from Dr. A. G. Æmler, of Savannah, Georgia, and have adopted the specific name that he gave to it, and from which it is to be presumed that the larva lives upon the *Ipomœa*. The *Melanthus* and *Nycteus* of Cramer resemble it somewhat, and are probably congeneric with it.

Subgenus *Cosmosoma*. Hübner.

Antennæ long, very much attenuated at the end, and with a double row of very short pectinations beneath. Tongue moderate, spirally rolled. Palpi long, curved upwards, and extending beyond the clypeus; the joints cylindrical, covered with small scales, a little hairy at base, and obtuse at tip. Wings elongated, hind pair rather small, and with the discoidal cell and nervures as in *Syntomeida*. Body cylindrical, rounded and not tufted behind, and with a small tubercle on each side of the first abdominal segment. Spurs of the hindmost tibiæ four and of moderate size.

2. *G. (C.) Omphale*. Hübner (according to Say). = *Ægeria Omphale*. Say.

Scarlet; wings transparent, veined and bordered with black, the first pair with a small black subcostal spot, and the black border very much widened at tip; head azure-blue; antennæ black, with the tips white; two terminal joints of the palpi, and a line on each shoulder-cover black; four azure-blue dots in a transverse row on the fore-part of the thorax; last four segments of the abdomen black, with four azure-blue spots on each side, and a dorsal black line extending from the middle of the second segment including in it seven azure-blue spots; belly and outside of the second pair of tibiæ black. Expands one inch and a half or more. Inhabits Florida.

For a specimen of this beautiful insect I am indebted to Mr. Doubleday. It cannot belong to the genus *Ægeria*, to which it was referred by Mr. Say, in his American Entomology, where it is figured. As Hübner's works are not accessible to me, I have drawn up the characters of the subgenus *Cosmosoma* from the specimen of the *Omphale* in my possession. *Zygana Andromacha* of Fabricius and the *Caunus* of Cramer probably belong to the same subgenus.

Subgenus *Lycomorpha*. II.

Antennæ rather short, curved, toothed or with very short pectinations on each side, which give to the joints, when seen from beneath, a cordate or bilobed appearance. Tongue about half as long as the body, spirally rolled. Palpi short, hardly extending beyond the clypeus, nearly horizontal and but slightly curved at base, and covered with large and rather loose scales. Wings not elongated, rounded at tip; discoidal cell of the hind pair long, extending nearly to the hind-margin, and

closed by an oblique nervure. Body rather short, nearly cylindrical, not tufted behind. Spurs of the hind-legs three, two at the end and one beyond the middle of the tibiæ.

3. *G. (L.) Pholus*. Drury.

Blue-black, or deep indigo-blue, wings at base and shoulder-covers orange-colored. Expands fourteen or fifteen lines. *Larva*, according to Mr. Leonard, pale green, with yellowish spots running into the green (in a specimen preserved in spirit, pale green mottled with red;) head black, covered with a few short whitish hairs; body sparingly clothed with rather long hairs, which are white at the sides and black on the back, the hairs arising singly from minute tubercles, those on the third segment the longest and with the others before them directed forwards. It eats the lichens on stone heaps and walls in shady places, and undergoes its transformations in a thin silky cocoon.

This pretty species is often seen flying in considerable numbers in the fields, throughout the day, and at first sight would be mistaken for a species of *Lycus*.

Subgenus. *Ctenucha*. Kirby.

Antennæ pectinated on both sides in the males, thickened in the middle with extremely short pectinations in the females. Tongue moderate, spirally rolled. Palpi slender, rising beyond the clypeus, nearly cylindrical and obtuse, covered with small close scales, and somewhat hairy at base. Wings in some rather narrow, in others widened and rounded at the tip; discoidal cell of the hind pair closed by an angulated nervure. Body nearly cylindrical, enlarged a little behind in the females, with a few minute tufts at the sides of the segments, obtuse and slightly tufted at tip; first abdominal segment with a conspicuous tubercle on each side. Spurs of the hind-legs small, four in number, two terminal, and two beyond the middle of the tibiæ.

4. *G. (C.) semidiaphana*. H.

Slate-colored; wings rather narrow and subacute; first pair brownish slate, with the anterior edge clay-colored; hind-wings semitransparent in the middle; head and antennæ black; collar, front edge of the breast, and base of the palpi, orange-colored. Expands fifteen to sixteen lines. Inhabits the Middle and Southern States.

Dr. Charles Pickering, several years ago, gave me specimens of this insect, which he captured near Philadelphia; there are also specimens of it, in the cabinet of the Boston Society of Natural History, taken in North Carolina by Prof. Hentz; and I have recently received several individuals, in fine preservation, which were found by Mr. Doubleday in Florida. This species some-

what resembles, in form and color, the *Thetis* of Linnæus and Drury.

5. *G. (C.) Latreillana*. = *Ctenucha Latreillana*. Kirby.

Fore-wings dusky drab, with a silky lustre, and the anterior edge clay-colored; hind-wings rusty black; fringes of all the wings white, interrupted with black in the middle; top of the head, orbits behind, base of the palpi, front of the breast, and a spot on the fore-part of each shoulder-cover orange-colored; thorax, abdomen, and coxæ, glaucous or greenish blue with a silky lustre; belly and legs light brown. Expands almost two inches. Inhabits New-Hampshire and Maine, and, according to Mr. Kirby, Canada and Nova-Scotia.

I am indebted to the Rev. L. W. Leonard for one specimen, taken by him in New-Hampshire, and to Dr. J. W. Randall for another from Maine. Although they are rather smaller than Mr. Kirby's *Latreillana*, and do not exactly agree with the description in the Fauna Bor. Amer. Vol. IV, p. 305, I think that they must be referred to his species. This insect has precisely the same antennæ and nearly the same form as the *Glaucopis* of Drury and Fabricius, stated by the latter author to be a native of Carolina, and is, without doubt, generically allied to it, and probably also to several other American species, such as the *Pylotis* and *collaris* of Drury. The following species, from the figures given of them, seem also to belong to the same generical group; viz. *Glauca*, *Celadon*, *Circe*, *Calestina*, *Asterea*, *Cephise*, *Alecton*, *Cassandra*, and *Porphyrina* of Cramer.

Subgenus *Psychomorpha*. H. (Catalogue) = *Callimorpha*. Westwood.

Antennæ in the males pectinated on both sides, the pectinations rather short, setaceous in the female, according to Drury. Tongue moderate, spirally rolled. Palpi slender, nearly horizontal, extending a little beyond the clypeus, covered with loose hairs so as to conceal the joints. Wings short, somewhat triangular, with the outer margins rounded; discoidal cell of the hind pair short, closed by a sinuous nervure. Body slender, hairy at tip. Legs short, hairy; spurs of the hind tibiæ three, slender, nearly concealed by the hairs.

6. *G. (P.) Epimenis*. Drury. = *Psychomorpha maculata*. H. (Catalogue.)

Brownish black; fore-wings sprinkled in spots with light blue scales, which form a narrow band near the hinder margin, and marked with a large yellowish white patch beyond the middle; hind-wings with a broad dark orange-red band behind the middle. The white spot of the fore-wings is indented towards the

middle of the wing, and on the under side there is a small triangular spot near the base of the wing, and a short transverse one beyond it which unites behind with the angular projection of the large white patch. Expands rather more than one inch.

I captured this beautiful insect on the wing at midday, in Milton, Mass., and have since seen it flying among the shrubbery at Mount Auburn, Cambridge. There is also a broken specimen, among Mr. Say's insects, which was taken in Indiana. My specimen is a male, as is also the one in Mr. Say's cabinet, and they have the anal organs very large and hairy. Drury's specimen seems to have been a female, for he says the antennæ are setaceous. It is possible that this insect is not one of the *Sphinges adscitæ*; but I place it here on account of its diurnal habits, and a certain resemblance, more easily seen than described, which it bears to some of the *Glaucopididæ*. It does not agree generically with the types of Latreille's genus *Callimorpha*. When my Catalogue of the Insects of Massachusetts was published, I had not seen a colored copy of Drury's Illustrations, and failed to recognize this insect in the uncolored one which I used.

Cambridge, Mass., Feb. 1, 1839.

ART. IV.—*On American Amphibia*; by ABM. SAGER, M. D.

Detroit, (Mich.) March 5, 1839.

TO PROF. SILLIMAN.

Sir—If the following observations upon some of the American Amphibia, and description of some new ones, appear worthy of publication, you will confer a favor by inserting them in your valuable journal.

The structure and arrangement of the teeth, are of acknowledged classic importance in distributing animals in a natural series, and like most other characters are of variable importance in different classes, depending upon the constancy and generality of their existence, structure and arrangement. In the Class Amphibia, Lat., Order Batrachia, Brongn., they are generally regarded as of generic value, (and here let me say that I have frequently verified the truth of the observations of Drs. Davy, Weber and others with regard to the biauriculate structure of the heart in this

class, by which the ordinal character of *M. Brongn.* is invalidated,) thus *Rana* and *Hyla* are distinguished from *Bufo*, by the presence of teeth in the upper jaw, and in two transverse processes of the palate, generally anterior to the internal nares, sometimes between, but never behind them, the toads being quite destitute of both. The *Salamandrae* possess not only teeth in both jaws, but also palatines, which according to most authors, are arranged in two longitudinal rows. This character does not agree with my observations upon our *Salamandrae*. Indeed so varied is the arrangement of the palatine teeth in those American Salamanders which have fallen under my observation, that if much importance be attached to this character, they might be divided into several sub-genera. My observations have not been sufficiently extensive, to enable me to determine whether a classification founded upon agreement in the general dental arrangement of the palatines in this class, would be natural or coincident with one based upon a general correspondence in all the generic characters. Future investigation may settle that point. At all events it is believed that the modifications in the arrangement of the palatine teeth from their constancy will be found to be of essential importance in determining species, the more so from the admitted fact that the color of these animals (a character much employed for this purpose) is extremely variable. I shall content myself by submitting the result of my investigations. The palatine teeth of the *Salamandra erythronota*, Raf., are arranged in two longitudinal palatine rows, slightly diverging as they proceed backward. This is the only species that agrees generically with the description. The *Sal. interrupta*, Gr., has two longitudinal patches of palatine teeth, each composed of several rows, nearly in juxtaposition centrally. In the *Sal. agilis*, there is but a single longitudinal patch of palatines composed of several rows so arranged as to form very acute angles pointing forwards. The *Sal. variolata*, Gill., has beside an armation of the longitudinal palatine ridge similar to the last, two partial rows on the transverse palatine ridge, interrupted in the middle, curved backward and joined to the longitudinal patch. Those of the *Sal. maculata*, Gr., are similar to the last, but the longitudinal patch has fewer rows. The palatines of the *Sal. rubriventris*, Gr., differ only from the *Sal. variolata* in having the transverse and longitudinal rows separate. The *Sal. bilineata*, has no longitudinal rows, and the straight transverse row has a

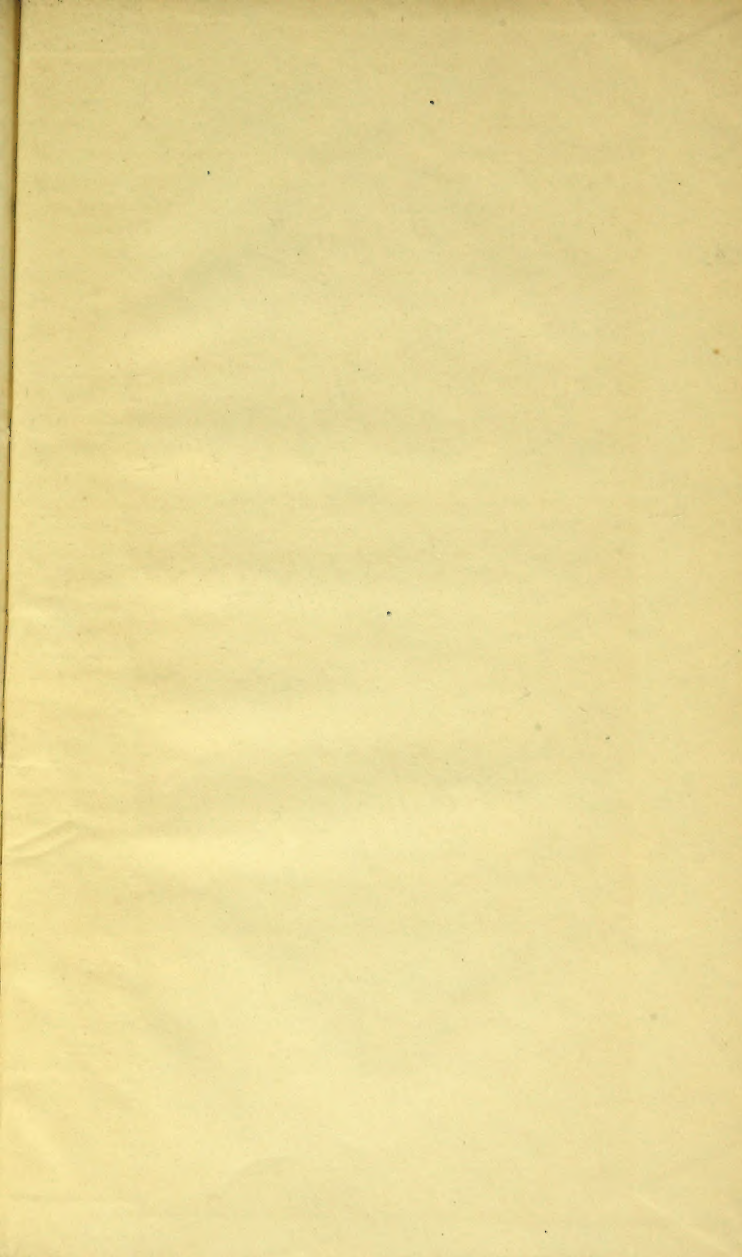
wide central interruption. The *Sal. lurida*, has an uninterrupted transverse palatine row forming an obtuse angle directed forward. The *Sal. subviolacea*, Bart., corresponds with the last in having but a transverse row, but may easily be distinguished by this row being undulating with a slight central angle. The palatine teeth in all are curved backward and very acute. It will be perceived that these nine species may be divided somewhat into three groups, founded upon the possession of longitudinal or transverse teeth only, or both combined. In nearly all, the general structure of the tongue is similar to that of the *Ranae*, but is more closely bound down; the sides and the posterior extremity which is quite short and rounded, are free but not capable of being projected from the mouth as in the *Ranae*.

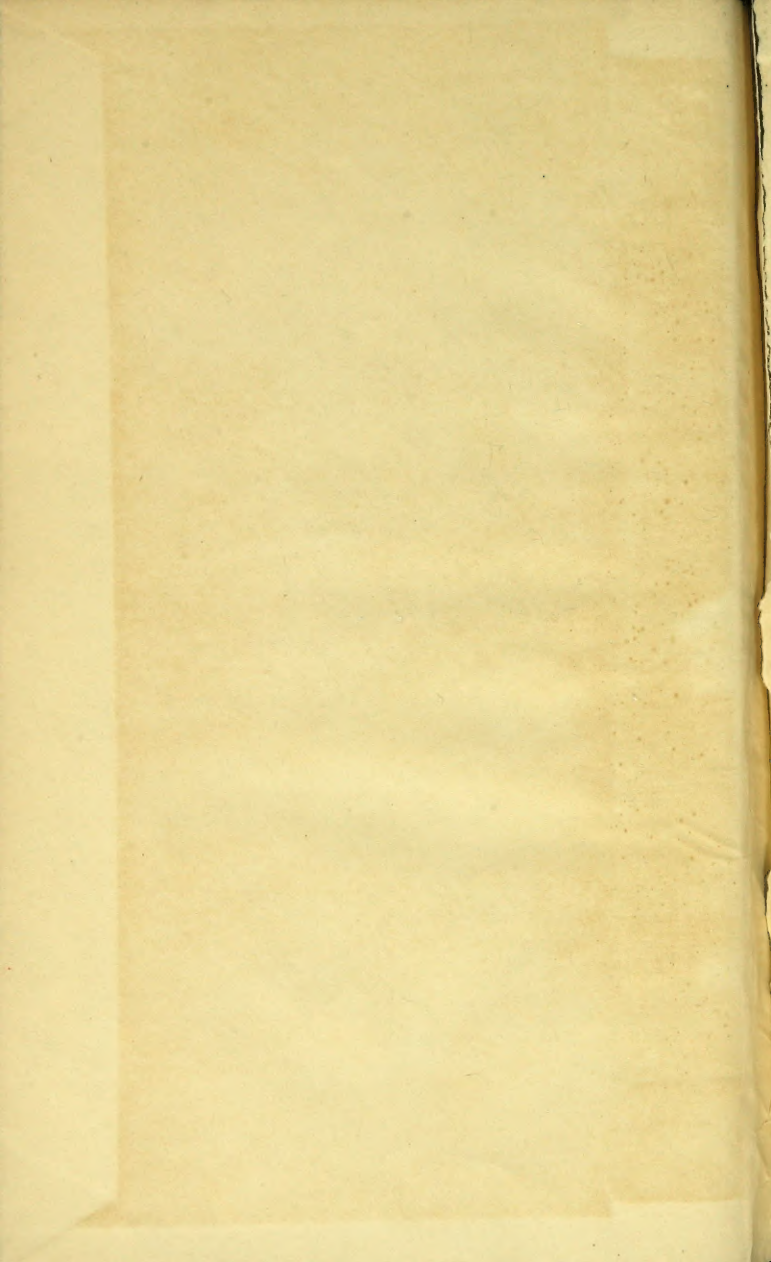
In the *Sal. lurida* and *subviolacea*, it is almost perfectly bound down all its length. I would here remark that the expression, "tongue not attached at the bottom of the gullet but to the edges of the jaw," found in the works of the most eminent authors, when applied to the *Ranae*, conveys an erroneous idea. I believe in all the species of the restricted genus *Rana*, the tongue is composed of two muscles a *hyo-glossus* and *genio-glossus*, the former attached to the horns of the hyoid cartilage, the other to the angle of the lower jaw. Such is the structure in all the species of *Rana*, *Bufo* and *Salamandra* I have examined. In the male *Bufo Americanus*, Le Conte, as well as in the *Hylae*, there is a sac beneath the tongue opening by an orifice on each side of it; a fact not mentioned in any of the books to which I have had access. In the works of some of our American Herpetologists, the fact of the existence of the external branchiae in the early period of the development of the young tadpole, appears to be doubted. I possess many specimens illustrative of this fact, as well as the development of the anterior extremities of the tadpole of the *Ranae*, previous to their protrusion.

The following appear to be nondescript species:

Sal. agilis, Nob. Palatine teeth an oblong patch, composed of several rows so arranged as to form very acute angles pointing forward; curved backward; length $2\frac{3}{4}$ in.; head $\frac{1}{3}$ in.; tail $1\frac{1}{4}$ in.; fore legs $\frac{1}{4}$ in.; hind legs $\frac{1}{3}$ in.; head oval, flattish; snout obtuse; nostrils lateral, small, round; eyes prominent; body and tail round, the last terete, pointed; toes minute, four anterior, five posterior. Color of the head, back and tail above testaceous or lateritious,







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