

distinct ocelli near the hind margin of the fore wings, and with several similar ocelli near the margin of the hind wings. On the under side, the ground-colour of the wings is rather paler, but uniform; whilst the ocelli of the upper side are here repeated in the hind wings, but greatly increased in size, there being generally two near the outer angle, and three between the middle and the anal angle. But these ocelli vary in an endless manner; in some the ocelli being not only very large and connected together, but also accompanied by smaller ocelli attached to them; whilst in others the ocelli are obliterated, the fore wings being without any spots, and the hind wings with only three minute white spots. Every intermediate variety is found.

The caterpillar is pubescent, of a greyish white colour, with a slender black dorsal line; and sometimes it is entirely blackish. It feeds on the *Poa annua*, and other grasses, keeping during the day at the roots. The perfect insect appears at the end of June, and is found in damp grassy places about woods and lanes, and seems to be generally dispersed throughout the country.

CÆNONYMPHA, HÜBNER.

This genus comprises the smaller species of the Hipparchiides, distinguished from all the rest by several evident characters; the wings are entire and not denticulated, the anterior pair having the three veins (mediasinal, median, and anal) strongly and equally swollen, the eyes naked, the palpi slender, moderately hairy, with the last joint very long and acute, the antennæ annulated with grey and brown, with a decided club.

The fore legs (in *C. Pamphilus*) are of comparatively moderate length, those of the males very densely clothed with long hairs, those of the females almost naked, with the tarsi long and articulated, almost resembling a perfect foot; whilst the tarsi of the males are very short and simple.

The larvæ are completely glabrous and shining; thus differing from the larvæ of all the preceding species of this sub-family.

This genus, to which I have applied Hübner's name (*Cænonympha*), corresponds with Stephens's section E, and with Duponchel's group *Dumicoles*.

DESCRIPTION OF PLATE XXI.

INSECTS.—Fig. 6. *Cænonympha Davus*, the small Ringlet Butterfly. 7. Showing the under side.

„ Fig. 3. *Cænonympha Polydama* (the specimen formerly figured by Mr. Stephens), showing the under side, with the cream-coloured band or fascia continuous, and not interrupted as in fig. 2.

„ Fig. 1. *Cænonympha Typhon*, the Marsh Ringlet Butterfly (the specimen formerly figured by Mr. Stephens as *Iphis*). 2. Showing the under side. 4. The Caterpillar of *C. Iphis* of Godart. 5. The Chrysalis.

„ Fig. 8. Another specimen of *C. Typhon*, approaching in colour on the upper side to *C. Pamphilus*. 9. Showing the under side of the same specimen, which is also paler and more indistinct than ordinary.

PLANT.—Fig. 10. *Aira Flexuosa*, a common Heath-grass.

The species here figured with some of their most prominent variations have been the subject of some confusion, and have been at different times subdivided into more distinct species than there are varieties in the present plate. It is now the opinion of several entomologists, more particularly of Mr. Stephens, who is one of the best authorities upon the subject, that they can only form two distinct species, viz., *C. Davus* and *C. Typhon* or *Polydama*—the continuity or interruption of the cream-coloured band or fascia on the under side of the hind wings, with other trifling differences of marking, being no longer considered specific distinctions. These two species may be generally distinguished by the following characteristics:—*C. Davus* always has the little rings more or less defined on the upper side, and is of a dull brown with a slight inclination to grey; on the under side the markings are very strong and

perfect, and in the darker parts inclining to an olive green. *C. Typhon* or *Polydama* has the little rings very alight, and in some cases altogether deficient on the upper side, whilst the ground-colour is somewhat paler, and instead of inclining to grey, inclines rather to tawny; and on the under side all the markings are paler and less distinct. *Davus* is found in Lancashire, more particularly in the neighbourhood of Manchester, where *Polydama* is seldom or never seen; whilst *Polydama* is confined to Yorkshire, Cumberland, and South Wales. Notwithstanding these distinctions both of markings and locality, I should myself feel almost tempted still further to simplify the matter, and to refer the two reputed species to one; the different localities being rather an argument in favour of uniting the species than separating them, for it is well known that the insect of the mountain and the same insect of the plain beneath have always different characters sufficiently constant for specific distinction, if there were not abundant general evidence of identity.

The specimens figured in the present plate seem sufficient evidence that they may be all referred to one species; for though there is a wide difference between *Typhon*, fig. 9, and *Davus*, fig. 7, yet the connecting links are not wanting; and indeed ALL the intermediate gradations might be selected from any hundred specimens indiscriminately taken. *Davus* seems the type of the genus; there, all the markings are complete, distinct, and unclouded; in *Polydama*, fig. 3, they are already somewhat paler and less defined; in *Typhon*, fig. 2, the broad band or fascia on the hind wing is broken up into two irregular marks; while in fig. 9 the whole is fainter, and some of the marks have disappeared altogether.

As the caterpillars of these butterflies are at present unrecorded in this country, I hope some of our subscribers in the neighbourhood of Manchester, and others in Yorkshire, Cumberland, or Wales, will endeavour to forward specimens to us in the course of the next season,* which will decide the question, and they shall be carefully figured and described in our supplemental plates. They must be sought during the fine nights of June, as they only feed after sunset; and when discovered, some care must be used, as they drop from the blade of grass (on which they are feeding) directly it receives the slightest touch. H. N. H.

SPECIES 1.—*CENONYMPHA DAVUS*. THE SMALL RINGLET BUTTERFLY.

Plate xxi. fig. 6, 7.

SYNONYMES.—*Papilio Davus*, Fabricius, Haworth, Jermy (but not of Godart).

Hipparchia Davus, Ochsenheimer, Curtis, Stephens.

Papilio Tullia, Hübner, Pap. 243, 244.

Papilio Philoxenus, Esper.

Papilio Musarion, Borkhausen.

Maniola Typhon, Schrank (not *P. Typhon*, Esper, nor *P. Typhon* of Haworth).

Papilio Hero, Donovan Brit. Ins. 6, pl. 186. Hewin, pl. 23, fig. 5, 6 (but not *P. Hero* of Linnæus).

This plain-coloured butterfly varies in the expanse of its wings from $1\frac{1}{2}$ to $1\frac{3}{4}$ inch. On the upper side they are of a brownish ochre colour, the base being rather darker and the fringe of a pale grey; parallel to the outer margin of the fore wings are the rudiments of two eyes, and occasionally with one or two smaller ones. Traces also of several eyes appear near the margin of the hind wings. Beneath, the fore wings have the basal half of a somewhat brighter ochre; this is succeeded by a narrow irregular pale bar (narrowed to the hinder margin), the space between which and the outer margin of the wings is greyish brown, with only two larger ocelli, and sometimes with one, two, or three additional smaller ones. The hind wings beneath are dark brownish grey at the base, the outer margin of which is angulated, this is followed by a broad irregular whitish central bar; this is succeeded by brownish grey usually ornamented with six large ocelli, having a black iris surrounded by a whitish or fulvous ring, with a small silvery central dot. The markings on the under side of the wings vary in size, and the eyes in number; sometimes the whitish middle bar is interrupted in the centre, and the anal ocellus is generally doubled. The outer edge of the hind wings is whitish and the fringe brownish.

This species is so closely allied to the *P. TYPHON* of Haworth, that it is most probable that the latter may ultimately prove to be a local variety of it.

The specimen described by Mr. Haworth was captured near Manchester, in the month of July. Since that time it has been plentifully taken in the marshes between Stockport and Ashton, near that town. Trafford and White Moss, also near Manchester, and Shorn Moor, Yorkshire, have likewise been given as its localities.

* These or any other communications may be forwarded to our publishers.



The first of the two figures is a photograph of the specimen in its natural state, showing the whole animal. The second figure is a drawing of the same specimen, showing the details of its anatomy. The specimen is a small, dark-colored insect, possibly a fly or a beetle, with a long, segmented body and six legs. The drawing shows the head, thorax, and abdomen in detail, with the legs and wings also visible. The specimen is shown from a dorsal view, with the head at the top and the abdomen at the bottom. The drawing is a detailed line drawing, showing the texture of the body and the structure of the legs and wings. The specimen is shown in a naturalistic setting, with some foliage and a small pool of water in the background.

FIGURE 1 - *SPERMATOPHYTES* (1) *SPERMATOPHYTES*

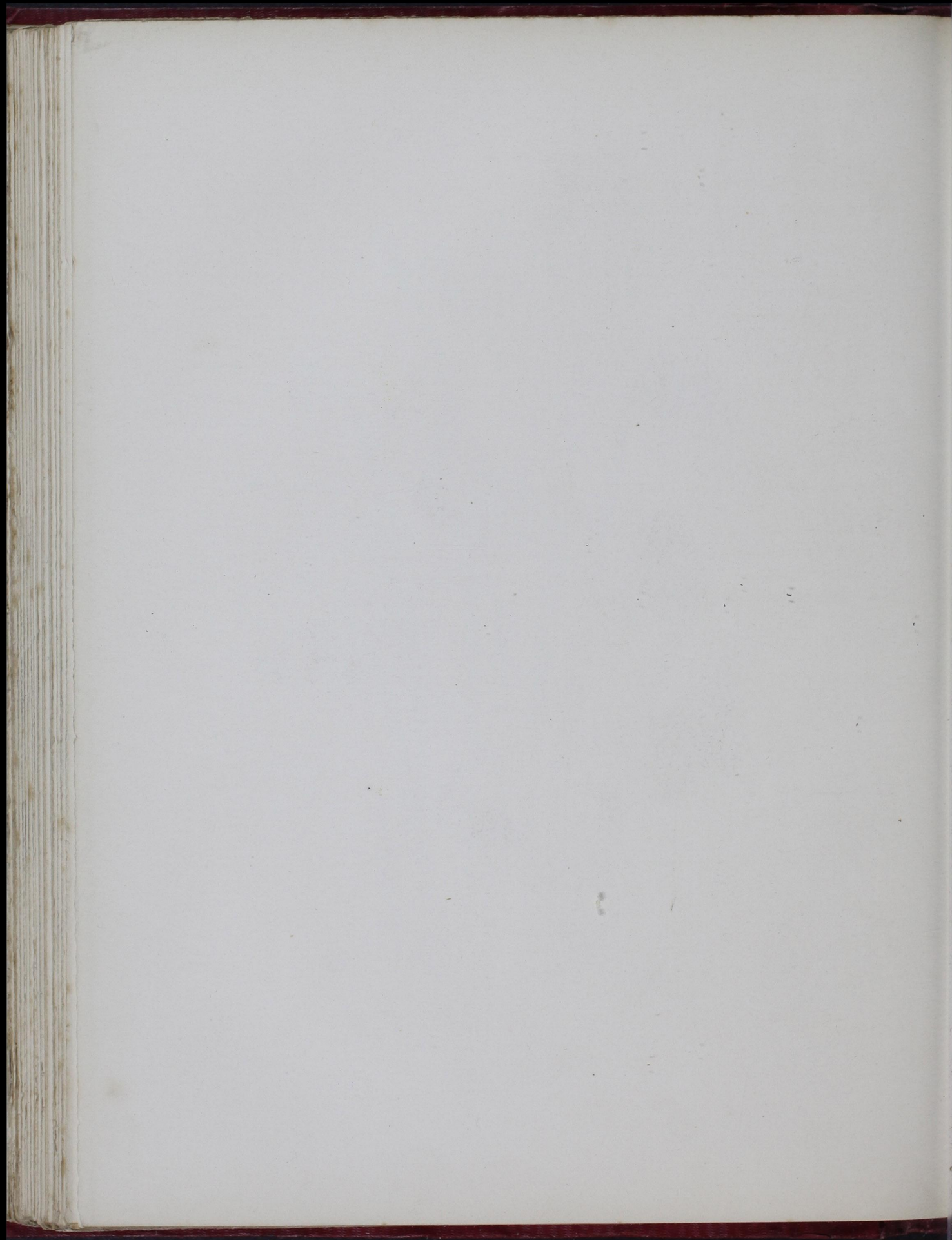
The first of the two figures is a photograph of the specimen in its natural state, showing the whole animal. The second figure is a drawing of the same specimen, showing the details of its anatomy. The specimen is a small, dark-colored insect, possibly a fly or a beetle, with a long, segmented body and six legs. The drawing shows the head, thorax, and abdomen in detail, with the legs and wings also visible. The specimen is shown from a dorsal view, with the head at the top and the abdomen at the bottom. The drawing is a detailed line drawing, showing the texture of the body and the structure of the legs and wings. The specimen is shown in a naturalistic setting, with some foliage and a small pool of water in the background.

The specimen is a small, dark-colored insect, possibly a fly or a beetle, with a long, segmented body and six legs. The drawing shows the head, thorax, and abdomen in detail, with the legs and wings also visible. The specimen is shown from a dorsal view, with the head at the top and the abdomen at the bottom. The drawing is a detailed line drawing, showing the texture of the body and the structure of the legs and wings. The specimen is shown in a naturalistic setting, with some foliage and a small pool of water in the background.

The specimen is a small, dark-colored insect, possibly a fly or a beetle, with a long, segmented body and six legs. The drawing shows the head, thorax, and abdomen in detail, with the legs and wings also visible. The specimen is shown from a dorsal view, with the head at the top and the abdomen at the bottom. The drawing is a detailed line drawing, showing the texture of the body and the structure of the legs and wings. The specimen is shown in a naturalistic setting, with some foliage and a small pool of water in the background.

The specimen is a small, dark-colored insect, possibly a fly or a beetle, with a long, segmented body and six legs. The drawing shows the head, thorax, and abdomen in detail, with the legs and wings also visible. The specimen is shown from a dorsal view, with the head at the top and the abdomen at the bottom. The drawing is a detailed line drawing, showing the texture of the body and the structure of the legs and wings. The specimen is shown in a naturalistic setting, with some foliage and a small pool of water in the background.





PAPILIO POLYDAMA of Haworth (*Polymeda* of Jermyn, but not of Scopoli, the last-named author having given that name to *Hyperanthus*) is considered by Curtis as a variety of *Davus*; whilst Mr. Stephens at first gave it as a distinct species, but subsequently, in the Appendix to the first volume of his *Illustrations*, asserted it to be a variety of *Typhon* of Haworth. It measures about an inch and a half in the expanse of its wings, the fore pair of which, on the upper side, are of a greyish ochre, with two obscure blind eyes; the hind wings above are brown, but with the inner edge broadly whitish or buff, with a small obscure eyelet near the anal angle. The fore wings beneath are of a brownish ochre, blackish at the base and ashy at the tips, with an abbreviated whitish fascia across the middle, between which and the outer margin are two eyes of small size; the hind wings beneath have a broad basal bar of greyish brown externally dentated, terminated by a whitish irregular bar, sometimes almost interrupted in the middle, beyond which the wings are ashy, with six small eyes surrounded with a whitish ring, three of which are usually much smaller than the others. The ocelli, as well as the ground-colour of the wings, vary considerably.

This variety—or species, as it may be considered—was first found in the county of York in the month of June, and subsequently on the 21st of July, 1809, by the Rev. W. T. Bree, on the moors between Bala and Festiniog, North Wales, in company, however, with a specimen of *Typhon*, Haw. Mr. Weaver also found *Polydama* plentifully in North Wales, in 1827; whilst he found *Typhon* still more profusely in Cumberland one month earlier. According to Mr. Wailes, however, both *Typhon* and *Polydama* occur plentifully on damp heaths in Northumberland in the beginning of July. Mr. Curtis, on the other hand, states that it is taken near Manchester in company with *Davus*—"Non nostrum tantas componere lites."

Our figure 3, in plate 21, is taken from the specimen which was represented by Mr. Stephens, *Illustr. Haust.* 1, pl. 7, fig. 3.

SPECIES 2.—*CÆNONYMPHA TYPHON*, HAWORTH. THE SCARCE HEATH BUTTERFLY.

Plate xxi. figs. 1, 2, 4, 5, 8, and 9.

SYNONYMES.—*Papilio Typhon*, Haworth, Jermyn, Curtis.

Papilio Typhon, Esper (according to Stephens, but disputed by Curtis).

Papilio Iphis (*Wien* V.?), Borkhausen, Jermyn. Stephens *Illustr. Haust.* 1, pl. 7, fig. 1, 2 (but not of Ochsenheimer, Hübner, nor Godart;

according to Curtis, the species described by those authors being the *Hero* of Fabricius).

Satyrus Davus, Godart.

VAR.—*Hipparchia Polydama*, Stephens, *Syst. Cat. and Illustr. Haust.* 1, App. p. 148.

This species (if indeed it be specifically distinct from *Davus* and *Polydama*) varies from $1\frac{1}{2}$ to $1\frac{3}{4}$ inch in expanse. On the upper side the wings are usually of a rusty grey or ochre colour, having the base brownish. The hind wings are generally darker, and without any trace of rudimental eyes, but sometimes with distinct ocelli, varying in number near the tip; on the under side the fore wings are dusky at the base, with the disc rusty ochre, followed by an abbreviated irregular white stripe; the outer part of the wing being greenish ash, and bearing generally two (but sometimes as many as five) small eyes, which are occasionally obsolete; the hind wings beneath are of a greenish brown at the base, with an irregular *interrupted* whitish bar beyond the middle of the wing, succeeded by an ochre shade in the female, but greenish brown in the male, and generally ornamented with six small eyes, but their number is liable to great variation. The females are further distinguished by having the wings paler and more ochreous, and marked on the upper side with a large pale blotch on the disc of all the wings.

The varieties of this species are very numerous, not only in the markings, but also the ground-colour of the wings. One of the most striking is represented in our plate xxi., fig. 8, 9. Specimens of the insect captured in Arran are stated by Mr. Hodgkinson (Zoologist, p. 1882,) to connect the Rannock with the Cumberland varieties.

This butterfly was first taken in June, in Yorkshire, near Beverley. Many years afterwards it was again found by Mr. Haworth, in a marsh near Cottingham, in the same county. It also occurs in Scotland, Wales, Cumberland, Northumberland, the Shetland Islands, and other parts of the north of Great Britain. It was found by Mr. Weaver, in Cumberland, unaccompanied by *Polydama*, which he had found in North Wales nearly a month earlier; although, according to Mr. Wailes, both occur in company in Northumberland.

It will be seen by the synonymes how great a confusion has prevailed as to the specific name of the insect. Mr. Stephens first described it under the name of *Iphis*, which he afterwards altered to *Polydama*, regarding it as identical with the *Polydama* of Haworth, which he had also at first considered as distinct. If *Polydama*, however, be a variety of *Davus*, some other name must be given to this species; and although the synonymes of Esper (to *Tiphon*) are disputed, and the change of the name to *Typhon* not perhaps strictly correct, yet I have thought it best to recur to the name imposed on the species by my lamented friend and tutor in Entomology, Mr. Haworth, instead of giving it a new specific name, which would otherwise have been rendered necessary. Recent observations (1848) seem fully to confirm the specific identity of this and the former species, for which it will be advisable to retain the name of *Davus*. The local varieties, however, appear constant, as stated in the "Entomologist," p. 191.

The caterpillar and chrysalis are copied from Godart's figures of *C. Iphis*; but the synonymes of the species so named have been so confused, that we are not quite certain whether it be identical with *Typhon* or not.

DESCRIPTION OF PLATE XXII.

INSECTS.—Fig. 1. *Cænonympha Pamphilus* (the small Heath Butterfly). 2. Showing the under side.

„ Fig. 3. *Cænonympha Hero*. 4. Showing the under side.

„ Fig. 5. *Cænonympha Arcanius*. 6. Showing the under side. 7. The Caterpillar. 8. The Chrysalis.

„ Fig. 9. *Oreina Cassiope* (the Mountain Ringlet B.) 10. Showing the under side.

PLANTS.—Figs. 11, 12, 13. *Cynosurus cristatus* (Dog's-tail Grass). Fig. 14. *Melica nutans* (Mountain Melic-grass).

C. Pamphilus is from a specimen in the possession of Mr. Westwood. *C. Hero* and *O. Cassiope* from the collection of Mr. Stephens. The caterpillar of *Arcanius* is from Godart, who describes it as feeding upon *Melica ciliata*, which, not being an English species, I have represented it upon *M. nutans*. H. N. H.

SPECIES 3.—CÆNONYMPHA ARCANIUS.

Plate xxii. fig. 5—8.

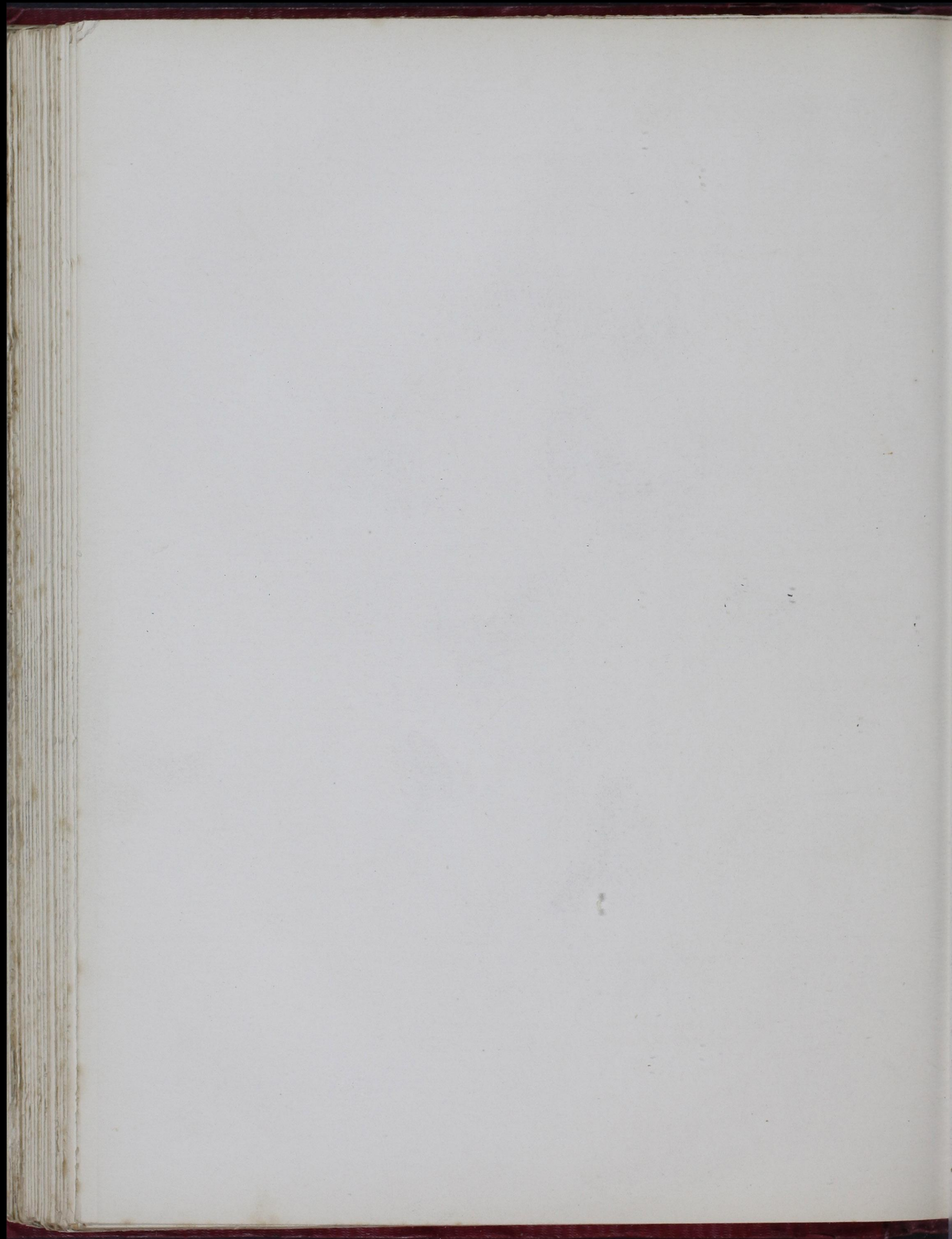
SYNONYMES.—*Papilio Arcanius*, Linn.? Hübner (*P. Arcania*).

Hipparchia Arcanius, Jernyn, Stephens. Curtis Brit. Ent. pl. 235 ×.

This butterfly measures an inch and a half in the expanse of its wings; the fore pair of which are tawny, with the front edge and outer margin brown, having a small obscure eye near the tip; the hind wings are brown, palest across the middle, with a narrow orange stripe at the anal angle, and three or four very indistinct ocelli. The fore wings beneath have the front and outer edges slightly brown, with a short pale ochreous stripe towards the apex, where there is an ocellus with a black iris (sometimes accompanied by a smaller eye). The hind wings beneath are orange brown at the base, terminated in an irregular margin beyond the middle of the wing, having an ocellus with a black iris and silver pupil at the superior extremity; a broad whitish irregular band beyond is succeeded by a bright tawny margin, in which are two large and two or three small ocelli, with a silver line running near the margin of the wing.







Such is the description of the only specimen of this butterfly at present in any British collection, and even its claims as a real native are questioned. Mr. Curtis, to whom it belongs, states that it "was captured by Mr. Plastead, it is understood, on the borders of Ashdown Forest;" but Mr. Stephens ("Illust. Brit. Ent. Haust." 4. 379) doubts its authenticity. It is an abundant species on the Continent, appearing in the months of June and July.

The caterpillar is green, with a red mouth, a darker green line down the back, a pale yellow line down each side, and another above the feet. It feeds upon *Melica ciliata*.

A hybrid between *C. Arcanius* and *C. Hero* has been described and figured by Schummell (Beitrage z. Entomol. Schlesische Faun. pl. 9, f. 5), having the upper side of *Arcanius*, and the under side of *Hero*. It was found in 1809 near Gerlachsdorf.

SPECIES 4.—CÆNONYMPHA HERO. THE SILVER-BORDERED RINGLET BUTTERFLY.

Plate xxii. fig. 3, 4.

SYNONYMES.—*Papilio Hero*, Linnæus. Haworth Ent. Trans. (not of *Papilio Sabæus*, Fabricius.
Fabricius, nor of Donovan, who figures *Davus* under that name.) *P. Melibæus*, Ernst.
Hipparchia Hero, Ochseneimer, Stephens. Curtis Brit. Ent. pl. 205.

This species measures about an inch and a half in the expanse of its wings, which are of a fulvous brown colour, the fore wings being paler along the fore edge, with an orange stripe close to the posterior margin, near to which are two small, indistinct, orange ocelli, with brown pupils; the hind wings have also a narrow orange stripe near the outer margin, above which are four large black ocelli having minute whitish pupils, and surrounded by a broad orange ring. The fore wings beneath are coloured as on the upper side, except that there is a narrow silver stripe adjoining the orange submarginal one, and which is also continued through the hind wings, which have an irregular whitish bar rather beyond the middle, succeeded by orange, in which are seven ocelli of various size; the two nearest the anal angle being confluent and smallest; the iris being black, with a white pupil, and surrounded by an orange circle.

This is one of our rarest insects; a female taken by Mr. Plastead, near Withyam, on the borders of Ashdown Forest, Sussex, and now in Mr. Curtis's collection, being the only specimen in British collections until recently, when it appears to have been again taken in Sussex; Mr. Stephens stating, in the Appendix to the Lepidopterous volumes of his Illustrations, that he had obtained a specimen from the neighbourhood of Lamberhurst.

SPECIES 5.—CÆNONYMPHA PAMPHILUS. THE SMALL HEATH BUTTERFLY.

Plate xxii. fig. 1, 2.

SYNONYMES.—*Papilio Pamphilus*, Linnæus. Lewin Papil. pl. 23, fig. 3, 4. *Hipparchia Pamphilus*, Ochseneimer, Leach, Stephens, Curtis. Duncan,
Haworth, Stewart, Harris, Aurelian, pl. 21, fig. e—h. De Geer Mém. 2, Brit. Butt. pl. 26, fig. 3.
pl. 2, fig. 3. *Papilio Nephele*, Hübner, Pap.

This, which is one of the commonest of our British butterflies, varies in the expanse of its wings from $1\frac{1}{2}$ to $1\frac{3}{4}$ inch. The wings on the upper side are of a pale tawny or fulvous colour, with the entire margins brownish; the anterior pair having an indistinct ocellus near the tip, sometimes accompanied by a still smaller one, or by one or more black spots. The hind wings have sometimes also an obsolete ocellus near the anal angle. On the under side the fore wings are fulvous, with the base and apex ashy, a rather large ocellus being placed near the tip, having a black iris and white pupil, and surrounded by whitish. The hind wings are brown at the base and ashy at the tips, with an abbreviated whitish band across the middle, beyond which are several

minute indistinct ocelli. Varieties occur in which the ocelli are more or less obliterated, and in the males the dusky edging of the wing is more decided than in the females.

The caterpillar feeds upon *Cynosurus cristatus*, and is found at the beginning of May and August. It is greenish, with a dusky line down the back and a pale line down each side. The perfect insect is found abundantly on heaths and dry pasture lands, appearing at the beginning of June and September. Moses Harris also states that there is a brood in April, making three in the course of one year.

GENUS XIX.

OREINA,* WESTWOOD, (EREBIA, BOISDUVAL, DOUBLEDAY, but not of DALMAN).

This genus is distinguished from the other British species of Hipparchiides by having none of the veins of the wings dilated at the base. The antennæ are slender, with a more or less globular or pyriform club. The eyes are naked, the palpi hairy, the wings varying in shape, the anterior being either rounded or elongate, and the posterior denticulated or entire. The fore feet in the males of *Blandina* are very small, so as not to be visible among the hairs of the breast, and very densely hairy; those of the female, on the other hand, are comparatively long, quite visible, slender, naked, and with the tarsal portion articulated.

This genus, to which Boisduval inappropriately applied Dalman's generic name of *Erebia* (which is a synonyme of *Hipparchia* or *Satyrus*) is composed of species for the most part natives of mountainous districts; hence I have applied to it a name derived from the Greek, in allusion to this habitat. The continental species are very numerous, and very difficult to determine. Boisduval states that they exclusively inhabit the Alpine mountains, and the mountain districts of Central Europe, being but very rarely found on the plains, except where the vegetation has an alpine character. They are not found on the mountains of the north of Europe (where they are replaced by the species of *Chionobas*), nor on the mountains of the south of Europe. They constitute Duponchel's ninth and last group, named from the same circumstance *Alpicoles*; which that author suggests may be formed into two divisions, from the entire and denticulated wings; indeed by Stephens they are, from this circumstance, separated into two groups, forming his sections C and D of *Hipparchia*. The species with denticulated hind wings are termed *Epigea* by Hübner, whilst those with entire wings are his *Melampias*.

DESCRIPTION OF PLATE XXIII.

INSECTS.—Fig. 1. *Oreina Ligea* (the Arran Brown Butterfly), female. 2. The male. 3. Showing the under side. 4. The Caterpillar.

„ Fig. 5. *Oreina Blandina* (the Scotch Argus B.), male. 6. The female. 7. The under side of the English variety, male. 8. The under side of the Scotch variety, male. 9. The under side of the English variety, female. 10. The under side of the Scotch variety, female.

PLANTS.—Fig. 11. *Poa glauca* (Glaucous Meadow-grass).

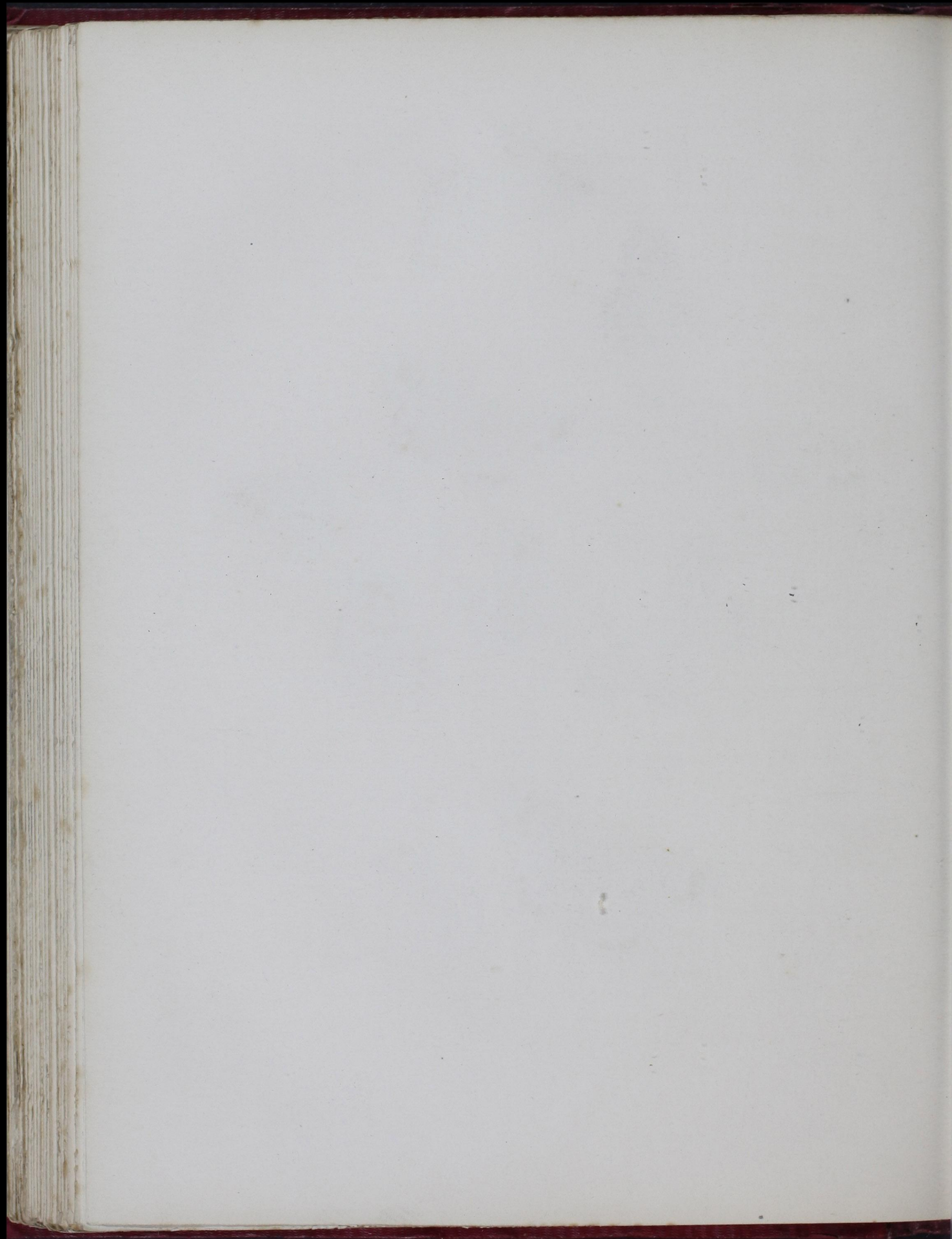
„ Fig. 12. *Poa alpina* (Alpine Meadow-grass).

I have been enabled from the fine cabinet of Mr. Stephens to enrich the present plate with a variety of specimens illustrative of the distinctions of the Scotch and English varieties of *O. Blandina*. It will be seen that, in the English specimens, the light band on the hind wing is ashy grey, broad in the female, and narrow in the male, and that in the female the grey band is repeated towards the base of the wing. In the Scotch specimens, the light band on the hind wing is yellowish brown in the female, and in the male almost invisible, from being scarcely lighter than the ground-colour; while the secondary band is nearly obliterated in both sexes. I regret much not being able to figure the caterpillar of this species, but hope some of our subscribers will enable us to supply the deficiency before the completion of the work. H. N. H.

* From the Greek *ὄρεως*, *montosus*, from the species generally frequenting mountain districts.







SPECIES 1.—OREINA LIGEIA. THE ARRAN BROWN BUTTERFLY.

Plate xxiii. fig. 1—4.

- | | |
|--|---|
| <p>SYNONYMES.—<i>Papilio Ligeia</i>, Linnæus. Sowerby Brit. Miscell. pl. 2.
 <i>Hipparchia Ligeia</i>, Ochseneheimer. Stephens Illust. Haustell. 1, pl. 6, fig. 1,
 2, 3. Duncan. Brit. Butt. pl. 25, fig. 1.
 <i>Papilio Aleris</i>, Esper.</p> | <p><i>Papilio Philomela</i>, Hübner, Papil. Esper.
 <i>Erebia Ligeia</i>, Dalman, Boisdual, Stephens Cat. B. Mus.
 <i>Epigea Ligeia</i>, Hübner (Verz. bek. Schmett.)</p> |
|--|---|

This rare butterfly measures from $1\frac{5}{8}$ to 2 inches in the expanse of its wings, which are of a dark rich brown, all the wings having a broad oblong patch of red near the outer margin, within which, on the fore wings, are four eyes, black (with white pupils in the females), the two nearest the apex confluent, and in the hind wings three ocelli, which are also blind in the males. On the under side the wings are of a paler brown, and the band is brighter in the fore wings, but almost obsolete in the hind ones, which are ornamented beyond the middle with an abbreviated and irregular white band, between which and the hind margin are three black ocelli, with white pupils, each surrounded by a red ring. The fringe of all the wings is alternately brown and white.

Asserted to have been taken in the Isle of Arran, by the late Sir Patrick Walker and Alexander Macleay, Esq., in July or August; but Mr. H. Doubleday places it among the "reputed" British species. It is described as occurring in France and Sweden, and as appearing in meadows and open spaces of woods.

The caterpillar is green, with a dusky line down the back, with several white lines along the sides.

SPECIES 2.—OREINA BLANDINA. THE SCOTCH ARGUS BUTTERFLY.

Plate xxiii. fig. 5—10.

- | | |
|--|--|
| <p>SYNONYMES.—<i>Papilio Blandina</i>, Fabricius. Sowerby British Miscell. 1,
 pl. 7. ? Donovan, vol. 12, pl. 426.
 <i>Erebia Blandina</i>, Dalman. Stephens Cat. Brit. Mus.</p> | <p><i>Hipparchia Blandina</i>, Ochseneheimer, Stephens, Curtis. Duncan Brit.
 Butt. pl. 25, fig. 2.
 <i>Papilio Medea</i>, Hübner.</p> |
|--|--|

This species varies in the expanse of its wings from $1\frac{1}{2}$ to 2 inches. The upper side of all the wings is of a dark uniform brown colour, the fore wings having a dark orange patch near the apex, the lower part being narrower than the upper, from which it is ordinarily separated by a constriction in the middle of the patch. The upper part of this patch bears a united pair of black eyes, having white pupils, and the lower part has a single eye, similar in colour but smaller, which is occasionally obliterated. The hind wings are ornamented with a curved bar (or rather a united series of round marks), of obscure orange near the hinder margin, in which are generally three small black eyes with white pupils, and a black dot in the outer part of the bar. Specimens occasionally occur with as many as five ocelli on the fore wings. Others have only two ocelli in the hind wings. The fringe of all the wings is brownish, but paler and interrupted in the females. On the under side the fore wings are of a somewhat redder brown, with an orange bar ocellated as above; the hind wings have the base greyish brown, succeeded by a broad irregular red brown bar, which extends beyond the middle of the wings; this is again succeeded by a rather narrower greyish bar, in which are three minute rudimentary ocelli; and the margin of the wing is brown. The colouring of these bars varies considerably, not only according to the localities where the specimens are taken, but also in the sexes, as represented in the upper series of figures in plate 23. Ordinarily, however, the specimens taken in Scotland have the bars more indistinctly marked. There are numerous continental species closely allied to this insect.

Messrs. Stephens and Curtis only mention the island of Arran and Castle Eden Dene as the localities for this species; but Mr. Duncan adds, that "it occurs in some plenty over a district of considerable extent in Dumfries-shire, near Minto in Roxburghshire, occasionally near Edinburgh, and probably in most of the southern counties of Scotland. Mr. Wailes informs us that it exists in profusion in one or two places in the magnesian limestone district not far from Newcastle, and Mr. F. Bond has it from Durham. The caterpillar is light green, with brown and white longitudinal stripes; head reddish. The egg is ribbed, and of a whitish colour, speckled with brown.

SPECIES 3.—OREINA CASSIOPE. THE SMALL RINGLET BUTTERFLY.

Plate xxiii. figs., 9, 10.

SYNONYMES.—*Papilio Cassiope*, Fabricius.

Hipparchia Cassiope, Ochseneimer. Stephens Illustr. Haust. 1, pl. 8, figs. 1, 2, 3. Curtis. Duncan Brit. Butt. pl. 24, fig. 3.

Melampias Cassiope, Hübner.

Papilio Ethiops minor, Villars.

VAR.—*Papilio Mnemon*, Haworth Ent. Trans. 1, 332.

VAR.—*Hipparch. Melampus*, Newm. Zool. 29 (not of Esper).

This species differs from the two preceding species of this group in having the wings much more elongated; the hind pair being also entire and not denticulated. The fore wings generally measure $1\frac{1}{4}$ or $1\frac{1}{2}$ inch in expanse. The wings above are of a brown colour with a silky gloss; the fore wings having a red bar near the extremity interrupted by the veins, and not extending to the margins of the wings; in this bar are generally four small black dots with obscure pupils; but specimens occur with only three, two, or even no ocelli, whilst in others the bar itself is reduced to a few red spots. The hind wings have also a red bar near the extremity, bearing three similar eyelets. On the under side the fore wings are redder brown, with the red band marked with four black spots, whilst the hind ones are ashy or coppery-brown with three black spots, each surrounded by a slender red ring. Variations occur in the number and size of the spots as well as of the band.

The mountainous districts of Cumberland and Westmoreland are the only localities yet indicated for this small species, upon which Mr. Curtis makes the following observations:—"The males in forward seasons have appeared as early as the 11th of June; but last year (1829), when Mr. Dale and myself visited Ambleside, they were later, the first being taken the 18th of June; and they did not become plentiful till the 25th. They are found amongst the coarse grass that covers considerable spaces abounding with springs on the sides of mountains. They only fly when the sun shines, and their flight is neither swift nor continued, for they frequently alight amongst the grass; and, falling down to the roots, their sombre colour perfectly conceals them. The females are later, and have been taken even in August. We found the males on Red Skrees, a mountain near Ambleside; and Mr. Marshall took them at Gable-hill and Styehill, between Wastwater and Borrowdale."*

HIPPARCHIA MNESTRA of Ochseneimer (and our plate xlii., fig. 4, 5,) was introduced into the list of English species without authority, in the second edition of the "Butterfly Collector's Vade-Mecum," on the examination of a variety of *Oreina Cassiope* in the British Museum, in which the fascia on the fore wings has only two eyelet spots. Mr. Stephens, however, corrected the error, in his "Illustrations" (Haustell, vol. i. p. 63); but Mr. Curtis has subsequently given *Mnestra* as a British species, in the second edition of his "Guide," but accompanied by a

* The butterfly described under the name of *MELAMPUS* by Mr. Newman (in *Zoologist*, p. 729), is not the species so named by Esper, but is now regarded as a variety of this species. It measures $1\frac{1}{2}$ to $1\frac{3}{4}$ inch in the expanse of the fore wings, which are blackish brown; the fore wings with a subapical ferruginous patch divided by the veins, bearing several black dots; hind wings with three ferruginous spots bearing black dots. Beneath red brown, with broad brownish margins, and with the fascia and spots less distinct; hind wings rufo-atomose, with three red spots and black dots. Taken on the mountains in Perthshire, by Mr. Weaver, in July.

mark of interrogation. That gentleman has, however, recently observed to me in a note, "You will observe that *Mnestra* Hub.? is *queried*, and it may be only the female of *Cassiope*." The true *Mnestra*, as carefully figured by Boisduval, in his "*Icones Historiques des Lépidotères d'Europe*," v. i., pl. 35, fig. 1—4, has the disc of the under side of the fore wings in both sexes rich red brown; the fore wings are also "proportionnellement assez courtes arrondies." It is found in various parts of Switzerland, especially near the Great and Little St. Bernard. The males have the red band of the fore wings unspotted, and in the females it has two eyes on each side.

FAMILY III. ERYCINIDÆ.

This family of butterflies is distinguished by the males having only four ambulatory feet, whilst the females have six, or in other words, the fore legs of the males are rudimental, whilst they are perfect in the females; the anal edge of the hind wings is but slightly prominent, the discoidal cell is open, or closed either entirely or partially by a false nervure. The claws of the tarsi are minute, and scarcely perceptible. The caterpillars are very short, pubescent or hairy, and the chrysalis is short and contracted.

The insects of this family are of small size, and almost exclusively confined to South America. They are often very brilliant and varied in their colours, their wings being mostly marked with spots. They, however, exhibit a certain appearance of weakness in their formation quite unlike that of *Nymphalidæ*. M. Lacordaire, nevertheless, informs us that the flight of the South American species is very rapid, and that the majority rest with their wings extended on the under side of the leaves. The only British species which belongs to this family (forming, indeed, an aberrant group therein) is the small fritillary known to collectors under the name of the Duke of Burgundy, which differs from all the *Nymphalidæ* (in which family it has been arranged by Stephens, Curtis, etc.) in several important respects, especially in the perfect structure of the fore legs in the females, the minute simple unguis, the posterior tibiae destitute of spurs, the onisciform larva, and the girt chrysalis. In its general appearance, however, as well as in its colours and markings, it bears a more immediate resemblance to the small fritillaries of the genus *Melitææ*, but the relation is one of analogy and not of affinity, the general appearance alone constituting the resemblance, whilst in its more important structural characteristics it possesses no real relation with the *Melitææ*. How far it would be advisable (as has been done by Mr. Stephens in the British Museum List) to invert the arrangement of the genera constituting the family *Nymphalidæ*, in order to bring the *Hipparchiides* into conjunction with the *Pierides*, and thus terminate the family with the *Melitææ* (which would be thus brought into connection with the present family) is very doubtful. Such a step would, moreover, completely overturn the arrangement of Dr. Horsfield, and the *natural* transition of the genera which he laboured to propound.

DESCRIPTION OF PLATE XXIV.

INSECTS.—Fig. 1. *Hamearis Lucina* (the Duke of Burgundy Fritillary B.) 2. Showing the under side. 3. The Caterpillar. 4. The Chrysalis.

" Fig. 5. *Thecla Quercus* (the Purple Hair-streak B.) female. 6. The male. 7. A common variety of the male, more dusky in tint. 8. Showing the under side. 9. The Caterpillar. 10. The Chrysalis.

PLANTS.—Fig. 11. *Primula vulgaris* (the common Primrose). 12. *Quercus pedunculata* (a variety of the common Oak).

I have described fig. 1 as the female *T. Quercus*, a fact said to be ascertained by a careful dissection. But, as in every other instance among diurnal

Lepidoptera, the fine *metallic* tints, similar to the brilliant purple marks on the fore wings of this insect, are only displayed by the male—as in the purple Emperor, all the genus *Lycena*, etc., etc.—this assertion is against general analogy. Both insects are from specimens in the British Museum, and the larvæ are from Hübner. H. N. H.

The only British Genus is the following :

HAMEARIS, HÜBNER. (NEMEOBIUS, STEPHENS.)

This very interesting genus is distinguished from all the preceding by the small size of the insects, as well as from all the Nymphalidæ by the nature of its transformations. The head is rather small, with the eyes hairy, and the short palpi not extending beyond the tuft of hairs on the forehead; they are slender, and three-jointed, the second joint long, and the third small and subglobose. The antennæ are slender, and terminated by an abrupt compressed club. The fore wings are short and somewhat triangular, the front margin being nearly straight, the hind wings are rounded and denticulated. The veining of the wings is peculiar, and has not been before described. In the fore wings the veins are arranged as in *Argynnis*; the postcostal vein superiorly emitting two branches before reaching the transverse vein which closes the discoidal cell. A third branch is emitted at the place of the junction of the transverse with the postcostal veins; this third branch superiorly emits two branchlets; the postcostal vein after emitting this third branch is simple, and extends to below the tip of the wing. In the hind wings the vein which corresponds with the postcostal one emits an outward branch (which extends to the outer angle of the wing), at a considerable distance *below* the place from whence the interior branch of this postcostal vein is emitted.* Whereas in the other Fritillaries the outward branch originates considerably nearer the base of the wing than the inward branch. The fore legs are short, imperfect, and thickly clothed with hair in the males, the tarsal portion being destitute of articulations. In the female the fore legs, on the contrary, are as perfect as the others, and clothed with short scales; the tarsi being as long as the tibiæ, composed of five distinct joints, terminated by minute simple claws and pulvilli. The tibiæ of the hind feet are destitute of spurs.

Mr. Stephens, with philosophical tact, pointed out the propriety not only of separating this genus from the other Fritillaries, but also noticed its variance in several respects with the characters of the family Nymphalidæ, in which he placed it, such as the simplicity of the claws and posterior tibiæ. He was, however, unacquainted with the caterpillar and chrysalis states. These have, however, since been figured by Mr. Curtis (copied from Hübner), and fully prove the correctness of Mr. Stephens's suggestion of the distinction between this genus and the other Nymphalidæ, the caterpillar being onisciform, and the chrysalis not only attached by the tail, but also fastened by a girth across the middle of the body.

The only British species is

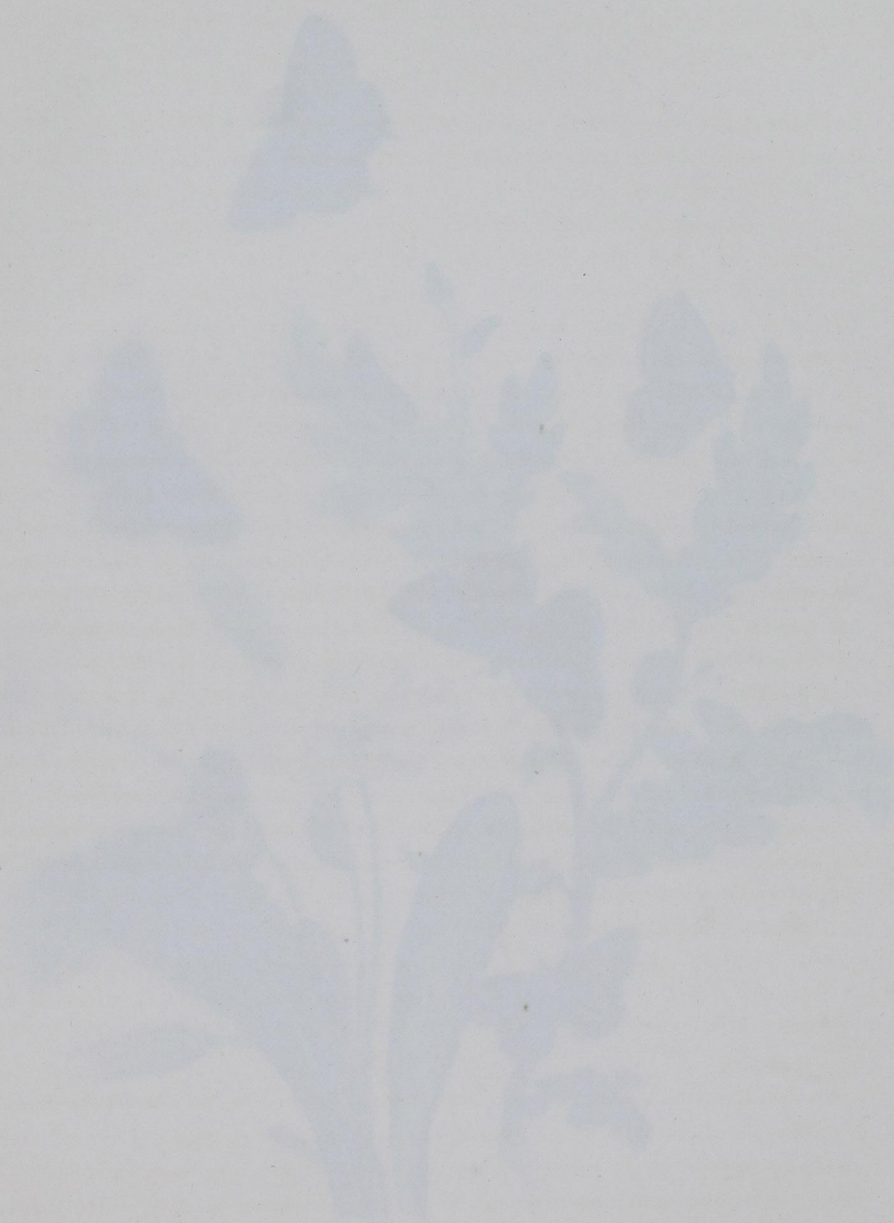
HAMEARIS LUCINA. THE DUKE OF BURGUNDY FRITILLARY.

Plate xxiv. fig. 1—4.

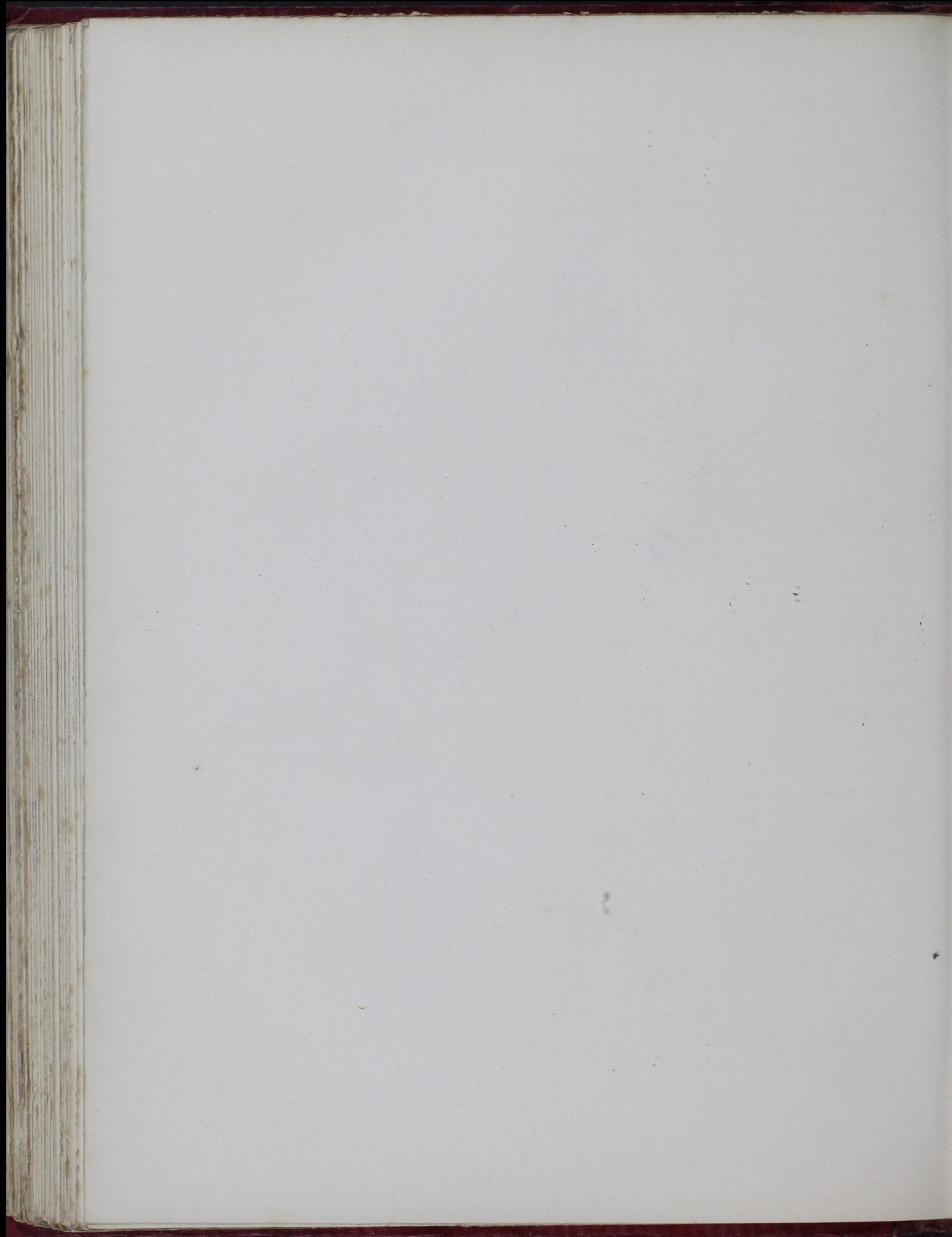
- | | |
|---|--|
| SYNONYMS.— <i>Popilio Lucina</i> , Linnæus. Lewin Br. Pap. pl. 15. | Boisduval Hist. Nat. Lep. vol. 1, pl. 2 B, fig. 8. Westwood Introd. to |
| Donovan Brit. Ins. vol. 7, pl. 242, f. 2. Harris Aurelian, pl. 27, fig. n—o. | Mod. Classif. of Ins. vol. 2, p. 357, fig. 99, 12—14. |
| Haworth (not of Wilkes, pl. 114, which represents <i>Artemis</i>). | <i>Hamearis Lucina</i> , Hübner. Curtis Brit. Ent. pl. 316. |
| <i>Nemeobius Lucina</i> , Stephens. Horsfield. Duncan Brit. Butt. pl. 12, fig. 1, | <i>Melitæa Lucina</i> , Ochsenheimer, Leach, Jerymn. |

This pretty little butterfly varies in the expanse of its wings from 1 to 1½ inch. On the upper side the ground-colour of the wings is brown, ornamented with numerous orange-coloured marks and spots, forming in the fore wings three transverse series. The one nearest the base of the wings is most irregular,

* I have only found this peculiarity in several species of *Erycinidæ*.—(See Boisduval, "Hist. Nat. Lep.," pl. 20, 21).







forming two strong curves; in the second, the spots are of unequal size, the two nearest the costa being very minute, and the two following the largest; the terminal row consists either of a series of oval spots, with a black dot in the centre of each, or orange crescents. The cilia is alternately black and white; the hind wings are brown, with about four small irregular pale spots, and a submarginal row of spots or lunules as in the fore wings. Beneath, the wings are much more varied in their colours, the ground colour being much paler; the orange spots again appear, but are separated from each other by black marks towards the hind margin of the fore wings; the hind wings are ornamented towards the base with an abbreviated bar, formed of four or six white oblong spots; this is succeeded by an orange bar, which is followed by an irregular white bar, formed of nine unequal-sized white patches. Along the margin is a row of fulvous ocelli, with a black dot in the middle of each, edged behind with white. The ground colour of the wings of the female is black instead of brown, with the markings larger and brighter coloured; the latter in the males are occasionally almost obliterated, except the marginal ones.

The following account of the preparatory states of this interesting insect is quoted by Mr. Curtis, from Hübner's valuable work on the European Lepidoptera:—"The eggs are found solitary, or in pairs, on the under surface of the leaves of *Primula veris* and *elatior* at the beginning of summer; they are almost globular, smooth, shining, and pale yellowish-green. The caterpillar feeds on the leaves; its head is roundish, heart-shaped, smooth, shining, and bright ferruginous, black only on the mouth and about the eyes; its body is almost oval, but long, depressed, and set with rows of bristly warts; the other parts are set with feathery hairs; on the back, at least, from the fourth joint to the tail, there is a black dot on each joint, and on the sides similar, but less distinct spots; the colour is pale olive orange; its feet are rusty brown; the spiraculæ black; claws and belly whitish. It moves very slowly, rolls itself up when disturbed, and remains in that state a long time. Soon after the middle of summer it becomes a pupa, not only fastening its body by the apex, but also by spinning a cord across its middle; in this state it remains until the end of the following spring. Hübner, who reared it from the egg, says also that the caterpillar throws off five skins before it becomes a pupa, and its appearance, at different ages, varies considerably. The larva represented (and copied in our plate xxiv., fig. 3), he found on a *primula* in his own garden."

Coombe Wood; Darenth, Kent; Boxhill; Dulwich; the New Forest; and in Dorsetshire, Berkshire, and Barnwell-wold, Northamptonshire, are given for the localities of this rather uncommon species; and Mr. Duncan adds, that it has been also taken as far north as the neighbourhood of Carlisle, by Mr. Heysham.

FAMILY IV.
LYCÆNIDÆ, LEACH.

The present family (corresponding with the Polyommata of Swainson and the Vermiform Stirps of the butterflies of Dr. Horsfield) comprises a numerous assemblage of small and weak, but beautiful creatures, distinguished by the minute size of the tarsal claws; the apparent* identity in the fore tarsi of both sexes, the fore legs being fit for walking; the hind tibiae with only one pair of spurs; the antennæ not distinctly hooked

* The fore tarsi have been described by Messrs. Curtis, Stephens, etc., as identical in both sexes; but in examining the Indian *Thecla Isocrates*, I discovered that the tarsus of the males consists of a long simple joint; and I subsequently found the same to be the case in *Polyommatus Corydon*.

at the tip; the last joint of the palpi is small and naked; the anal edge of the hind wings slightly embraces the abdomen; the discoidal cell of the hind wings is apparently closed by a slender vein. The caterpillars bear a very considerable resemblance to wood-lice, the head being retractile, and the feet very minute; the body is oval and depressed; the chrysalis is short, obtuse at each end, and girt round the middle as well as attached by the tail.

The family comprises several distinct groups, namely, such as are known to collectors under the names of blues, coppers, and hair-streak butterflies, respectively distinguished in our indigenous species by their varied tints of blue, fiery red, or dusky, with slender lines on the under side of the wings. In many of the exotic species, however, these colours run beyond the limits of their respective groups, thus forming a series. The majority have the entire under surface of the wing, or at least the anal angle, ornamented with beautiful eye-like spots of various colours. Some of the exotic species are amongst the most lovely of the butterfly tribes. In many of these, the hind wings are produced into very long tails. Their flight is varied, some delighting to sail over the tops of oaks and other trees, on which they have passed their preparatory states, whilst others are feeble and slow in their motions, flying over low grass and herbage.

Dr. Horsfield has investigated the transformations of several of these insects, in his *Lepidoptera Javanica*, the larvæ of which vary very considerably in their form, some exhibiting a much slighter resemblance to wood-lice than others; some are very rough on the upper surface of the body; and that of *Thecla Xenophon*, a Javanese species, has several rows of fascicles of hairs. They have hitherto been observed to feed only upon the leaves of different plants and trees in the larva state; but a beautiful Indian species (*Thecla Isocrates*) resides within the fruit of the pomegranate—several (seven or eight) being found within one fruit—in which, after consuming the interior, they assume the pupa state, having first eaten as many holes as there are insects through the rind of the fruit, and carefully attached its footstalk to the branch by a coating of silk, in order to prevent its falling. (Westwood, in "Trans. Entomological Society," vol. ii., pl. 1).

I have already (in p. 35) referred to the arrangements which have been proposed by various authors, in order to bring this family, with its girt chrysalis, into connection with the Papilionidæ, in which the chrysalis is also girt. We are not sufficiently advanced in the knowledge of the transformations of exotic Lepidoptera to determine the soundness of these different views.

GENUS XXI.

THECLA, FABRICIUS.

This genus, as characterised by our English species, is at once known from the two following by the very gradually formed club to the antennæ, the short terminal joint of the palpi, the hairy eyes,* the short triangular fore wings and hind wings generally furnished with a short tail and strongly scalloped near the anal angles, and by the under surface of the wings being generally ornamented with one or two delicate lines of a pale colour on a dark ground. This last-mentioned peculiarity has led to the insects of this genus being named by collectors "hair-streak butterflies."

* Mr. Curtis, "Brit. Ent." pl. 264, represents the eyes of this genus as naked, although he describes them correctly.

No genus has ever more strongly proved the great advantages to be derived from a minute, analytical examination of the different organs of insects than the present. For want of such an examination in the structure of the feet, which in this group affords sexual differences, the males of the beautiful species represented in our 24th Plate are described in all previous works on English butterflies as the females, and vice versâ. Even by Messrs. Curtis and Stephens, who introduce the structure of the fore feet into the characters of the genus, they are described as "alike in both sexes." For our knowledge of the peculiarities existing in these organs in the different sexes we are indebted to Dr. Horsfield, who was accordingly enabled to determine the sexes of the species with precision. The male anterior tarsus consists of a single long joint; which is as long as the entire *articulated* tarsus of the female, and when covered with scales might easily be regarded as similarly articulated. The intermediate thigh is also furnished with a remarkable tooth near the extremity, and there is a corresponding notch in the tibia.

In preceding pages (9 and 23), I have described the two different plans adopted by elongated Caterpillars, in order to effect their transformation beneath a girth across the middle of the body. The caterpillars of the present family, by their short wood-louse form, at first sight present far more apparent obstacles to the accomplishment of such a proceeding. We have only to fancy to ourselves a very stout little man, with his arms bound to his sides, and his legs tied together, laid upon his stomach on the ground, and whilst in that situation compelled to attach a rope on one side of his body, to carry it across his back, to fasten it on the other side, and then to undress himself. Reaumur has, however, so carefully and circumstantially described the proceedings of a species of this genus,* that we are enabled to bring the whole process before our mind's eye. When the period for the transformation of the insect is arrived, the caterpillar attaches itself by the tail, and shortening the fore part of the body by contracting the segments considerably, it emits an arched thread from the extended spinneret of its mouth, which it attaches at one side of the head; it then carries the thread to the other side, having the instinct to extend it to a fit length, in order that when the process is complete the body may neither be too much tightened nor too loose for support. After attaching a number of threads by passing the head backwards and forwards, emitting a continuous thread from the mouth during the process, a skein of between 50 and 60 threads (as Reaumur supposes) is formed, of a fit length, attached at each end at the sides of the head; which, as already stated, is drawn considerably backwards, owing to the great contraction of the anterior segments of the body. In this consists the chief difference between the proceedings of these insects and those of the swallow-tailed and cabbage butterflies, described in our previous pages, the head of the caterpillars of those species, owing to the slender form of the body, being thrown over the back, or greatly elevated. During the process of spinning this skein of thread, the caterpillar has contrived to insinuate its head beneath them, so that the skein rests upon the scaly back of the head, and when the skein is completed it gradually pushes the front of its body beneath the skein, pressing its body down as closely as possible, until it contrives that the middle of the body shall be girt by the skein. The difficulty is apparently increased by the very great delicacy of the threads, and by the body of the larva being clothed with strong short bristles. When completed, the skin of the caterpillar bursts, and the pupa appears; the process of getting rid of the old skin being similar to that adopted by the other girt caterpillars of the butterflies mentioned above.

* Linnaeus gives Reaumur's insect as his *Papilio Pruni*, but this it can scarcely be, for Reaumur's description does not accord with that species, and Reaumur found his larvæ on the elm.

The caterpillars of this genus are not found on herbaceous plants, but frequent trees and shrubs, over which the perfect insects fly. The species are very numerous, although we possess but very few; and even amongst those some very peculiar distinctions occur. Thus, in *Thecla Quercus* (contrary to the general rules of insect colouring), the female puts on the "imperial purple;" the fulvous patch in the fore wing of the female of *Thecla Betulæ* is found in the females of some exotic species, the males of which are adorned with the purple tint, whereas the males of *Thecla Betulæ* are obscurely coloured. The males of *Thecla Rubi*, *Spini*, and *W-Album*, are distinguished by having a small ovate glabrous patch at the extremity of the discoidal cell of the fore wings on the upper side.* *Th. Rubi* differs from all the rest in not having the hind wings tailed, and by the underside of the wings being neither marked with the slender pale hair-streak, nor by any ocellus at the anal angle.

Dr. Horsfield, who has described twenty-six species of these insects, found in Java, has divided the genus into two subgenera,—*Thecla* proper, and *Amblypodia*. Unfortunately, however, he did not investigate the peculiarities of the veins of the wings of his subgenera and sections; a character which the reader need scarcely be reminded has been already shown, in the pages of this work, to be of primary importance in determining natural groups. Although previously so greatly neglected, this character supplies the means of dividing our English species into two primary groups,† which ought, perhaps, consistently to be considered as distinct subgenera, supported as they are by some other characters. It is, however, perhaps more advisable (until the exotic series of species is carefully investigated), to leave the genus entire, indicating the groups into which the British species are divisible. This plan is also adopted, because the investigation of the peculiarities in the veining of the wings is attended with great difficulty, the scales having to be carefully removed from the surface of the wings. It is certainly remarkable that we should find, in species so closely allied together as all the British *Theclæ* are, such a variation in the veins; more especially as we have seen that nearly all the *Nymphalidæ*, varying as they do so greatly in their preparatory as well as perfect forms, exhibit a general identity in the arrangements of these veins—but Nature, in every extensive group, shows us the impropriety of trusting to a single character, which, in some tribes, may be most important and constant, whereas, in others, it may become variable and of secondary importance.

Retaining *Thecla Betulæ* as the true Fabrician type of the genus, I divide it in the following manner:

I. Those in which the postcostal vein of the fore wings emits two branches before its union with the ordinary transverse vein, and a third branch beyond its union therewith; this third branch sending forth a superior branchlet. Males without a patch at the extremity of the discoidal cell of the fore wings; antennæ with the club very gradually formed.

Sp. 1. *Thecla Betulæ*. 2. *Thecla Quercus*.

II. Postcostal vein of the fore wings emitting, in both sexes, three simple branches before and none after its union with the ordinary transverse vein. Males with a thickened patch at the extremity of the discoidal cell of the fore wings; antennæ with the club more suddenly formed.

A, with the hind wings tailed. 3. *Thecla Pruni*. 4. *Thecla W-Album*. 5. *Thecla Spini*. 6. *Thecla Ilıcis*. B, with the hind wings not tailed. 7. *Thecla Rubi*.

* This is produced by the dilatation of the base of the 2nd and 3rd branches of the postcostal vein.

† Hübner unites all the *Theclæ* into one family (Fam C. *Armati*), of his *Adolescentes*, separating *Rubi* under the generic name of *Lycus*, and *Quercus* under that of *Bithys*; the remainder forming his *Strymon*. Ochsenheimer gives our *Thecla* as the third family of *Lycœna*, separating, however, *Rubi* from the rest, and uniting it with the second family containing the *Coppers*.

DESCRIPTION OF PLATE XXV.

INSECTS.—Fig. 1. *Thecla Betulæ* (the brown hair-streak B.), female. 2. The male. 3. Showing the under side. 4. The Caterpillar.
5. The Chrysalis.
„ Fig. 6. *Thecla Pruni* (the black hair-streak B.), male. 7. The female. 8. Showing the under side. 9. The Caterpillar.
10. The Chrysalis.

PLANTS.—Fig. 11. *Prunus domestica* (the wild Plum). 12. *Betula alba* (the common Birch).

T. Betulæ is from specimens in the British Museum. *T. Pruni* from specimens in the fine collection of Mr. Stephens. The larvæ of both are from Hübner. The under side, fig. 3, is a female; the markings of the male are much less distinct, and of a more general rust colour. H. N. H.

SPECIES 1.—THECLA BETULÆ. THE BROWN HAIR-STREAK.

Plate xxv. fig. 1—5.

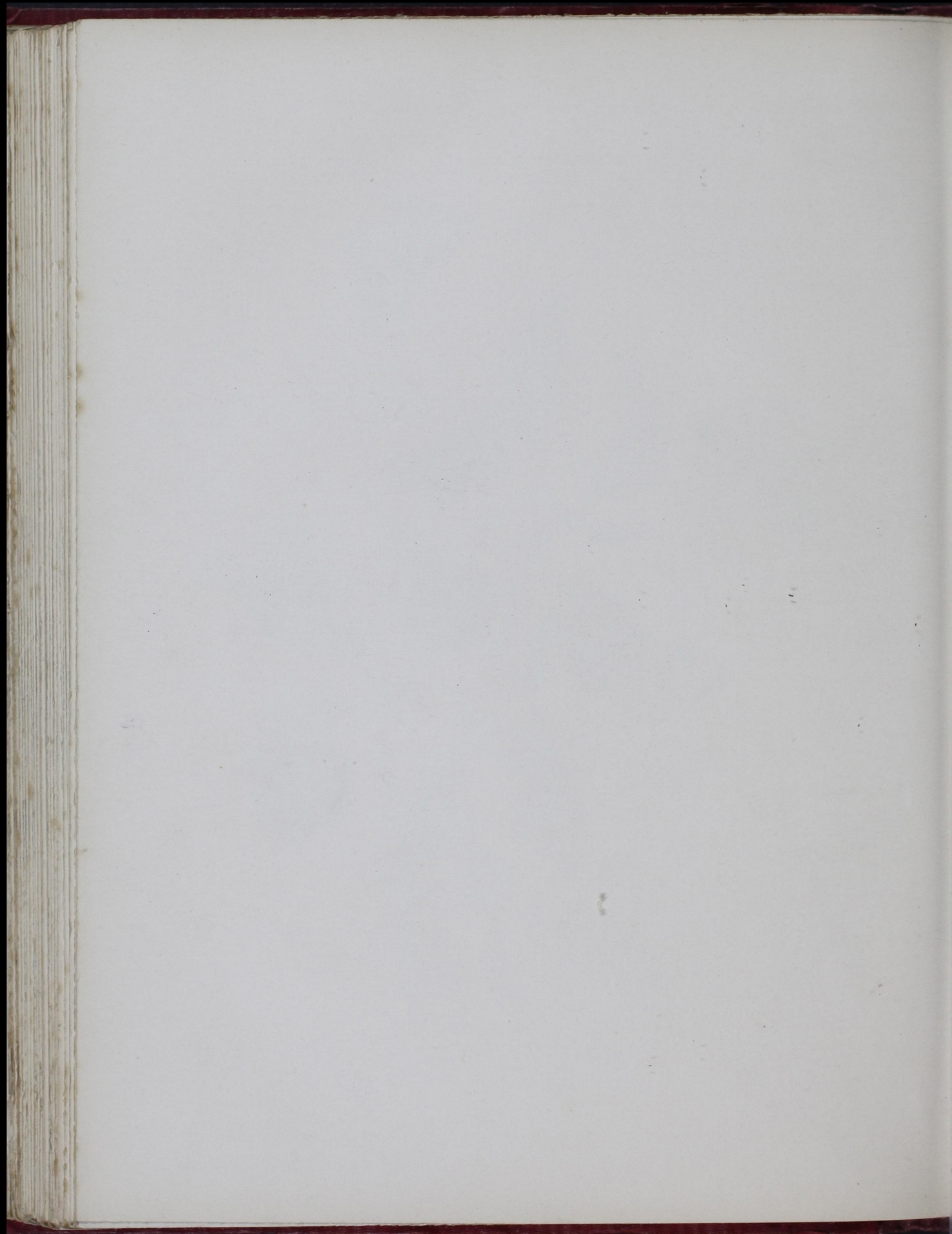
SYNONYMES.—*Papilio Betulæ*, Linnæus. Haworth, Donovan, vol. 8, pl. 250. Albin, pl. 5, fig. 7. Wilks, Brit. Butt. pl. 117. Harris, Aurelian, pl. 42. Lewin, pl. 42.

Thecla Betulæ, Fabricius. Leach, Stephens, Curtis, Duncan, pl. 27, fig. 1.
Lycana Betulæ, Ochsenheimer.
Strymon Betulæ, Hübner (Verz. bek. Schm.)

This species being the true Fabrician type of the genus *Thecla*, is placed at the head of the species of Hair-streak Butterflies; moreover it is the largest British species of the genus, the fore wings extending from $1\frac{1}{3}$ to rather more than $1\frac{1}{2}$ inch; their upper surface is of a rich brown with a satiny gloss; the fore wings, in both sexes, are marked at the extremity of the discoidal cell with a short transverse black line, generally succeeded in the males by an obscure orange cloud (which is, however, sometimes wanting), and which in the females is replaced by a large kidney-shaped orange patch; the cilia is whitish; the hind wings are marked at the anal angle and at the base of the tail (and of the succeeding lobe of the female) with orange; there is also a minute white spot near the anal angle. The under side of the wings is tawny yellow, with the edge brighter orange; at the extremity of the discoidal cell of the fore wings is a short transverse dark line, edged with white, between which and the extremity of the wing is another broader dark orange wedge-shaped spot extending rather more than half-way across the wings, edged with a very slender dusky line, which is margined with white on the outside. The hind wings are somewhat richer coloured, especially near the anal angle, with an abbreviated white line edged externally with a dusky line extending half-way across the middle of the wing; between this and the margin of the wing is another slender irregular white line, edged internally with a dusky line, the space between these two dusky lines being rich orange; the anal angle is marked with small black spots, and the cilia on each side of the tail is striped with brown.

The caterpillar is pale green with paler oblique lines along the sides, and straight ones down the back. It feeds on the birch, black-thorn, plum, etc. The chrysalis is brown, with darker marks. The perfect insect appears in the month of August. It is by no means a common species, although widely distributed: Coombe, Birch, Hornsey, and Darenth Woods; Raydon Wood, near Ipswich; Barnwell-wold, Northamptonshire; Monks Wood, Cambridgeshire; Berkshire, Dorsetshire, Devonshire, Dartmore, and Norfolk, are given as the localities of this species.





SPECIES 3.—THECLA PRUNI. THE BLACK HAIR-STREAK BUTTERFLY.

Plate xxv. fig. 6—10.

SYNONYMES.—*Papilio Pruni*, Linnæus, Hübner.

Thecla Pruni, Stephens, Illustr. Haust. vol. 2, p. 66, note (not vol. 1, p. 77, which is *W-Album*). Curtis, Brit. Entomol. pl. 264. Duncan, Brit. Butt. pl. 28, fig. 1.

Thecla Spini, Brit. Butt. p. 30.*Strymon Pruni*, Hübner (Verz. bek. Schm.)*Lycæna Pruni*, Ochsenheimer.

This species measures from $1\frac{1}{4}$ to nearly $1\frac{3}{4}$ inch in the expansion of its wings, which are of brownish-black colour, the anterior in the males having a small silky oval patch near the middle towards the costal margin, the posterior wings have two or three (and sometimes more) orange-coloured lunular spots near the hind margin towards the anal angle, where there is a small bluish dot occasionally, as in the upper figure of the twenty-fifth Plate. The orange lunules exist along the entire margin of the hind wings, and extend into the fore wings; but such is of rare occurrence, if indeed it be not the character of the female, as stated by Mr. Stephens. Beneath the ground colour is of a lighter brown, having an ochre-tint; the fore wings having a slender nearly straight bluish-white line extending across the wing beyond the middle, and reaching to the inner margin of the hind wings, where it assumes a more irregular appearance, somewhat resembling an obtuse W; beyond this line the fore wings are marked with several obscure fulvous patches, those nearest the anal angle being preceded by a small black and silvery dot or eyelet; these black spots, seven in number and edged internally with silver, are more conspicuous on the hind wings, and are succeeded by a broad fulvous bar extending to the anal angle, the outer edge of which is marked with semicircular black marks (followed by a silvery line), those nearest the anal angle being the largest; the anal angle itself is black with a silvery dot. The cilia is black at the base, and externally silvery with black spots; the tails are black, the antennæ are annulated with white, and the eyes are margined with the same colour.

This species has only been known as a native species during the last ten or twelve years, the earliest notice of its occurrence having been given by Mr. Stephens, as above referred to (and not in vol. ii., p. 69, of the "Illustrations" as referred to by Mr. Stephens in vol. iv., p. 382). Shortly afterwards it was figured by Mr. Curtis in his "Illustrations," who states that a number of specimens had been taken in Yorkshire, by Mr. Seaman, in the preceding July (1828). Mr. Stephens states, however, that this locality is erroneous, and that the insect occurs in profusion in Monk's Wood, Herts. It is true we find a *Thecla Pruni*, in English works published previous to this period, but the fact was that English entomologists had mistaken the next species (*Thecla W-Album*) for the Linnæan *Papilio Pruni*, until the capture of the real species enabled them to correct their error. Mr. Bree informs us that this butterfly has been taken by his son in great abundance in Barnwell-wold, in July, 1838, where also Mr. F. Bond has since found it equally common.

The caterpillar is green, with oblique yellowish lines at the sides, and darker marks down the back. The chrysalis is brown with lighter markings, and dark tubercles.

DESCRIPTION OF PLATE XXVI.

INSECTS.—Fig. 1.—*Thecla W-Album*, male (the white W-hair streak Butterfly). 2. The female. 3. Showing the under side. 4. The Caterpillar. 5. The Chrysalis.

„ Fig. 6. *Thecla Rubi*, male (the green hair-streak B). 7. The female. 8. Showing the under side. 9. The Caterpillar. 10. The Chrysalis.

PLANTS.—Fig. 11. *Ulmus campestris* (the common Elm).

„ Fig. 12. *Rubus caesius* (the common Dewberry).

T. *W-Album* and T. *Rubi*, are both from specimens in the British Museum; the Caterpillar and Chrysalis of the former are from Godart; of the latter, from Hübner. H.N.H.

SPECIES 4.—THECLA W-ALBUM. THE W-HAIR-STREAK BUTTERFLY.

Plate xxvi. fig. 1—5.

SYNONYMES.—*Papilio W-Album*, Villers Ent., vol. 2, pl. 4, fig. 12.*Thecla W-Album*, Hübner, Godart, Stephens, Illust. vol. 2, p. 66; Curtis, Duncan, Brit. Butt. pl. 23, fig. 2.*Papilio Pruni*, Lewin Pap. pl. 44. Haworth, Donovan, Brit. Ins. vol. 13, pl. 437.*Thecla Pruni*, Leach, Jermyn, Stephens's Illust. vol. 1, p. 77.*Strymon W-Album*, Hübner.*Lyceena W-Album*, Ochsenheimer.

This species is closely allied to the preceding, but may at once be distinguished by the want of the orange marks on the upper side of the wings, and the more acute form of the W near the anal angle of the hind wings beneath, whence the name of the species. The expansion of the wings varies from a little less than $1\frac{1}{4}$ to rather more than $1\frac{1}{2}$ inch. The upper surface of the wings is of a uniform dark brown or blackish, with a minute white, and sometimes a few rufous scales near the anal angle. The males have an oval glabrous spot near the middle of the fore wings towards the costa. On the under side, the ground colour of the wings is of a paler brown, and the fore wings are marked beyond the middle with a transverse white line (which is rather broader and more wavy in the female than in the male), and which does not extend to the anal angle; the hind wings are traversed by a slender white line beyond the middle, which is more slender and greatly angulated near the abdomen, forming the letter W. A row of slender black lunules (slightly edged internally with white) runs nearly parallel with the outer margin of the hind wings, succeeded by a fulvous band extending from the anal angle about half-way towards the outer angle of this pair of wings, where it becomes gradually obliterated; externally this band is marked with black semicircular spots, succeeded by a silvery line at the base of the cilia (those nearest the anal angle being largest); the anal angle itself is black, with a silvery dot. The tails are black, tipped with white; those of the females being the longest: the antennæ are ringed with white, the tip reddish, the tarsi whitish, ringed with brown.

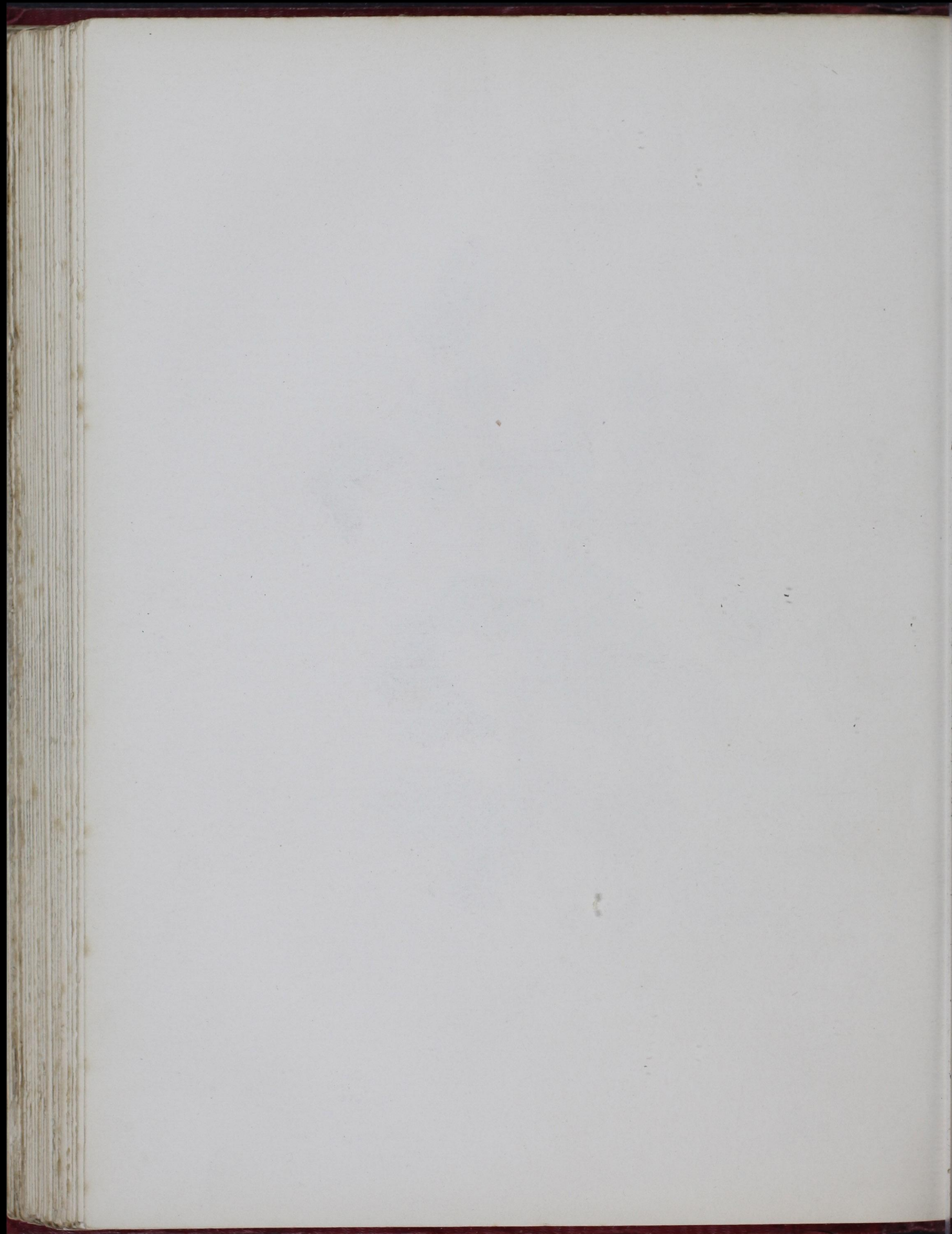
The caterpillar is green, the posterior segments of the abdomen being spotted with dark red, and two rows of small dots down the middle of the back, which is dentated, and paler oblique lateral marks. Previous to undergoing its transformations, it assumes a brown colour. The elm and the black-thorn have been given as its food. The chrysalis is brown, with a white head.

Until about twelve years ago this was a scarce insect, and was confounded with the preceding.* In July 1827, however, Mr. Stephens found it in myriads enlivening the hedges for miles in the vicinity of Ripley (but not to the north nor north-west of the village, although the bramble, upon the blossoms of which it chiefly delighted to settle, was in equal profusion there). Of their astonishing numbers then observed, an idea may be obtained when it is stated that he captured nearly 200 specimens in less than half an hour as they approached the bramble-bush near which he had stationed himself. This is the more remarkable, as he had never previously observed it in that neighbourhood, although he had frequently collected there; near Windsor, Cambridgeshire; near Ipswich, and Bungay, Suffolk; and Southgate, Middlesex, have been given as additional localities. The Rev. W. T. Bree also informs us that his son has taken it sparingly in Barnwell-wold, and that it occasionally occurs near Allesley; and Mr. F. Bond, that it occurs at Monks Wood, Cambridgeshire, and near Yaxley, its larva feeding on the elm.

* "*Papilio W-Album*, Villars, 2, 83, t. 4, t. 12, a. *P. Pruni* nullo modo differt." Haworth "*Lep. Brit.*" p. 33.







DESCRIPTION OF PLATE XXVII.

INSECTS.—Fig. 1. *Thecla Spini*, male. 2. The female. 3. Showing the under side. 4. The Caterpillar. 5. The Chrysalis.

„ Fig. 6. *Thecla Ilicis*, female. 7. Showing the under side. 8. The Caterpillar. 9. The Chrysalis.

PLANTS.—Fig. 10. *Prunus Spinosa* (Sloe).

„ Fig. 11. *Quercus Ilex*.

It is doubted by many, whether either of the above-named insects is British; but as they are said to have been captured upon one or two occasions, this work would not be complete without them. *T. Spini* is from a pair of German specimens in the British Museum. *T. Ilicis* from the figure of Hübner; and the larvæ of both are from the same source. H. N. H.

SPECIES 5.—THECLA SPINI. THE PALE BROWN HAIR-STREAK BUTTERFLY.

Plate xxvii. fig. 1—5.

<p>SYNONYMES.—<i>Hesperia Spini</i>, Fabricius, Hübner, Pap. pl. 75, fig. 376, 377. <i>Papilio Spini</i>? Haworth, Ent. Trans. 1, p. 336. <i>Thecla Spini</i>, Jermy, Stephens, Wood Ind. Entomol. fig. 53, Curtis?</p>	<p><i>Papilio Lynceus</i>, Esper. 1, pl. 39, fig. 3. <i>Strymon Spini</i>, Hübner. <i>Lycæna Spini</i>, Ochsenheimer.</p>
---	---

In the third part of the Transactions of the old Entomological Society, of which the late Mr. Haworth was the main support, we find in a list of species of butterflies which had been exhibited from time to time before the Society, one called the pale brown hair-streak with the trivial name *Papilio Spini* attached, but accompanied by a mark of interrogation. This specimen was stated by Mr. Haworth to Mr. Curtis to have been purchased in an old English collection. Mr. Stephens, however, gave the *Thecla Spini* as an undoubted native species, on the further authority of a specimen which he states to have been taken in Norfolk by Mr. Sparshall.* He however gives a translation of the Fabrician character of *T. Spini* instead of a description either of Mr. Haworth's or Mr. Sparshall's specimens, which is the more to be regretted as Mr. Curtis states not only that Mr. Sparshall received his specimen from some of his correspondents in town (thus rendering its real indigenesness questionable), but that Mr. Haworth's specimen neither agreed with Hübner's figure of *Spini* nor with Mr. Stephens' (that is the Fabrician) description of the same species. I regret that I have not been able to obtain access to either of these two reputed specimens for comparison, in consequence of the deaths of both Mr. Haworth and Mr. Sparshall. Mr. Haworth, however, allowed Mr. Wood to make a drawing of his specimen, the under side of which is accordingly represented in the "Index Entomologicus," pl. 2, fig. 53, of the natural size, the fore wings measuring about an inch in expanse; the ground colour is pale brown, the fore pair having a transverse, straight, white streak beyond the middle of the wing extending from the costa, but not reaching the anal angle, and edged internally with a black streak. A similar white streak edged within with black extends across the hind wings to the anal edge, where it forms a letter W more obtuse than in *Th. W-Album*, but more clearly marked than in *T. Pruni*. The anal angle is brown, with a fulvous marginal streak, and there is a large fulvous patch with a black dot at the base of the tail, which is much longer than in any other English species. The base of the cilia is black. The true *Spini* closely resembles *T. Pruni*, the upper surface of the wings being of a brown colour, the hind pair having several red spots next the margin. The tip of the tail is white. Beneath, the

* Many specimens of the *Thecla Spini* are stated by Mr. Hoy, in "London's Magazine of Natural History," (vol. 2, p. 88,) to have been taken by Mr. Seaman, of Ipswich. The insects in question were *Th. Pruni*.

wings are ashy, with a white streak which is slightly angulated at the anal angle. Towards the posterior margin are several fulvous lunules marked with black, and a large bluish spot at the anal angle, with a terminal black spot. The caterpillar is green, with dorsal lines formed of yellow spots, and with a black head; when more mature it becomes reddish. The chrysalis is pilose, brown above, and ashy beneath. This description, which is translated from the Fabrician character, together with our figures taken from German specimens of *T. Spini*, will enable any one to determine the species in case it should hereafter be captured in this country, which is not improbable; its claim to be regarded as a British species being at present very questionable. (It is indeed placed among the *reputed* species by Mr. Stephens, in the "Brit. Mus. Catalogue of English Lepidoptera.")

SPECIES 6.—*THECLA ILICIS*. THE EVERGREEN OAK HAIR-STREAK BUTTERFLY.

Plate xxvii. fig. 6—9.

SYNONYMES.—*Papilio Ilcis*, Esper. Schmett. 1, t. 39, Suppl. 15, fig. 1, b. (fem.) Borkhausen, Eur. Schm. 1, pp. 138, 267, and 2, p. 216; Hübner Pap. t. 75, fig. 378, 379; Ochsenheimer, Schmett. v. Eur. 1, pts. 2, p. 105.

Hesperia Rur. Linæus, Fabricius, Ent. Syst. 3, p. 279.
Polyommata Lynceus, Godart, Lep. d. France, 1, 186.

The expansion of the wings of this species is rather greater than that of *Th. Spini*. The upper side of the wings in the male is of a blackish-brown colour with a greenish tinge, whilst the female has a large orange patch on the disk of the anterior pair of wings beyond the middle. In both sexes the anal angle is marked with a reddish spot. The underside is brown grey, with a very slender somewhat waved white streak, edged internally with black, extending across all the wings and forming an obtuse W near the anal angle. The hind wings are also ornamented with a row of orange crescents between the white streak and the margin of the wing, bordered with black, the anal angle itself being also orange; the tails and base of the ciliæ of the hind wing being black, edged internally with white.

The caterpillar is green, varied with slender oblique lateral lines and dots, and a dark purple line down the side. It feeds upon the evergreen oak.

I have introduced this species on the authority of a specimen in the collection of Mr. Maynall, stated to have been taken in Yorkshire. From later information, however, given to me by Mr. Stephens (who places it among the reputed British species in his "Brit. Mus. Catalogue"), there is perhaps reason to doubt the fact of the capture of the specimen in this country, it having been purchased from a dealer in London who is reputed not to be sufficiently precise in the localities of his specimens of rare Lepidoptera, and who moreover deals in exotic and European as well as British insects. It is proper to mention the circumstance, although there seems no reason why the species should not be a native of this country, the *Quercus Ilex*, or Common Evergreen Oak, which is a native of the south of Europe, having been extensively cultivated in Britain from a very remote period.

SPECIES 7.—*THECLA RUBI*. THE GREEN HAIR-STREAK BUTTERFLY.

Plate xxvi. fig. 6—10.

SYNONYMES.—*Papilio Rubi*, Linnæus, Lewin Pap. pl. 44. Haworth, Donovan, Brit. Ins. vol. 13, pl. 443. Wilkes, pl. 118. Harris, Aurelian, pl. 26, figs. a. b. d. g. Albin, pl. 5, fig. 8.

Thecla Rubi, Leach, Stephens, Curtis, Duncan, Brit. Butt. pl. 28, fig. 3.
Lycus Rubi, Hübner, (Verz. bek. Schmett.)

This species, which from the nature of the food of its larva is more frequently observed flying nearer the ground than its congeners, varies in the expanse of its wings from one inch to an inch and a third; on the upper side the wings are of a uniform obscure brown colour, with a slight silky gloss, especially in the male, which has



The first of these is the fact that the British Empire is a vast and varied one, covering a large part of the world. It is a fact which has been recognized for many years, and it is one which has led to the development of a new and more comprehensive system of international relations. The second of these is the fact that the British Empire is a vast and varied one, covering a large part of the world. It is a fact which has been recognized for many years, and it is one which has led to the development of a new and more comprehensive system of international relations.

THE HISTORY OF THE BRITISH EMPIRE

The first of these is the fact that the British Empire is a vast and varied one, covering a large part of the world. It is a fact which has been recognized for many years, and it is one which has led to the development of a new and more comprehensive system of international relations.

The second of these is the fact that the British Empire is a vast and varied one, covering a large part of the world. It is a fact which has been recognized for many years, and it is one which has led to the development of a new and more comprehensive system of international relations.

The third of these is the fact that the British Empire is a vast and varied one, covering a large part of the world. It is a fact which has been recognized for many years, and it is one which has led to the development of a new and more comprehensive system of international relations.

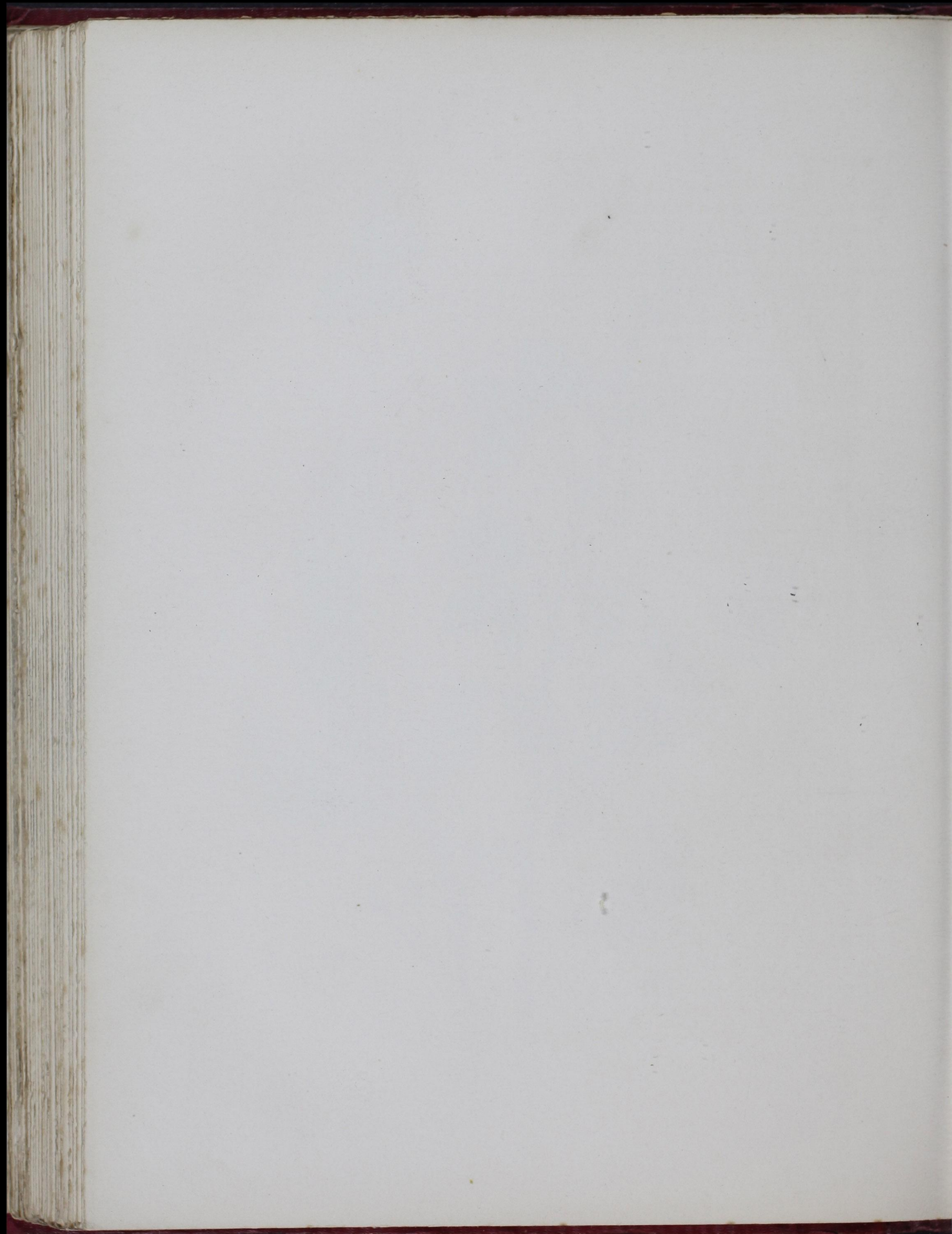
The fourth of these is the fact that the British Empire is a vast and varied one, covering a large part of the world. It is a fact which has been recognized for many years, and it is one which has led to the development of a new and more comprehensive system of international relations.

THE HISTORY OF THE BRITISH EMPIRE

The first of these is the fact that the British Empire is a vast and varied one, covering a large part of the world. It is a fact which has been recognized for many years, and it is one which has led to the development of a new and more comprehensive system of international relations.

The second of these is the fact that the British Empire is a vast and varied one, covering a large part of the world. It is a fact which has been recognized for many years, and it is one which has led to the development of a new and more comprehensive system of international relations.





an oval opaque spot near the middle of the wing towards the costa; the base of the wings has also a slight greenish tinge; on the under side the wings are of a uniform pea-green, except along the inner edge of the fore wings, which is hidden by the fore edge of the hind ones, and is of a brownish colour. The hind wings are marked beyond the middle with a row of minute white dots, which vary in their size, being sometimes obsolete, and sometimes so large as to form a streak across the wings. The tail is obsolete, its place being indicated by a slight projection or tooth, besides which there are several others, so that this pair of wings is denticulated. The ciliæ are brown, dotted with black in the hind wings. In addition to the variation in the size of the white dots on the hind wings beneath, Mr. Stephens mentions a variety in which the fore wings on the under side have a row of white dots on the front margin; the female has also occasionally a pale whitish oval dot near the middle of the fore wings towards the costa.

The caterpillar is pubescent, light green, with lateral rows of triangular yellow spots, and a white line above the legs. The head is black. It feeds on the bramble, broom, dyers'-weed, etc., and may be found at the middle of July. This butterfly, which flies over white-thorn hedges, and especially bramble-bushes and other low shrubs on which the caterpillar feeds, further differs from the rest of the genus in being double-brooded; the first brood appearing in May or at the beginning of June, and the second at the beginning of August. It appears to be distributed over the greater part of our island; it has, however, only been observed in the southern counties of Scotland.

GENUS XXII.

CHRY SOPHANUS, HÜBNER; (POLYOMMATUS, Boisduval; LYCÆNA, Stephens.)

This genus, restricted to the butterflies which are termed Coppers by collectors, is distinguished from the other species of the family not only by the brilliant colour of the upper surface of the wings, but by having the antennæ long, and terminated by an abrupt fusiform club, which is not spoon-shaped; the hind wings more denticulated than in the Blues, but destitute of the tails; the pulvilli of the feet are also larger than in the last-named genus, whilst the naked eyes separate the species from those of Thecla. In the males of most of the species the hind wings have the anal angle produced, and in the females the hind margin of the wing joining the angle is subemarginate. The palpi are nearly straight, with the last joint naked, rather long and subulated, and the head is narrower than the thorax. The postcostal vein of the fore wings emits three branches extending to the costa, the third of which, arising near to, or rather beyond the union of the postcostal with the ordinary transverse vein, is forked, as in Thecla Quercus, and Betulæ. Boisduval's figure of the veins of this genus, "Hist. Nat. Lep." 1, pl. 6—C, fig. 7, is (as I am sorry to say is the case with many of his other figures of the veins) inaccurate. The ground colour of the wings above is fiery orange, at least in one sex, and the females have the upper side of the wings always marked with black spots.

The caterpillars resemble rather elongated woodlice, and appear somewhat hairy when seen through a lens. They feed on low plants. Dr. Horsfield, indeed, considers that the chief difference between his genera Polyommatus and Lycæna depends on the variation of the metamorphosis, the larva in the former being regularly rounded or cylindrico-gibbose; in the latter more oblong and impressed at the sides. He, in fact, states that in the antennæ and palpi of these two genera no tangible difference can be pointed out; the distinction

derived from the wings is, however, more decisive, the differences, though not easily described in words, being readily seized by an experienced eye. The British Blues are altogether without tails, and their character is well preserved in the oriental tropical regions; but it is remarkable that in that part of the world no true Coppers have been discovered, which, in Europe, chiefly constitute the present genus.

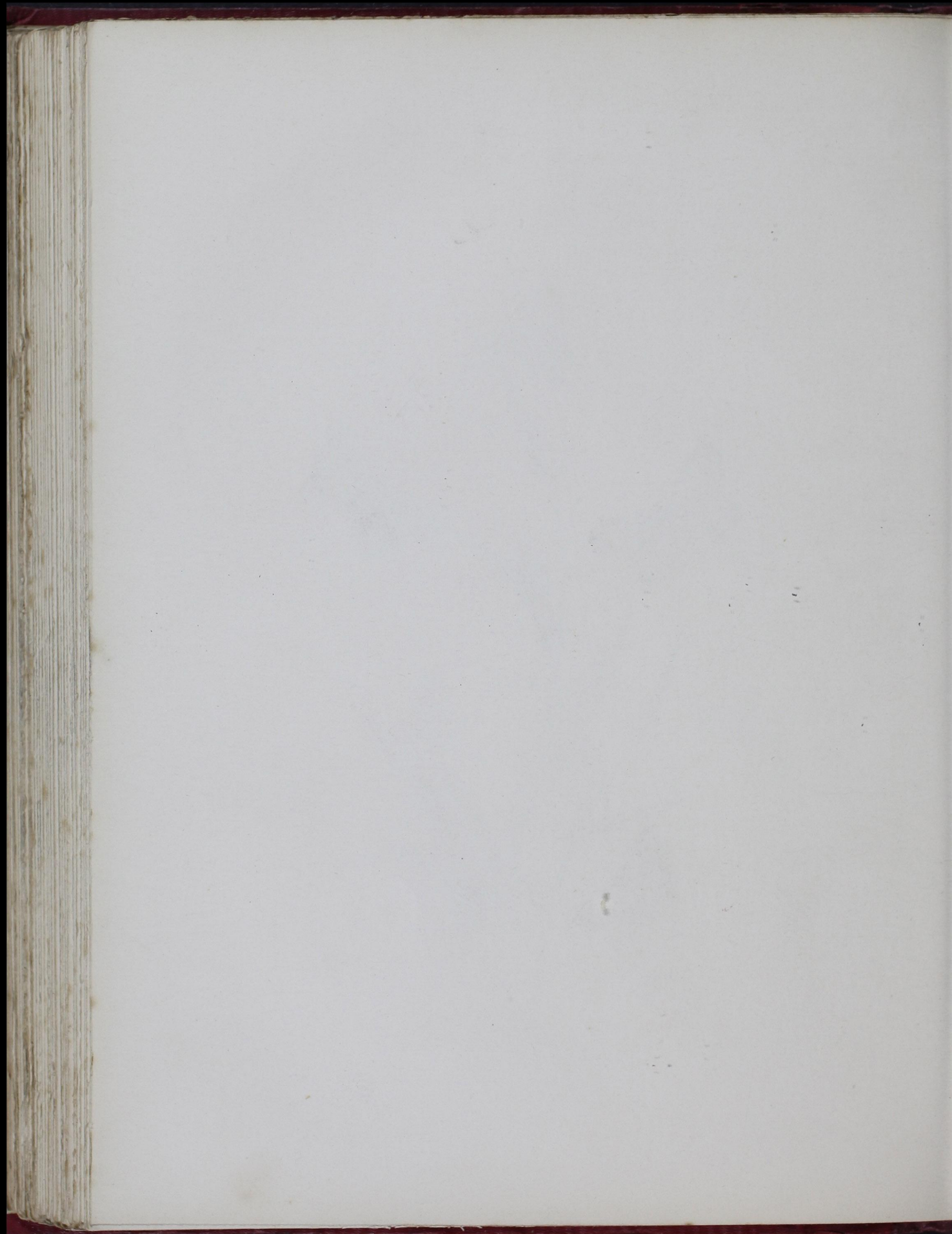
The relationship of this genus with that of the Blues is indeed very close, and we accordingly find considerable diversity of opinion as to the employment of the generic names of the two groups. Latreille in all his works employed the name *Polyommatus* for the whole of the species of the present family, giving at the first our *Thecla* as the primary division, whilst in his late works he gives one of the Blues as an example of the genus. Fabricius separated some of the Hair-streaks under the name of *Thecla*, retaining the Blues and Coppers, together with a great number of foreign species, under the name of *Lycæna*, which name Ochsenheimer employed, arranging, however, the entire family under this generic name, and forming the Blues, Coppers, and Hair-streaks into three groups or families. Mr. Curtis, in his "British Entomology," gave the Blues and Coppers under the genus *Lycæna*; but in his "Guide" he has adopted the nomenclature of Mr. Stephens, namely, *Thecla* for the Hair-streaks, *Lycæna* for the Coppers, and *Polyommatus* for the Blues.

Dr. Horsfield, in his beautiful work on the Lepidoptera of Java (which, it is to be hoped, will still be completed, at least as far as regards the diurnal Lepidoptera), placed in the genus *Polyommatus* only two Javanese species allied to *P. Alsus* and *P. Argiolus*, but greatly enlarged the limits of *Lycæna*, making it comprise many Blues; whilst Boisduval adopts the name *Lycæna* for exotic insects, such as *P. Bœticus*, Linn., calling our Blues by the name of *Argus*, taken up from Scopoli and Geoffroy, and our Coppers *Polyommatus*.

Such is one of the many instances of confusion to be met with in the works of modern entomologists, owing to the want of some fixed principle regulating the adoption of old generic names when the genera are required to be cut up into minor groups. The names both of *Lycæna* and *Polyommatus* were, as we have seen, intended to indicate groups of greater extent than our present genera. If, therefore, we form our Coppers into one group, and our Blues into another, the generic names *Lycæna* and *Polyommatus*, as intended by their original proposers, are not applicable thereto, unless indeed we can ascertain that they were regarded by the proposers of such names as their types; and we have seen that such is not the case with either name; the Hair-streaks being placed at first at the head of *Polyommatus* by Latreille, whilst we find the Coppers at the end of the genus *Lycæna* of Fabricius. The Purple Emperor, again, is placed at the head of the *Argus* group by Geoffroy, which also includes the Blues and the Coppers. In such cases my opinion is that (in order to avoid such distracting confusion) wherever a species or division of a genus is separated from an old genus, a new name ought to be given to it, unless such species or division be the true type of the old genus, when, of course, it will retain the old generic name. Instances might be pointed out in which entomologists are agreed as to the nomenclature of a group, although from the non-adoption of some such principle as this, an old generic name has been abstracted from the true type of a genus and conferred upon an aberrant species; but in the case of the Copper and Blue Butterflies no such uniformity of opinion prevails, each writer having acted without any principle. In the present instance, therefore, I feel no hesitation in rejecting the nomenclature of recent Lepidopterologists, being convinced that a revision of the entire family *Lycænidae* will necessitate the establishment of a much greater number of named groups, when the name of *Lycæna* will have to be restored to the true type of the genus. I have, therefore, adopted Hübner's name *Chrysophanus* for the present group, which is quite expressive of their splendid appearance, being derived from the Greek words *Χρυσός*, gold, and *φαίνω*, to appear.







DESCRIPTION OF PLATE XXVIII.

INSECTS.—Fig. 1. *Chrysophanus Chryseis* (the purple-edged Copper Butterfly. 2. The Female. 3. Showing the under side.

„ Fig. 4. *Chrysophanus Phlaeas* (the common Copper Butterfly). 5. Showing the under side. 6. The Caterpillar. 7. The Chrysalis.

PLANTS.—Fig. 9 and 10. *Rumex acetosella* (the Sorrel).

The most brilliant, though perhaps not the most beautiful, of this genus is here figured with the most common and least striking of its family, the well-known little Meadow Copper. I have not given the female, as, unlike the rest of the genus, it does not differ from the male; but, instead, have figured a beautiful variety described by Hubner, in which all the dark brown and black marks are extracted, leaving a milky white in their place, whilst the orange marks remain perfect. This beautiful variety of the common Copper has been taken in England, and it might be worth the experiment of collectors to rear a number of broods for the chance of obtaining a specimen. The Caterpillar and Chrysalis are from Godart. H. N. H.

SPECIES 1.—*CHRYSOPHANUS PHLÆAS*. THE COMMON COPPER BUTTERFLY.

Plate xxviii. fig. 4—8.

SYNONYMS.—*Papilio Phlaeas*, Linnaeus. Haworth, Lewin, pl. 41. Donovan, vol. 13, pl. 466. Harris, Aurelian, pl. 34.
Lycæna Phlaeas, Fabricius. Ochsenheimer, Leach, Stephens, Curtis.

Duncan, British Butterflies, plate 30, fig. 3. Wood, Ind. Entom. t. 2, fig. 56.

Chrysophanus Phlaeas, Hubner (Verz. bek. Schmett.)

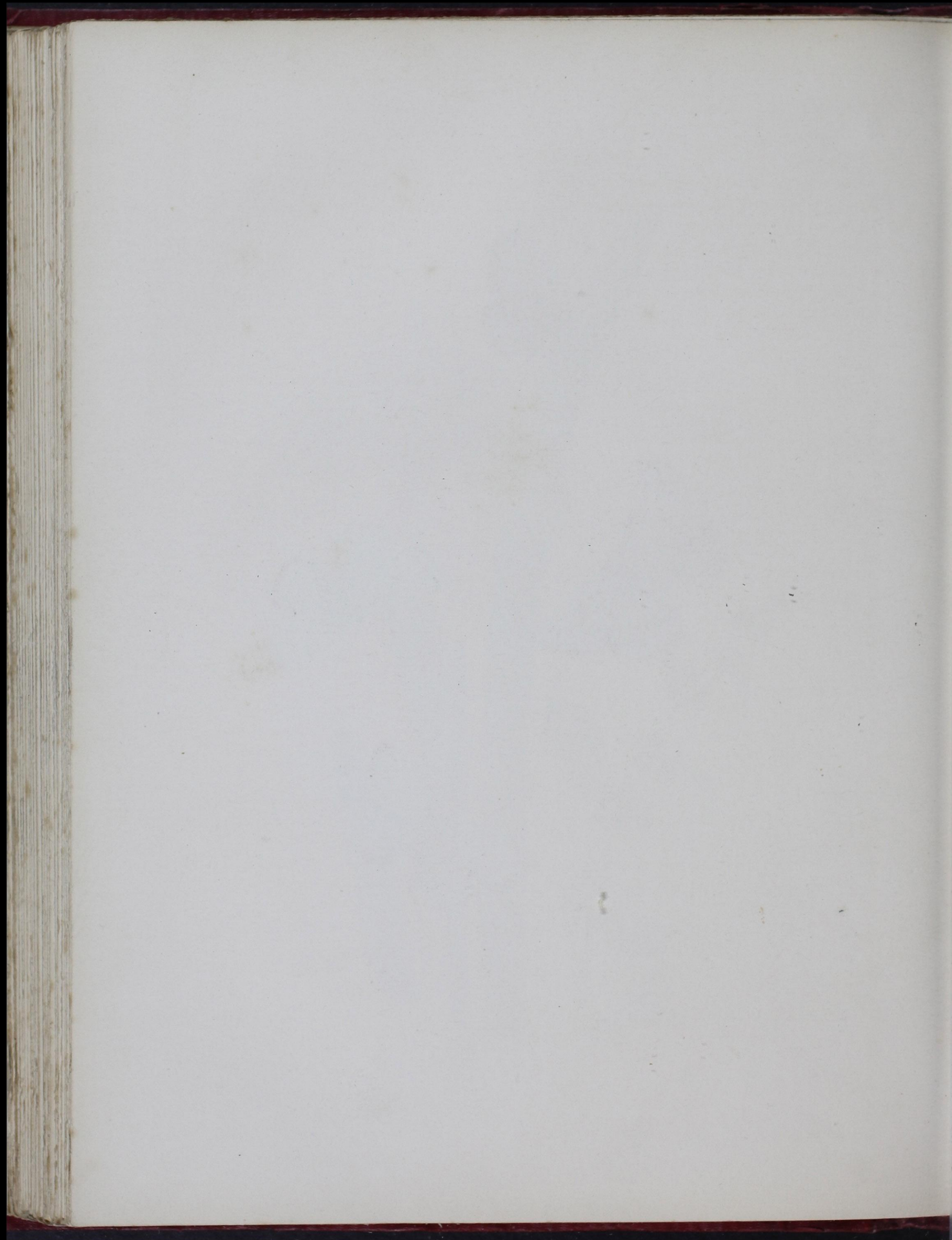
Polyommatus Phlaeas, Boisduval.

This very pretty, and at the same time abundant species, varies in the expanse of its wings from 1 to 1½ inches. The fore wings on the upper side are of a shining fiery copper-colour, ornamented on the disk with from eight to ten black spots of unequal size and dissimilar shape, of which the three or four nearest the extremity of the wing are placed transversely, and more or less confluent, and are preceded by a detached spot which is larger than the rest. The front margin of the wing is narrowly, and the hind margin broadly edged with brown: the hind wings above are dark brown, powdered at the base with copper, with several nearly obsolete black marks on the disc; near the hind margin is a bar of copper of variable breadth, edged above and beneath with black spots, so as to cause the bar to appear as if formed of five confluent patches. The upper row of these black spots is often preceded by blue irrorations. Beneath, the fore wings are of a fulvous colour, without any gloss, the black spots being more distinct and slightly edged with buff, one near the base of the wings, and a minute one on the costa near the tip, being on this side quite distinct; the hind margin is drab-coloured, with several dark-coloured crescents next the anal angle; the under wings on this side are also drab-coloured, with numerous minute, nearly obsolete brown marks placed transversely, and with an obscure narrow orange band parallel with the hind margin. The tails in this species are longer than in the others of the genus. The body above is black, with tawny hairs about the head and thorax, and drab-coloured beneath. There is no difference in the colour and markings of the two sexes.

The perfect insect is distributed throughout the country, and appears at the beginning of April, June, and August: thus there are several broods in the course of the year. The caterpillar is green, with a pale dorsal and lateral line, and feeds on the sorrel. I have received specimens from North America.* It also occurs throughout Europe and in Asia.

* It is proper to observe, that my American specimen differs in the decided black spotting of the under side of the hind wings, the bright red streak near their hind margin, and in wanting the minute spot on the costa of the fore wings; but these characters can scarcely be held to constitute a distinct species.





This is one of the rarest British species; indeed, by some collectors its claim to be considered an indigenous insect is considered as doubtful. Mr. Stephens informs me that Dr. Leach received fine and recent specimens from the vicinity of Epping for several successive seasons previous to the termination of the war in 1815. I believe, however, they were obtained from a dealer, who persisted in keeping the precise locality secret. This, of course, he would have done whether the specimens were native or obtained from abroad, as it would have diminished their value, if British, had other collectors been made acquainted with the spot. It is also said to have been taken in Ashdown Forest, in Sussex. It appears at the end of the summer, frequenting marshy places.

DESCRIPTION OF PLATE XXIX.

INSECTS.—Fig. 1. *Lycena dispar*, male (the large Copper Butterfly). 2. The female. 3. Showing the under side. 4. A common variety of the female. 5. The Caterpillar. 6. The Chrysalis.

PLANTS.—Fig. 7. *Iris Pseud-acoris* (the yellow water Iris). 8. *Rumex palustris* (the Marsh Dock).

I have devoted an entire plate to this, perhaps the handsomest of British Butterflies, which is, moreover, interesting as an example of the results of research in natural history. It was actually unknown to naturalists till a very few years ago, although the fens in Huntingdonshire and parts of Cambridge-shire absolutely swarm with it in the month of July. It was supposed to be an exclusively British insect, and Hübner has figured it from English specimens. But I have a specimen which I took between Rome and Naples, in the Pontine Marshes, which appears perfectly identical in every respect with English specimens. The caterpillar I have been enabled to publish for the first time from a drawing by Mr. Stephens, which he has obligingly furnished me with for the purpose. H. N. H.

SPECIES 3.—CHRY SOPHANUS DISPAR. THE LARGE COPPER BUTTERFLY.

Plate xxix. fig. 1—6.*

SYNONYMS.—*Papilio dispar*, Haworth. Kirby and Spence, *Introd. to Ent.* 1, pl. 3, f. 1, male.

Lycæna dispar, Curtis, *Brit. Ent.* 1, pl. 12. Duncan *Brit. Butt.* pl. 29, fig. 1—2. Wood, *Ind. Ent.* t. 3, f. 59, male and female. Swainson, *Zool. Illustr. n. ser.* pl. 132.

Polygonmatius dispar, Boisduval, *Icon. Histor. Lepid. Eur.* pl. 10, fig. 1—3.

Papilio Hippothœe, Lewin, *Pap.* pl. 40. Donovan, *Brit. Ins.* pl. 217.

Papilio Hippothœe, var., Esper, *Pap.* pl. 14, fig. 1—2.

This splendid species varies in the expanse of its wings from $1\frac{1}{2}$ to rather more than 2 inches. The upper surface of the wings in the male is of a brilliant fiery copper colour, similar in its tone to that of *L. Phlæas*. The fore wings are marked with a small black spot in the middle, and a transverse one at the extremity of the discoidal cell; between the latter and the outer margin of the wing are to be observed traces of the spots of the under side; the front margin and extremity of the fore wings are narrowly edged with black, which is broadest at the apex of the wing. The hind wings have also a slender transverse mark at the extremity of the discoidal cell, between which and the hind margin are also traces of the rows of spots of the under side; the hinder and anal margin are also black; on the margin are five black spots, the anal one being doubled. The fore wings in the female on the upper side are of a darker copper colour, the base and fore margin being irrorated with brown; on the disc are eight black spots, one within, and another at the extremity of the discoidal cell, the others forming a transverse bar beyond the middle of the wing, the inner one being doubled. The rudiment of another spot also appears near the base of the wing. The black outer margin is broader than in the male. The disc of the hind wings in this sex above is brown-black, more or less irrorated with copper, the veins being copper-coloured, running into a bar of copper near the hinder extremity of these wings, the edge itself being brown with six triangular black-brown spots extending into the copper bar and giving it a lobed appearance.

On the under side both sexes are alike; the disc of the fore wings being pale fulvous with the edges ashy, with ten very distinct black ocellated spots, each with a slender pale iris: three of these spots are placed

longitudinally, the others forming a waved band across the wing, the two inner ones being small, more or less confluent; this is succeeded by a row of obscure unequal-sized dark spots. The hind wings beneath are of a pale silvery blue, which becomes greyer as it recedes from the body, with a slender oblique bar at the extremity of the discoidal cell, and about twenty-five black spots, various in size, those towards the base of the wings being placed irregularly and ocellated with white, as well as the transverse irregular row formed of nine spots beyond the middle of the wing. This is succeeded by a row of dark spots, followed by a submarginal fulvous bar, between which and the grey extremity of the wing is a very indistinct row of similar spots. The caterpillar is described by Mr. Stephens as "somewhat hairy, bright green with innumerable white dots; it feeds upon a kind of dock. The chrysalis is at first green, then pale ash-coloured, with a dark dorsal line and two abbreviated white ones on each side, and lastly sometimes deep brown." The fen districts of Cambridge and Huntingdonshire are the localities for this beautiful species, which appears not to be known as a native of any other part of Europe. Benacre, Suffolk, and Bardolph Fen, in Norfolk, have also produced it. It is also said to have been taken by the botanist Hudson in Wales; but Mr. Stephens thinks it probable that this locality belonged to *P. Hippothoe*. Donovan states that the specimens from which his figures are drawn were from Scotland; but Mr. Haworth says "Nunquam in Scotiâ ut amicus meus E. Donovan ex informatione erroneâ dixerit."

Within the last twenty years the insect has become common in collections, owing to the immense numbers taken by collectors in the former localities, which, together with the draining of the fens, as I understand, has almost extirpated the species.

Boisduval, who at first gave it as *Hippothoe*, has since figured it under the name of *Polyommatus dispar*, observing, "ce joli *Polyommatus* n'est très probablement qu'une variété locale d'*Hippothoe*; remarquable par sa taille. Il est au moins un tiers plus grand qu'*Hippothoe* du Continent; ses ailes sont d'un fauve plus vif, et elles ont souvent un reflet un peu purpurin."

The end of July and the beginning of August is the period of the appearance of this insect in the perfect state; it is found flying amongst the reeds growing in the fens, and is very active. In "Loudon's Magazine of Natural History," (No. 37,) Mr. Dale has noticed a variation in the form of the wings of this species.

DESCRIPTION OF PLATE XXX.

INSECTS.—Fig. 1.—*Lycæna Virgaureæ* (the scarce Copper Butterfly), male. 2. The female. 3. Showing the under side. 4. The Caterpillar. 5. The Chrysalis.

„ Fig. 6. *Lycæna Hippothœ* (the dark under-winged or tawny copper Butterfly). 7. The female. 8. Showing the under side.

PLANTS.—Figs. 9 and 10. *Solidago Virgaureæ* (the Golden-rod).

Hippothœ and *Virgaureæ* are sufficiently distinct on the upper surface, the former being of a pure tawny hue, whilst the latter presents an intense and brilliant copper colour, somewhat more orange and fiery in its tone than *Dispar*. The under sides are very distinct; that of *Hippothœ*, however, closely resembles that of *Dispar*. The Caterpillar and Chrysalis are from Godart. H. N. H.

SPECIES 4.—CHRYSOPHANUS HIPPOTHŒ. THE DARK UNDER-WINGED COPPER BUTTERFLY.

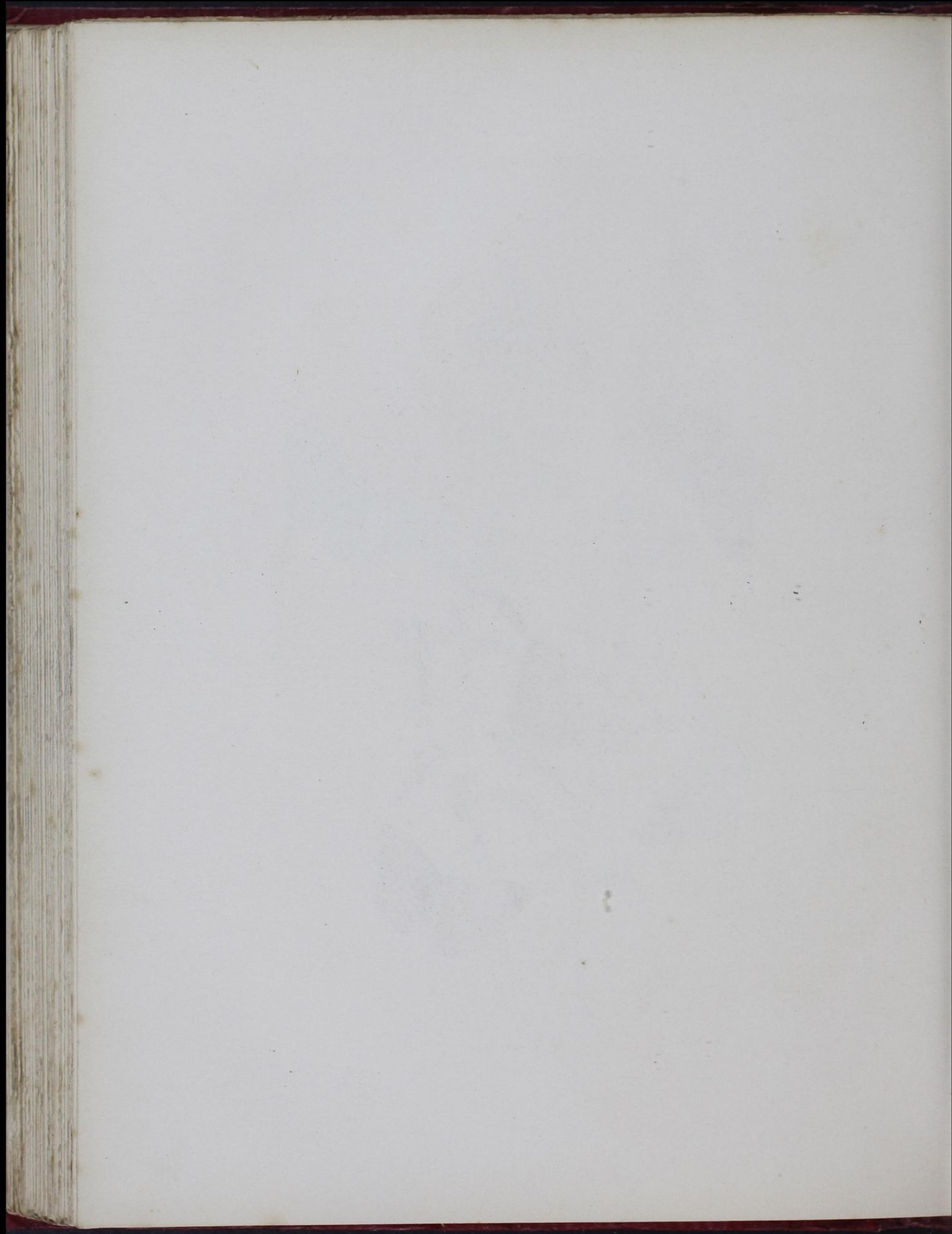
Plate xxx. fig. 6–8.

SYNONYMS.— <i>Papilio Hippothœ</i> , Linnæus. Rosel, Ins. Bel. cl. 2, t. 37, f. 6–7, male. Haworth, Ent. Trans. p. 333 (nec. Lewin et Donovan).	plate 30, fig. 2. Wood, Ind. Entomol. pl. 2, fig. 58, male; pl. 3, fig. 58, female.
<i>Lycæna Hippothœ</i> , Stephens. Curtis, Duncan, British Butterflies,	<i>Polyommatus Hippothœ</i> , Boisduval.
	<i>Chrysophanus Hippothœ</i> , Hübner (Verz. bek. Schmett.)

This species, which has been regarded by many Entomologists as specifically identical with the preceding, differs from it in its constantly smaller size, the fore wings never expanding more than an inch and a half. It is,







therefore, described by Linnaeus as of the size of *Virgaureæ*.* The wings of the male on the upper side are of a pure tawny or fulvous colour, with the outer edges alone black, and in the hind wings marked within with small black spots, of which the fourth is placed nearer the base of the wing. In most specimens there is also a transverse line at the extremity of the discoidal cell. The female has the upper surface of the fore wings dull copper with spots, arranged as in *Ch. dispar* ♀, but smaller. The hind wings have the entire upper surface dusky without orange veins, but marked with darker spots, the margin itself being black and internally crenated. On the under side both sexes resemble each other, the disc of the wings being luteous ash-coloured, with fewer and smaller spots, but similarly ocellated, as in *Ch. dispar*, three of larger size being placed along the discoidal cell longitudinally, succeeded by an irregular row placed transversely, and several very minute ones parallel with the outer margin; the hind wings beneath are ash-coloured, with about seventeen ocellated spots, and a fulvous band on the hinder margin anteriorly spotted with black.

Although regarded by some authors as specifically identical with *Ch. dispar*, the present species differs in its smaller size, more tawny hue of the upper side of the wings of the male (generally destitute of the small transverse bar or streak at the extremity of the discoidal cell of the fore wings), fewer and smaller spots on the under side of the wings, and more uniform hue of the hind wings of the female, which seems to warrant a specific distinction between the two insects: moreover, as Mr. Stephens observes, amongst several hundreds of *Dispar* which have been taken at Whittlesea Mere, not one specimen occurred agreeing with the true *Hippothœ*. Nothing is known with certainty as to the true locality of this species, of which several specimens were preserved in old English collections. It is presumed, however, that one of these was taken in some part of Kent, having been obtained from an old collection made in that county, known to collectors under the name of the Kentish Cabinet.

SPECIES 5.—*CHRYSOPHANUS VIRGAUREÆ*. THE SCARCE COPPER BUTTERFLY.

Plate xxx. fig. 1—5.

SYNONYMS.—*Papilio Virgaureæ*, Linnaeus; Haworth; Donovan, vol. 5, pl. 173, male; Lewin, pl. 41, f. 1—2. | pl. 9, fig. 1—2, male, fig. 3, female. Duncan, Brit. Butt. pl. 29, fig. 3; Wood, Ind. Ent., t. 3, fig. 60, male and female.
Lycæna Virgaureæ, Fabricius; Ochsenheimer; Stephens, Brit. Ent. 1, | *Chrysophanus Virgaureæ*, Hübner, (Verz. bek. Schmett.)

This very distinct species is about the size of *Ch. Hippothœ*, the fore wings expanding about an inch and a half; the upper surface of all the wings is of a very rich yellow copper colour, without any discoidal spots or any clouds indicating the situation of the spots on the under side of the wings; the margin of all the wings is black, and more or less narrow; the hind wings having, moreover, a few black spots near the posterior edge, and confluent with the dark margin, except the two next the anal angle, which are close together and smaller than the rest. The female is more obscure in the colours of the upper side, with a spot in the middle, and a larger one at the extremity of the discoidal cell; beyond this is an irregular row of black spots, which is succeeded by a submarginal row of six large somewhat confluent black spots. The hind wings are more variegated in their appearance than in any other species, being of an obscure fulvous colour at the base, a large discoidal patch and several dashes of brown between the veins of the wings (including a transverse curved row of seven larger spots, nearly square, beyond the middle of the wing), and a marginal row of smaller ones of a dusky brown colour. Beneath the sexes are nearly similar, being of a dull fulvous stone colour, the base and extremity being irrorated with greenish. In the discoidal cell are two small black spots, and a transverse one

* In the Linnaean Cabinet, a specimen of *Chr. Chryseis* is attached to the Linnaean label of *C. Hippothœ*.

at its extremity; beyond this are six or eight small black spots placed irregularly but in pairs, and beyond this the margin is clouded with a row of dusky spots. The posterior wings are dusky at the base, and they are marked with about twelve small black spots, those towards the base of the wing being placed irregularly, but those near the middle placed in a series across the wing, each with a small patch of white below it, so as unitedly to form an interrupted white bar. Near the anal angle are a few orange spots, and the angle itself is rather acute, and has an emargination adjoining it.

The caterpillar is pubescent, and of a dull green colour, with a pale yellow line on the back, and pale green streaks on the sides. It feeds on the Golden-rod, Sharp dock (*Rumex acutus*), etc. The chrysalis is brownish yellow, with dusky red wing-covers.

No specimens of this species having occurred for a great number of years, the claim of this insect to be regarded as indigenous has begun to be questioned. It has at all times been very rare. According to Lewin, two specimens of it were taken by himself in marshes; and Donovan states that one was once taken in Cambridge. The marshes in the Isle of Ely and Huntingdonshire are also stated as localities of this butterfly, which appears in the perfect state at the end of August. I possess a specimen, given to me by the late Mr. Haworth as an undoubted native specimen.

POLYOMMATUS,* LATREILLE (OP. RECENTIOR.)

(*Polyommatus*, Stephens; Curtis; Horsfield; nec Boisduval. *Argus*, Geoffroy, Scopoli, Boisduval. *Lycæna*, fam. A. Oelshenh. Fabricius.)

Referring to the observations made under the genus *Chrysophanus* (pp. 91, 92), as to the close relationship existing between that genus and the present (which comprises the Blues of collectors), it will be sufficient in this place to observe that this genus is distinguished by having the upper surface of the wings generally of a blue colour, especially in the male, but occasionally brown in the females, with a row of fulvous spots near the outer margin; the under surface generally greyish with numerous ocelli, with black pupils surrounded by white irides.

The antennæ are filiform, and terminated by an abruptly-formed elongated compressed club terminating in a lateral point. The palpi are longer than the head, with the terminal joint naked and sharp. The fore legs have been described as alike in both sexes; but such is not the case. (See *ante*, p. 81, note, and my *Introd. to "Mod. Class. of Ins.,"* vol. ii., p. 358, fig. 100., [12. 13.]). The tarsi are furnished with minute simple unguis extending beyond the minute pulvilli. The wings are entire and without tails, the posterior being scarcely denticulated at the anal angle. The larvæ are onisciform, with the head and feet very small and scarcely perceptible, the body lacinate, the back elevated and generally beautifully coloured. The pupa is rather long, naked, and of a whitish colour, with some dusky spots on the back and sides. The species generally undergo their transformations on the stem of a plant, but occasionally beneath the surface of the earth.

The genus extends all over Europe. Species are also found in the north of Africa, the Cape of Good Hope, Madagascar, the Isles of France and Bourbon, the East Indies, and North America. Boisduval also mentions a species from New Ireland. I possess several species from New South Wales; and Captain Ross brought one from the Arctic regions. Mr. Swainson, however, informs us that they are almost unknown in South America.

* Πολῶς, many, and ὄμμα, an eye, in allusion to the numerous ocelli on the under side of the wings of the genus.

Caterpillars of such species as have been observed feed upon leguminose herbs, such as *Trifolium*, *Lotus*, *Onobrychis*, *Medicago*, etc.

From the generic synonymes given above, it will be seen that the French, German, and English schools of Entomology are at variance as to the name to be given to these insects. If in this instance I have followed the authors of our own country, it is; first, because Latreille himself, the founder of the genus, has in his later works given one of the Blues as its type; secondly, because the name is a very expressive one; and thirdly, because the objections to the use of either of the names of *Argus* or *Lycæna* for the present group are as strong as those against the employment of that of *Polyommatus*.

The number of the species in the genus being considerable, Ochsenheimer divided it artificially into two sections, according to the presence or want of a row of fulvous spots within the hind margin of the posterior wings beneath. Subsequently Mr. Stephens observed, that "*P. Argiolus* differs from its indigenous congeners by the form and texture of its wings; that *P. Alsus*, *Agestis*, and *Artaxerxes* are characterised by a uniformity of colouring in both sexes; while the remaining species are distinguished in general by the males being blue above, and the females brown, excepting *Po. Arion* and *Alcon*, in which the latter sex is known by a predominance of brown above, and by having the disc considerably spotted with dusky or black, and that the five first species (*Argiolus*, *Alsus*, *Acis*, *Arion*, and *Alcon*,) are destitute of a marginal fascia beneath, which is, however, rudimentary in the two last-mentioned insects. Again; some few of the species have the eyes pubescent, while others have them naked." ("Illustr. B. Ent." *Haust.* 1., p. 85).

Dr. Horsfield, in the "*Lepidoptera Javanica*," divided the genus *Polyommatus* into two subgenera; the first named *Pithecopis*, from the peculiar aspect of the chrysalis, distinguished by a very distinct habit and aspect, "owing to the great length and lateral expansion of the wings, to their comparative narrowness, and to their (especially the posterior pair) being regularly elliptical and rounded in the anal region." This subgenus is represented in the European Fauna by *P. Alsus*, and several others described by Ochsenheimer, having the character "*alæ integerrimæ*." The subgenus *Polyommatus*, properly so called, is characterised by Dr. Horsfield by having the margins of the hinder wings with the anal extremity angular, and produced to a short, rounded point. Mr. Stephens, in his subsequently published Catalogue, adopts these two subgenera as sections, giving *Argiolus* and *Alsus*, as well as *Acis*, as belonging to *Pithecopis*; and in his manuscripts, which he has been so kind as to allow me to examine, he confines *Pithecopis* to *Argiolus*, giving *Alsus*, *Acis*, *Arion*, and *Alcon* under the sectional name of *Nomiades*, and the remainder under that of *Agriades*, from Hübner. As, however, Dr. Horsfield gives *Alsus* expressly as the European type of *Pithecopis*, which he characterises by the comparative narrowness of the wings, and as *Argiolus* has broader wings than any other European species, we must restrict *Pithecopis* to *P. Alsus*; which species, indeed, possesses a peculiarity in the arrangement of the veins of the fore wings which has not hitherto been noticed, and which I have found in no other Lepidopterous insect, thus confirming Dr. Horsfield's views. As, however, in treating on the genus *Thecla*, I did not consider it advisable to separate *T. Rubi*, although differing from the other species in the veins of the wings, so I shall not in the present genus separate *Alsus* generically from the rest, considering them too closely allied together to allow of such a step. My arrangement of the species is therefore as follows:

SECTION I.—(*Pithecopis*, Horsfield.) First branch of the post or subcostal vein of the fore wings coalescing with the mediastinal or costal one, and subsequently again branching off from it. *P. Alsus*.

SECTION II.—(*Polyommatus* proper.) First branch of the post or subcostal vein free, and extending to the costa of the fore wings; the other veins as in *Thecla* proper.

SUBSECTION I.—Hind wings without a submarginal row of fulvous spots on the under side.

A. Wings broad, hind wings rounded; females blue above, with broad dark margin to the fore wings.

P. Argiolus.

B. Wings more triangular, hind pair more ovate. *P. Acis*, *Arion*, and *Alcon*.

SUBSECTION II.—Hind wings with a submarginal row of fulvous spots on the under side, comprising all the other species, which may be divided into groups according to the colour of the upper side of the wings in the opposite sexes.

DESCRIPTION OF PLATE XXXI.

INSECTS.—Fig. 1. *Polyommatus Argiolus*, male (the azure blue Butterfly). 2. The female. 3. Showing the under side.

„ Fig. 4. *Polyommatus Alsus* (the Bedford blue Butterfly), female. 5. The male. 6. Showing the under side. 7. The Caterpillar. 8. The Chrysalis.

„ Fig. 9. *Polyommatus Acis* (the Mazarine blue Butterfly), male. 10. The female. 11. Showing the under side.

PLANTS.—Fig. 12. *Medicago denticulata* (Reticulated Medicago). 13. *Astragalus Alpinus* (the Alpine milk-vetch.)

The English names of *P. Argiolus* and *P. Alsus* seem to require reformation; the former seems inappropriately styled the *azure* blue, which term does not at all describe its peculiar tint, whilst others of the genus, *P. Adonis*, for example, might truly be styled “*azure blue*.” I should propose calling it the “*light blue*.” The name of *P. Alsus*, “the Bedford blue,” is still less descriptive, for neither of the sexes is blue at all, though in some individuals the male has a sort of purple gloss in certain lights. The “*Bedford brown*” would be far more intelligible. Godart (from whose figure I have taken the Caterpillar and Chrysalis), describes the larvæ of *Alsus* as feeding upon *Astragalus cicer*; but as that plant is not found in England, I have figured an elegant British species instead. The *Medicago*, upon which it is probable that the larvæ of some of the *Polyommatus* may feed, I have been induced to give a figure of, from the singularity of its seed-vessels.—H. N. H.

SPECIES 1.—POLYOMMATUS (PITHECOPS) ALSUS. THE BEDFORD BUTTERFLY.

Plate xxxi. fig. 4–8.

SYNONYMS.—*Hesperia Alsus*, Fabricius.

Papilio Alsus, Gmelin; Lewin, Pap. pl. 39, f. 3, 4; Donovan, Brit. Ins. 9. pl. 322, fig. 1.

Polyommatus Alsus, Stephens, Curtis; Duncan Brit. Butt. pl. 31, f. 3; Wood, Ind. Ent. t. 2, f. 62.

Nomiades Alsus, Hübner (Verz. bek. Schmett.).

Papilio minimus, Esper, Schaffer, Villers.

Papilio Pseudolus, Borkhausen.

This is the smallest of our British Butterflies, the expanse of the fore wings generally varying from $\frac{2}{3}$ to 1 inch. On the upper side the wings are of an obscure brown colour, with a slight blue gloss towards the base, especially in the males, of which sex I possess a specimen, in which at least half of the atoms of the disc of the wings are silvery blue; the female, on the contrary, is more obscure. The fringe of the wings is white; on the under side all the wings are of a light ash colour, with a slender black lunule at the extremity of the discoidal cell; half-way between this lunule and the hind margin of the fore wings is a transverse row of black, ocellated spots, with white irides, the two inner ones being more confluent; the hind wings have three or four similarly ocellated spots, irregularly placed in the basal half of the wings, beyond the middle of which is a waved row of seven or eight similar spots; and on the margin of these wings is a black spot, at a short distance from the anal angle, unnoticed either by Haworth or Stephens, and several obsolete brown spots. The number of the spots on the disc of the wings is, however, liable to variation.

This plain-coloured little butterfly, remarkable for the great delicacy of the markings on the under side of the wings, appears at the end of May and beginning of July, and occurs in a number of localities in different parts



GENERAL DESCRIPTION

1. The bird is a small species, about 10 cm. in length, with a slender body, long legs, and a long tail.

2. The plumage is a uniform brown, with a lighter shade on the underparts.

3. The bill is long and straight, with a slight hook at the tip.

4. The wings are long and narrow, with a distinct primary feather.

5. The tail is long and narrow, with a distinct central feather.

DESCRIPTION OF PLATE 1

1. The bird is shown in profile, facing left.

2. The bird is shown in profile, facing right.

3. The bird is shown in profile, facing left.

4. The bird is shown in profile, facing right.

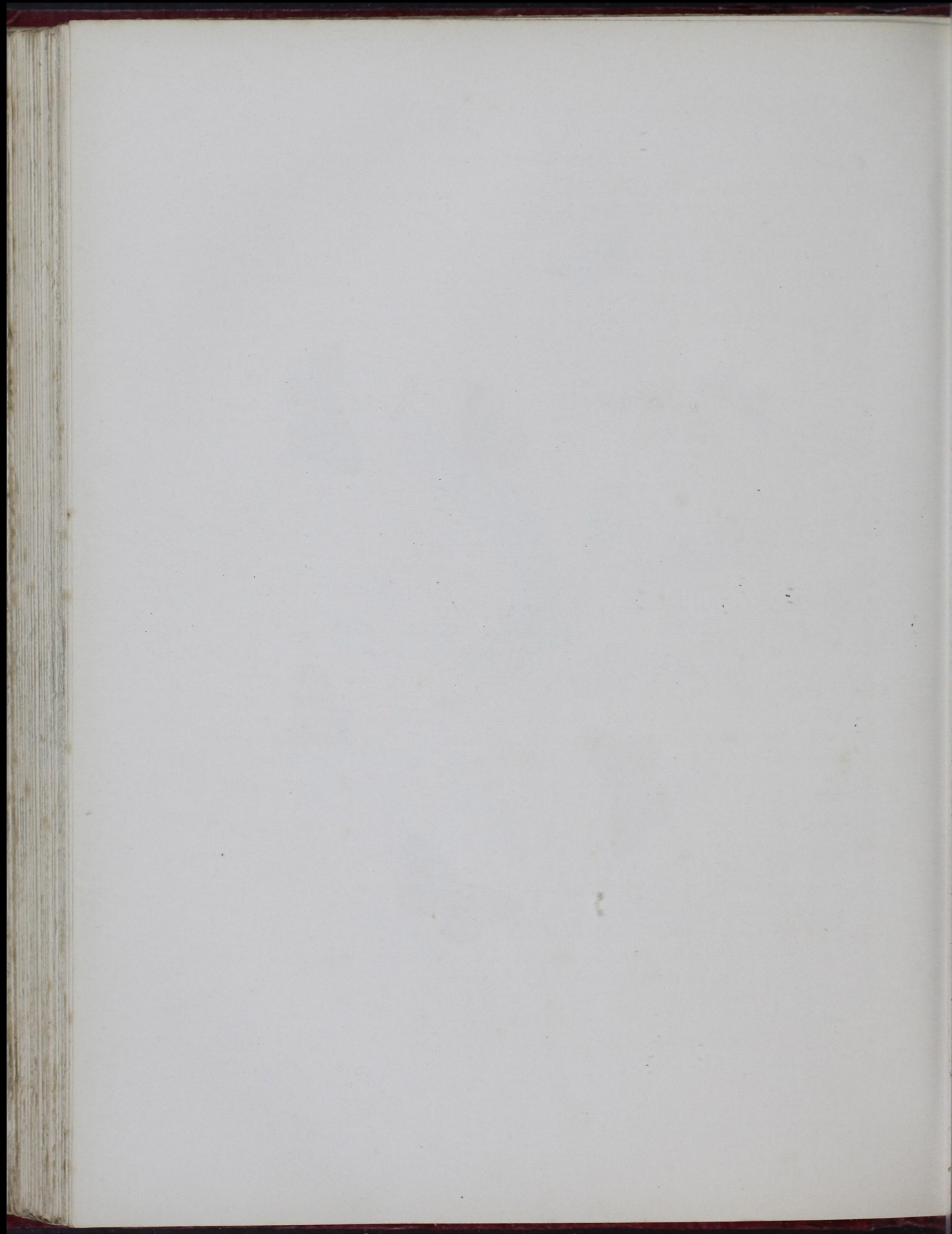
PLATE 1. *SPHINX LUTESCENS* (L.) (MUSCIVORACEAE)

1. The bird is shown in profile, facing left.

2. The bird is shown in profile, facing right.

3. The bird is shown in profile, facing left.





of the country. South Creek, Norfolk; Brandon Warren, Suffolk; Dartmouth; near Andover, Hants; Birch and Darenth Woods, Kent; and near Hertford, are mentioned by Mr. Stephens; near Darlington, in great abundance, by Mr. J. O. Backhouse; near Amesbury, Wilts, by the Rev. G. T. Rudd; near Newcastle, by Mr. Wailes; near Durham, and in most of the northern counties of Scotland, by Mr. Duncan; near Cambridge and Newmarket, in chalk pits, common, by Mr. F. Bond; and in the Isle of Wight, also between Woodstock and Enstone, near Cheltenham, Dover, etc., by the Rev. W. T. Bree.

The caterpillar is green, with yellow dorsal and lateral lines; it feeds upon *Astragalus cicer*, according to Godart.

SPECIES 2.—POLYOMMATUS ARGIOLUS. THE AZURE BLUE BUTTERFLY.

Plate xxxi. fig. 1—3.

SYNONYMES.—*Papilio Argiolus*, Linnaeus, Syst. Nat. 2, 790. Haworth; Donovan, British Insects, vol. 14, pl. 481. Lewin Pap. pl. 36, fig. 4—6.
Lycena Argiolus, Ochsenheimer, Leach, Samouelle.
Polyommatus Argiolus, Latreille; Stephens; Curtis; Wood, Ind. Entomol. pl. 2, fig. 61. Duncan, Brit. Butt., pl. 31, fig. 1, 2.

Agriades Argiolus, Hübner (Verz. bek. Schmett).
Papilio Acis, Hübner, Pap. fig. 272—4.
Papilio Cleobis, Esper. Pap.
Papilio Argus marginatus, De Geer, Gen. Ins., 30, 3.

This delicate butterfly measures from an inch and a sixth to an inch and a half in the expansion of its wings, which in the male are, on the upper side, of a delicate light blue, with a tinge of a pinkish-blush: the costa of the fore wings being still paler. At the extremity of the wings in this sex, there is a narrow border of dark brown, which colour also extends at the tips of the principal veins of the wings into the fringe which is otherwise of a white colour; in the hind wings the fringe is entirely white, preceded by a very slender dark-brown line at the edge of the wings; the base of the wings is also darker. On the under side, the wings are of a very delicate greyish-white, tinged with silvery blue, especially at the base of the hind wings; the fore wings are marked with a slender blackish transverse line at the extremity of the discoidal cell; beyond this are five or six black spots, one placed a little in advance of the others, and nearer the fore margin of the wings; the others are more oblong and placed obliquely; that near the posterior angle being sometimes geminated; between this row of marks and the margin are several almost obsolete dusky crescents. The hind wings beneath are marked with ten or twelve small black dots, placed irregularly, one of which is at the anal angle; besides which there appear traces of a submarginal row of dusky crescents above a row of dusky spots; there is also a very slender dusky line at the extremity of the discoidal cell.

The female differs from the male in being generally of a smaller size, with the blue colour of the upper side of the wings somewhat paler, but it is more particularly distinguished by having the extremity of the anterior and the entire outer margin of the fore wings marked with a broad black or dark-brown border. The hind wings are also marked with a submarginal row of dark-brown or black spots, which are sometimes so large as to be almost confluent; the costa of these wings is also dusky. In other respects, as well as on the under side of the wings, there is scarcely any difference between the two sexes. The spots on the under side of the wings, as well as the dusky markings of the female, vary considerably in size; the former also differs in number in different individuals. The caterpillar is pubescent, of a greenish-yellow colour, with a bright green line down the back, the head and legs being black. It feeds on the buckthorn and holly.

The chrysalis is smooth, brown and green, with a dark dorsal line.

This pretty species differs materially in its habits from its congeners, frequenting gardens and plantations

where the holly abounds.* It is by no means uncommon, although certainly local. Some years ago it appeared for two consecutive years in my garden at Hammersmith, where some hollies had then recently been planted, but I have not since seen it. Epping Forest, near Ripley, near Dartford, and various parts of Norfolk, Suffolk, Hants, and Devonshire, are recorded as its localities by Mr. Stephens. Not unfrequently near Newcastle, in places where hollies abound, and also in Castle Eden Dean, by Mr. Duncan. The Rev. W. T. Bree informs us it is common near Allesley in the early spring (as early as the middle of April), and that he has taken it in the Isle of Wight in the month of July. Mr. F. Bond finds it common near Dropmore and in Hainault Forest. The middle of May and end of August are given as the times of its appearance by Haworth and Stephens, but the Rev. W. T. Bree states that it seems to be only single-brooded near Allesley; during the present season he has not, however, observed it in any of its usual localities near Coventry. In "Loudon's Magazine of Natural History," Nos. 21, 23, 24, 27, 30, 65, and 66, are various communications relative to this butterfly, chiefly connected with the question as to whether it is a single or double brooded species.

SPECIES 3.—POLYOMMATUS ACIS. THE MAZARINE BLUE BUTTERFLY.

Plate xxxi. fig. 9—11.

SYNONYMES.—*Papilio Acis*, Wiener Verz., Ernst. 1, pl. 42, fig. 68, a—d.

Lycæna Acis, Ochsenheimer.

Polyommatus Acis, Stephens; Curtis; Wood, Ind. Ent. t. 2, f. 63.
Duncan, Brit. Butt. pl. 31, fig. 4.

Nomiades Acis, Hübner (Verz. bek. Schmett.).

Papilio Cymon, Lewin, Pap. pl. 33, f. 6, 7. Haworth; Jermyn.

Lycæna Cymon, Leach; Samouelle.

Papilio Argiolus, Esper. Schmett. t. 21, f. 1. Hübner Pap. p. 56.
f. 267—9.

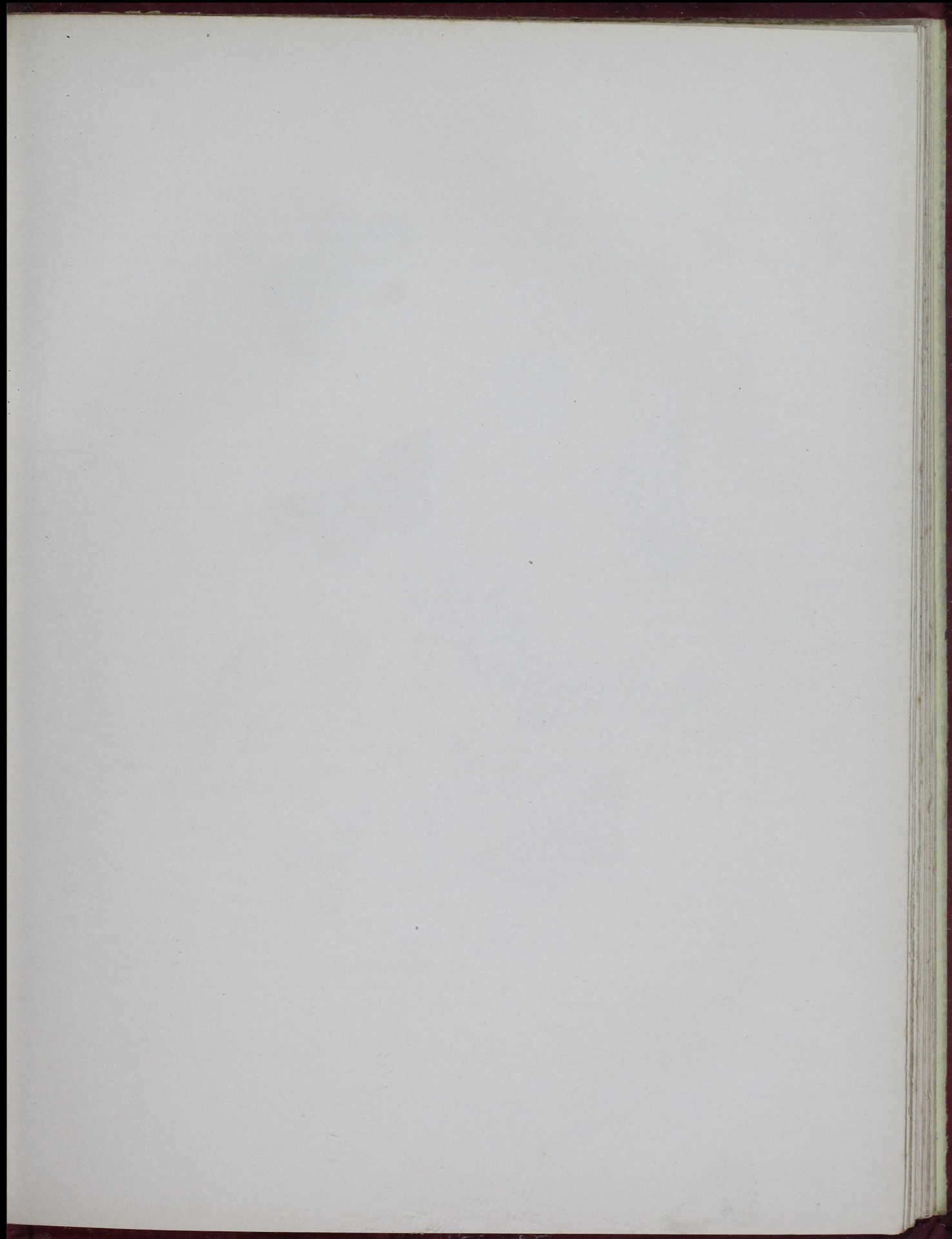
Papilio Semiargus, Borkhausen.

This very distinct species differs from the two preceding in the complete diversity in the colour of the upper surface of the wings of the two sexes, being blue in the male and dark brown in the female. The expansion of the wings is rather more or less than an inch and a quarter. The upper side of the wings, in the male, is of a dark-purplish blue, the costa of the fore wings with a very thin edging of white. The outer margin in all the wings is narrow and dark brown, which colour runs up into the wing along the veins; the fringe of all the wings is white. Beneath, the wings are of a pale greyish-brown, the base being saturated with blue; there is a slender transverse dark line at the extremity of the discoidal cell of each wing, beyond which is a curved row of irregular-sized black spots, margined with white rings, there being sometimes as many as seven such spots on each wing; that near the anal angle of the hind wings being minute and doubled; there are also sometimes one or two ocellated spots near the base, but the number of these spots is liable to considerable variation. All the wings have a very narrow outer marginal line of darker brown.

The female differs from the male in having the upper side of all the wings dark brown, sometimes with a slight purplish irroration towards the base in both pair of wings.

This rare species frequents chalky districts. The late Mr. Haworth gave Yorkshire and Norfolk as its localities, and Miss Jermyn, Sherborne, etc., Dorsetshire. Various parts of Cambridge, Hampshire, and Windlesham-heath, Surrey, are mentioned by Mr. Stephens. There are also some notices of this insect in the 31st and 32nd Numbers of "Loudon's Magazine of Natural History," by the Rev. W. T. Bree, who informs us that he once took it in Coleshill Park, Warwickshire, also near Hinkley, Leicestershire: other specimens have also been taken in Worcestershire. Mr. F. Bond used to take it on the Gog-Magog Hills, and at Haylingfield, near Cambridge.

* It is a more restless and high-flying insect than any of the other *Polyommatus*, hovering and vapouring about the trees and bushes. Mr. Bree also observes that it does not evince the same partiality for settling upon flowers and leaves of humble growth, as it does for settling on the leaves of the holly.







DESCRIPTION OF PLATE XXXII.

INSECTS.—Fig. 1. *Polyommatus Arion* (the large blue Butterfly). 2. The female. 3. Showing the under side.

„ Fig. 4. *Polyommatus Alcon* (the Alcon blue Butterfly). 5. The female. 6. Showing the under side.

PLANTS.—Figs. 7 and 8. *Trifolium fragiferum* (the strawberry-headed Trefoil).

P. Arion is drawn from specimens in the cabinet of Mr. Stephens. *P. Alcon* from the accurate figure of Hübner, as I was unable to procure a well authenticated British specimen. It is not ascertained what plants the larvæ of these two species feed upon, and the larvæ themselves are yet unknown. It is probable, however, that the Caterpillar of *P. Arion* feeds upon some species of Trefoil; and as the perfect insect is found in marshy meadows, I have grouped it with a plant of the singular *Trifolium fragiferum*, which grows in such situations. H. N. H.

SPECIES 4.—*POLYOMMATUS ALCON*. THE ALCON BLUE BUTTERFLY.

Plate xxxii. fig. 4–6.

SYNONYMS.—*Hesperia Alcon*, Fabricius.

Papilio Alcon, Hübner, pap. pl. 55, f. 263, 4–5.

Lycæna Alcon, Ochsenheimer, Schmett. v. Europa 1, p. 7, No. 3.

Polyommatus Alcon, Stephens; Wood, Ind. Ent. t. 53, fig. 16. Duncan, Brit. Butt. pl. 32, fig. 2.

Argus Alcon, Boisduval, Icon. Hist. Lepid., vol. pl. 13, f. 1–3.

Papilio Arcas, Esper. Schmett. t. 34. Suppl. 10, fig. 4, 5.

Papilio Diomedes, Borkhausen.

Hesperia Argiades, Fabricius?

This species appears to be intermediate between *P. Acis* and *Arion*. The expansion of the fore wings is about an inch and a half. The upper side of the wings in the male is of a shining violet-blue, the middle vein and the costal margin having a silvery-white tinge; the extremity of all the wings is ornamented with a rather broader blackish border, the fringe being white; the discoidal cell of the fore wings is sometimes closed by a thin blackish transverse streak. The under side of all the wings is of a darkish ashy-grey colour, with the base suffused with blue; each is marked at the extremity of the discoidal cell with a black crescent, bordered with white, half-way between which and the extremity of the wings is a sinuous row of black spots, each encircled with yellowish-grey; between this row of spots and the outer margin of the wings is another series of black ocellated dots, succeeded close to the margin by a row of almost obsolete lunules. There are also two or three ocellated spots near the base of the wings. The fringe is white above, but spotted with black beneath.

The female differs in having the upper surface of the wings strongly suffused with black along the anterior and outer edges of the fore wings, and leaving a large patch along the inner edge of the fore wings, and the disk of the hinder wings saturated with blue; in addition to this, there is a transverse black line at the end of the discoidal cell, and a row of black spots between the latter and the outer margin of the wing; the fringe of the female is of a reddish-grey colour. The hind wings also bear a nearly obsolete series of black spots between the middle and the hind margin.

This species, which is abundant in some parts of France and other Continental districts, has been introduced by Mr. Stephens into the British lists, on the authority of a specimen formerly in Mr. Haworth's collection, captured by the late Mr. Jones, in Buckinghamshire, many years since. Mr. Stephens, however, suggests that Mr. Haworth's specimen may prove to be only an extraordinary variety of *Pol. Arion*; such is also the opinion of Mr. Edward Doubleday, so that *P. Alcon* ought, in all probability, to be removed from the British list. (It is accordingly placed among the reputed species by Mr. Stephens in his "British Museum Catalogue.")

SPECIES 5.—POLYOMMATUS ARION. THE LARGE BLUE BUTTERFLY.

Plate xxxii. fig. 1—3.

SYNONYMES.—*Papilio Arion*, Linnæus, Faun. Suec. 1073. Haworth; *Polyommatus Arion*, Latreille; Stephens; Curtis; Wood, Index Ent. t. 3, Lewin, Pap. pl. 37, f. 1—2. Donovan, Brit. Ins. v. 6, p. 184, fem. Hübner, fig. 64, ♂ ♀. Duncan, Brit. Butt., pl. 32, fig. 1. Schmett. pl. 54, fig. 254—6. *Nomiades Arion*, Hübner (Verz. bek. Schmett).
Lycæna Arion, Ochsenheimer; Leach.

This fine and very rare species generally measures somewhat more than an inch and a half in the expanse of its wings, which are of a rather dark purplish-blue in the males, with the anterior or costal margin pale brown; but the outer margin in all the wings is rather broadly black; in addition to this, the males may be distinguished from those of every other indigenous species by having a black crescent at the extremity of the discoidal cell, and five black oval spots between it and the dark border on the upper side of the fore wings; the hind wings have also several black oval dots beyond the centre, and a submarginal row of black spots ocellated with blue; the fringe is white. Beneath, the ground colour of the wings is ashy-grey, rather darker in its tone than in *P. Acis*; strongly suffused with shining blue atoms, at the base especially, on the hind wings. The fore wings have one circular and one kidney-shaped black spot, ocellated with whitish in the discoidal cell, beyond which is a very curved row of large black spots similarly ocellated; parallel with the outer margin of the fore wings are two rows of black spots, separated from each other by whitish atoms, and the extreme margin of the wings is also black, and the fringe, which is white, is marked at the tips of the longitudinal veins with black spots. Each of the hind wings is marked with about twenty-six black spots, which (with the exception of those which are nearest the margin of the wing) are ocellated with whitish; three of these spots form a curve near the base of the wings, and are followed by a curved short transverse line at the extremity of the discoidal cell; this is succeeded by an irregularly-curved row of eight ocellated spots; beyond this, are two rows of spots, parallel with the posterior margin, and the fringe is marked in the same manner as in the fore wings.

The female is distinguished by having the wings more suffused with dark brown, and the spots on the disk of the fore wings are larger and longer than in the males; the spots are also occasionally more numerous, and the edges of the wings with a broader dark margin. There are, however, several varieties described, in which the number and size of the spots varies considerably, and Mr. Stephens mentions one variety in which the wings are almost immaculate above.

Mr. Haworth received this species from Dr. Abbot, who took it near Bedford, in the Mouse's Pasture; where Mr. Dale again took it 1819. It is also recorded as having been taken on Dover Cliffs, Marlborough Downs, and on the hills near Bath; also on commons near Bromham, Bedfordshire, near Winchester, and on bramble-blossoms in some parts of North Wales. The species has also been recently taken by Mr. Queckett in some profusion, as well as by Mr. Bree's son and Mr. F. Bond, in the beginning and middle of July, at Barnewell Wolde, near Oundle, Northamptonshire, where Mr. Bree himself also found it on the 4th of July, 1840.

DESCRIPTION OF PLATE XXXIII.

INSECTS.—Fig. 1. *Polyommatus Adonis* (the Clifden, or azure blue B). 2. The female. 3. Showing the under side.

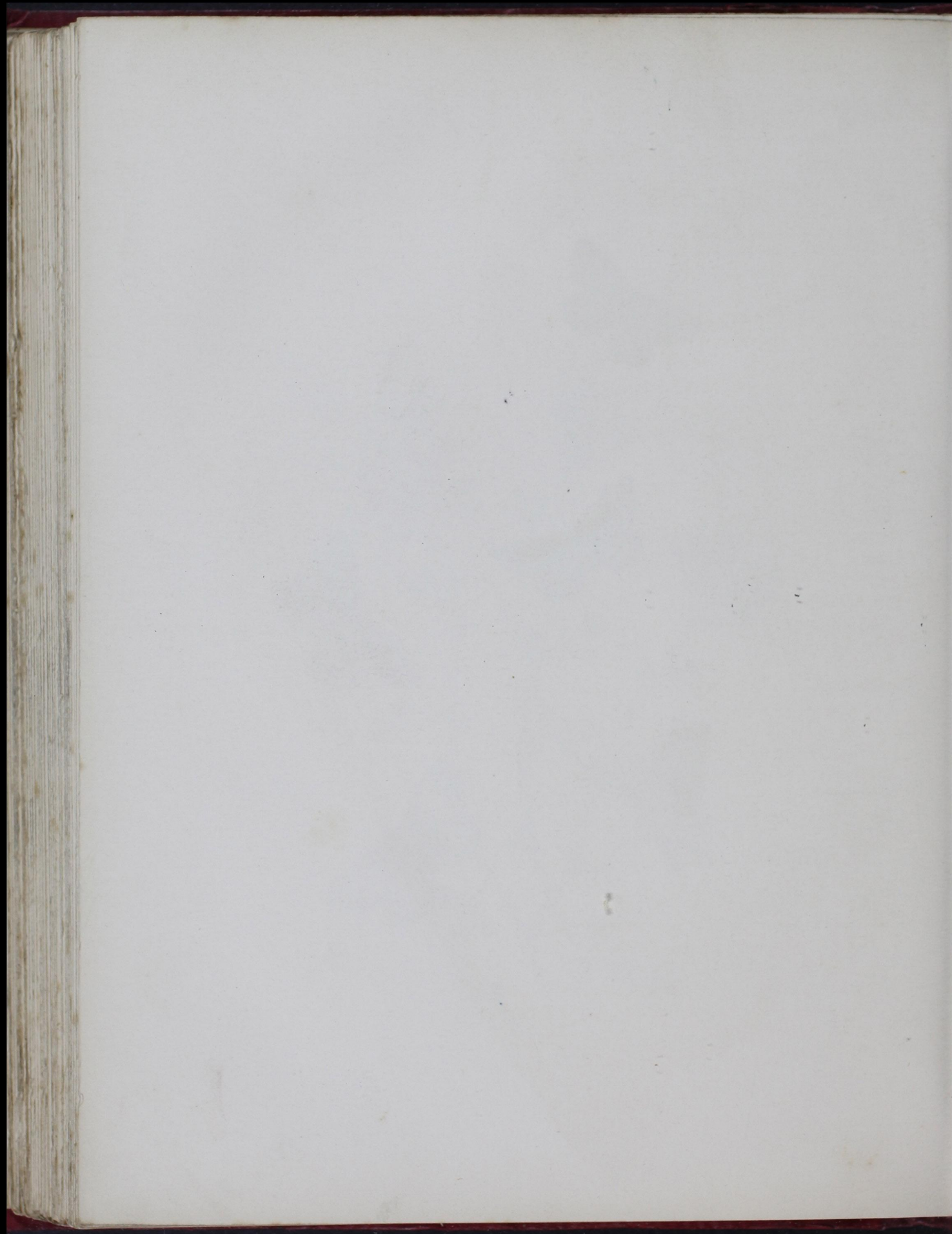
„ Fig. 4. *Polyommatus Corydon* (the Chalk-hill blue B). 5. The female. 6. Showing the under side. 7. The Caterpillar. 8. The Chrysalis.

PLANTS.—Figs. 9 and 10. *Trifolium stellatum* (the starry-headed Trefoil).

All these insects are figured from beautiful specimens in the cabinet of Mr. Stephens. The Caterpillar of *P. Corydon* I have represented feeding upon *Trifolium stellatum*, which I have selected for the singular appearance of the seed-vessels. The Caterpillar is from Hübner. H, N. H.







SPECIES 6.—POLYOMMATUS CORYDON. THE CHALK-HILL BLUE BUTTERFLY.

Plate xxxiii. fig. 4—8.

SYNONYMES.—*Hesperia Corydon*, Fabricius; Hübner, Pap. pl. 59, 286—8.
 Lewin's Pap. pl. 36, figs. 1, 2, 3. Donovan, Brit. Insects, pl. 231, f. 1, male.
 Esper. Schmett. t. 33, fig. 4.
Polyommatus Corydon, Latreille; Stephens; Jermyn; Curtis; Wood,
 Ind. Ent. pl. 2, fig. 65. Duncan, Brit. Butt. pl. 32, fig. 3.

Agriades Corydon, Hübner (Verz. bek. Schmett).

Papilio Tiphys, Esper. Pap. pl. 21, cont. 1, fig. 4. (Female.)

Var. *Papilio Calæthys*, Jermyn, 2nd Edit. p. 169.

This species varies in the expansion of its wings from an inch and a third to more than an inch and a half. The male has the upper surface of the wings of a very light silvery blue, with the outer margin and veins dusky; close to the outer margin is a row of black spots, which are almost suffused with the dark margin of the fore wings, but are more distinct in the hind pair, two at the anal angle being smaller and close together; these spots are more or less annulated with silvery white. The fore wings in this sex are of a greyish white on the under side, with five rows of spots, four towards the base in pairs, one larger, and one smaller in each; then a transverse nearly straight row of four spots, of which the inner one is doubled, succeeded by a curved row of four spots towards the costa, then two submarginal rows of dots, the inner ones being the largest, forming an interrupted bar, and the outer ones rounded and subocellated; the tips of the veins, and of the ciliæ opposite to the veins, are marked with dark spots; the disc of the hind wings is of a pale greyish-brown hue, the base strongly saturated with greenish-blue, each marked with about twenty blackish ocellated spots, an almost blind white spot at the extremity of the discoidal cell; the space beyond the two middle spots in the outer curved series is also white. Seven or eight of the terminal spots are ocellated, each being preceded by an angular black mark, and a small patch of orange colour; the extreme edge of the wing is also blackish, and the fringe is white.

The female differs from the male in having the upper surface of the wings of a brown colour, with a small paler spot in the middle of each, that in the fore wings having a black pupil; moreover, there is a submarginal row of ocelli having the pupil black, surrounded by a whitish iris, the upper part of the hind wings being orange; these ocelli are also sometimes preceded by a row of almost obsolete pale lunules; in some specimens, however, the appearance of these ocellated spots is almost lost; on the under side the ground colour of all the wings is considerably darker than in the males, and the ocelli are much more distinct; they are, however, similar in their number and situation to those of the male, but the fringe is more strongly marked alternately with brown.

There are a number of varieties in our cabinets resulting from the greater or less distinctness of the ocelli, and the greater suffusion of brown over the wings of the male. One of these varieties having the wings "above, brown with a blue disc, and a whitish discoidal dot with a black pupil; beneath, the posterior wings have a discoidal, white, cinctured crescent, with a waved band of seven undulated spots towards the hinder margin," constitutes the *Polyommatus Calæthys*, of the second edition of Miss Jermyn's "Butterfly Collector's Vade Mecum."

The caterpillar is green, with yellow dorsal and lateral lines. It is stated to feed upon the wild-thyme. The perfect insect appears in July. It is local in respect to the districts in which it is found, especially frequenting chalky places. In such places it is, however, very abundant. From Dover, along the southern coast near Shoreham, Newport in the Isle of Wight, and near Darenth Wood in Kent, various parts also of Suffolk, Oxfordshire, Cambridgeshire, are recorded as its localities. It is also "very abundant on the hills above Prestbury, near Cheltenham, and near Winchester. A single specimen was also taken a few years ago near Knowle, Warwickshire," as we are informed by the Rev. W. T. Bree.

SPECIES 7.—POLYOMMATUS ADONIS. THE CLIFDEN BLUE BUTTERFLY.

Plate xxxiii. fig. 1—3.

SYNONYMS.—*Hesperia Adonis*, Fabricius.*Papilio Adonis*, Lewin, Pap. pl. 38, fig. 1—3; Haworth.*Lycena Adonis* Ochsenheimer; Leach; Samouelle.*Polyommatus Adonis*, Stephens; Curtis; Wood, Ind. Ent. pl. 2, f. 66;
Duncan, Brit. Butt. pl. 33, fig. 1—2.*Papilio Argus*, Donovan, Brit. Ins. pl. 143, fig. 1, female (not the upper figures, which belong to *P. Alexis*, and not the *Pap. Argus* of Linnæus).*Papilio Ceronus*, Hübner, Pap. pl. 295—297.*Papilio Bellargus*, Esper; Villars; Müller.Var. ? *Papilio Hyacinthus*, Lewin. (C. P. Dorylas, Steph. Ill.)

This, the most splendid of all the British blues, varies from $1\frac{1}{4}$ to $1\frac{1}{2}$ inch in the expanse of the wings, which in the males are of a most lovely, shining, silvery, azure blue; the costa of the fore wings rather more silvery, and the outer margin of the wings with a slender dark line, the fringe white, with small brown patches at equal distances. On the under side the ground colour of the wings is darker than in the corresponding sex of *P. Corydon*, and the ocelli are more strongly marked, although nearly similar in their situation; there is, however, only a remote spot preceding the dot at the end of the discoidal cell of the fore wings, and the succeeding series of spots is more continuous, the fifth from the costa not being thrown so much forward as to break the curve, as it is in *P. Corydon*. The ocelli and other spots on the under side of the hind wings are, however, almost exactly placed as in that species, and they are also similarly coloured.

The female has the upper surface of the body and wings of a dark-brown colour, the disc towards the base being sometimes saturated with blue; there is a small black spot at the extremity of the discoidal cell in each wing, and in the hind wings there is a submarginal row of ocellated black spots, the inner part of the iris of each being marked with an orange curve, the ocelli towards the outer angle being almost obliterated; some specimens also have the rudiments of a series of fulvous arches nearer the outer margin, the fringe is brownish white, interrupted with brown spots; on the under side the ground colour of the wings, as in *P. Corydon*, is darker than in the males, and the ocelli larger and more conspicuously ocellated with whitish, although similar in their situation.

The position, size, and number of the ocelli on the under side are liable to some variation; and I possess several specimens in which the opposite sides do not exactly correspond with each other in these particulars: the white blotch on the hind wings and the orange submarginal spots are also sometimes almost obliterated. Mr. Stephens, in the "Brit. Mus. Catalogue," gives the *P. Hyacinthus* of Lewin as a variety of this species.

The caterpillar is described by Fabricius as being green, with dorsal rows of fulvous spots. The perfect insect appears to be double-brooded, the first specimens appearing at the end of May, and the others at the middle of August. It occurs in various parts of the southern counties of England, especially in chalky districts, in some profusion. It also occurs in some parts of Suffolk. As it is by far the most lovely of the British blues, it used to be much sought after by the Spitalfields collectors, who, as Mr. Haworth states, made distant pedestrian excursions for the sole purpose of procuring its charming males to decorate their pictures with:—a picture consisting of numerous and beautiful Lepidoptera ornamentally and regularly disposed, having been the ultimate object of these assiduous people in the science of Entomology. These pictures were of various shapes and sizes, and Mr. Haworth mentions having seen some which contained at least five hundred specimens. Such was the custom some twenty-five years ago, and it is this class of persons whose feelings Crabbe thus records in his "Borough"—

"There is my friend the weaver; strong desires
Reign in his breast,—'tis beauty he admires.
See! to the shady grove he wings his way,
And feels in hope the rapture of the day:

Eager he looks, and soon to glad his eyes
 From the sweet bower by Nature form'd arise
 Bright troops of virgin Moths and fresh-born Butterflies;—
 He fears no bailiff's wrath, no baron's blame,
 His is untax'd and undisputed game."

Indeed so strong is the "fancy," as it is termed, with some of these laborious collectors, that I have known some, who, after toiling at their weaving-machines all the week, have started at ten o'clock on Saturday night, in order to arrive at Darenth and Birch Wood by daybreak, so as to collect the twilight-flying moths. Daniel Bydder—one of the most industrious of these collectors, and who was employed by Dr. Leach to collect for him in the New Forest (where he discovered *Platypus cylindrus* and *Cicada Anglica*—was, I believe, the first of the Spitalfields collectors who attempted to arrange his insects scientifically, and now, following the example of the Entomological Society, they have formed themselves into a Society of "Practical Entomologists," and have a well-arranged collection, meeting at regular intervals, in order to communicate to each other the result of their captures.

DESCRIPTION OF PLATE XXXIV.

INSECTS.—Fig. 1. *Polyommatus Ægon* (the silver-studded blue Butterfly). 2. The female. 3. A common variety of the female. 4. Showing the under side. 5. The Caterpillar. 6. The Chrysalis.

„ Fig. 7. *Polyommatus Alexis* (the common blue Butterfly). 8. The female. 9. Showing the under side. 10. A variety of the female. 11. An Hermaphrodite variety, having the wings of a female on one side and of a male on the other. 12. The Caterpillar. 13. The Chrysalis.

PLANTS.—Fig. 14. *Cytisus Scoparius* (the common broom).

„ Fig. 15. *Medicago sativa* (the cultivated lucerne).

The insects on the present plates are from specimens in the British Museum, where are three other Hermaphrodite specimens of *P. Alexis*, but none of any of the other species. The caterpillars are both from Godart. Hübner has given a very different figure of the larva of *Alexis*; but, as Godart minutely describes the rearing of several, I have preferred his figure. He describes the larva of *P. Alexis* as feeding upon the cultivated lucerne, and those of *P. Argus* upon the common broom, H. N. H.

SPECIES 8.—POLYOMMATUS ALEXIS. THE COMMON BLUE BUTTERFLY.

Plate xxxiv. fig. 7—12.

SYNONYMES.—*Papilio Alexis*, Wiener, Verzeichniss, p. 184; Hübner, Pap. pl. 60, fig. 292.

Polyommatus Alexis, Latreille; Stephens; Curtis; Wood, Ind. Ent. pl. 3, fig. 69, m. and f. Duncan, Brit. Butt. title page.

Papilio Icarus, Villars; Haworth; Lewin, Pap. pl. 38, fig. 4, 5, 8, Esper, Schmett, t. 32, fig. 4, m.

Papilio Argus, Wilks, pl. 119; Donovan, Brit. Ins. pl. 143, upper figures; Harris Aurelian, pl. 39, fig. g—i.

Lycæna Dorylas, Leach; Samouelle; but not of Hübner.

Var. ? *Papilio Hyacinthus*, Lewin, Pap. 37, fig. 4, 5, 6; nec Fabricius;

Haworth (P. Dorylas Steph, Ill. i. 90).

Var. *Polyommatus Labienus*, Jermyn.

Var. *Polyommatus Thestylis*, Jermyn.

Var. *Polyommatus Lacon*, Jermyn.

Var. *Polyommatus dubius*, Kirby MSS.

This, one of the most abundant of our native butterflies, varies in the expanse of its wings from less than an inch to nearly an inch and a half. The upper surface of the wings in the males is of a fine silky lilac-blue, the anterior margin of the fore wings being edged with white, the outer edge of all the wings with a slender dark line, and the fringe white. The body is clothed with long whitish-blue silken hairs. The under side of the wings is also very similar in its marking to the two preceding species, but the ground colour of the wings is rather paler. There is an ocellated spot in the middle of the discoidal cell, with another, more indistinct, beneath it, which is sometimes connected with the innermost ocellus of the series between the extremity of the discoidal cell and the outer margin of the wing; the base of the hind wings is strongly glossed with shining bluish-green atoms, and the sub-marginal row of fulvous markings on the hind wings is very distinct, the marks at the anal angle being duplicated. In

the centre of the hind wings is a triangular white spot, generally with a black dot in the centre, preceded, towards the base, by four ocelli, placed obliquely, and between the middle ocelli of the row beyond the centre of the wing and the orange spots is a white patch; there is also a slender black marginal line, and the fringe is white.

The female differs in having the upper side of the wings brown, the disc more or less suffused with blue; there is also a submarginal row of fulvous spots, which are sometimes obsolete in the fore wings; in the hind wings they are preceded by black lunules, and succeeded by black sub-ocellated spots. On the under side the ground colour of the wings is browner than in the males, and the ocelli larger and more distinct. The base in these wings is also less strongly tinged with green. The fringe in this sex is rather darker than in the male, especially at the base, but not spotted, by which it is at once known from the female of *P. Adonis*. Varieties occur in this, as in the preceding species, in which the number and size of the ocelli beneath, and markings on the upper side, are more or less obliterated. I possess indeed some specimens in which the opposite sides are not alike in these respects.

One of these varieties, which Mr. Haworth thought might be a hybrid between *Adonis* and *Alexis* (but which Mr. Stephens, in the "Brit. Mus. Catalogue," gives as a variety of *P. Adonis*), has the two spots towards the base of the fore wings, on the under side, obsolete, and the upper sides of the wings of the female more strongly saturated with blue. This forms the species *P. HYACINTHUS* of Lewin and Haworth.

Others, again, of very small size (not expanding more than $10\frac{1}{2}$ lines), have the upper side of the wings of a very pale lilac-blue, and the spots on the under side very small and pale, the inferior spot at the base of the fore wings obsolete, only five spots in the curved row beyond the middle of the discoidal cell, and the fulvous lunules almost obsolete, the two basal spots on the costa of the hind wings large and black. I have made this description from Mr. Kirby's original specimen on which the *POLYOMMATUS LABIENUS* was proposed. This is to be noticed, because Mr. Stephens, in the "British Museum Catalogue," gives *Labiensus* as identical with his *P. EROS* (Haust. i. 93), and both as varieties of *Alexis*.

POLYOMMATUS THESTYLIS of Jermyn is formed upon large female specimens of this species, in which the blue of the upper surface of the wings is much more extended than in ordinary individuals; "the anterior wings beneath with a large kidney-shaped blackish spot cinctured obscurely with white, the concave side turned towards the interior margin; the posterior wings with the spot next the costal margin kidney-shaped; the concave side turned towards the disc; the number of ocelli in all the wings varies considerably, and the kidney-shaped spot is sometimes interrupted."

POLYOMMATUS LACON of Jermyn is another variety, in which the disc of the wings beneath is only marked with a triangular spot; "the hind margin of the anterior with a few indistinct dusky marks, and of the posterior with a fulvous band terminated internally with a series of black wedge-shaped spots, and externally with black dots on a white ground."

Mr. Stephens also adds that some specimens even differ in form from the rest, some of the females having the anterior wings very much rounded at the tip; whilst in others they are somewhat acute. In some females also the disc of the wings on the upper side is entirely brown, whilst in others it is nearly as blue as in the males, with a black discoidal spot.

Other specimens, which were inaccurately regarded by Mr. Stephens as *P. EROS* of Ochsenheimer, and *P. ICARIUS* of Esper, are also considered by Mr. Edward Doubleday, and now also I believe by Mr. Stephens, to be varieties of *P. Alexis*.



the work of the last year. The following table gives a summary of the work done in the various departments of the Museum during the year 1887-88. It will be seen that the work has been very extensive, and that the results are of great value.

The first of the departments is the Department of Zoology. The work done in this department during the year 1887-88 was very extensive. The number of specimens of animals received was 1,234, and the number of specimens of plants was 567. The total number of specimens received was 1,801. The number of specimens of animals which were examined was 1,123, and the number of specimens of plants which were examined was 545. The total number of specimens examined was 1,668.

The second of the departments is the Department of Botany. The work done in this department during the year 1887-88 was also very extensive. The number of specimens of plants received was 1,234, and the number of specimens of animals was 567. The total number of specimens received was 1,801. The number of specimens of plants which were examined was 1,123, and the number of specimens of animals which were examined was 545. The total number of specimens examined was 1,668.

The third of the departments is the Department of Geology. The work done in this department during the year 1887-88 was also very extensive. The number of specimens of minerals received was 1,234, and the number of specimens of fossils was 567. The total number of specimens received was 1,801. The number of specimens of minerals which were examined was 1,123, and the number of specimens of fossils which were examined was 545. The total number of specimens examined was 1,668.

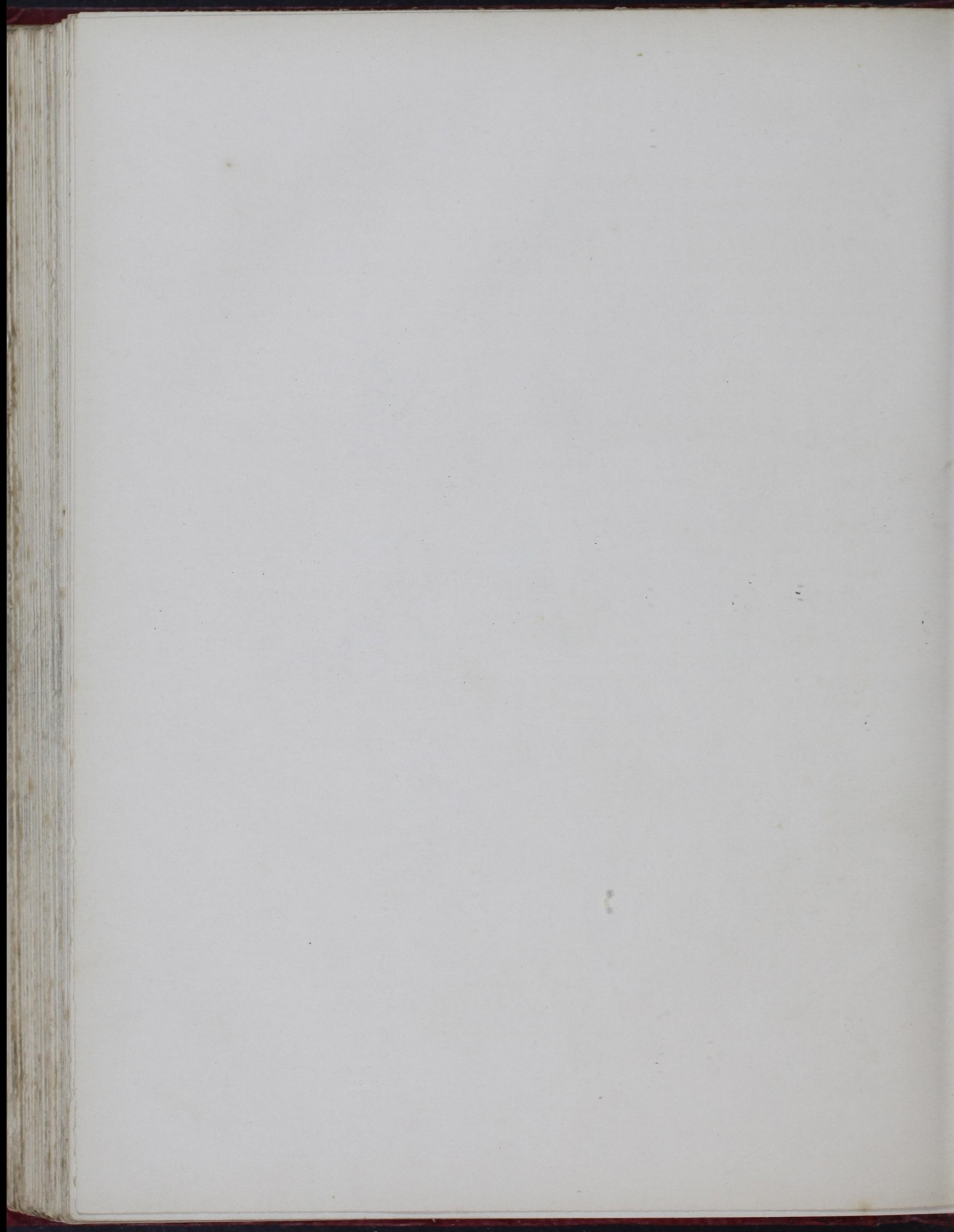
The fourth of the departments is the Department of Mineralogy. The work done in this department during the year 1887-88 was also very extensive. The number of specimens of minerals received was 1,234, and the number of specimens of fossils was 567. The total number of specimens received was 1,801. The number of specimens of minerals which were examined was 1,123, and the number of specimens of fossils which were examined was 545. The total number of specimens examined was 1,668.

The fifth of the departments is the Department of Paleontology. The work done in this department during the year 1887-88 was also very extensive. The number of specimens of fossils received was 1,234, and the number of specimens of minerals was 567. The total number of specimens received was 1,801. The number of specimens of fossils which were examined was 1,123, and the number of specimens of minerals which were examined was 545. The total number of specimens examined was 1,668.

The sixth of the departments is the Department of Anthropology. The work done in this department during the year 1887-88 was also very extensive. The number of specimens of human remains received was 1,234, and the number of specimens of human artifacts was 567. The total number of specimens received was 1,801. The number of specimens of human remains which were examined was 1,123, and the number of specimens of human artifacts which were examined was 545. The total number of specimens examined was 1,668.

The seventh of the departments is the Department of Ethnology. The work done in this department during the year 1887-88 was also very extensive. The number of specimens of human remains received was 1,234, and the number of specimens of human artifacts was 567. The total number of specimens received was 1,801. The number of specimens of human remains which were examined was 1,123, and the number of specimens of human artifacts which were examined was 545. The total number of specimens examined was 1,668.





As some of the preceding varieties appear to be constant in certain localities, Mr. Stephens informs me that he has but little doubt that they in fact constitute distinct species; such is particularly the case with certain individuals of the males, which have the wings very transparent, and of a more silvery blue; and the females very blue, with very distinct red lunules adjoining the black submarginal and distinct ocelli.

This species also appears to be subject to gynandromorphism to a greater degree than any other of our butterflies, although this is probably owing to its being a more abundant species. Several instances of this are contained in the British Museum Cabinet, one of which is represented in our figure 11; other instances are recorded in the "Annales de la Société Entomologique de France," "The Field Naturalist," etc.

The caterpillar is slightly pubescent, and of a bright green colour, with a dark dorsal line, adjoining to which are rows of yellow spots. It is found at the end of April and of July, and feeds upon different grasses. The wild liquorice and wild strawberry are also mentioned by Mr. Stephens as its food.

This common insect seems to be distributed over all parts of the kingdom, and is double-brooded, the first appearing about the end of May (but later in the northern parts of the country), and the second in August. It frequents meadows, grassy places at the sides of lanes, and pasture-lands. Mr. Knapp thus describes some of its habits:—"We have few more zealous and pugnacious insects than this little elegant butterfly, noted and admired by all. When fully animated, it will not suffer any of its tribe to cross its path, or approach the flower on which it sits, with impunity; even the large admirable *Atalanta* at these times it will assail and drive away. Constant warfare is also kept up between it and the small copper butterfly; and whenever these diminutive creatures come near each other, they dart into action, and continue buffeting one another about till one retires from the contest, when the victor returns in triumph to the station he had left. Should the enemy again advance, the combat is renewed; but should a cloud obscure the sun, or a breeze chill the air, their ardour becomes abated, and contention ceases. The pugnacious disposition of the *Argus* butterfly soon deprives it of much of its beauty; and, unless captured soon after its birth, we find the margins of its wings torn and jagged, the elegant blue plumage rubbed from the wings, and the creature become dark and shabby."—*Journal of a Naturalist*, p. 277.

SPECIES 9.—POLYOMMATUS ÆGON. THE SILVER-STUDDED BLUE BUTTERFLY.

Plate xxxiv. fig. 1—6.

- | | |
|--|--|
| <p>ΣΥΝΟΤΗΤΕΣ.—<i>Papilio Ægon</i>, Borkhausen, Hübner.
 <i>Papilio Argus</i>, Linnæus. Faun. Suec. 1074. Lewin, Pap. pl. 39, fig. 5—7.
 Haworth (not <i>P. Argus</i> of Donovan, vol. 4, pl. 143 ♂, which is the male of <i>P. Alexis</i>).
 <i>Lycæna Argus</i>, Fabr., Leach, Ochsenh., Hübner Pap. tab. 64, f. 316 ♂, 317, 318, ♀.
 <i>Polyommatus Argus</i>, Stephens. Duncan Brit. Butt. pl. 33, fig. 3, Wood, Ind. Ent. t. 2, fig. 71.
 <i>Lycæides Argus</i>, Hübner (Verz. bek. Schmett.).
 <i>Papilio Idas</i>, Linnæus, Faun. Suec. 1075 (female), (<i>P. Argus</i> β. Linn.</p> | <p>S. N. 2, 790), not <i>P. Idas</i> of Lewin, Donovan, and Haworth, which is <i>P. Agestis</i>.
 <i>Hesperia Acreon</i>, Fabricius (variety?).
 <i>Papilio Argyrognomon</i>, Borkhausen (variety?).
 <i>Papilio Argiades</i>, Esper. Papil. 1, pl. 101, cont. 56, fig. 6 (variety).
 <i>Polyommatus Alcippe</i>, Kirby's manuscripts, in Mus. Ent. Soc. Lond. (variety).
 <i>Polyommatus maritimus</i>, Haworth's manuscripts (variety).
 <i>Pap. Leodorus</i>, Esper. Pap. 1, pl. 80, cont. 30, fig. 1, 2 (variety).</p> |
|--|--|

This pretty butterfly generally measures about an inch and a quarter in the expansion of the wings, which have the upper surface, in the male, of a fine, deep, lilacy blue, with the front margin of the anterior pair silvery white; of which colour also are the hairs on the wings, especially in the hind pair. The apical margin of all the wings on this side is broad and black, the dark colour slightly ascending along the veins into the disc of the wing, and in the hind wings assuming the appearance of oval, marginal spots. The ciliæ, both

above and below, are white, a very slight black spot at the extremity of each of the veins being alone visible at the base of the fringe; the body above is clothed with silvery and blue hairs, the eyes are margined with white; and the antennæ are black, with white rings, the upper side of the club black, and the lower fine orange. Beneath, the wings in this sex are of a pale greyish colour, the base being saturated with blue; at the extremity of the discoidal cell of the fore wings is an oval, black ocellus, edged with white; this is succeeded by a curved row of six similar ocelli, varying in their form and size; the innermost of these spots is often doubled; then follow two rows of dark spots, the inner row formed of arched spots, and the outer one of round, smaller ones; the space preceding the former is whiter than the rest of the wing, and the space between the two rows of spots is often coloured with orange: the margin of all the wings is slender and black, and triangularly dilated at the extremity of the veins. The hind wings have more numerous ocelli; namely, three small, round ones near the base, one transverse near the middle, a much curved and irregular row of eight beyond the middle, beyond which the wing is whiter than in the other parts; then follows a curved row of eight black arches, and a fulvous band, on which are about the same number of round black spots, most of which are adorned with silvery scales.

The females are larger than the males, and have the upper surface of the wings of a dull warm, brown colour, darker at the base, and near the extremity of the wings is a series of fulvous, arched spots, occasionally more obsolete on the fore wings; along the margin of the hind wings is also occasionally a very slender, dull white, interrupted streak. The ciliæ are also dusky, especially at the base. Beneath the ground colour of the wings is darker grey, or brownish ashy, which throws the white ocelli and other markings beyond the middle curved row of spots into stronger contrast. Moreover, the submarginal orange band is brighter coloured, the dark marking by which it is edged being more distinct. The female often differs by having the disc of the wings on the upper side more or less (and especially in the hind wings, as in our figure 3) suffused with blue.

Some striking varieties of this species have been observed. In one, captured by the late Mr. Hatchett, at Coombe Wood, the upper surface of all the wings is of a pale fulvous, tawny colour, like that of *Hipparchia Pamphilus*. In another, taken by the late Mr. Haworth, in salt marshes, near Holt, Norfolk, and thence named by him *P. MARITIMUS*, the ocelli on the disc of the under side of the wings are elongated into those on the middle of the wing, being almost confluent with the following row of spots. To a specimen of this variety in the cabinet of the Entomological Society of London, is attached the manuscript name of *ALCIPPE*, of Kirby; but Mr. Stephens applies that name to another, and apparently very distinct variety, of smaller size, having "the wings narrower, blue above, with a broad, black margin to all the wings, the under side of the male of a deep greyish or drab colour, the ocelli very distinct in the female, and the oblique series on the posterior wing consisting of four."

The caterpillar is described as being of a dull green colour, with whitish tubercles, and a blackish head and legs; a line down the back and sides, oblique marks on the latter, of a dark red colour, bordered with white. It feeds on broom, sainfoin, and other kinds of *Trifolium* and allied genera. The chrysalis is at first green, and afterwards brown.

This species frequents lanes, marshy commons, damp fields, etc., about the middle of July, not appearing to be attached to chalky districts. Although not apparently found in the north of England, it is sufficiently common in various parts of the south; Coombe and Darenth Woods, Ripley Green, Wood Hay Common, Hants; Parley Heath, Dorset; Coleshill Heath, Warwickshire (as we learn from the Reverend W. T. Bree); and other localities are recorded by preceding authors.

DESCRIPTION OF PLATE XXXV.

INSECTS.—Fig. 1. *Polyommatus Eros*. 2. Showing the under side.

„ Fig. 3. *Polyommatus Dorylas*. 4. The female. 5. Showing the under side.

PLANTS.—Figs. 6 and 7. *Hippocrepis comosa* (the horse-shoe Vetch).

I have not met with any British specimens of either of these species, those marked *Dorylas* in many collections being merely varieties of *Adonis*; and I have seen small varieties of *Argus* marked *Eros*. It seems doubtful whether the true species has ever been found in this country; I therefore give the figures of Hübner to enable collectors to compare specimens, which they may suppose to be either of these species. H. N. H.

SPECIES 10.—POLYOMMATUS EROS. THE PALE BLUE BUTTERFLY.

Plate xxxv. fig. 1—2.

SYNONYMES.—*Lycæna Eros*, Ochsenheimer, 4, p. 26.

Polyommatus Eros, Jermyn, Steph. Ill. Haust. 1, p. 93. Wood, Ind. Ent. t. 3, fig. 70, ♂, ♀.

Argus Eros, Boisduval, Icones Hist. Lep. pl. 14, fig. 4—6.

Papilio Tithonus, Hübner, Pap. pl. 108, fig. 555, 556, ♂. Haworth in Ent. Trans. 1, 334.

The expansion of the wings of this doubtful British species is rather less than an inch and a quarter. The upper surface of the wings in the males is of a pale azurine blue, with a silvery or greenish tinge, which is not found in the allied species, *P. Dorylas*. The fringe is white, and separated from the ground colour of the wings by a black border, which is broader than in *P. Dorylas*, and which extends slightly upwards along the tips of the veins, especially in the under wings, which thus assume the appearance of having the margin spotted with black.

The under side of the wings has considerable resemblance with *Alexis* in the ground colour and arrangement of the ocelli and markings; the ground colour being brownish grey, with the base saturated with greenish blue. The fringe is separated from the ground colour by a slender black edge, preceded by marginal lunules of pale yellowish orange, within each of which is a black arch, and on the opposite side a small black spot. These fulvous markings are more indistinct on the upper wings; their black anterior part is, on the contrary, more strongly marked. Between the mark at the extremity of the discoidal cell of the fore wings (which is nearly the same as in *Alexis*) and the fulvous lunules, is a range of ocellated spots; the discoidal spot is preceded by an ocellated spot (Boisduval figures two such basal spots) in the fore wings, and in the hind wings by a row of four (or three) similar ocelli, placed upon the greenish part of the base, as in *Alexis*. The under side of the breast and legs are of a greenish grey, and that of the abdomen white; the thorax and the under side of the abdomen are blue.

The female differs from the male almost in the same manner as in *Alexis*; some specimens being entirely brown, and others saturated with blue from the base to beyond the middle; some again have only some blue atoms at the base, and along the inner edge of the fore wings. The ground colour of the wings is rather black than brown, with a central black lunule. The extremity of the hind wings is ordinarily marked with a row of lunules, fulvous within, black in the middle, and edged externally with white. The under side scarcely differs from that of the male, except that the fulvous spots are rather brighter coloured.

On the Continent this is a rare species, being found on the Alps of Valois, Tyrol, and France; Mount Ceni and the environs of Digne and of Gap have been recorded as its localities. It is therefore doubtful whether Messrs. Haworth and Stephens, who have introduced this species into the English catalogues, may not have mistaken some pale variety of *Alexis* for it: such is the decided opinion of Mr. Edward Doubleday, and the matured opinion of Mr. Stephens himself, given in the British Museum Catalogue, in which we consequently find the true *P. Eros* placed among the reputed British species, and the *Eros* of the "Illustrations" given as identical with the variety *Labienus* of *P. Alexis*. From that species it is at once known by the peculiar pale

upper surface of the wings of the male, with a dark border; and from the female, by the much darker upper surface.

Mr. Haworth's specimen is supposed to have been taken in Kent. Mr. Stephens gives his specimen as a variety, describing it thus:—"Colour of the upper surface rather more intense; the inferior ocellated, nearly as in *Alexis*; but destitute of a fulvous, marginal fascia, in lieu of which it has a series of ocelli, with minute black irides, cinctured with white, faintly tinted with yellowish towards the inner side. This variety is probably synonymous with *P. Labienus*, of the first edition of the 'Butterfly Collector's Vade Mecum,' unless var. γ of the preceding insect [*Alexis*] be the kind intended." The description which I have given of Mr. Kirby's original specimen of *P. Labienus*, in p. 108, will at once show that that supposed species has no connection with the true *Eros*. Mr. Stephens's specimen was taken in July 1826, in a grassy lane, near Ripley, Surrey.

SPECIES 11.—POLYOMMATUS DORYLAS. THE AZURINE BLUE BUTTERFLY.

Plate xxxv. fig. 3—5.

SYNONYMS.—*Papilio Dorylas*, Fabricius, Wien. Verz., Hübner, Pap. pl. 67, fig. 289—291.
Lycæna Dorylas, Ochsenheimer.
Polyommatus Dorylas? Stephens Ill. Haust. 1, p. 90. Wood, Ind. Ent. tab. 2, fig. 67.

Argus Dorylas, Boisduval, Icon. Hist. Lep. pl. 14, fig. 1—3.
Papilio Hylas, Esper. Schmett. pl. 46, Suppl. 21.
Papilio Thetis, Esper. (female), pl. 55, cont. 5, fig. 1.
Papilio Golgus, Hübner, Europ. Schmett. (variety).
L'azuré, Ernst. Papil. d'Europe, pl. 83, Suppl. 2, pl. 4, fig. 82.

The expansion of the wings of this doubtful British species is rather more than an inch and a quarter. The upper surface of the wings of the male is of a bright azurine blue, nearly like *Adonis*, with the fringe and the anterior margin white; the fringe is preceded by a slender black margin, which extends a little along the veins of the wings, especially in the anterior pair. The under side is of an ashy-grey colour, slightly shaded with blue at the base; the discoidal cell of the fore wings is not marked with an ocellus in the centre, but is terminated by a curved black spot, margined with white; beyond this is an irregular curved row of six ocellated black spots, succeeded by a row of fulvous, arched spots, forming the inner edge of the pale margin of the wings. The under surface of the hind wings is marked with two, three, or four ocelli at the base; the extremity of the discoidal cell is occupied by a white spot, destitute of any black marks, and is succeeded by a curved row of ocelli, the middle ones of which are placed near or upon a patch of white; the extremity of the wings being marked with a row of fulvous crescents, preceded by black arches, and marked on the outside with black spots. The under side of the breast and the feet are of a bluish colour, and of the abdomen white. The upper side of the latter and of the thorax is blue; the antennæ are ringed with white.

The upper side of the female is of a uniform brown colour, with a marginal row of fulvous spots, sometimes on the hind wings alone, but occasionally on all the wings. The under side is of a reddish grey, not saturated with blue at the base, with similar spots to the male, except that the fulvous markings are brighter.

This species differs from *P. Adonis* in the fringe being unspotted; the fore wings beneath have not the basal ocellus, and the hind wings have the white spot at the extremity of the discoidal cell unspotted with black.

Boisduval gives the Alps, Pyrenees, and some parts of Hungary and Germany, as the habitats of this species. Ochsenheimer gives Lewin's plate 38, figs. 1 and 2, as identical with this species; but Mr. Stephens regards them as representing *P. Adonis*. The specimens also which were regarded as identical with this insect in Miss Jermyn's "Vade Mecum," 2nd edition, Mr. Stephens further considers as possibly identical with his variety γ of *P. Adonis*; but that variety has the fulvous band on the hind margin of all the wings obliterated. The





the male on the under side (fig. 3) have two ocelli at the base, preceding the central spot; and the female is powdered with blue (fig. 2), and has the fulvous marks of the margin of the fore wings spotted with black, none of which characters agree with the true *Icarius*. How far Mr. Haworth's "several English specimens," which were taken in Kent, agreed with the true *Icarius*, I have now no means of ascertaining.

On the Continent, *Icarius* is found in the Pyrenees, the Piedmontese Alps, Lapland [?], Hungary, and some parts of Germany.

SPECIES 13.—POLYOMMATUS AGESTIS. THE BROWN ARGUS BUTTERFLY.

Plate xxxvi. fig. 5—7.

SYNONYMES.—*Papilio Agestis*, Wien. Verz., Hübner, Pap. pl. 62, f. 303, 304.

Polyommatus Agestis, Jermyn, Stephens, Duncan, Brit. Butt., pl. 34, fig. 1.

Wood, Ind. Ent. t. 3, f. 9, and t. 2, f. 72.

Agriades Agestis, Hübner, Verz. bek. Schm.

Papilio Idas, Lewin, Pap., pl. 39, f. 1, 2. Donovan, Brit. Ins., vol. 10, pl. 322, f. 2. Haworth, Jermyn (not *Idas*, Linn., F. S., which is the female of *Argus*).

Lycana Idas, Ochseneimer, Leach.

Pap. Medon, Esper., Pap., pl. 32, Suppl. 8, f. 1.

We have now taken leave of the species of *Polyommatus* in which the males are ornamented with blue or purple tints on the upper surface of the wings. In both sexes of this species the wings are coloured alike, being of a fine silken brown, with a very slender pale margin along the costa, and with a row of small bright orange-coloured lunulated spots; marked on the outside in the hind wings with small black round dots. There is also a small black crescent at the extremity of the discoidal cell of the fore wings. The fringe is white or pale brown, with minute dark lines at the extremity of the veins. The upper surface of the body is black, with greyish hairs. The under side of the wings is of a brownish ash colour, the fore wings with a rather large and very distinct white spot, generally inclosing a smaller black one at the extremity of the discoidal cell, succeeded by a *strongly curved* row of five or six (the inner one when present being minute and duplicated) similar ocelli. These are succeeded by the same number of fulvous patches edged within with a brown curve, and marked next the margin with a brown spot. The margin is slender, and blackish brown, dilated at the tips of the veins, and white within; and the fringe white, slightly marked with brown at the extremity of the veins. The hind wings are tinted with blue at the base, which is marked with three ocelli; the discoidal white spot is transverse-oval, and emits a small branch behind; it is but slightly marked with black in the centre; beyond this is a curved and irregular row of eight white spots, varying in size (the middle one being confluent), each of which has a black dot in the centre. Then follows a row of slender, black, pointed arches, edged within with a slender white line, and externally bearing a row of fulvous patches succeeded by a row of white, connected, transverse-oval spots, each bearing a small black dot; the margin is very slender, and black, and dilated at the extremity of the veins.

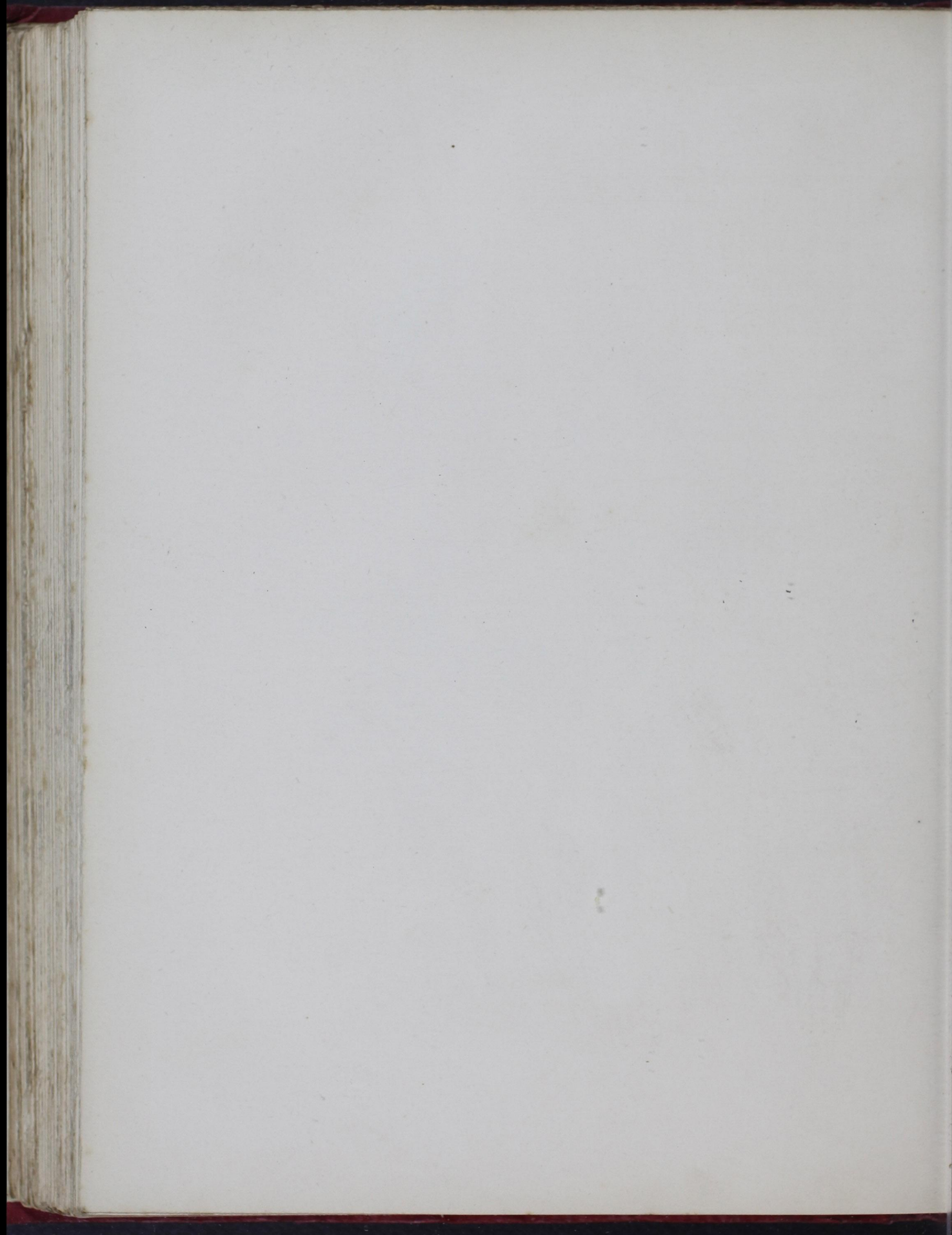
The female differs in not being so intensely brown on the disc of the wings, and in having the fulvous band of spots larger and more distinct, extending to the front margin of the fore wings, and more strongly marked with black spots on the hind wings. Varieties occur in the number of the spots on the under side of the wings, and in the size and extent of the row of fulvous spots.

The expansion of the wings in this species varies from an inch to an inch and a quarter.

This species appears to be double-brooded: May and June, and July and August, being the times of its appearance in a winged state. It is found in most of the southern counties of England in tolerable abundance, as well as in various localities in Norfolk and the adjacent counties. The most northerly recorded situation is Seaham Dean, near Sunderland.







The caterpillar is green, with a pale angulated row of dorsal spots, and a central brownish line. It feeds, according to Haworth, on grasses, but Esper figures it upon the wild strawberry. It appears in this state in the months of April and June.

In the "Entomological Magazine" (vol. ii. p. 515), Mr. Newman endeavoured to prove that this species and the two following "are but one species." Specimens taken at Ramsgate, Dover, Hythe, Hastings, Rye, Brighton, Worthing, Little Hampton, Chichester, Portsmouth, Isle of Wight, Dorsetshire, and Somersetshire, exhibit the "typical form" of the species (as described above); at Birmingham, Worcester, and Shrewsbury, "an evident change has taken place, the band of rust-coloured spots has become less bright; at Manchester these spots have left the upper wing almost entirely; at Castle Eden Dean they are scarcely to be traced, and a black spot in the centre of the upper wing becomes fringed with white; in some specimens it is quite white; the butterfly then changes its name to *Salmacis*. We proceed further northward, and the black pupil leaves the eyes on the under side, until at Edinburgh they are quite gone; then it is called *Artaxerxes*." Mr. Stephens does not, however, agree with Mr. Newman in this respect, stating that "his definitions do not accord with my series of specimens of the three insects obtained from nearly every one of the localities enumerated by him." ("Illustr. Haust." 4, p. 382.) Boisduval also gives the *Artaxerxes* as distinct, stating that its fore wings are proportionably longer than those of *Agestis*; to which I may add that the relative position of the spots (which seems to me in this genus to afford a good specific character) is different in the two species, especially on the under side of the upper wings.

DESCRIPTION OF PLATE XXXVII.

INSECTS.—Fig. 1. *Polyommatus Salmacis* (the Durham Argus B.). 2. The female. 3. Showing the under side.

„ Fig. 4. *Polyommatus Artaxerxes* (the *Artaxerxes* B.). 5. The female. 6. Showing the under side.

PLANTS.—Figs. 7 and 8. *Ononis procurrens* (trailing Rest-harrow).

The insects on this plate are all figured from the cabinet of Mr. Stephens. I have placed these two species together to enable the collector to compare them, as they have been supposed by some to be merely variations of one species. In *Salmacis* it will be seen the female is sometimes without the white mark, which is more constant in *Artaxerxes*, and *Salmacis* has more frequently a slight indication of an orange border on the fore wings. On the under side, *Artaxerxes* is without the black pupil in the pale spots, which is pretty constant in *Salmacis*. H. N. H.

SPECIES 14.—POLYOMMATUS SALMACIS. THE DURHAM ARGUS BUTTERFLY.

Plate xxxvii. fig. 1—3.

SYNONYMES.—*Polyommatus Salmacis*, Stephens, *Illustr. Haust.* vol. iii. p. 235.

Wood, *Index Ent.* t. 3, p. 73, ♂ ♀, and fig. 12. Duncan, *Brit. Butt.* pl. 34, figs. 2 and 3.

This species is intermediate between *Agestis* and *Artaxerxes*, and varies in the expanse of its wings from $1\frac{1}{2}$ to $1\frac{3}{4}$ inch. The upper side of the wings is of a silky blackish brown colour, with a black spot at the extremity of the discoidal cell in the males, and a white one in the females, which is, however, sometimes obsolete, especially in the latter sex. There is also a row of submarginal fulvous spots on the hind wings, which sometimes also extends along the margin of the fore wings, but it is occasionally almost obsolete in the male. The fringe is white, with slight brown marks at the base. The under side of the wings is of a brownish grey, the anterior wings having a white spot at the extremity of the discoidal cell, succeeded by a curved row of similar spots, each marked in the centre with a dusky point; there is also a submarginal row of orange spots bounded above with a dusky crescent, and marked beyond with a dusky spot surrounded with white, the extreme margin being

marked by a dusky line: the posterior wings have several white spots towards the base; a larger discoidal one, a curved irregular row of white tuberculated spots beyond the middle, with a broad patch of white connecting the middle spots with the submarginal band of fulvous spots, which are similar in their markings to the corresponding row of the fore wings: the white subocellated spots on this side of the wings have the middle marked more conspicuously with a dusky spot in the females than in the males.

Mr. Stephens's short description of this species is as follows:—"Alis fusco-nigris, subtus fuscescentibus maculis subocellatis, anticis supra in masculis puncto discoidali atro, in fœminis albo; posticis utrinque fascia submarginali rubra;" and Mr. Wailes, an acute entomologist, resident upon the spot where the species occurs, namely, Castle Eden Dean, near Durham (it also occurs in the magnesian limestone district, near Newcastle), entirely coincides with Mr. Stephens in considering it as a distinct species, observing, however, that Mr. S.'s description is not quite correct, since, out of at least 150 specimens, the variety with the black spot forms two-thirds of the whole; and that neither sex possesses exclusively either the white or black spot; though the majority of the former variety are males. ("Entomol. Mag." i. p. 42.) He further states that this butterfly appears to be confined to the sea-banks, having only seen a few stragglers so far from the coast as half a mile. It appears in July. It is, however, considered by some of our best entomologists as a local variety of the next species.

SPECIES 15.—POLYOMMATUS ARTAXERXES. THE SCOTCH ARGUS.

Plate xxxvii. fig. 4-6.

SYNONYMES.—*Hesperia Artaxerxes*, Fabricius. Lewin, Pap. pl. 39, fig. 8

—9. Haworth. Donovan, Brit. Ins. v. 16, pl. 541 (*Papilio Art.*).

Lycœna Artaxerxes, Leach.

Argus Artaxerxes, Boisduval, Icon. Hist. Lep. pl. 14, fig. 7-8.

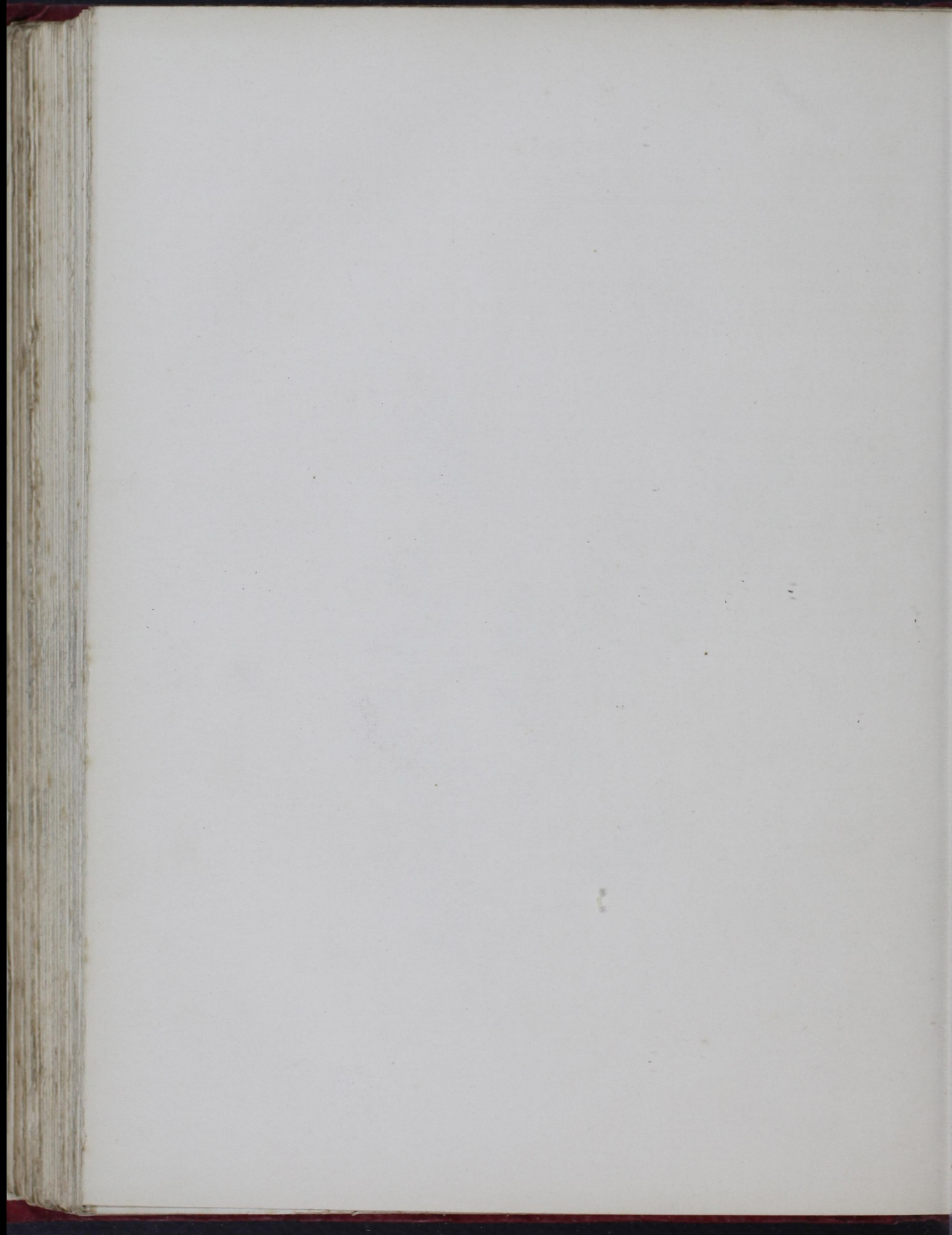
Polyommatus Artaxerxes, Stephens. Jermyn, Wood, Ind. Ent., pl. 3, f. 74 and 13. Duncan, Brit. Butt., pl. 34, fig. 4.

This species is closely allied to the preceding, if, indeed, that be not a local variety of this. It varies in the expanse of the wings from an inch to an inch and a sixth. The upper surface of the wings in both sexes is of a silky blackish-brown colour, with the anterior margin very slender and white, and a small white spot at the extremity of the discoidal cell; and in a few instances, a similar minute white spot occurs on the disc of the hind wings above. There is also a submarginal row of small orange-red marks on all the wings, although they are often almost, or even entirely, obsolete in the fore wings. The fringe is white, slightly marked with brown at the base opposite to the extremity of the veins. The under side of the wings is of a greyish brown; the anterior wings having a large round patch at the extremity of the discoidal cell, succeeded by a *slightly curved* row of white oval spots; beyond this is a row of fulvous spots, bounded within by dusky crescents, edged with white, and terminating in round black spots; beyond which is a slender bar of white immediately preceding the slender dark margin which is dilated at the extremity of the veins. The under side of the fore wings is marked by four white spots, forming an oblique line at the base; the spot at the extremity of the discoidal cell is white, and of transverse-oval form, emitting a minute straight branch from its outer edge; near this, on the costa of the hind wings, are two white spots, and there are six others, forming an interrupted white bar beyond the middle of the wings, those in the centre being confluent, and thus forming a larger white patch; the margin of this pair of wings is ornamented with fulvous spots and other markings, exactly corresponding with those on the margin of the fore wings.

The female, as in *Agestis*, closely resembles the male, but the submarginal row of fulvous spots is generally larger and more extended into the fore wings than in the male. The upper side of the antennæ is like that of *Agestis*, except that the extremity of the club is reddish; their under side is almost entirely whitish.







Like several of the allied species, this insect is double-brooded, appearing in June and August. Fabricius, by whom the species was first described, gave it as a native of *England*, from the drawings of Mr. Jones. It appears, however, to be exclusively an inhabitant of Scotland, and was, until lately, supposed to be only found on Arthur's Seat, Edinburgh, being of such rarity, that scarcely a single cabinet possessed a specimen,—the owners endeavouring, according to the bad taste of the day, to supply its place with a drawing of the insect stuck in their cabinets. More recently, however, it has occurred in considerable plenty, not only in the locality above mentioned, but also on Salisbury Craigs, King's Park, and near Duddingston Loch, Pentland Hills; near Queensferry and Rosslyn Castle; Jardine Hall, Dumfriesshire; and Flisk, in Fifeshire. The other localities mentioned by Mr. Stephens appear to belong to *Salmacis*, except the last, "Dartmoor, 23 August, 1823, Dr. Leach," which is probably erroneous.

In addition to what has been already observed under *P. Agestis*, relative to the specific rank of this and the two preceding species, it must be stated, that, although *Agestis* is very abundant on the Continent, the continental entomologists have never met with a single specimen of *Artaxerxes*, their cabinets being entirely furnished with Scotch specimens.

POLYOMMATUS TITUS (*Hesperia* T., Fabricius; Turton; Donovan, in "Rees' Encycl.," art. *Papilio*, Jermyn; Stephens) was described by the first-named author as a native of England, on the authority of Mr. Drury and Mr. Jones's collection of drawings of *Lepidoptera*.* Mr. Haworth, however, who was personally well acquainted with the latter gentleman, states that the information given to Fabricius was incorrect, the insect not being a native of this country. The following is a translation of his character:—Stature quite like *Artaxerxes*, etc.; all the wings above, brown, unspotted; beneath, also brown: the anterior, with a posterior or submarginal row of short white and black lines; and the posterior, with a central short line, and a row of black dots edged with white; near the margin is a row of red spots, each marked with a black dot.

FAMILY V. HESPERIIDÆ.

THIS family, which is the last in the general arrangement of the diurnal *Lepidoptera*, was well indicated by Linnæus, under the title of *Papiliones Plebeii Urbicoli*, and is composed of a very distinct tribe of butterflies, constituting, indeed, a primary division amongst them, which Boisduval has termed *Involuti*, from the circumstance of the caterpillars enclosing themselves in a curled-up leaf; and thus, as well as in several other important characters, approaching the moths.

The six feet are of uniform size in both sexes; the hind tibiæ have a pair of spurs at the apex, and generally another pair near the middle of the limb, a character found in none of the preceding butterflies; the hind wings are generally horizontal during repose, and in some species all the wings are placed in this manner

* This collection of drawings is still in existence, being in the possession of a gentleman resident at Chichester; many of the species figured in it, and thence described by Fabricius, have since been published by Donovan in his "Naturalist's Repository."

(*Tamyris Zeleucus*, Fab. Swainson "Zool. Ill.," vol. 1, pl. 33). The antennæ are wide apart at the base, and are often terminated in a very strong hook; the labial palpi have the terminal joint very small; the spiral tongue (or maxillæ) is very long, and the discoidal cell of the hind wing is not closed.

The caterpillars, of which, however, but few are known, are cylindrical, without spines, with the anterior segments narrowed, and the head very large, which thus appears to be borne upon a footstalk; the hind part is always obtuse. The larvæ * roll up leaves, in which they construct a very slender silken cocoon, wherein they are transformed to chrysalides, which are entire and without angular prominences.

Poeys, in his "Centurie des Lépidoptères de Cuba," pl. 4, and Swainson, in his "Zoological Illustrations," vol. 1; Abbot and Smith, Reaumur, Stoll, Hübner, etc., have represented the transformations of various species. The chrysalis is generally smooth, but occasionally angulated, of a lengthened form, and attached at one end as well as girt round the middle, the transformation being effected in the rolled-up leaf which served the caterpillar as its abode.

The species are of comparatively small size, and of obscure colours; but many are ornamented with pellucid spots; and others have the hind wings furnished with long tails. The body is short, very robust, and their flight is accordingly very strong, rapid, and so peculiar, that they have obtained the name of skippers—indicative of their singular short, jerking kind of flight. They also frequently settle on flowers, leaves, or branches, as well as upon the ground, with which their dull colours well associate.

H. Tages (according to Dr. Abbot, "Lin. Trans.," vol. 5, p. 276) flies early in the morning; its flight being extremely short, and very near the ground. Mr. Curtis mentions the curious circumstance, that old specimens, whilst alive, frequently lose one or both of their palpi: an accident he had only observed amongst the *Pyralidæ*.

The relations of these butterflies with other insects are very interesting. Latreille united in the same group a singular exotic genus, *Urania*, which is nearly related to the *Hesperis-sphingides*. Mr. Swainson, indeed, states that their *palpable affinity* to the *hawk-moths* has induced almost every writer to place them as the connecting link between the diurnal and crepuscular *Lepidoptera*; but such is not the case: it is with the *Hesperis-sphingides* that they are nearest allied, their relationship with the *hawk-moths* being very slight. They have another relation with the *Tortricidæ*, a family of small moths, founded merely upon the habit which is exhibited by the caterpillars of both groups of rolling up the leaves of plants, and which, in the *Tortricidæ*, becomes a practical source of annoyance in many instances. These relations are self-evident; but another has recently been pointed out, which appears to me to be so far-fetched and ridiculous as to merit only silence, were it not that it forms part of a system which is asserted to be all-natural, and which is to supersede all others hitherto or hereafter to be promulgated. "The Natural Arrangement of Insects," of Mr. Swainson, furnishes us (p. 205) with a test of the relative position in Nature of the tribes of the *Coleoptera*, founded upon the corresponding position of the families of the diurnal *Lepidoptera*. The *Hesperiidæ* are thus made to represent the *Malacoderm-beetles*, because the skin of the larvæ of the former is said to be so thin that the

* "The larvæ of the *Hesperiidæ* are so strikingly distinguished from those of the *Polyommaticæ*, and the only one known of the *Erycinidæ*, that it is really surprising how entomologists still continue to arrange them in the same group."—Swainson, "History of Insects," p. 97. Nothing more completely proves the ignorance of this writer of the works of modern entomological writers, by the majority of whom *Hesperia* is constituted into a separate family.

caterpillars are obliged to defend themselves by the artificial means of curled-up leaves. "The Hesperiidæ are, in fact, the *soft-skinned butterflies*, just as the Malacodermes among the Coleoptera"!*

England is comparatively poor in the species of this family—tropical America being the metropolis of the group; at least 300 species having been collected in that part of the world. Other parts of the world, as India, New Holland, South Africa, and Europe, possess various species, but fewer in number. Boisduval thinks that there are more than 400 species in collections.

The species are very closely allied together, and difficult to be determined, except by very precise examination. M. Rambur has, however, proved in the last number of his "Faune Entomologique de l'Andalousie," lately published, that good specific distinctions exist between nearly allied species in the structure of the male organs of generation.

The study of the whole of this extensive family can alone determine the propriety of the distribution of the species into genera or still minor groups. It is impossible to examine the very few indigenous species we possess, without being convinced of the difficulty of attempting this from so small a portion of the group. For instance, the antennæ in *Malvæ* or *Alveolus*, and *Tages*, have the club differently formed, and the position of their wings in repose is different, although they agree in the folded costa of the fore wings of the males, and in the curved clava of the antennæ. Again, the club of the antennæ differs in its form in every one of the species composing the genus *Pamphila* of Stephens; and yet this is the character which the last-named author uses to characterise the two genera into which he has divided the British species. Hübner, Boisduval, and, still more recently, Zeller, have attempted the distribution of the species into subordinate groups, and it is much to be regretted that Mr. Swainson's researches in this difficult family have not yet been published. In the "Genera of Diurnal Lepidoptera" I have recently undertaken a generic revision of the family.

DESCRIPTION OF PLATE XXXVIII.

INSECTS.—Fig. 1. *Pyrgus Malvæ* (the Grizzled Skipper). 2. The female. 3. Showing the under side. 4. The Caterpillar. 5. The Caterpillar prepared for its change to the Chrysalis state. 6. The Chrysalis.

" Fig. 7. The white-banded variety of *Pyrgus Malvæ*, by some considered a distinct species. 8. Showing the under side.

" Fig. 9. *Nisoniades Tages* (the Dingy Skipper). 10. The female. 11. Showing the under side. 12. The Caterpillar. 13. The Chrysalis.

" Fig. 14. *Pyrgus Oileus*. 15. Showing the under side.

PLANTS.—Fig. 16. *Dipsacus fullonum* (Fullers' Teazle).

" Fig. 17. *Eryngium campestre* (Field Eryngo).

P. Malvæ and the variety are from specimens in the British Museum; *N. Tages* from specimens in the cabinet of E. Doubleday, Esq., of Epping; and *P. Oileus* from specimens taken by Mr. Doubleday in North America: he having no doubt that it is the insect which has been considered a British species, and found its way into some British cabinets under the name of *P. Oileus*. The caterpillar and chrysalis of *P. Malvæ* are from Hübner, and those of *N. Tages* from Godart. H. N. H.

PYRGUS, HÜBNER (THYMELE P. STEPHENS).

The species of this genus, or rather sub-genus, are distinguished by the greater length of the palpi, which are very hairy, and extend in front of the head, being at least as long as the head, the terminal joint being

* In like manner the Erycinidæ represent the Monilicorn beetles, because the larva of the former resembles that of a *Cassida* or Tortoise beetle; and the Satyridæ [*Hipparchiides*] represent the Capricorn beetles, because the antennæ in the perfect insects of both groups are pre-eminently long, and because the head of the larvæ of these butterflies is often armed with long horns!! Scientific trifling can scarcely go further than this.

slender, distinct, and exserted. The antennæ are rather short, without any hook at the tip, and terminated by a gradually formed arched club; the head is rather broad, with a tuft of recurved hair at the base of the antennæ, and the thorax robust. The wings are short, and rounded along the outer margin in both sexes; the front margin towards the base in the males being folded, the base rounded: the mediastinal vein scarcely extends beyond the middle of the front margin of the wing; the postcostal one extends to a short distance below the apex of the wing, emitting on its front side four straight branches, the fourth of which runs to the tip of the wing; it also emits a branch from its posterior side. The great median vein is divided into three branches, and between the anterior one of these and the posterior one of the postcostal vein is a straight free vein.* The males are not distinguished by having a thickened oblique patch upon the disc of the fore wings. The wings in repose are *deflexed*. The abdomen in the males is narrow, with the tip bearded, whilst in the females it is more robust, with the tip acute and nearly naked. The cilia of the wings is long, alternately black and white, and the wings are also of a dark colour, spotted with white.

The larvæ are naked, or but very slightly pubescent, resembling those of the Tortricidæ, with a large head, the following segment being attenuated; generally subsisting upon the rolled-up leaves of malvaceous plants. The pupa is entire, and conical in its form, enclosed in a cocoon, and fastened by the tail as well as by a girth round the middle.

As there are a considerable number of species agreeing with *Malvæ*, I have retained that as a type of a distinct genus, for which I have employed Hübner's name in preference to that of *Thymeles* of Fabricius (used by Stephens), the real types of which are exotic tailed species, and because it has a priority of date over that of *Syrictus* of Boisduval, employed for the group.

SPECIES 1.—PYRGUS MALVÆ. THE GRIZZLED SKIPPER.

Plate xxxviii. fig. 1—6.

SYNONYMS.—*Papilio Malvæ*, Linnæus, Faun. Suec. 1081. Lewin, pl. 46, f. 8—9. Haworth, Turton. Harris, Aurelian, pl. 32, fig. 1—m.

Hesperia Malvæ, Leach, Curtis. Dalman, Hesp. Su. 202, 6. Zetterstedt, Faun. Lapp. p. 915 (not *Thymeles Malvæ* of Stephens and Wood, nor of Fabricius).

Syrictus Malvæ, Boisduval, Icon., p. 231.

Papilio Alceolus, Hübner, Pap. t. 92, f. 466, 467.

Thymeles Alceolus, Stephens, Duncan, Brit. Butt. v. 2, pl. 1, f. 1. Wood, Ind. Ent. t. 3, f. 75. E. Doubleday (Cat. Brit. Lep. 1848).

Pyrgus Alceolus, Hübner (Verz. bek. Schmett.). Stephens, Cat. Brit. Mus. Lepidoptera.

Papilio Sæo, Bergsträsser, Eur. Schmett. t. 40, f. 8. Faun. Franc. pl. 26, f. 7, 8.

Hesperia Fritillum minor, Fab. Ent. Syst. 3, part 1, p. 351, pl. 356.

Papilio Fritillum, Lewin, pl. 46, f. 4, 5 (variety).

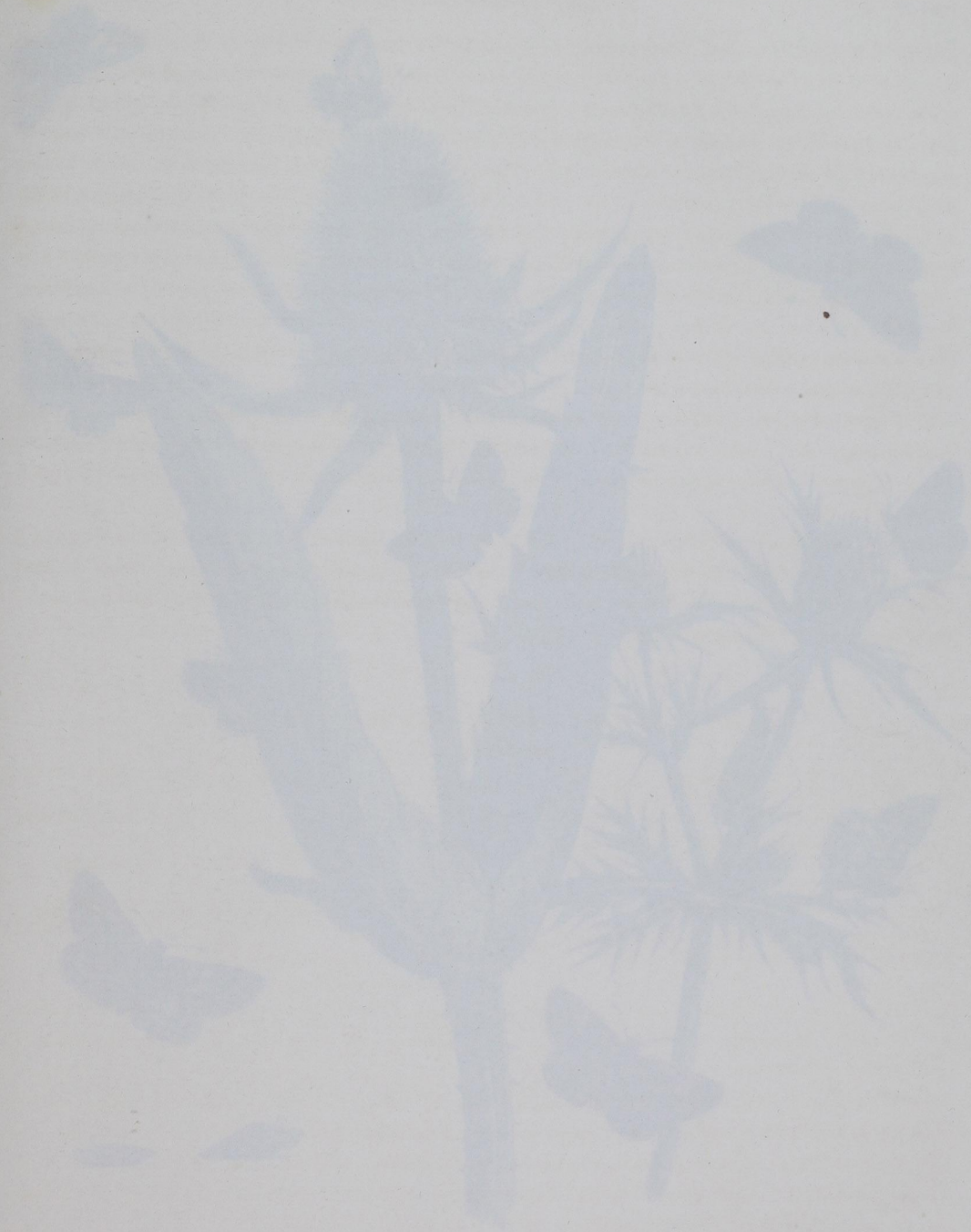
Papilio Lavatera, Fabricius, Haworth, Jermyn (variety). Not *P. Lavatera* of Hübner.

Papilio Althea, Borkhausen (variety).

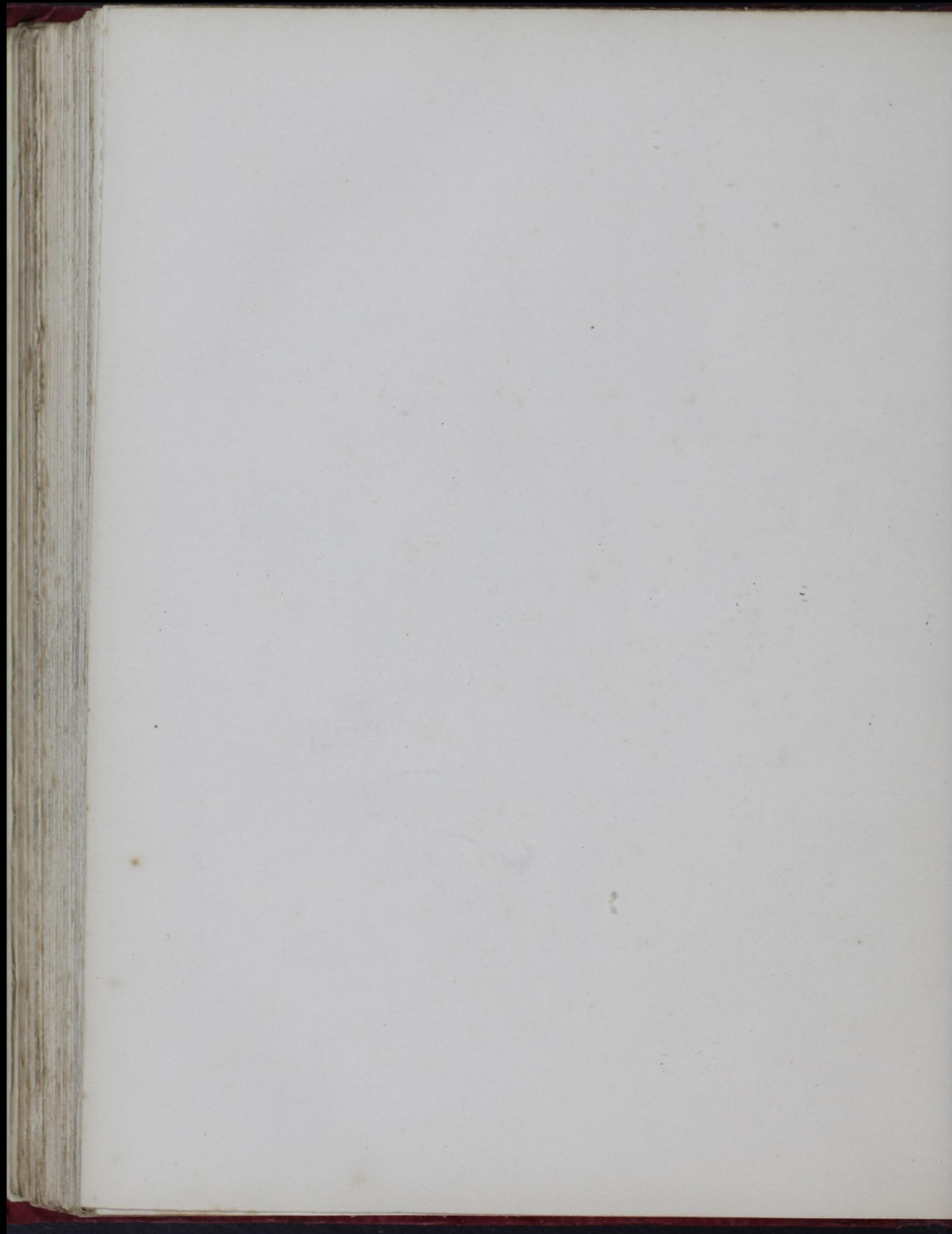
Papilio Malvæ minor, Esper.

This species generally measures about an inch in the expanse of the wings, varying a little both more or less. On the upper side the wings are of a dark brown colour, marked with many small, squarish, cream-coloured spots, of which there are about fourteen on each of the fore wings; the ground colour of which, especially towards the base, is much powdered with white, especially in the males. The middle of the hind wings is marked with several more or less confluent larger spots, and beyond the centre is a curved row of six small dots. The cilia is white, spotted alternately with black; the body has a greenish hue. Beneath, the ground colour of the wings is much paler, the spots towards the tips of the wings forming fine lines; the spots are also larger and more

* I have found no material variation, in regard to the arrangement of the veins of the wings, in any of the indigenous species of the entire family.







numerous on the hind wings, especially towards the base, and the front margin has a large white blotch; the veins in these wings are also pale-coloured.

A not very uncommon variety, regarded by Fabricius, Lewin, etc., as distinct, is represented in our figures 7 and 8, in which there is a white oblong blotch in the middle of the fore wings towards the posterior margin, visible on both sides, which is frequently duplicated from the confluence of two contiguous spots. The white dots are also longer and larger than in the typical individuals. Mr. Stephens possessed a specimen with one of the fore wings marked as in the variety, and the other as in the type.

The caterpillar is green, with pale longitudinal stripes, a black head, and a yellow ring round the neck. It feeds on the teasle, the leaves of which it rolls up.

This is a common and generally dispersed species, occurring in woods and dry pastures in Kent, Surrey, Essex, Hertford, Wilts, Durham, Cambridge, Northumberland, and the south of Scotland. It appears at the end of May. Reaumer has given the history of this species in the eleventh plate of his first volume. The Rev. W. T. Bree informs us that he once took the "variety?" regarded by some writers as distinct under the name of *Fritillum*, near Yarmouth, in the Isle of Wight; and that a friend takes it in some abundance in the Forest, near Bewdley, Worcestershire. "It seems to be, like the White *Colias Edusa*, what may be called a permanent variety, or one which is constantly occurring."

I have followed Boisduval and Zetterstedt in restoring to this species the name of *Malvæ*, that name, in the handwriting of Linnæus himself, being attached to his specimen of this insect in the Linnæan Cabinet. His words also, "*marginæ quasi dentato, interjacentibus maculis albis*," distinguish it at once from *P. Malvarum*.

SPECIES 2.—PYRGUS OILEUS?

Plate xxxviii. fig. 14—15.

These figures represent a North American insect, respecting the history of which, as a doubtful inhabitant of this country, it will be necessary to give the following details.

The late Mr. Haworth, in the 3rd part of the "Entomological Transactions" (p. 334), gives the following statement:—

"*Oileus*, *Papilio*, (The *Georgian Grizzle*), Gmel., Syst. Nat. 2370, 269?"

"Obs.—Has been caught in Bedfordshire by the Rev. Dr. Abbot, and is in Leman's ancient English Cabinet, now in the possession of Lee Phillips, Esq., Manchester."

From this English name, it is evident that Mr. Haworth considered the specimens as identical with a North American species, to which he applied Gmelin's name *Oileus*, but with a mark of doubt, which is by no means surprising, when it is stated that Gmelin gives Algiers as the locality of that insect, with only the following short description of it: "*P. alis subdenticulatis fuscis albo maculatis; supra basin exteriorem primorum linea alba. Pithoni similimus*." (Syst. Nat. 4, p. 2370.)

Mr. Stephens describes the species as having the "wings rounded; anterior varied with black and white; posterior beneath, cinereous with waved black streaks; antennæ black; the club cinereous beneath;" and suggests that the specimens in question (which he had not seen) may be rather identical with the *P. Fritillum* of Hübner. Mr. Curtis, however, states that they all agree with the North American species.

DESCRIPTION OF PLATE XXXIX.

- INSECTS.—Fig. 1. *Pyrgus*? *Malvarum*. 2. Showing the under side. 3. The Caterpillar when young. 4. When in a more advanced stage.
 5. The Chrysalis.
 „ Fig. 6. *Cyclopides Paniscus*. 7. The female. 8. Showing the under side. 9. The Caterpillar.
 „ Fig. 10. *Cyclopides Sylvius*. 11. The female. 12. The under side of the male.
 PLANTS.—Fig. 13. *Althea officinalis* (the marsh mallow).
 „ Fig. 14. *Plantago major* (the greater plantain).

Pyrgus Malvarum is from a specimen which I took in Italy, near Turin; Mr. Stephens does not consider it has any claim to be considered an English species; but, as it is found in old collections, I have thought it right to give a figure of it. The Caterpillars are from Godart, who minutely describes rearing them himself. *Cyclopides Sylvius* has no greater claim to be considered British than *P.*? *Malvarum*, but I have introduced it for similar reasons. It is probably a Continental variety of *C. Paniscus*, and it is not impossible that some English varieties may have been taken nearly resembling it. *C. Paniscus* is from specimens kindly furnished by Mr. Doubleday, and the Caterpillar is from Godart. H. N. H.

SPECIES 3.—PYRGUS? MALVARUM.

Plate xxxix. fig. 1—5.

SYNONYMES.—*Hesperia Malvarum*, Hoffmannsegg, Ochsenheimer.
Hesperia Malva, Fabricius, Stewart, Donovan, 16, pl. 567.
Thymele Malva, Stephens; Wood, Ind. Ent. t. 53, f. 17.

Carcharodus Malva, Hübner, Verz. bek. Schmett. (but not *P. Malva* Linn.)
Papilio Althea, Hübner (variety).
Hesperia de la Guimauve, Godart.

The Linnæan name of *Malvæ* having been applied to this species, and given as a native insect by Stewart and Donovan, it has become necessary to introduce it into this work to show the distinction between the two species; in fact, the present is more nearly allied to *Hesperia Tages*; its dentated wings, however, induced Hübner to place it in a separate group under the name of *Carcharodus*. The wings are *dentated* and brown, with waving cinereous lines, and six transparent spots on the fore wings; the hind wings beneath dotted with white. Of this species no authentic instance has occurred of the capture in this country. The caterpillar is of a dirty blackish green, when young; but becomes lighter coloured as it increases in age, with darker longitudinal lines, a black head, and a yellow neck. It feeds on mallows.

NISONIADES, HÜBNER (THANAOS, BOISDUVAL).

This group differs from the preceding in having longer, slenderer antennæ, with the club attenuated at the tip; the palpi with the last joint thicker; the anterior margin of the fore wings slightly angulated beyond the middle; the surface of the wings not tessellated, and the fringe alternately spotted. It agrees with it in having the wings identical in the outline in both sexes, and in the costa being folded at the base in the males. The wings are deflexed in repose, and they are longer than the abdomen. The difference in their colour in the two sexes indicates a relation with the following group. As there are several species which agree in these respects, I have adopted the group with Hübner's name, which is prior to that of Boisduval.



DESCRIPTION OF PLATE XXXIII

Fig. 1. Front aspect of the head of the male of the species described in the text.
Fig. 2. Side aspect of the head of the male of the species described in the text.
Fig. 3. Front aspect of the head of the female of the species described in the text.
Fig. 4. Side aspect of the head of the female of the species described in the text.

The species described in this plate is a new species of the genus *Chrysomelidae*. It is characterized by its small size, its yellowish-brown color, and its distinctive markings on the elytra. The head is small and rounded, with large eyes and a short snout. The elytra are short and broad, with a distinct pattern of dark spots and lines. The legs are short and stout, with long, curved claws.

PLATE XXXIV

Fig. 1. Front aspect of the head of the male of the species described in the text.

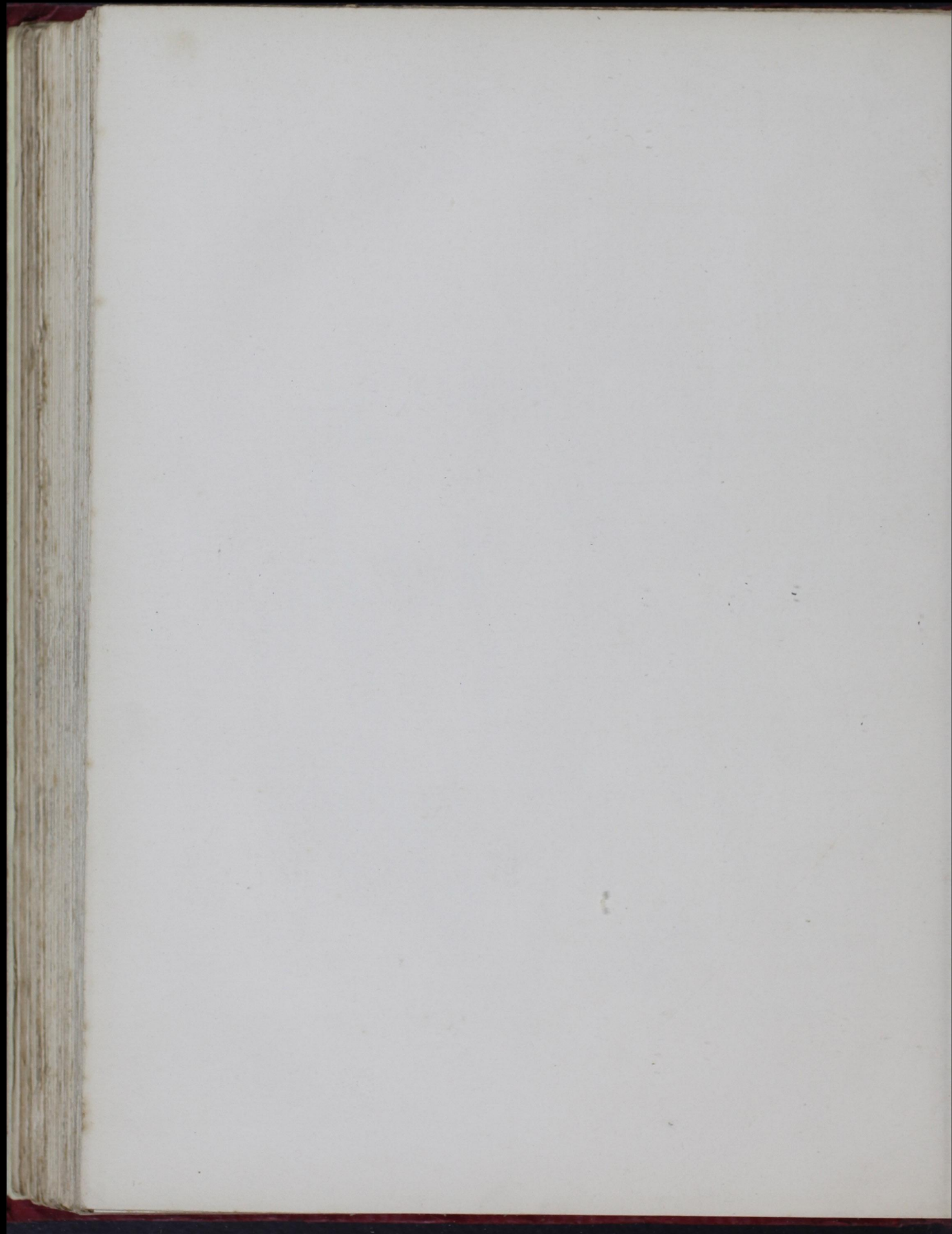
The species described in this plate is a new species of the genus *Chrysomelidae*. It is characterized by its small size, its yellowish-brown color, and its distinctive markings on the elytra. The head is small and rounded, with large eyes and a short snout. The elytra are short and broad, with a distinct pattern of dark spots and lines. The legs are short and stout, with long, curved claws.

The species described in this plate is a new species of the genus *Chrysomelidae*. It is characterized by its small size, its yellowish-brown color, and its distinctive markings on the elytra. The head is small and rounded, with large eyes and a short snout. The elytra are short and broad, with a distinct pattern of dark spots and lines. The legs are short and stout, with long, curved claws.

PLATE XXXV

The species described in this plate is a new species of the genus *Chrysomelidae*. It is characterized by its small size, its yellowish-brown color, and its distinctive markings on the elytra. The head is small and rounded, with large eyes and a short snout. The elytra are short and broad, with a distinct pattern of dark spots and lines. The legs are short and stout, with long, curved claws.





SPECIES 1.—NISONIADES TAGES. THE DINGY SKIPPER.

Plate xxxviii, fig. 9—13.

SYNONYMS.—*Papilio Tages*, Linnaeus, *Pap.*, pl. 45, f. 3, 4.
 Haworth, *Harris Aurelian*, pl. 34, fig. 0.

Hesperia Tages, Fabricius, Leach, *Jermyn*.

Thymele Tages, Fabricius (Gloss.), Stephens, *Duncan*, Brit. Butt. 2,
 pl. 1, f. 2. Wood, *Ind. Ent.* pl. 3, f. 76.

Thanaos Tages, Boisduval, *H. n. Lep.* pl. 9, B fig. 8.

Nisoniades Tages, Hübner (*Verz. bek. Schm.*).

The expansion of the wings of this species is about an inch and a quarter. The upper surface of the wings is brown, the fore wings marked with alternate waved bands of darker brown and grey, which in some specimens are in bright relief against each other, and separated by paler zigzag marks; in addition to which there are several indistinct whitish dots, one brighter than the rest being placed near the extremity of the costa; and there is also a marginal row of dull white dots. The hind wings are brown, with a small discoidal spot, beyond which are two rows of nearly obsolete paler dots. Beneath, the colour is uniformly greyish brown, the fore wings not shaded as above, but marked as well as the hind wings with the traces of the pale dots of the upper side. The male is duller and more uniformly coloured than the female.

The caterpillar is bright green, with the head brown, with yellow dorsal and lateral stripes dotted with black. It feeds on the field Eryngo, and bird's-foot lotus.

This species frequents woody pastures, heaths, etc., and is found in the beginning of May, in June, and the middle of July. It is by no means so common as *Malvæ*. It appears to be very widely extended, for, in addition to the numerous localities in various parts of England given by Mr. Stephens, Mr. Duncan mentions several places in Scotland where it has also occurred. Mr. F. Bond finds it very abundantly at Stanmore Common (Middlesex), and Devil's Ditch, Cambs.

CYCLOPIDES, HÜBNER (STEROPES, BOISDUVAL).

The typical species of this group differs from the preceding, in its long acuminate fore wings, short hind wings, scarcely bent club of the antennæ, and want of a fold at the base of the costa of the fore wings; and from the following, by the more slender body, differently formed club of the antennæ, and especially by the want of an oblique black patch across the middle of the wings of the males, and the identity of colouring in the sexes. The palpi are exerted, and as long as the head, with the terminal joint nearly concealed by hairs. The body in the males is long and slender, and slightly tufted at the tip. The antennæ are short, with the club stout, nearly straight, and not hooked at the tip. The wings are brown, tessellated with bright orange spots of a square or roundish form. A more important character, however, than any of the preceding, consists in the posterior tibiæ possessing only a pair of spurs at the tip.

Boisduval's name for this group is inappropriate, not only because there is a Coleopterous genus *Steropus*, but also because one of the European *Hesperiidæ* is specifically named *Steropes*.

SPECIES 1.—CYCLOPIDES PANISCUS. THE CHEQUERED SKIPPER.

Plate xxxix. fig. 6—9.

SYNONYMS.—*Hesperia Paniscus*, Fabricius, Ochseneimer, Leach, Jermyn, Curtis.

Papilio Paniscus, Donovan, vol. 8, pl. 254, fig. 1; Haworth.

Pamphila Paniscus, Fabricius, Syst. Gloss.; Stephens; Wood, Ind. Ent. t. 3, f. 77; Duncan, Brit. Butt. 2, pl. 1, fig. 3.

Steropes Paniscus, Boisduval, H. n. Lep. pl. 9 B, fig. 7.

Cyclopides Paniscus, Hübner (Verz. bek. Schmett.).

Papilio Brontes, Hübner.

Papilio Sylcius, Villars.

This pretty species is generally about an inch and a quarter in the expansion of its wings, which on the upper side are of a dark brown colour, spotted with orange; the anterior with a large orange blotch in the middle, marked towards the costa with a small square brown spot; beyond the middle is an irregular bar of orange, divided by the veins of the wings, and interrupted in the middle; the two small spots which are wanting to complete the bar being pushed outwards nearly to the margin of the wing, which is also marked with a row of fulvous dots. The hind wings are marked in the middle of the disc with three large round spots, and a submarginal row of smaller dots; the fringe is brown, the extremity being dirty orange. Beneath, the ground colour of the wings is tawny; the anterior with three discoidal and four smaller posterior dusky spots, which is also the colour of the veins at the extremity of the fore wings, and the entire veins in the hind wings, which are ornamented with pale buff spots, edged with brown; five being on the disc of larger size, and a submarginal row of smaller ones, the outer two of which are the largest. The antennæ on the under side are bright orange. The spottings differ in size in different specimens, but there is no material difference between the sexes.

The caterpillar has the head black, the neck with an orange ring; it is dark brown on the back, with two pale-yellow stripes on the sides. It feeds on the *Plantago major* and *Cynosurus cristatus*. The perfect insect appears at the end of May. It is a very local species, although where found it is abundant. Castor Haglands Wood, near Peterborough; Clapham Park Wood, Bedfordshire; Whitewood, Gamlingay, Camb.; near Dartmoor; near Luton, Bedfordshire; a wood near Milton, Northamptonshire: are recorded by Curtis and Stephens as its localities; and the Rev. W. T. Bree informs us that he took it abundantly the latter end of May, 1825, in Barnewall Wolde, near Oundle, and in Rockingham Forest, and that he has also taken it near Woodstock. "In profusion in Monk's Wood, Hunts, and in a wood near Oundle, Northamptonshire." H. Doubleday, Esq., in "The Entomologist," August, 1841.

SPECIES 2.—CYCLOPIDES SYLVIUS.

Plate xxxix. fig. 10—12.

SYNONYMS.—*Papilio Sylcius*, Knoch; Hübner, Pap. pl. 94, f. 477, 478; Ernst, 1, pl. 74, Suppl. 20, f. 96, e. f.

Hesperia Sylcius, Fabricius, Ochseneimer.

Pamphila Sylcius, Stephens; Wood, Ind. Ent. t. 53, f. 18.

Cyclopides Sylcius, Hübner.

This reputed British insect is nearly an inch and a quarter in the expanse of its fore wings, which are tawny orange above, spotted with black, four being on the disc, and a row of smaller ones along the margin, which is dusky. The hind wings, on the contrary, are brown above, spotted with orange, four spots being on the disc, and a row of five within the hind margin. On the under side the wings are nearly coloured as above, except that there is a chain-like series of brown spots, united by a black line on each vein with the outer margin of the fore wings. The hind wings have a similar submarginal series, the discoidal spots being the same as above.

A specimen of this species in Mr. Stephens's cabinet, obtained from "an old cabinet," in which it was named *Paniscus*, and "other specimens" in the late Mr. Milne's cabinet, which he also believed to be *Paniscus*, are the only authorities for the introduction of this species into our English lists; and it is more than probable that these were Continental specimens, introduced under mistake for the then rare *Paniscus*, with which their possessors thought them identical; indeed, Mr. Curtis entirely omits the species, and Mr. Stephens introduces it into the list of reputed species in the British Museum Catalogue.

PAMPHILA, FABRICIUS. HESPERIA, BOISDUVAL.

These insects are at once distinguished from all the preceding, by the males possessing an oblique velvety patch of scales on the disc of the fore wings; moreover, when in repose the fore wings alone are elevated. There is also a diversity in the colouring of the sexes, the females being brighter than the males. The head is large, as broad as the thorax; the eyes large and prominent; the palpi short, wide apart, very hairy, the last joint short, nearly naked, and exposed. The antennæ are terminated by a thick, nearly straight, club, which is often furnished at the tip with a hook. The thorax is very robust, and the body as long as the hind wings. The wings are entire, with the fringe not alternated in its colours; the anterior ones are elongated, and the latter slightly sinuated at the anal angle, forming a short rudimental tail. A character which I have not seen noticed exists in the typical species, the outer margin of the fore wings of the females being much more rounded than in the males. The general colour of the wings is either tawny orange, marked with brown, or brown, strongly marked with the former colour; and generally the colours are so disposed as to leave a series of squarish spots near the outer margin of the fore wings.

The powerful flight of these insects far surpasses that of the other *Hesperidæ*, owing to the strength of their muscles and superior robustness of the body. In the larva state they generally feed upon low plants, especially *Gramineæ*. The exotic species are very numerous. The five species described in the following pages constitute several sections.

- A. (*Augiades*, Hübn.) Antennæ hooked at the tip, head very large; palpi very short, squamose, last joint exposed; hind wings subtriangular. *Vitellius*? and its supposed female *Bucephalus*.
- B. Head moderately large, palpi longer and hairy; hind wings more rounded, wings maculated; antennæ hooked at the tip. *Comma* and *Sylvanus*.
- C. (*Thymelinus*, Hübn.) Head moderate, palpi moderately long and hairy; antennæ with the tip nearly straight, and not hooked at the tip. *Linea* and *Comma*.

DESCRIPTION OF PLATE XL.

INSECTS.—Fig. 1. *Pamphila Vitellius*? male. 2. Showing the under side. 3. The supposed female (figured by Mr. Stephens from the English specimen as *P. Bucephalus*).

„ Fig. 4. *Pamphila Sylvanus*, male. 5. The female. 6. Showing the under side.

PLANTS.—Figs. 7 and 8. *Aira alpina* (smooth Alpine hair-grass).

P. Vitellius? is from a specimen taken in North America by Mr. E. Doubleday, who is decidedly of opinion that the insect captured in England, and described as *P. Bucephalus*, is the female of this species. *P. Sylvanus*, male and female, are from strongly marked British specimens, also furnished by Mr. Doubleday. I have not been able to give a figure of the caterpillar, for, although this species is so generally distributed over the whole island, the caterpillar is at present unrecorded.

THE CHURCH OF ENGLAND

THE CHURCH OF ENGLAND

The Church of England is a part of the Christian Church, and is the only Church in England which is not a part of the Roman Church.

The Church of England is a part of the Christian Church, and is the only Church in England which is not a part of the Roman Church.

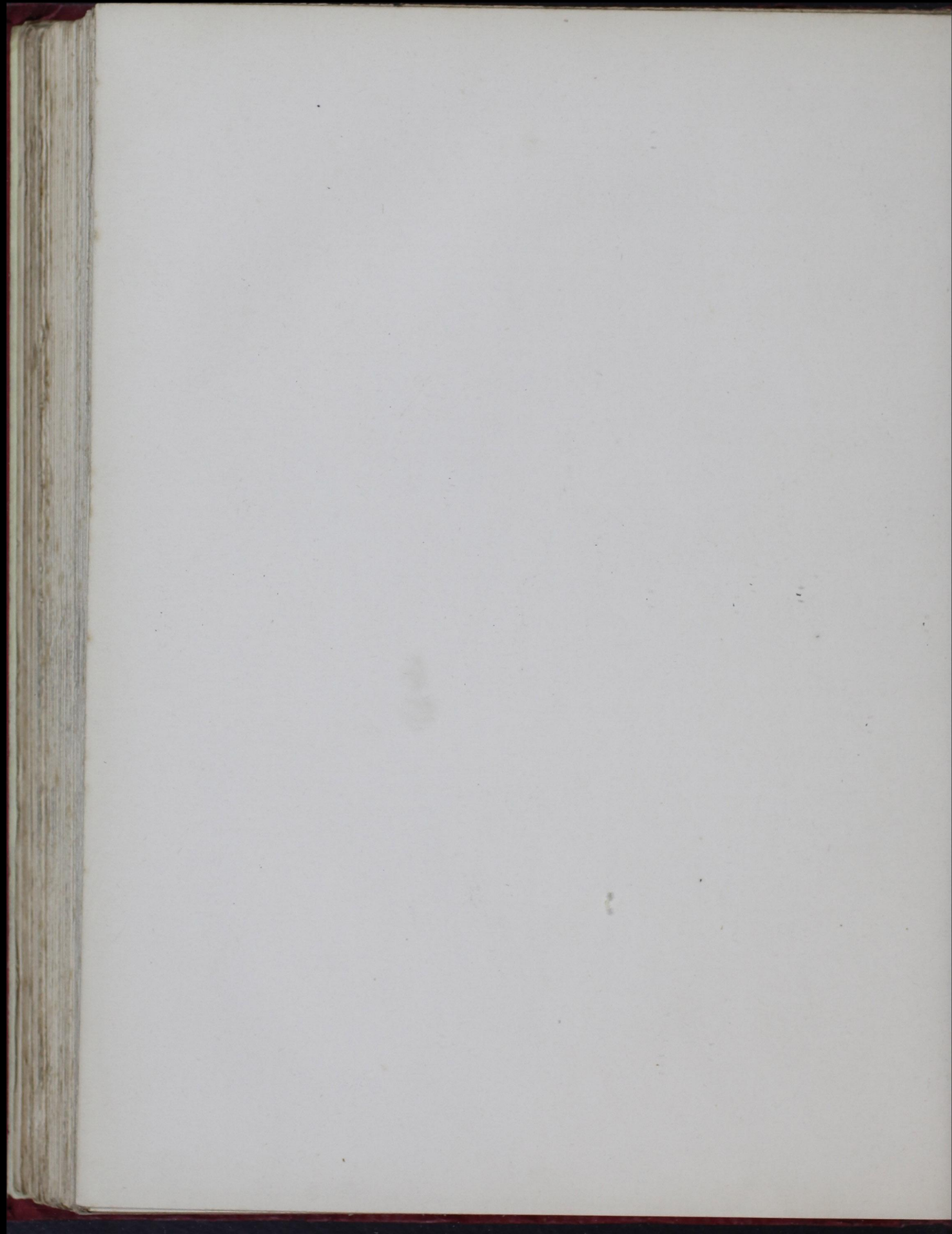
The Church of England is a part of the Christian Church, and is the only Church in England which is not a part of the Roman Church.

The Church of England is a part of the Christian Church, and is the only Church in England which is not a part of the Roman Church.

The Church of England is a part of the Christian Church, and is the only Church in England which is not a part of the Roman Church.

The Church of England is a part of the Christian Church, and is the only Church in England which is not a part of the Roman Church.





appear to be those of a female (which he has in fact informed me is the case), differing only from the description above given of the male in such characters as are common to the rest of the females in this group of Skippers, namely, the want of the discoidal black patch on the fore wings (in the place of which is an oblong dusky spot), and the more decided and more extended markings on the wings, which are only very slightly indicated in the male. The large head, the peculiar pointed inner edging of the marginal spots of the fore wings, and the longitudinal, slender, fulvous streak near the anal angle of the hind wings, seem to indicate the sexual identity of *Bucephalus* with the male described above;* moreover, Mr. Stephens "could not avoid surmising that the origin of *Bucephalus* is questionable, and that the specimens were probably imported in one of their earlier states among the timber or other stores, which Mr. Raddon acquainted him came direct from the *North American Continent* to Barnstaple, the section of the genus to which this insect belongs being, without any other exception, exclusively found in America." We have likewise the authority of Mr. Doubleday, whose acquaintance with North American Lepidoptera is superior to that of any other living entomologist, for considering the two insects to be thus identical. It should, however, be added, that Curtis and Stephens (Append. vol. 4, p. 383) mention that Mr. Newman had also taken a male of *Bucephalus* near Godalming. This specimen has been figured by Mr. Wood in his "Index Entomologicus." Mr. Newman has, however, informed me, that he believes his "Godalming *Bucephalus* to be an Illinois insect, and came with various others he used to receive from Wandborough, Edward's County, Illinois, U. S.;" and Mr. Stephens has accordingly introduced the species into the list of *reputed* indigenous species in the British Museum Catalogue.

SPECIES 2.—*PAMPHILA SYLVANUS*. THE LARGE SKIPPER.

Plate xl. fig. 4—6.

SYNONYMES.—*Hesperia Sylvanus*, Fabricius, Villars, Gmelin, Ochsenheimer, Curtis. | pl. 244, fig. 2. Haworth. Harris, Aurelian. pl. 42, fig. 1.
Pamphila Sylvanus, Fabricius (Gloss.), Stephens, Duncan, Brit. Butt. 2,
Papilio Sylvanus, Hübner, Lewin, Pap. pl. 46, fig. 1—3. Donovan, 8, | pl. 2, fig. 1. Wood, Ind. Ent. t. 3, fig. 80.

This, which is the largest of our British Skippers, sometimes measures nearly an inch and a half in the expanse of the wings. The upper wings are tawny brown above, with black veins; the costa, a spot on the middle, and an oblique bar beyond the middle, consisting of spots of varied size, emarginate behind, and extending nearly to the tip, the two small upper ones being near the margin, whilst three other small spots connected together towards the front margin form, with the preceding, a very irregular curved fulvous bar. The male has the base of the wings brighter orange than in the female, and an oblique central black patch of hairs. The hind wings are dark tawny above (darker in the female), with an oblong discoidal, and irregular submarginal row of paler spots. On the under side the wings are paler tawny, with a greenish tinge, the anterior at the base and the anal angle in the posterior brighter fulvous, the former with the base internally black. The pale spots on the upper side are here represented of a buff colour, but smaller in size. The antennæ are annulated, the club dark behind, pale in front; the latter has the tip very sharp, and bent into an acute and sudden angle.

This common species appears at the end of May, and again at the end of July. It frequents the borders of woods, lanes, etc., and occurs in most parts of the country.

* The distinction between this male and our figures 1 and 2 must not be overlooked, nor the confusion which exists among these Skippers, owing to the number of closely allied species. It is on this account that I have abstained from speaking more decidedly of the species in question.

DESCRIPTION OF PLATE XLI.

INSECTS.—Fig. 1. *Pamphila Comma*, male. 2. The female. 3. Showing the under side. 4. The Caterpillar.

„ Fig. 5. *Pamphila Actæon*, male. 6. The female. 7. Another specimen.

„ Fig. 8. *Pamphila Linea*, male. 9. The female. 10. Showing the under side. 11. The Caterpillar. 12. The Chrysalis.

PLANTS.—Figs. 13 and 14. *Ornithopus perpusillus* (Bird's-foot).

The *Pamphila Comma*s are from remarkably well-marked specimens in the British Museum, the caterpillar from Hübner. *P. Actæon*, 5, 6, are from, Hübner's figures: 7, is from a specimen taken by myself at Shanstone, near Lichfield, in 1835, where it was in great abundance; but I did not at the time, being a very inexperienced collector, remark that it differed from *P. Linea*. The specimens of *P. Linea* are from Mr. Doubleday's collection, and the caterpillar and chrysalis are from Hübner. H. N. H.

SPECIES 3.—PAMPHILA COMMA. THE PEARL, OR SILVER-SPOTTED SKIPPER.

Plate xli. fig. 1—4.

SYNONYMES.—*Papilio Comma*, Linnaeus, Haworth, Lewin, Pap. pl. 45, fig. 1, 2. Donovan 9, pl. 295. Hübner, Pap. 795, fig. 479—481.

Hesperia Comma, Fabricius, Ochsenheimer, Curtis, Boisduval, Zetterstedt.

Pamphila Comma, Fabricius (Gloss.), Stephens, Duncan, Brit. Butt. 2, pl. 2, fig. 2. Wood, Ind. Ent. t. 3, f. 81.

Argiades Comma, Hübner (Verz. bek. Schmett.).

Female. *Hesperia Sylvaenus*, Jermyn.

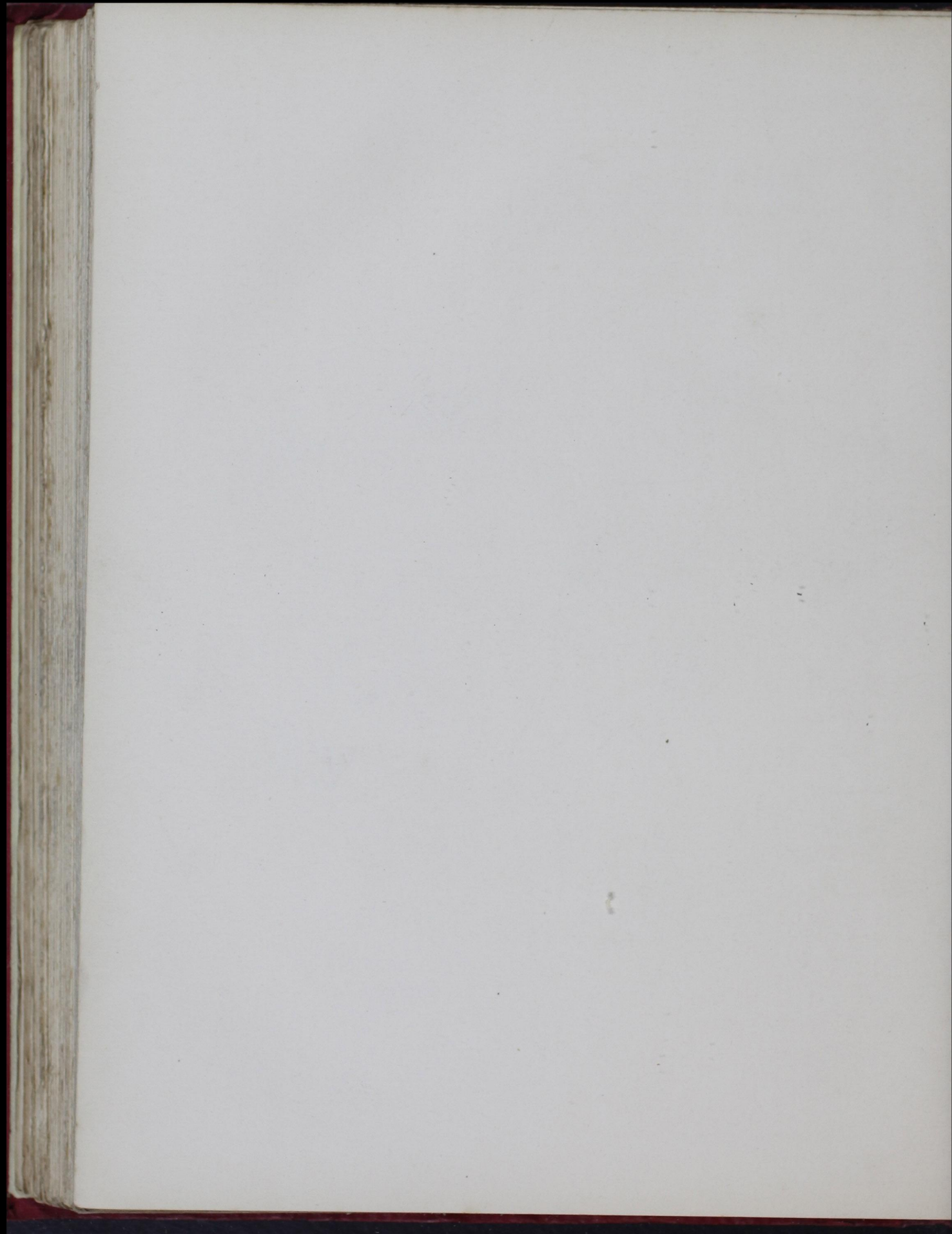
This local species bears considerable resemblance to the preceding, but is distinguished by its darker and more varied appearance, especially on the under side, caused by the pearly white spots, the very different shape of the fore wings in the males, and the different form of the club of the antennæ, and the terminal hook of the club. The fore wings measure $1\frac{1}{2}$ to $1\frac{3}{4}$ inch in expanse. On the upper side the wings are of a dark tawny orange, varied with brown, with the veins black. In the males the basal and central parts are tawny, with an elongated, rather narrowed, incassated black patch, the middle ridge of which is glossy; in the female the basal and middle part of the wings (except the space between the postcostal and median veins, which is tawny) is dusky; the outer margin in both sexes is broadly dusky, with a very irregular and much broken and curved series of small spots, which are larger, more distinct, and paler coloured in the females. The hind wings are dusky, with the disc obscure tawny, marked obscurely with about five paler spots in the middle and towards the outer angle. On the under side the hind wings and the tips of the fore wings have a greenish tinge, which is brighter in the females; the hind wings marked with eight or nine squarish silvery white spots, three towards the base (two of which are often confluent), and the remainder forming a much-curved series parallel with the margin. All these spots are emarginate on the outside. The antennæ are annulated.

The larva is obscure green, marked with reddish, and shining; the head black; the neck with a white collar, and a row of black dots on the back and sides. It feeds on *Coronilla varia* on the Continent. The chrysalis is elongated and cylindrical.

The perfect insect appears in July and August, frequenting chalky districts near Croydon, and on the chalky downs near Lewes, Sussex. The Devil's Dyke, near Newmarket, and Old Sarum, Wilts, are recorded by Stephens as the localities of this uncommon species. In those places, however, it is very abundant. The Rev. W. T. Bree has also taken it near Dover.







SPECIES 4.—PAMPHILA ACTÆON. THE LULWORTH SKIPPER.

Plate xli. fig. 5—7.

SYNONYMES.—*Papilio Actæon*, Esper, Hübner Pap., Fab. 96, figs. 488, 489, male; 490, female.

Hesperia Actæon, Ochsenheimer, Curtis, Brit. Ent. pl. 442. Godart.

Pamphila Actæon, Stephens, Ill. Haust. vol. 4, p. 383. Wood, Ind. Ent. t. 3, f. 179. Duncan, Brit. Butt. vol. 2, p. 121 (not figured).

Thymelinus Actæon, Hübner, Verz. bek. Schm.

The expansion of the wings in this species is about an inch in the female, or rather more. The male has the wings on the upper side dusky, with the disc glossed with tawny-orange; the veins black; the fore wings having the usual black oblique dash; occasionally there is a dusky patch at the extremity of the discoidal cell of the fore wings; the tawny colouring beyond this assuming the appearance of a curved series of spots. The under side is more uniformly orange. The disc of the fore wings in the female is more tawny orange: beyond the dark extremity of the discoidal cell is a curved series of six or seven orange spots, divided from each other by the veins of the wings. The under side in this sex has a pearly ochre lustre; a large orange patch on the fore wings extending to the tip of the discoidal cell, where the pale row of spots again appears, but more obscurely; and an oblique portion of the inner edge of the hind wings yellowish orange.

In its general character, and the almost uniform colouring of the male, this species approaches *Linea*, but the more maculated appearance of the female approaches nearer to the preceding species.

This extremely local species was discovered in August, 1832, by J. C. Dale, Esq., at Lulworth Cove, in Dorsetshire, in considerable numbers, frequenting thistles. It has since been found by the Rev. J. Lockey near the Burning Cliff, in Dorsetshire, in plenty. Mr. Humphreys mentions above that he took it in 1835, at Shenston, near Lichfield, where it was in great plenty.

SPECIES 5.—PAMPHILA LINEA. THE SMALL SKIPPER.

Plate xli. fig. 8—12.

SYNONYMES.—*Hesperia Linea*, Fabricius, Ochsenheimer, Leach, Curtis, Boisduval.

Papilio Linea, Haworth, Donovan, vol. 7, pl. 236, f. 2, male. Harris, Aurelian, pl. 2, f. 1.

Thymelinus Linea, Hübner (Ferz. bek. Schmet.).

Pamphila Linea, Fabricius, Gloss. Stephens; Wood, Ind. Ent. t. 3, f. 78. Duncan, Brit. Butt. 2, pl. 1, f. 4.

Papilio Thaumus, Esper, Lewin, Pap. pl. 45, f. 5—7. Stewart.

Papilio Comma, Barbut.

Papilio Flavus, Müller.

This common little species varies in the expanse of its wings from an inch to an inch and a quarter. The wings above are fulvous, with the veins brown, and a dark margin; the male is distinguished by the ordinary oblique line of black scales on the disc of the fore wings, which is wanting in the female; in which sex the ground colour is not so bright, and the dark margin more suffused within; like the male, however, this sex is destitute of the maculations observable in the preceding species. Beneath, the wings are almost of a uniform colour. The fore wings beneath are paler than above; the base brownish, and the margins pale; the hind wings are ashy-fulvous, with a large fulvous spot at the anal angle. The club of the antennæ in this species is nearly straight, and not hooked at the tip.

The caterpillar is solitary, of a deep green colour, and unspotted, but having a dark line down the back, and two whitish lateral lines margined with black. It feeds on the mountain air-grass and other grasses. The chrysalis is enclosed in a slight cocoon, and is of a green colour.

This species is one of the commonest of the family—flying about low bushes at the outskirts of woods, making its appearance in the beginning and middle of July, and middle of August, and appearing to be distributed all over the country.

SUPPLEMENT.

DESCRIPTION OF PLATE XLII.

- INSECTS.—Fig. 1. *Colias Myrmidone*, male. 2. The female. 3. Showing the under side.
„ Fig. 4. *Hipparchia* [*Oreina*] *Mnestra* of Hübner. 5. Showing the under side.
„ Fig. 6. A variety of *Hipparchia Janira*.
„ Fig. 7. A splendid variety of *Argynnis Lathonia*.

The figures of *Colias Myrmidone* are from the figures of Hübner, which I have given in this supplemental plate, as it has now some claim to be considered a British species, Mr. Stephens having a specimen in his possession which he considered to be this species, and which he took near Dover. The *Hipparchia* [*Oreina*] *Mnestra* having been (although without decisive authority) stated to have been taken in England [see ante, p. 78], I have thought it interesting to give a figure in this place. The variety of *Janira* [p. 70] is from a singular specimen [remarkable for the confluence of the discoidal patches on the fore wings] in the British Museum. And the *Argynnis Lathonia* is a splendid variety, sometimes taken on the Continent, which industrious collectors may hope to meet with in this country. H. N. H.



SUPPLEMENT

THE HISTORY OF THE UNITED STATES

THE HISTORY OF THE UNITED STATES

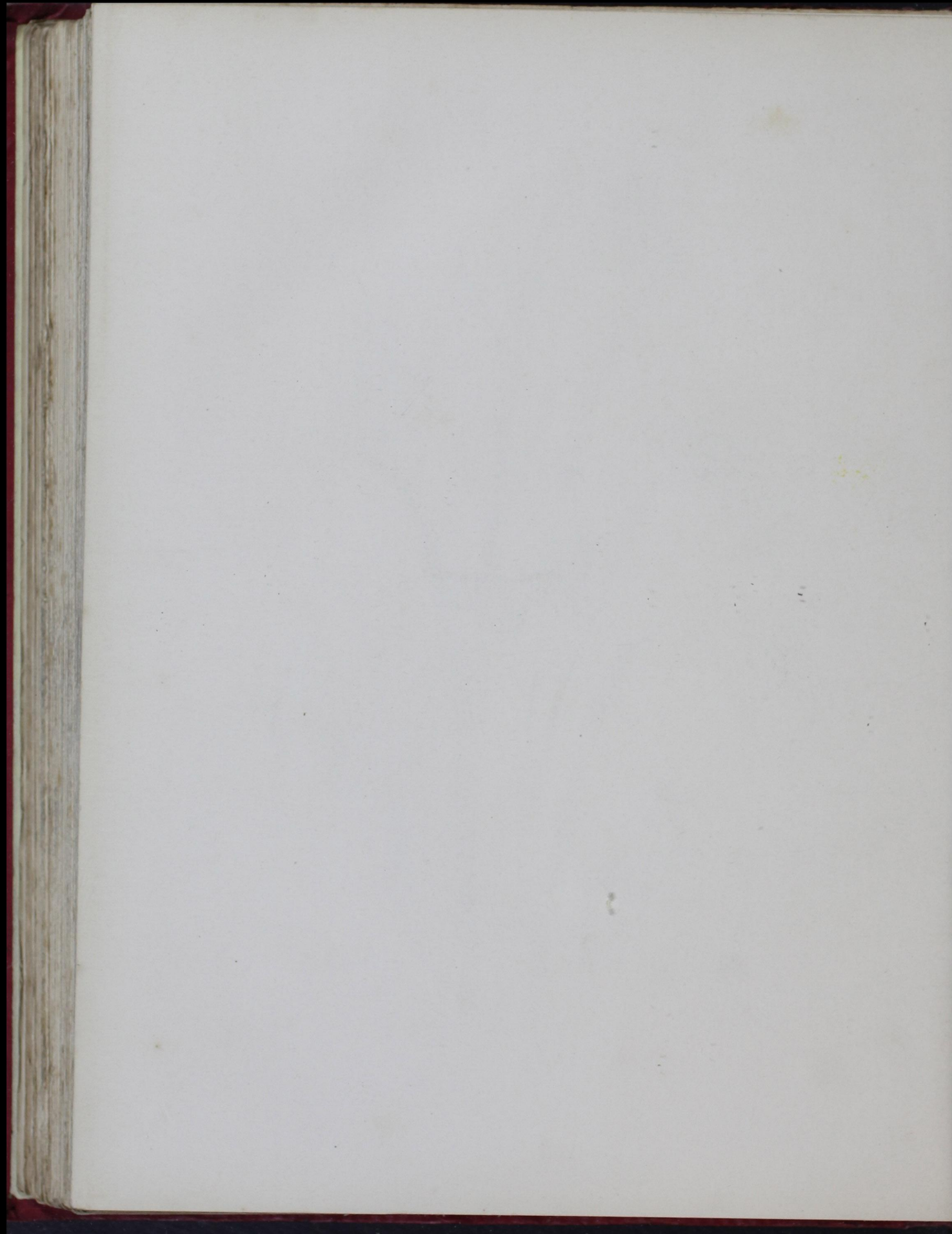
THE HISTORY OF THE UNITED STATES

THE HISTORY OF THE UNITED STATES

THE HISTORY OF THE UNITED STATES

THE HISTORY OF THE UNITED STATES

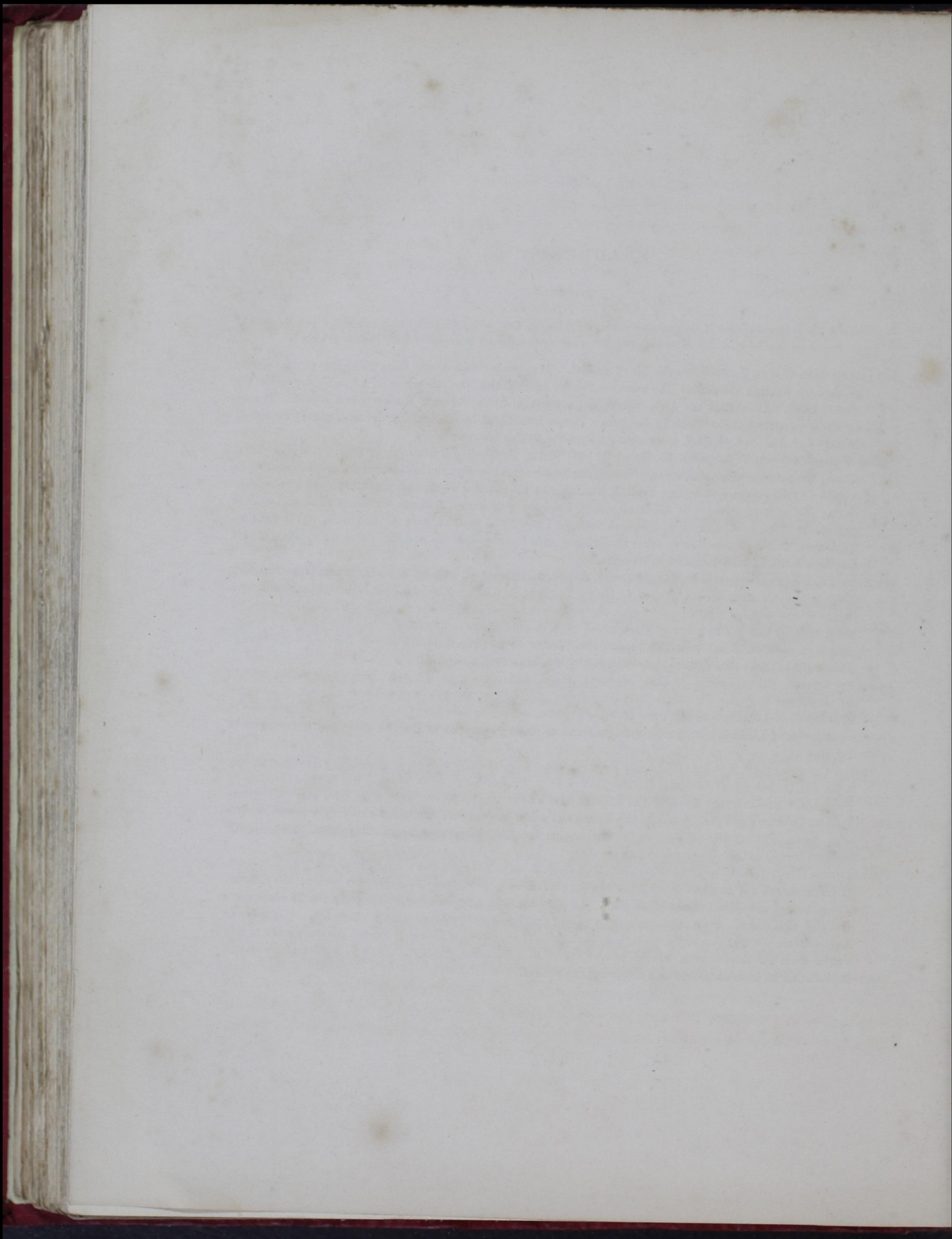




ADDENDA.

In addition to the species described in the preceding pages, the following have also been incautiously introduced into the lists of British species, but upon such slight authority that it has not been deemed necessary to figure them in this work.

- PARNASSIUS MNEMOSYNE**, Latreille (Papilio Mn. Linnæus). It is smaller than Apollo, from which it is at once distinguished by wanting the ocelli. The veins are slender and blackish, the fore wings with two black spots in the discoidal cell. It inhabits the Alps, Pyrenees, Switzerland, Sicily, Sweden, Hungary, and Russia. It may therefore possibly still be found in England. It was introduced by Turton and Jermyn, and is figured in Wood's Ind. Entomol. pl. 53, f. 4, amongst the doubtful British species.
- PIERIS FERONIA** (Pontia F. Stephens, Ill. Haust. 1, 149; Ernst, Papillons d'Europe, vi. p. 209). "Wings above, white; the anterior with a single row of triangular brown spots touching the hinder margin, and terminating in a point on each nervure internally; beneath, immaculate; the anterior white, with a yellowish tint on the outer angle; the posterior entirely of the latter colour, irrorated with dusky." Ernst, by whom alone this species appears to have been noticed and figured amongst Continental authors, says of it, that it was "prise en Angleterre." No other authority exists for its being an indigenous species; and Mr. Stephens suggests that it may be a native of New England, in America.
- MELITEA THAROS** (Papilio Dan. Fest. Tharos, Drury, App. v. 2; Cramer, pl. 169, fig. E. F.; Argynnis Tharossa, Enc. Méth. 9, 289; Melitæa Tharos, Westw. in Drury, 2nd Edit. 1, p. 39). The wings are black-brown, with many orange marks, some of which form an irregular bar beyond the middle of the fore wings, the tips and margins being dark. There is also a row of black round spots in orange spaces beyond the middle of the hind wings. This is a common North American insect; but Cramer, in figuring it, stated it was "reçu d'Angleterre;" whence it has been inferred that it was regarded by him as an English species.
- LIMENITIS POPULI**, Fabr. (Papilio P. Linn. Stewart; Wood, Ind. Ent. t. 53, fig. 10). The wings above, brown, fasciated, and spotted with white; beneath, luteous, fasciated with white, and ornamented with blue spots. This fine species, which is nearly three inches in expanse, appears to have been introduced in the English lists in consequence of Linnæus having erroneously referred to Ray's description of Camilla, amongst his synonyms of Populi.
- LIMENITIS CAMILLA**, Fabr. (but not of Linnæus, Haworth, etc.; L. Sibilla of Stewart; Stephens, Ill.; Wood, Ind. Ent. t. 53, fig. 11, but not of Linnæus) is closely allied to L. Sibilla, Linn., with which it has been confounded by Fabricius. Stewart, who followed the nomenclature of the latter author, accordingly gave this as a native species. L. Camilla, Fabr., is nearly two inches and a half in expanse; the wings above, dark brown, with a white fascia, without any red spot at the anal angle; beneath, orange-tawny, spotted as above. No authentic instance is recorded of its capture in this country.
- POLYOMMATUS TITUS** (Hesperia Titus, Fabricius, Ent. Syst. 3, a. p. 297; Turton: Pol. Titus, Jermyn, Stephens). Habit of Argus and Artaxerxes. All the wings above, brown, unspotted; beneath, also brown; the anterior with a hinder row of white and black lines; the posterior with a short central line, and a row of black spots ocellated with white. Near the margin are a row of red spots, each marked with a black dot. "Habitat in Anglia. Dom. Drury, Jones, fig. pict. 6, t. 44, t. 2." It appears that Fabricius derived his knowledge of this species from the same source, whence he also described Artaxerxes, namely, Jones's Collection of Drawings. Beyond this we have no information respecting the species.



DIRECTIONS FOR COLLECTING AND REARING THE CATERPILLARS, AND PRESERVING THE PERFECT INSECT.

HAVING in the preceding pages given a portrait and description of every species of Butterfly indigenous to Britain, or reputed British ; and also the larva and pupa of each, as far as they are known ; it only remains, in conformity with a promise in my preface, to add a few suggestions as to the best mode of collecting, and also of rearing, caterpillars from the egg ; and the most approved manner of setting out and preserving the perfect insects.

To become a fortunate collector, requires not only much industry in the pursuit, but also a keen observation and study of natural phenomena in general. For instance, many persons, with all the necessary enthusiasm and industry, and perhaps a great sacrifice of time, take numerous collecting excursions with scarcely any success ; whilst others, with less eagerness and much less expenditure of time, seldom return without numerous captures. The cause lies in a proper selection of season and weather for the objects in pursuit.

It is almost useless to attempt collecting winged insects during a cold east or north-east wind ; and places at other times abounding in insect life will then be still, and to all appearance deserted. A warm and genial day is therefore, above all things, necessary ; and to secure this desideratum it is necessary to become as far as possible *weather-wise*. Mr. Ingpen, in his excellent little work upon collecting insects, mentions many circumstances which different writers have considered infallible *signs* of fair weather ; but he considers most of them doubtful—such as the opening of the pimpernel, the early flight of the cabbage-white butterfly, etc. etc. ; whilst he considers the *high* flight of swallows an almost certain forerunner of a fine day. Sir H. Davy, in his delightful “Days of Fly-fishing,” has philosophically accounted for this and many other natural phenomena which have become popular omens. “Swallows,” he says, “follow the flies and gnats, and flies and gnats usually delight in warm strata of air ; and, as warm air is lighter and usually moister than cold air, when the warm strata of air are high, there is less chance of moisture being thrown down from them by the mixture with cold air ; but when the warm and moist air is near the surface of the earth, it is almost certain, as the cold air flows down into it, a deposition of water will take place.” As these instructions are intended for beginners, and not for the accomplished entomologist, I may usefully add a few more such remarks from the same source. “It is always unlucky (for anglers in spring) to see a single magpie,—but *two* are a good omen ; and the reason is, that in cold and stormy weather one magpie always remains sitting upon the eggs or young ones, to keep them warm ; when the two go out together, the weather is warm and settled.” Another popular sign of fine weather, is, when the red clouds of the setting sun take a tint of purple ; upon which the same author remarks, that “the

air when dry refracts more red or heat-making rays; and, as dry air is not perfectly transparent, they are again reflected on the horizon. I have generally observed a coppery or yellow sunset to foretel rain; but as an indication of wet weather approaching, nothing is more certain than a halo round the moon, which is produced by precipitated water; and the larger the circle, the nearer the clouds, and consequently the more ready to fall." I must not omit, in conclusion, his beautifully simple verification of the rustic couplet,

"A rainbow in the morning, is the shepherd's warning :
A rainbow at night, is the shepherd's delight."

"A rainbow can only occur when the clouds containing or depositing the rain are opposite the sun: and in the evening therefore the rainbow is in the east, and in the morning in the west; and, as our heavy rains in this climate are usually brought by westerly winds, a rainbow in the west (occurring only in the morning) indicates that the bad weather is on the road, by the wind, to us; whilst a rainbow in the east (occurring only in the evening) proves that the rain in these clouds is passing from us."

These remarks of the philosophic fly-fisher, beside the general information they convey, may teach the young entomologist how to select his weather with a good chance of a fine day; and also that popular omens are not to be rejected at once by superficial and pert reasoning, but that they are generally founded on truths, however deeply concealed by an accumulation of fancy or superstition. Having stated that a favourable day is indispensable to a successful search for insects—more particularly as I am now referring principally to butterflies, as the only class of insects treated of in this volume—it is next necessary to suggest the best seasons for search. Long, then, before any specimens are to be taken in the winged state, the collector may, as early as the end of January, dig for the chrysalides of such species as enter the earth to undergo their transformation to the pupa state; and these he will be most successful in finding near the roots of such plants as the caterpillars feed upon. Other species he will find upon walls or paling, near the foot of the larvæ; and others still attached to the withered stems of the plants of the previous summer. He may also search for the eggs of many species, the most likely places to find which, and the various modes of depositing them, he will find described in the body of the work. Caterpillars may be collected as early as the beginning of April, and the best time to find them is early in the morning and late in the evening, or even night, as many species remain concealed during the greater part of the day, and some feed only at night; consequently, a search for them by day would be fruitless; though some might occasionally be found by pulling up the plants and carefully examining the roots, about which they sometimes lie concealed. Caterpillars may be sought all through the summer, and, as some butterflies are what is called double-brooded, their larvæ are to be found as late as September. It will be useless here to repeat at what particular season each species is found, as that will be found fully described in the preceding pages. I therefore merely remark in addition, that some that can scarcely ever be seen, as they feed at the top of high trees, may be taken by shaking or beating the tree—such, for instance, as the beautiful larva of the Purple Emperor, which feeds upon the highest branches of the oak, which is indeed a fertile theatre for the occupation of the entomologist, each tree affording shelter and food to various tribes of insects, too numerous to specify. A white cloth or sheet should be spread upon the ground before beating or shaking trees. [These observations are as applicable to moths as to butterflies.]

Wherever the collector is a draughtsman, a careful and exceedingly accurate drawing of several individuals of every species of caterpillar should be taken, and each caterpillar kept separate, and distinguished by a *number*

corresponding with a *number* attached to the drawing; and by this system, not only every butterfly will be assigned to its proper caterpillar (which has not always been the case), but even the male and female caterpillars may perhaps be distinguished by unvarying markings, as distinct, no doubt, in many instances, as those of the perfect insects themselves; a fact which it would be highly interesting to prove satisfactorily.

The caterpillars, when taken, should be touched with care, as they will not bear rough handling. A large box should be prepared for them with a gauze lid, and should contain several divisions, each distinguished by a *number*; each division should also have a little earth, mixed with rotten wood at the bottom, which may be prevented from getting too dry and dusty by keeping a layer of damp moss upon it. In the corner of each division should be placed also a phial of water, in which a branch of the plant which the insect feeds upon will be kept fresh; it should, however, be renewed every day, or even twice a day, if possible, care being taken not to disturb the caterpillars at the time they are casting their skin, which occurs several times before they attain their full growth, varying in different species. It will be understood that the earth at the bottom of the divisions is for the use of such caterpillars as undergo their change in the ground.

To rear caterpillars from the egg is much more difficult; but the most certain method is to place the eggs securely upon a branch of the proper food of the species, in the open air, and, to prevent escape, enclosing the branch in a gauze or muslin bag or frame. It will be found necessary, however, to remove them to other branches as often as the leaves are destroyed, or become unfit food. Caterpillars, when taken nearly full grown, may also be treated in this way with great success; but great care must be taken in removing the chrysalides to a box covered with gauze as soon as they are formed, and they must in all cases be examined frequently, as if the perfect insect remains long in the box without being secured, the wings will become injured by its endeavours to escape; and one great advantage of rearing them from the caterpillar state is, that more perfect specimens are secured than could possibly be obtained by capturing them in the winged state, as even the exercise of flying destroys the downy bloom which they exhibit on first emerging from the chrysalis.

To capture the winged insect flying, or settled upon a flower, or on the ground, gauze nets are used of two or three sorts, which will be found described in Mr. Ingpen's little work, or Mr. Westwood's "*Entomologist's Text-Book*:" for instance, to capture the high-flying Purple Emperor a net is sometimes used, fixed to a rod or pole, twenty feet long; but Mr. Ingpen mentions that he is sometimes, in common with other strong flyers, brought to the ground by throwing up a piece of stone or tile in his course, which he follows in its fall, and sometimes alights upon it, when he is easily taken.

When captured and killed, care being taken not to rub off the down from the wings, a pin must be passed through the thorax, and the wings kept expanded by thin braces of cord until the insect is perfectly dry. This requires several days, varying according to the weather, after which it is ready to be placed in the cabinet. When the season is past, both for taking the insects in the larva or imago state, the leisure hours of late autumn may still be occupied in search of chrysalides. These may be sought, as the garden flower-beds are dug over, upon the plants on which they have fed, and on walls and palings; but in the latter situations it frequently happens that they are diseased individuals, which, pierced by the ichneumon fly, have wandered from their food, and in their *malaise* sought a shady and solitary retreat, instinctively, perhaps, endeavouring to escape their enemy, who generally pierces them in the bright sunshine. Chrysalides taken in such situations will frequently, when they burst, instead of the expected butterfly, discharge a hundred small silken cocoons, each

containing a chrysalis, from which eventually issues a small fly, which, in its turn, seeks some unhappy caterpillar, and, by means of its sharp ovipositor, places a number of eggs in its body, which, quickly hatched by the warmth, feed upon its vitals till it is destroyed. The ichneumon of the small silken cocoons, mentioned above, seems to confine its ravages to the caterpillars of the cabbage-white butterfly; but each species has its peculiar foe of this description, some large and some small, the former depositing only one or two eggs in the body of each caterpillar, the latter from ten or twelve to near a hundred. I have seen a caterpillar of the lacquey moth wince under the repeated punctures of its ichneumon foe, till it has at last fallen from the branch upon which it was feeding; it, however, soon resumes its food, doubtless with redoubled rapacity, to satisfy the insatiate legion within, till, overcome by exhaustion, it crawls away to fix itself in some solitary place, where the chrysalis is found.

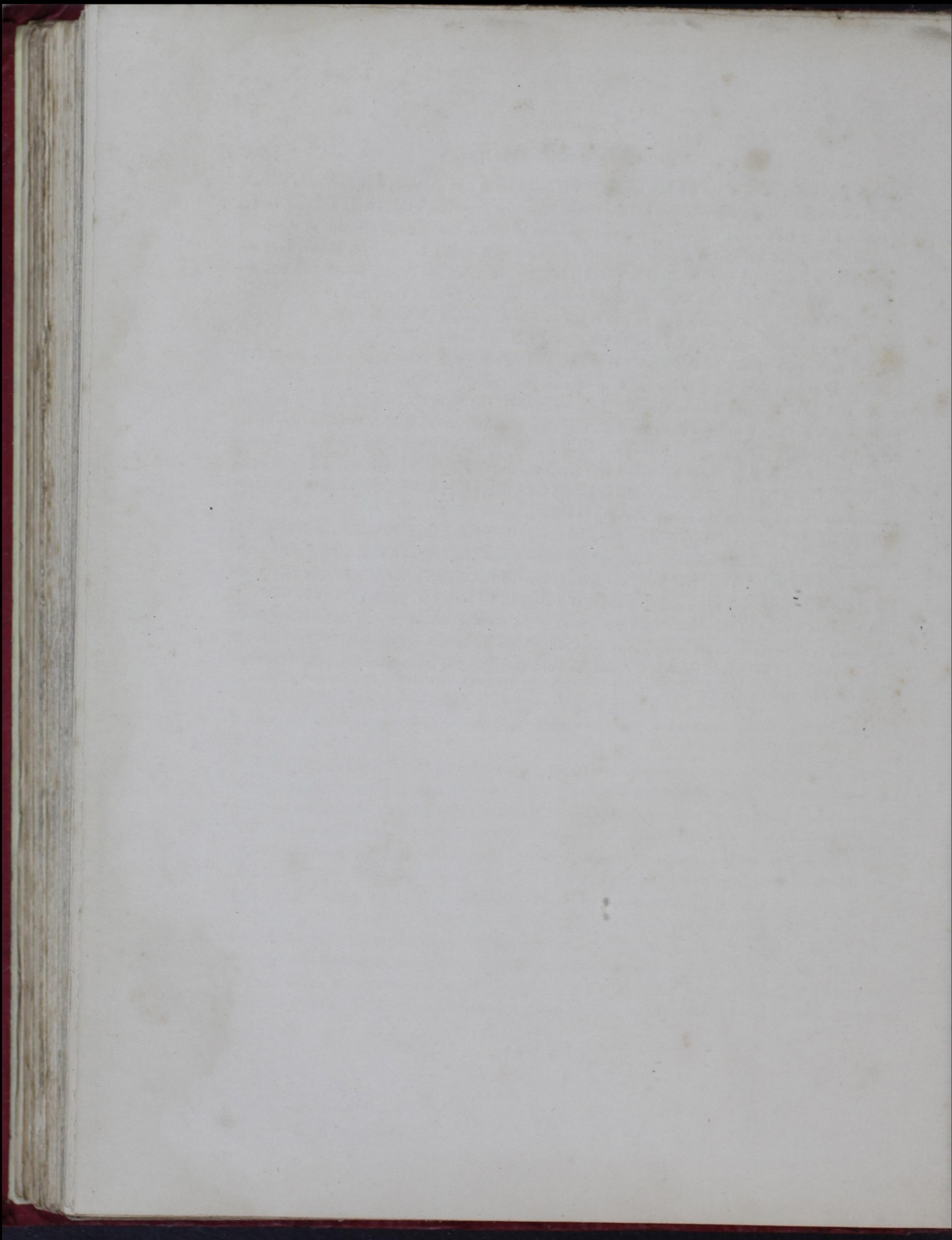
After the season of collecting is entirely over, or when bad weather confines the student to the house, he may occupy his leisure time in arranging his collection; and I would strenuously advise him to do so, not merely as a pretty display of beautiful objects, but with due regard to nomenclature and system. Doubtless the most deeply interesting portion of natural history is the observation of the habits, physiology, structure, and properties of organised creatures (by far the greater number of which belong to the entomological division); but their proper and convenient arrangement, according to the most recent terms and system of science, is absolutely necessary for the successful progress and application of all knowledge; and even those who are confining themselves to the arrangement of the mere nomenclature of the catalogue, are doing good service to the advancement of the science. The elaborate and searching observations of Reaumur and Bonnet would have been much more valuable had they been conducted with such a view to system and arrangement; whilst as it is (as mentioned in Kirby and Spence's Introduction), some of the insects of which they have recorded the most interesting circumstances, cannot, from their neglect of system, be at this day ascertained. No one, for instance, knew Reaumur's *Abeille tapissière* until Latreille, happily combining system with attention to the economy of insects, proved it to be a new species, *Megachile Papaveris*. Even with the assistance of carefully-coloured portraits, it is almost impossible so to describe insects as to render them recognizable with certainty, unless the accepted terms and system of science be also employed; and Mr. Westwood, in his "Entomologist's Text-Book," alludes to the fact that many rare insects, of which engraved portraits have been given by the early entomologists, have from this cause been thought to be new species.

Kirby and Spence affirm that a well-arranged system, with proper terms and names, is as necessary to the understanding of a science as is a dictionary to the understanding of a foreign language. "The labours of a Michaelis or a Laplace might be sealed books to us without dictionaries of the French and German languages; and, in fact, a good system of insects, containing all the known species, arranged in appropriate genera, families, orders, and classes, is in reality a dictionary, enabling us (without the incalculable loss of time which would otherwise occur) to ascertain the name of any given insect, and thus to learn all that has been recorded of its properties and history, as readily as we determine the meaning of a word in a lexicon."

As far as regards the systematic position of any insect connected with the order treated of in the present volume, the student will have, comparatively, little trouble. The veriest tyro will at once know that any *butterfly* or *moth* must belong to the order *Lepidoptera*. He will perceive that as a *butterfly* it must belong to the section *Diurna*; a few striking characteristics will show him to which family he must refer it, and it then only remains to ascertain its genus; and, supposing it to belong to the genus *Vanessa*, it will not be at all difficult to

ascertain the specific name, as the different species of this genus are at once obviously distinguishable by their various markings alone, without reference to their minute structural characters, which should, however, always be attended to by the student. If, after pursuing this course, he finds he has an insect evidently of the genus *Vanessa*, or any other, but that it accords with none of the recorded species, he may hope to have been the discoverer of a new species, particularly if he reared it from the caterpillar, and (having procured an accurate drawing of it) if he finds it differ from that of the species in question, he must then, from its characteristic differences of structure or marking, seek to give it such a specific name as will be acknowledged by science, and will serve to distinguish it from the rest of the genus, and also describe it by such *characters* as will be found under each species in this work. It is true that in butterflies, which, besides their conspicuous colouring, fly at high noon, the collector can hope to make few discoveries of this description; nevertheless, several such have occurred even within the last few years; and when we consider that the beautiful *Lycæna dispar* was only discovered about the year 1822, there are doubtless still some novelties in store for the industrious collector, even among our butterflies; but among our moths, of which I am preparing a series of similar illustrations to those of the butterflies, very numerous discoveries may be expected; for, flying at the dead of night, or at the early dawn, many must at present have escaped the search of entomologists, particularly among those which appear in the winter, when the collector is seldom abroad.

In conclusion, I have only to say that if the reader has any doubts respecting the utility and importance of Entomology as a science, let him not only inquire what eminent men have devoted a large portion of their lives to its pursuit, but let him at once read Kirby and Spence's Introduction to their beautiful work upon the subject: one of the most interesting and convincing pieces of writing in the language; and let him there learn what light has been thrown by the science upon the labours of the silkworm, whose product furnishes labour and subsistence to millions; upon the ravages of the turnip-fly, or the instinctive mechanism of the bee or the ant, and upon those links which it furnishes to the great chain of organization and intelligence, from infinite perfection to the brink of dreary nothing.—H. N. H.



ALPHABETICAL INDEX.

OBS.—The ordinary Synonyms of the Genera are enclosed in brackets, and those of the Species are printed in *Italics*.

	PAGE		PAGE		PAGE		PAGE
(<i>Anthocharis</i>)	30	Hampsteadensis	58	<i>Tessellata</i>	39	Agestis	114
<i>Apatura</i>	58	Huntera	57	<i>Thalia</i>	41	Alcon	103
Iris	59	Levana	58	Tharos	Suppl.	Alexis	107
<i>Aporia</i>	33	(<i>Doritis</i>)	11	(<i>Nemeobius</i>)	80	Alsus	100
Cratægi	34	<i>Euchloe</i>	30	<i>Nisoniades</i>	122	Argiolus	101
<i>Arge</i>	63	Cardamines	31	Tages	123	<i>Argus</i>	109
Galathea	64	<i>Gonepteryx</i>	12	<i>Oreina</i>	76	Arion	104
<i>Argynnis</i>	42	(<i>Goniapteryx</i>)	ib.	Blandina	77	Artaxerxes	116
Adippe	43	Rhamni	13	Cassiope	78	<i>Calæthys</i>	105
Aglaia	45	<i>Hamearis</i>	80	Ligea	77	Corydon	ib.
Aphrodite	46	Lucina	ib.	Mnestra	79	<i>Cymon</i>	102
<i>Charlotta</i>	45	(<i>Hesperia</i>)	125	<i>Mnemon</i>	78	Dorylas	112
Lathonia	43	<i>Hipparchia</i>	61	<i>Papilio</i>	8	<i>Dorylus</i>	107
Niobe	44	Aleyone	68	Machaon	9	Eros	111
Paphia	46	Briseis	69	Podalirius	10	<i>Icarus</i>	107
<i>Cænonympha</i>	71	Hyperanthus	70	<i>Pamphila</i>	125	Icarius	113
Arcanius	74	Janira	70	Actæon	129	<i>Labienus</i>	108
Davus	72	Phædra	68	Bucephalus	126	<i>Lacon</i>	ib.
Hero	75	Semele	ib.	Comma	128	Salmacis	115
Iphis	73	Tithonus	69	Linea	129	<i>Thestylis</i>	108
Pamphilus	75	<i>Lasiommata</i>	65	Sylvanus	127	Titus	Suppl.
Polydama	73	<i>Egeria</i>	ib.	<i>Vitellius</i>	126	(<i>Pontia</i>)	19
<i>Polymeda</i>	ib.	Mæra	67	<i>Parnassius</i>	11	<i>Pyrgus</i>	119
Typhon	ib.	Megæra	66	Apollo	12	(<i>Fritillum</i>)	120
Typhon	ib.	<i>Leptosia</i>	31	Mnemosyne	Suppl.	Malvæ	120
<i>Chrysophanus</i>	91	(<i>Leucophasia</i>)		(<i>Pieris</i>)	33	Malvarum	122
Chryseis	94	Candida	32	<i>Pieris</i>	19	Oileus	122
Dispar	95	<i>Sinapis</i>		Brassicæ	22	<i>Thecla</i>	82
Hippothœe	96	<i>Limenitis</i>	60	Bryoniæ	28	Betulæ	85
Phleas	93	Camilla	Suppl.	Chariclea	24	Ilicis	90
Virgaureæ	97	Populi	ib.	Daplidice	29	Pruni	87
<i>Colias</i>	14	Sibilla	60	Feronia	Suppl.	Quercus	86
Chrysotheme?	17	(<i>Lycæna</i>)	91	Metra	26	Rubi	90
Edusa	15	<i>Melitæa</i>	35	Napææ	27	Spini	89
<i>Electra</i>	Suppl. and ib.	Artemis	37	Napi	ib.	W. album	88
<i>Europome</i> ?	17	Athalia	38	Nelo	26	(<i>Thymele</i>)	119
Hyale	16	Cinxia	ib.	Rapæ	25	<i>Vanessa</i>	47
Myrmidone	18	Dia	42	Sabellicæ	28	Antiope	53
<i>Pateno</i>	17	Eos	39	(<i>Pithecopis</i>)	99	Atalanta	55
<i>Cyclopides</i>	123	Euphrosyne	41	<i>Polyommatus</i>	—	C. album	50
Paniscus	124	Materna	37	Acis		Io	53
Sylvius	ib.	<i>Melitæa</i> —	39	Adonis		Polychloros	51
<i>Cynthia</i>	56	<i>Pyronia</i>		Ægon		Urticæ	ib.
Cardui	56	Selene	40				

LONDON:
THOMAS HARRILD, PRINTER, SILVER STREET,
FALCON SQUARE.

31/6

