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NOTES ON ENTOMOLOGICAL NOMENCLATURE.

Part II.

BY W. H. EDWARDS.

In 1806, Hübner, as we have seen, printed for his own use and in order that it might be submitted to certain competent persons, to be examined and judged of, the sketch of a plan for the arrangement of the Lepidoptera, called the Tentamen, &c.; and this sketch "was afterwards enlarged and published as the Verzeichniss bekannter Schmetterlinge," as stated by Geyer, Thon's Archiv., vol. 1, p. 28, 1827. What the Tentamen is I have shown in a previous paper, CAN. ENT, vol. viii, Feb'y No., and have given reasons for denying its authority in nomenclature. I will now proceed to show the character of the Verzeichniss and to examine its claims in the same direction.

The Verzeichniss bekannter Schmetterlinge, a Catalogue of Known Butterflies, by Jacob Hübner, Augsburg, 1816, pp. 431, follows the general plan of the Tentamen. The Lepidoptera are divided into several *Phalanxes*, of which the first is called *Papiliones*, the second *Sphinges*, the third *Bómbyces*, &c.

The *Papiliones* are divided into two *Tribes*, called *nymphales* and *gentiles*.

The *nymphales* into 9 *Stirps*, the *gentiles* into 6, and each *Stirps* into many *families*, so that in all there are 62 *families* among the Butterflies; and each *family* is divided into small batches called *coitus* and altogether there are 309 *coitus* of Butterflies.

The *Stirps* are briefly and unevenly defined by characters drawn from the mouth, the "snout" (proboscis), the "ears" (antennæ), the body and wings, and partly from the colors of the wings.

The 1st *Stirps* of the *nymphales*, called *Nereides*, is thus defined: "Antennæ thin, but thickened like a club at the end, fore wings narrow

and long, hind wings broad and long, fore legs pretty long, the legs and feet beset with a pair of light spines at the end of the feet; the thighs pretty spiny; the abdomen very thin, but thickened towards the end." This Stirps embraces what modern authors call the Heliconidæ, and others.

The 2nd Stirps, Limnades, thus: "Antennæ pretty long and knobbed; both wings broad and pretty long; the fore legs short, almost smooth, the legs and feet at their ends beset with a pair of slight spines; the thighs rough, the claws long and almost straight; the abdomen long and thicker towards the end." Embraces the Danaidæ and others.

The remaining Stirps of the *nymphales* are more briefly defined. The 3rd, Napacæ, thus: "The antennæ long, the fore legs pretty hairy upon the langern (a word to be found in no dictionary), and the abdomen short." Partly covering the Lemoniadæ of modern authors.

The 4th Stirps, Lemoniades, thus: "The wings tolerably common-formed (fast gemeinformig), the abdomen moderately stout and long." Comprises in part Lemoniadæ, Acreidæ, Nymphalidæ (Melitæa).

The 5th Stirps, Dryades, thus: "The antennæ very short knobbed. The wings spotted above with black on an ochre-yellow ground, below pale and marbled." Embraces one section of the Melitæas, viz., Phyciodes and the Argynnidæ.

The 6th Stirps, Hamadryades, thus: "The wings angular, the lower ones having a sheath in which the body rests." Comprises Vanessidæ, Elymniadæ, &c.

The 7th Stirps, Najades, thus: "Antennæ tolerably club-shaped; the wings above dusky, below bright colored, every where spot banded." *Limnitis*, *Ageronia* and others of the Nymphalidæ.

The 8th Stirps, Potamides, thus: "Body pretty thick, antennæ club-shaped, the wings strong and considerable." Mainly the *Morphidæ*.

The 9th Stirps, Oreades, thus: "The palpi pretty roughly haired; the antennæ delicately bent down at the end and club-shaped; the wings with eye like spots, white pupilled; the legs very weak." Embraces the *Satyridæ* and others.

Of the *gentiles*, the 1st Stirps, *Agrodiacti*, is thus defined: "The palpi naked at the ends; the cheeks white margined; the antennæ tolerably short, long-knobbed; the legs, especially the fore legs, short." Includes the *Lycaenidæ*.

The 2nd Stirps, Archontes, thus: "The palpi entirely hairy; the antennæ clubbed, bent; the wings large; the fore legs much like the others, but spineless and the abdomen free." Comprises the Papilios and Parnassians.

The 3rd Stirps, Andropoda, thus: "All the members pretty badly shaped (ziemlich schlechtformig), the wings pale colored and black." Part of the Pieridae.

The 4th Stirps, Hypati, thus: "Palpi large, directed forward, the antennæ club-shaped, the wings angled and jagged." The Libytheidae.

The 5th Stirps, Telchinae, includes heterocerous moths, and I omit it.

The 6th Stirps, Astyci, thus: "The forehead broad, the palpi thickly haired; short-snouted; the antennæ beset with a little lock on their knoblets, hooked at the end; the wings pretty broad, moderately large." The Hesperidae.*

Now it strikes me that nothing more is needed than to give these definitions in full to show that they are almost if not wholly worthless. If in the 1st and 2nd Stirps of the *nymphales*, and the 2nd and 6th of the *gentiles*, there is a somewhat full definition, embracing the antennæ, palpi, legs and shape of the wings, in the remainder there is a singular indefiniteness and hesitancy. In some the wings are not mentioned at all (Napaeæ, Agrodiaeti), in others the members are not (Hamadryades, Lemniades), in others still the antennæ alone are coupled with the

* NOTE.—The language used by Hubner throughout this volume is uncouth and that of an unlettered man, a condition not at all incompatible with skill in delineating and coloring. Consequently, while his plates are models of excellence, his text is boorish. To him, fore wings are pinions, schwingen; hind wings sinkers, senken; the fore legs arms, aerme; the antennæ ears, ohren; the proboscis a two snouted nose, zweischnaubigen nase, &c. One of the coitus of the Astyci is thus characterized: "The wings spotted with white like a sausage," which is Hubnerian for mottled. Dr. Hagen, to whom I applied for light respecting certain words, writes thus: "Hubner was illiterate. His language cannot be called in any sense plain German. He invented a number of words for things and parts for which words existed long ago in German, and were used and adopted fifty or even a hundred years before Hubner. Apparently he had no knowledge of these words or of the works in which they were used. The consequence is that neither science nor even any popular writer has adopted Hubner's words. They are known to nobody, and for some of them the sense can only be guessed. You will find them in no German dictionary. They are simply self-made barbarisms." Geyer, Thon's Archiv., 1827, in his notice of Hubner and his works, calls his language "illiterate (schwunglose sprache), greatly marred by self-made words."

coloration, not shape, of the wings, and in three especially (Dryades, Najades and Andropoda), the coloration seems to be the essential part of the definition.

Who can possibly know from the definition what is embraced in Napacæ, or in Dryades, or Hamadryades, or Potamides, or Najades, or Andropoda ! or in Lemoniades, "the wings tolerably common formed, the abdomen stout and long." What idea does that language convey? Andropoda, "all the members pretty badly shaped," applied to the beautiful Coliades and Teriades ! It is the merest rubbish and does not deserve one moment's toleration. Moreover, these divisions accord with no modern system whatever. All through the Verzeichniss, we find that the members of distinct Stirps are ranged by Kirby (whose General Catalogue, 1871, is the latest work of classification of the Rhopalocera, and the one which for convenience I shall mainly use for comparison) in the same sub-family and even the same genus, while, on the other hand, the Hübnerian Stirps, families and coitus dissolve into distinct and unrelated sub-families and genera in Kirby. For example, Melitæa (species Phaeton, Cinxia, &c.) stands in Hübner among the Lemoniades, whose wings are "tolerably common formed," but Phyciodes (species Tharos, &c.), which is closely allied to Melitæa, and has by nearly all authors been considered as but a group under that genus, is put in another Stirps, Najades, where the wings must be intolerably common formed, or tolerably uncommon formed, I do not know which, by the side of the Argynnidæ. The Vannessidæ go in still another Stirps, and Limenitis in a fourth, and all these and others stand in Kirby in the single sub-family Nymphalinæ. So far as appears, Hübner regarded the barriers which separate these Stirps as substantial as those between any of the series—the Papilios (Archontes) from the Pierides (Andropoda), for instance. As to the species brought within the several Stirps, every lepidopterist knows that a very large proportion of the Butterflies naturally fall into groups so distinct that the veriest tyro in collecting can scarcely make a blunder in assorting his specimens. And what the tyro sees Hübner could not well help seeing, but the moment there was doubt he was completely at fault, and as a consequence several of his Stirps have no foundation in nature and his definitions of them from necessity are as vague and misty as are those of his families and coitus.

The family divisions are made up almost wholly from coloration, and a large part of the names chosen for them are simply puerile, as voracia, fugacia, sapientes, adolescentes, armati, festivæ, etc. And in assorting

the species all the ring-streaked go in one family, all the speckled in another. Thus 1st Stirps, Nereides, 1st family, Vitriæ, "both wings centrally transparent;" 2nd family, Fulvæ, "the wings rust-yellow, spotted with black and sulphur yellow." And as might be expected, both the families and the coitus under them being assorted by mere coloration, with the Stirps characters so insignificant, the results are often surprising. Thus Stirps Linnades, 2nd family Ferrugineæ, "all wings black margined and white dotted," contains species of Danaidae, our *D. Archippus* (called *Anosia Menippa*) being one. But the same definition applies equally well to our *Limenitis Disippus* (called by Hübner *Anosia Archippus*), and here of course it is among the Danaidae, though its natural allies are in a remote Stirps, the Najades. But the Najades are defined as "dusky above, bright colored below, every where spot-banded," and *Disippus* under this sort of classification has no place there. As to the characters derived from the members, they form no obstacle at all to the shifting of a species from one Stirps to another. Nereides has the antennæ "thickened like a club at the end"; Najades has them "tolerably club shaped." And so *Disippus* may range under either Stirps with this limp style of characterization. Another of these Anosians is *Misippus* Linn., put by Kirby in *Hypolimnas* Hüb., among the Nymphalinae near *Limenitis*, and *Hypolimnas* is also one of the coitus of Najades, defined "the fore wings white spotted, the hind pale banded"! Such instances occur repeatedly, as will hereafter appear, and that not merely between the Stirps of the same Tribe even. Nor need it be deemed strange that in many cases Heterocerous Moths overstep the Phalanx and find their places among the Butterflies.

The value of the family names is so uncertain that authors who reverence the Stirps and coitus names have in a great degree, and, in fact, except in two or three instances, altogether ignored them. And yet if Mr. Scudder's Canon 1 were to have the force of law, each of these 62 family names would have to have place made for it, and be a permanent addition to the nomenclature.

All these divisions, Stirps, families and coitus, are built on the same plan, and are subject to like defects. The family is a magnified coitus, and the Stirps bears the same relation to the family. Some of each may have their equivalents in modern classification, but it is accidental, and the greater part have none. Even were the Stirps homogenous, they could not run with modern families or sub-families. They are both too great and too small. Nor could the families, on same condition, run with

modern sub-families or with genera. They are of less value than the one and either greater or less than the other. So the coitus are also both greater and less than genera; often they are plainly nothing but groups or sub-genera, but as often they embrace a heterogenous collection to which no appellation can be given. They are constructed in defiance of any generic principle, whether it be community of descent or structural resemblance. They are precisely what the name *coitus* indicates, an assemblage, a batch, a lot of things brought together, and in this case the tie is not relationship, but a superficial resemblance in which relationship has no part, and by which all natural grouping is violated, and members of distinct genera, of distinct sub-families and families are brought together because they happen to be red or yellow or blue. Hübner struck out a new path for himself, and instead of adopting the systems sanctioned by the usage of his day, or the characters on which such systems were based, he fixed upon the single item of coloration as the unit of his arrangement. This runs from coitus to Stirps and vitates the whole. As I have said elsewhere, it is exactly as a child would sort his alleys and taws, or as if, according to the illustration of Dr. Boisduval, applied to this very book, a botanist should found his classification upon the colors of the flowers, or the marbling or pinking of the leaves. Or it is as if a zoologist were to sort the mammals by coloration, and put in one genus a black cat, black fox, black wolf, black bear, in another a gray cat, gray fox, gray wolf and a badger; or as if an ornithologist would couple a blue jay and a blue crane, a gold finch and a yellow parrot. It is impossible, therefore, that these coitus can be ranged with genera. They are something essentially different, crude creations of an unscientific mind,* and any attempt to utilize them is like forcing curved lines to lie parallel with straight.

* What good result was possible when such an author attempted to classify all the species of the several divisions of the great order Lepidoptera, never having seen more than a small fraction of the insects themselves and knowing nothing of the remainder except through loose descriptions and from plates like those of Herbst and Esper and Cramer, in which the superficies only is represented and that coarsely and with no heed to exactness. Many of the figures on these plates cannot even now be identified, and are believed to represent insects which have no existence in nature, perhaps manufactured articles sold to confiding collectors by cunning dealers. Treitschke intimates that the dealers palmed on the author of the Verzeichniss varieties for species, and common exotics as rare indigenous. Hübner's contemporaries understood his capabilities and were fully equal to judging correctly his system, and accordingly the Verzeichniss was quietly ignored, and except through his plates, this author exercised no influence on that generation.

The sooner and more completely this difference between a coitus and a genus is recognised, the better for the nomenclature of the lépidoptera. *And coitus not being genera, and having no equivalent in the nomenclature of the science, the laws regulating the standing of genera have no application to the coitus whatever.*

In the Butterflies of the Verzeichniss are 309 coitus, out of which Mr. Scudder in the Hist. Sketch has "reinstated" 283, as good and proper names of genera, entitled by what he terms "the inexorable laws of priority" to place, whether there be room for them at the feast or not.*

We have seen how Stirps are defined and families. Let us look at the coitus. Beginning at the 1st Stirps, Nereides, 1st family.

1st coitus,	Hymenitis.	Fore wings	half-banded.
2nd "	Ithomia.	" "	once "
3rd "	Oleria.	" "	twice "
4th "	Thyridia.	Both wings	banded.

2nd family, 2nd coitus, Dismorphia, "fore wings small, hind wings large, particolored." And being of that shape and particolored, the species under this coitus, which really are Pierids, and whose natural allies are in the Stirps Andropoda, in the other Tribe *gentiles*, must rank with the Heliconidæ, ten Stirps away. And why? *Because a Pieris as one of the Andropoda has no business to be particolored, that Stirps permitting only those species which are pale colored and black!*

Take Archontes (Papilios), 1st family, 2nd coitus Jasonidae, "hind wings tolerably long and tolerably short-tailed."

3rd coitus, Euphocades, "both wings tolerably broad, brown colored and yellow-spotted." Now one of these definitions is in no way incompatible with the other. Though the wings of Jasonides may be tolerably long, that does not hinder them from being tolerably broad also, and though Euphocades is brown-colored, for aught that appears, Jasonides

* The laws of priority are not inexorable, and such laws anywhere lead only to absurdity and injustice. The author of the Hist. Sketch nowhere hesitates to decide what names of genera are entitled to credit and what are not, and rejects such as he pleases with no regard to the "inexorable" laws. In the Rules of the Brit. Ass'n, the 11th Rule says, "a name may be changed when it implies a false proposition," &c., the systematist of course being judge. And in the notes on this, Prof. Verrill says, "it wou'd be well to exclude all names that refer to abnormal structures," &c. Usage condemns profane and blackguard names. The laws of priority, like all human laws, are to be applied with a few grains of common sense; that is all.

may be brown also. Under the former of these stands our Papilio Turnus, and under the latter the black female of same, or Glaucus. Not a particle of difference between a yellow female Turnus and this black Glaucus, except in the one item of color. But to suit the Hübnerian system the two must lie in distinct coitus! No better illustration of the nature and value of a coitus could be brought forward. It is black cat, black fox, versus gray cat, gray fox. *Are these two coitus genera or sub-genera, or are they groups? They are neither, but something radically different, and which has no equivalent in modern systems and cannot be expressed.* I happen to have an example of female Turnus, called an hermaphrodite, one side of the wings and body of which is yellow, the other black, and which therefore belongs equally to two coitus! The yellow half is Jasonides, the black Euphœades. Does my example therefore belong to two genera!

Mr. A. R. Wallace, President of the Entomological Society, London, in his Anniversary Address of 22nd Jan'y, 1872, Trans. Ent. Soc., uses this language: "We find Hübner's condemnation in almost every page of Kirby, in the utter want of agreement between his groups and modern genera. The modern restricted genus Heliconius contains species belonging to seven Hübnerian genera" (coitus), etc. . . . while in other cases the species comprising Hübner's groups are divided amongst several quite unrelated genera."

An impression prevails in some quarters that, although the coitus are often composed of heterogeneous materials, yet there are many exceptions, and in such cases, while the former should be rejected, the latter might properly be regarded as natural groups, and accepted as true genera, their names taking precedence accordingly. Mr. Kirby, in his paper on the Necessity of a Reform in the Generic Nomenclature of the Diurnal Lepidoptera, so speaks: "As Hübner relied almost exclusively on *facies*, his genera are both too numerous and too heterogeneous. His genera are usually treated as manuscript" (that is, as entitled to no authority on account of some intrinsic defect, as want of suitable definition, for example), "but unjustly as I now think, though I formerly expressed a different opinion; for on closely examining the work, *many of his genera will be found to be natural.*" And Dr. A. Speyer, in his paper on Eur.-Amer. Verwandtschaften, Stett. Ent. Zeit., 1875, says: *Only those of Hübner's coitus are to be regarded as scientifically established which are either sufficiently characterized, or in which the satisfactory characterization is at least replaced by the fact that the species of the special genus*

are all brought together under the same generic name without heterogeneous intermixture."

To determine whether homogeneous groups were the rule or the exception, I made an analysis of the Verzeichniss from the beginning as far as the Astyci (Hesperidae), looking out every species and noting its place in Kirby, and this is the result. There is occasionally a coitus co-extensive with the limits of a modern genus, but in all cases solely by reason of some strong peculiarity of color or shape; as *Chrysophanus*, which includes the coppers, and is equivalent to Doubleday's genus of same name. But out of 255 coitus preceding the Hesperidae there are but 35 such, and of these, 13 have but one species each, 6 have two and 6 have three; so that 25 of the 35 coitus contain but 3 species or less. Many other coitus are homogeneous, but of this class the species under two, three or several are lumped together by Kirby in one genus, so that such coitus are plainly regarded as equivalent to something less than genera, and the remaining coitus, 106 of the 255, are made up of species assigned by Kirby not only to distinct genera, but of sub-families and families. For example, 1st Stirps, 2nd family, 4th coitus, *Eueides*, under which stand 7 species. In Kirby 1 goes to *Eueides* Hüb., 2 to *Lycorea* Doub., 2 to *Melineae* Hüb., and 1 to *Tithorea* Doub.

Or 5th coitus, *Melineae*, 5 species, 1 to same, Hüb., 3 to *Heliconius* Latr., 1 to *Tithorea* Doub.

Or 3rd family, 1st coitus, 10 species, 2 to *Eueides* Hüb., and 8 to *Heliconius* Latr.

And so *Heliconius* picks species at random from the 2nd family, 3rd and 5th coitus, and from 3rd family, 1st, 2nd, 3rd and 4th coitus, and from 4th family, 1st and 2nd coitus. And *Eueides* from 2nd family 4th coitus, 3rd family 1st coitus.

Or 2nd Stirps, *Limnades*, which comprises the *Danaidae*, 3rd family, 4th coitus *Didonis*, 2 species only, one of which stands in Kirby as *Didonis* Hüb., the 56th genus of the 8th sub-family *Nymphalinae*, the other as *Elymnias* Hüb., 1st genus of 3rd sub-family *Elymninae*. Now the coitus *Elymnias* stands in the 6th Stirps, *Hamadryades*, 4th family 5th coitus, directly among the *Vanessans*, the species *Antiopa* being in the coitus next preceding, and *Prorsa* in the one next following!

Under the head of *Euploea* stand 7 species, 6 of which are put by Kirby into *Danais* Latr. and one in *Hypolimnas* Hüb., and by a curious swap, the species which Hübner put into three other coitus are lumped

in one genus called *Euploea* Hüb. ! And besides that the true *Euploea*s are put to *Danais* Latr., most of the species belonging to the coitus *Hestia* and *Anosia* are also put to *Danais* Latr., though they stand in two different families. And one of these *Anosians*, is a *Limenitis* (*Disippus*) as before related, while another is a *Hypolimnas*.

Third *Stirps* *Napaea*e, 1st family, 2nd coitus *Hamanumidae*, 6 species, 3 put by Kirby under same name, Hüb., and this genus stands in the 1st family, 8th sub-family *Nymphalinae*, and 87th genus of same ; of the rest, 1 is *Aterica* Bois., the 88th genus, 1 is *Zemeros* Bois., of the 2nd family, 2nd sub-family *Nemeobiinae*, and 1 is *Charis* Hüb., which stands in the 2nd family, 4th sub-family, *Lemoniinae*. Now the coitus *Charis* is one of the *Napaea*e, as well as the coitus *Hamanumidae*, which last, as we see, has so gotten among the *Nymphalinae* ; and under *Charis* are two species only, *Gyas* and *Anius*. Kirby puts *Gyas* into *Anteros* Hüb., among the *Lemoniinae*, but looking up *Anteros* in the *Verzeichniss*, I find it a coitus of the *Stirps* *Agrodiaeti*, or *Theclinae* ; that is, in the other Tribe, *gentiles*, 7 *Stirps* away from the coitus *Charis* ! That is the sort of wild goose chase one has between these two volumes.

Same *Stirps* *Napaea*e, 1st coitus *Thysonotis*, 2 species, 1 put by Kirby in *Cupido* Schrank, in the *Lycaenidae*, that is, according to Hübner, in the *Stirps* *Agrodiaeti*, the other in *Dynamine* Hüb., the 43rd genus of the *Nymphalinae*. Turning to *Dynamine* in the *Verz.*, we find it among the *Najades*, 7th *Stirps*, thus defined : "the wings white banded below, the hind wings marked by two eye like spots." But *Thysonotis* was defined : "*both wings colored only at the margins, centrally white.*"

Fourth *Stirps*, *Lemoniades*, 1st family, 3rd coitus, *Actinote*, 4 species, 3 of which go to *Acrea* Fab., among the *Nymphalinae*, 1 to *Alesa* West., in the *Lemoniinae*.

Second family 1st coitus *Melitaea*, 6 species, among them *Phaeton* and *Cinxia*, all put by Kirby under *Melitaea* Fab., as are likewise the species of 2nd coitus. Then comes 3rd family, 1st coitus, *Byblia*, 1 species, put in *Hypanis* Bois., a genus of *Nymphalinae* beyond *Melitaea* in Kirby, by the breadth of all the *Vanessidae*, and the very next coitus, *Cinclidia*, has all its species put in *Melitaea* again.

Fifth *Stirps*, *Dryades*, 1st family, *Reticulatae*, "wings above striped like a grating, the hind wings below with colored spots on a pale yellow ground and marked by eye like spots." 1st coitus, *Phyciodes*, "both wings above with a band of spots, under side very delicately marked," 2

species only, one of which is our *Tharos*, and as these species of *Phyciodes* form a section of the natural group *Melitaea*, it is worthy of notice how *Hübner's* system compels him to put them into a separate *Stirps*. The 2nd coitus, same family, is *Brenthis*, "the hind wings below gayly clouded, pale spotted," and here come 5 species, 4 of which are put by *Kirby* to *Argynnis* *Fab.*, while the 5th is *Euptoieta* *Claudia*, stuck in here because its hind wings are gayly clouded.

Next comes the 2nd family, 1st coitus, *Argynnis*, 10 species, all of which are put to *Argynnis* *Fab.* Then 2nd coitus, 3 species, of which 1 is *Argynnis* *Fab.*, 1 *Atella* *Doub.*, 1 *Lachenoptera* *Doub.* The 3rd and 4th coitus have all their species put to *Argynnis* *Fab.* The 5th, *Colænis*, 4 species, 2 of which stand as *Colænis* *Hüb.*, 1st genus of the *Nymphalinae*, *Argynnis* being the 12th, and 2 as *Eucides* *Hüb.*, amongst the *Heliconidae*. Definition of *Eucides*: "the fore wings twice spot-banded, the spots all yellow"; of *Colænis*: "wings striped, nearly plain beneath, the hind wings marked at base with white."!

The 6th coitus has 6 species, 1 put to *Messara* *Doub.*, 1 to *Atella* *Doub.*, 1 to *Pseudacrea* *West.* 6 genera ahead of *Argynnis*, and 3 go to *Argynnis*. So that *Argynnis* *Fab.* picks species from several coitus, situated in two families, among which are *Heliconidae*, *Melitaeas* and many distant genera.

The 6th *Stirps*, *Hamadryades*, consists of a mixed lot of species, many quite unrelated, and classed by *Kirby* in several distinct sub-families of the *Nymphalidae*, namely, in the 2nd, 3rd and 8th. In this last division are the *Vanessans*, a compact tribe naturally well characterized. The 1st coitus, 1st family, is *Vanessa*, comprising 3 species, *Cardui*, *Huntera* and *Carye*, and the coitus is defined: "wings above marbled, below with large peacock eyes." The next coitus is *Pyrameis*, 2 species, *Atalanta* and *Callirhoe*, defined: "wings red-banded above, marked like a peacock's tail below." These 5 congeneric species belong to 2 coitus, because 3 are marbled and 2 are red banded! By *Kirby* all these are classed under *Pyrameis* *Hübner*, regardless of the coitus character, which excludes everything that is not red-banded. By *Scudder*, (*Revision*, etc.) all are placed under *Vanessa* of *Fab.*, *not of Hüb.*, which is right. Now where are the rest of the *Vanessans*, *C Album*, *Antiopa*, *Io*, etc., in the *Verzeichniss*? Naturally they should at least stand by the side of *Cardui* and *Atalanta*. Instead of that they are 3 families away, being in 4th family, 2nd, 3rd and 4th coitus, under the names *Polygonia*, *Eugonia* and

Inachia. Then comes the 5th coitus, Elymnias, placed by Kirby in his 3rd sub-family (the Vanessans being in the 8th) and next follow more Vanessans, viz., *Araschnia Prorsa*. And between *Pyrameis* and *Polygonia* stand *Precis*, *Anartia*, *Temenes* (which includes a *Satyrid*), *Junonia*, *Apatura*, *Historides* (which last is composed of the species *Orion* and *Marchesius*, totally out of place here, and put by Kirby in the 98th and 111th genera, 8th sub-family, *Vanessa* being 22nd). That is, according to Hubner's notions, *all these intervening species were nearer Cardui and Atalanta than were C album and Polychloros and Antiopa*. *Polygonia* embraces 4 species, among which are *C Album* and *Progne*. One of the rest, *C Aureum* Linn., under its other name, *Angelica* Cramer, is also a member of the next coitus, *Eugonia*, classed with *Polychloros* and *Antiopa*, as much at home in one coitus as the other, and a 2nd species of *Eugonia*, *Polynice*, is placed by Kirby in *Rhinopalpa* Feld.

The coitus *Apatura* is quite another thing from *Apatura* Fab., the genus recognized by Kirby and all authors, Hubner having had the habit of appropriating names right and left from any author accessible,* and with no credit, using them in altogether other senses than the original. Under it stand 12 species, 6 of which are put by Kirby in *Precis* Hub., 24th genus of *Nymphalinae*, 1 in *Cymothoe* Hub., the 89th, 1 in *Siderone*, the 111th. But the name *Cymothoe* is not in this *Stirps Hamadryades*, being borrowed from 7th *Stirps Najades*. It must be borne in mind that in every case where a species is taken from one coitus and credited to a genus named from another coitus, violence is done to Hubner's arrangement, and his system, even while made use of, openly condemned.

The 7th *Stirps*, *Najades*, comprises another lot even more mixed than the 6th. The 1st family, 2nd coitus, is *Callianira*, 1 species only, *Ephestion* Stoll. (our species *Ursula*), put by Kirby in *Limenitis* Fab., with the European species *Sibilla* and *Camilla*, which in the *Verz.* stand in coitus *Limenitis*, separated from the other by 4 families and 20 coitus! And in these 20 coitus are species belonging to all sorts of unrelated genera, *Ageronia*, *Phyciodes*, *Colaenis*, *Siderone*, etc., etc., *all nearer to Ursula, from the Hübnerian point of view, than Sibilla was*. Why? Because *Ephestion* is "dusky below, banded and spotted with yellow," while *Sibilla* is "blackish brown, pale banded below, partly blue, the

* Thus the coitus *Hesperia* is one of the *Napacae*, as is also coitus *Lycæna*. Hubner proceeded in all respects as if he were the first and only systematist who had treated of the *Lepidoptera*.

bands *almost* broken into spots." And far away, in the 2nd Stirps, Limnades, is a third species of this genus *Limnitis*, namely, *Disippus*, because its wings are "black margined and white dotted." Here are three congeneric species, differently colored, and therefore placed in three widely separated coitus, and one of them in a distant Stirps! It seems odd, yet it is perfectly right under this alley and law system. The only wonder is that men of scientific training can soberly call these coitus genera, or that two Hubnerians can look each other in the face without laughter.

Second family, 5th coitus *Symphædra*, 4 species, 2 put to same, Hub., 1 put to *Athalia* Hub., and 1 to *Aterica* Bois. To make up *Aterica* species are taken from 1st family 1st coitus, 2nd family 5th coitus, 3rd family 1st coitus.

Third family 2nd coitus, 3 species, 1 to *Callizona* Doub., the 51st genus of *Nymphalinae*, 1 to *Gynæcia* Doub., the 52nd, and 1 to *Nymphalis* Latr., the 104th genus.

Fifth coitus, 3 species, 1 to *Catonephele* Hub., 40th genus *Nymph.*, 1 to *Euphaedra* Hub., the 85th, 1 to *Siderone* Hub., the 111th genus.

Fourth family 2nd coitus, 2 species, 1 to *Phyciodes* Hub., the 14th genus *Nymph.*, 1 to *Villa* Kirby, the 57th.

Fourth coitus, 3 species, 1 to *Colænis* Hub., the 1st genus *Nymph.*, 2 to *Victorina* Blanch., the 64th.

Fifth family 1st coitus, 4 species, 1 to 1st genus *Nymph.*, 1 to 58th, 1 to 81st, 1 to 82nd.

Second coitus *Acca*, 13 species, of which 7 go to *Neptis* Fab., the 81st of *Nymph.*, 3 to 82nd, 1 to *Eurytela* Bois., the 30th, 1 to *Phyciodes* Hub., the 14th. So that we see *Phyciodes* picking species from

5th Stirps,	1st family,	1st coitus.
7th " "	4th " "	2nd " "
" " "	5th " "	" " "

And *Eurytela* from

6th Stirps,	1st family,	1st coitus.
7th " "	5th " "	2nd " "

Eighth Stirps *Potamides*, 1st family 2nd coitus, 2 species, 1 to *Dolichalla* Felder., the 28th genus *Nymph.*, 1 to *Siderone*, the 111th. And *Siderone* picks from

6th Stirps,	3rd family,	1st coitus.
7th " "	" " "	5th " "
8th " "	2nd " "	2nd " "

And Morpho Fab. as it stands in Kirby picks from 3rd family 1st, 4th and 6th coitus, while between the 2nd and 4th comes Bia, one of the Satyrinae !

Ninth Stirps, Oreades, generally equivalent to what in Kirby is the 2nd sub-family of the Nymphalidae, the Satyrinae. 1st coitus Tenaris, 2 species, put under Tenaris Hub., which stands in the 4th sub-family of the Nymphalidae, the Morphinae.

Third family 1st coitus, Faunis, 2 species, 1 to Cleome West., among the Morphinae, the other to Taygetes Hub., the 57th genus of the Satyrinae. The very next coitus, Lethe, 1 species, put in Lethe Hub., the 7th genus of the Satyrinae. And the coitus immediately following is Hypna, 1 species, put as Hypna Hub., the 109th genus of the Nymphalinae !

Fourth family, 1st coitus Hipparchia, 7 species. 6 of which are put to Hipparchia Fab., the 32nd genus of Satyr., 1 to Calisto Hub., the 46th.

Third coitus Eumenis, 4 species, 2 to Hipparchia Fab., 2 to Oeneis Hub. The next coitus, Oeneis, has 5 species, 4 put to same and 1 to Hipparchia Fab.

This spurious genus, Oeneis Hub., thus made up by selecting from two coitus, each of which contains a mixed lot of Chionobas and Hipparchia, is quoted now-a-days as the equivalent of the well defined and natural genus Chionobas Boisduval, with a pretended precedence of some 30 years !

Hipparchia Fab. selects species from the 4th family, 1st, 2nd, 3rd, 4th coitus, and 5th family 7th coitus.

Ninth family, 1st coitus Callidula, 3 species, 1 doubtfully put to Pentila West., a genus of the Lycaeninae, 1 to Haematera Doub., the 48th genus of Nymphalinae, and 1 is a Heterocerous Moth. Scudder (Hist. Sketch) says that 2 of the 3 are Moths.

Second coitus, 3 species, 1 to Crenis Bois., 35th of Nymph., 1 to Callithea Bois., 56th of same, and 1 to Trichoris Hew., the 39th genus of the Lycaeninae. Now Oreades is claimed by the Hubnerians to be synonymous with Satyridae !

Under Maniola Schrank, Kirby lumps all the species of two families and eight coitus, except two species.

Second Tribe *gentiles*, 1st Stirps, Agrodiaeti. The 1st family has 11 coitus, every species except one under which is lumped in Kirby as Cupido Schrank, as are others in the next family and several coitus.

ON PLATYSAMIA COLUMBIA SMITH.

BY F. B. CAULFEILD, MONTREAL, P. Q.

(Concluded from April No.)

Taking into consideration the great difference in the lives and habits of the orders in question, I do not think the interbreeding of species of the genus *Tetreo* is any strong proof of the correctness of Dr. Hagen's conjecture. Robert Mudie, in his "Feathered Tribes of the British Islands," speaking of *Tetreo tetrica*, says: "During the latter part of autumn and winter the males live together in flocks and in a state of the most perfect harmony; but when the warmth of spring begins to be felt, and their plumage, which had become rather dull during the winter, begins to shine in all the beauty of its glosses, they separate from each other and fight stoutly for their females. They are then on the alert by early dawn, crowing and showing off the beauties of their plumage in a great variety of attitudes and gestures."

This, I think, is a great contrast to the life of the moth. The Grouse is gifted with the power of uttering cries or calls by which his presence is made known, not only to his own species, but to *every bird that is within hearing*. Of this the moth is entirely destitute; further, when the call of the male Grouse has attracted the female, he makes his desires known to her by various gestures and attitudes, and any person who has given a little attention to domestic fowls or to pigeons, must be aware that birds can convey a great deal of meaning by gesture. This power, too, is wanting in the moth. Now, supposing that the males of one species of *Tetreo* were absent, and the males of another were calling, the females of the first species would hear them and their natural instinct would, I think, teach them to go to a cry that must at least bear a family resemblance to that of their proper mates; once in sight of the male his animated gestures would convey his desires, and though they might not actually keep in his pack, yet from their social habits they would keep near them, and seeing the gestures of the male, would sometimes submit to him in the absence of their legitimate partners.

But with the moth it is very different; in this case the attracting power emanates from the female, and is silent and invisible. The moth utters no cry by which her presence would be made known to the males

of other species, her attractive power, as shown I think by the experiments quoted, affecting the males of her own species only. Therefore I cannot see how the scarcity of any species of *Atticii* would be the means of producing hybrids; surely the absence of the males of one species would not increase the attractive powers of the female to such an extent as to affect the males of another species; if so, why did not the female *promethea* exposed by Mr. Bethune attract some of the male *cecropias* that came so freely to their own female.

There is another point to be considered in this comparison of birds and moths. During the breeding season a pack of Grouse consists of one male and several females, therefore if half of the pack were killed by hunting, the male would in all probability be amongst them. But in the moths the sexes are, I believe, nearly equal, and even if a species was extensively damaged by parasites, we have no reason for thinking that both sexes would not be represented by the few that escaped the attacks of their enemies, in which case there would be no need of their recurring to another species.

Dr. Hagen says that in the year that *columbia* was taken in Maine, the *Atticii* were extensively attacked by parasites in that neighborhood. In this locality (Montreal) in 1874, the year that Mr. Pearson found *columbia*, the *Atticii* were remarkably free from parasites; I do not think there was more than one in eight affected. Mr. Pearson found five cocoons of *promethea* (it is always rare here), four of which produced the moth; the other was dead in the chrysalis, but had not been attacked by parasites. Mr. Pearson also found twelve cocoons of *cecropia* on one tree, all of which produced the moth, and from a large number of cocoons of *cecropia* and *polyphemus*, taken in various places around Montreal, the number affected by parasites was comparatively small.

I suppose the reason that *cecropia* and *promethea* are selected as the parents of *columbia* is that the dark color of the latter bears a slight resemblance to the smoky color of the male *promethea*, but how is it that there is no trace of the falcate primaries of that insect in either sex of *columbia*, and how is it that in *columbia* there is no trace of the very remarkable manner in which the cocoon of *promethea* is attached to its food plant?

Dr. Hagen mentions several instances of hybrids having occurred amongst the *Atticii* while in confinement. I do not think much importance should be attached to this circumstance, as the interbreeding of

insects while in confinement is no proof that they will do so under natural conditions. Doubtless many of the Atticii will interbreed if shut up together, but from the stay-at-home habits of the females, I think they are about the least likely of all Lepidoptera to do so while in a state of nature.

But leaving theories and conjectures, let us see what evidence known facts will give us in favor of *columbia* being a good species. In (I believe) 1862 or 1863; Prof. S. J. Smith found a number of cocoons of *columbia*, three of which produced the moth. In August, 1864, Mr. G. J. Bowles found at Quebec a larva which in due time spun its cocoon. This cocoon was at first of a whitish color, but turned to a dark brown, and was then similar to the other cocoons of *columbia*. Mr. Bowles tells us that the moth died in the chrysalis state, owing perhaps to the presence of parasites. In speaking of this larva, Mr. Bowles says: "The principal difference (as far as I can remember), was in the number of red warts with which the larva was ornamented, *columbia* possessing more than the other species" (*cecropia*). Dr. Hagen examined the dried larva skin of *columbia* (taken in Maine), and found the number of warts to be the same as *cecropia*, but the difference pointed out by Mr. Bowles was not in the total number of warts, but in the number of red ones, that is, the larva of *columbia* had more red warts than the larva of *cecropia* has.

In 1866, Mr. Bowles found another cocoon attached to a twig of thorn, but it was full of parasites, dead in the pupa. In the fall of 1867, Mr. Wm. Couper informed Mr. Bowles that he had seen a Saturnian larva spinning up on a gate-post. Mr. Bowles found this cocoon, which in the following May produced a female *columbia*.

In the winter of 1874, the Messrs. Pearson found a cocoon on a maple tree, in this city (Montreal), which next season produced a male *columbia*.

In Norway and Maine I believe both *cecropia* and *promethea* occur; certainly both these species occur in this locality (Montreal), but neither *cecropia* nor *promethea* have been recorded from Quebec. Now, Messrs. Couper and Bowles collected for a number of years at Quebec, but never met with either of these species; surely it is hardly possible that two experienced collectors would find a hybrid in the same locality, and neither of them find the species that produced it. Nor is it likely that a hybrid would occur in the same locality in such closely succeeding years as *columbia* did at Quebec, in 1864, 1866 and 1867. This, I think, is very

strong evidence, indeed, and weighing carefully all the facts of the case, the appearance of the moth and its cocoon, and the habits and instincts of the order and family to which it belongs, we are, I think, until further and more direct evidence to the contrary is produced, fully justified in considering *columbia* to be a distinct species.

NEW PYRALIDS.

BY A. R. GROTE,

Director of the Museum, Buffalo Society Natural Sciences.

Botis sexmaculalis, n. s.

♂ ♀. This species in ornamentation approaches *partialis* Led., Taf. 9, fig. 8. Both wings clear pale lemon yellow. Primaries crossed by four equidistant lines, of which the first three from the base form brown spots narrowly outlined in black on the costal region. The third spot coalesces with an inferior spot on the line. The second line widens into a small spot on internal margin. The fourth line has a small dark spot on costa and one on internal margin. The apical half of the fringes are dark brown. The secondaries show a distinct discal point, another at anal angle and another at the extremity of vein 2, the most prominent of a line of minute terminal marks. Head and thorax yellow, collar brown; abdomen yellowish; legs yellow, spotted with dark. No. 239, Prof. F. H. Snow, Lawrence, Kansas; Expanse 18 to 20 mil.

Botis penitalis, n. s.

♂ ♀. This species in size approaches *crinitalis* Led., Taf. 12, fig. 2. The color is a yellowish ferruginous, more or less bright. Subterminal line indicated by a darker shading. Outer line dentate, slightly inflected on vein 2, linear, distinct and tolerably regular. Discal spots undefined, darker shaded marks, the orbicular small. Interior line upright, thrice waved. Secondaries pale or stramineous, pellucid, slightly ferruginous stained along external margin, with pale fringes and a faint transverse line visible medially. Beneath yellowish, the outer line visible distinctly on

primaries, and the subterminal showing as a dark discontinued shade band. The dentate line on secondaries continuous. Expanse 29 mil. No. 285, Lawrence, Kansas, Prof. Snow. "Common; feeds upon the "receptacle" of the Western Water-lily (*Nelubium luteum*)."

Botis erectalis, n. s.

♀. This species resembles the preceding, but is a little larger. The color is a dusty wood brown. The exterior line has the dentations rounded at their points and the line itself differs by being less erect, more outwardly produced opposite the cell and followed by a narrow pale shading. It runs more inwardly at external margin and seems to be without the sinus on vein 2. The stigmata are small, dark, solid, less diffuse and more distinct than in *penitalis*. The hind wings are pale, dusted with fuscous with a median line visible centrally, a narrow terminal line and the terminal space more distinctly fuscous; beneath with a distinct discal mark. Fore wings fuscous, showing the markings of upper surface, the small reniform lunule and orbicular dot, evident. Expanse 34 mil. Albany, Prof. Lintner, No. 1,310.

Botis communis, n. s.

♂ ♀. This small species appears to be allied to the group of *ventralis*, but the venter is not discoloured. It varies from fuscous to orange yellow. Outer line finely denticulate, followed by a paler shade, upright, indented submedially thence perpendicularly to internal margin. Stigmata dark, small, solid, distinct. Hind wings pellucid; beneath paler than above. The secondaries vary to fuscous; the median line sometimes noticeable, beneath it can be made out as well as a discal spot. Expands 20 mil. New York (E. L. Graef, No. 144) to Alabama (Grote).

ON COPIDRYAS GLOVERI (*G. & R.*)

BY A. R. GROTE, BUFFALO, N. Y.

My kind correspondent, Mr. O. Meske, of Albany, sends me a male specimen presumably belonging to this species, which we referred originally to the Cuban genus *Euscirrhopterus* Grote, and (from a female)

considered congeneric with *E. Poeyi* Grote. The specimen now sent has an undivided frenulum and is unquestionably a male. It does not show, however, the aberrant wing structure of *Euscirrhopterus*. It might be referred to *Eudryas* but for the peculiar frontal structure. Instead of a tubercle, a wide plate extends forwards from the clypeus, with a lip-shaped outer margin, which is peculiar. I therefore make it the type of the genus *Copidryas*. The thorax is hairy, grayish black; two white lines run from the palpal tips above the eyes to the base of the head. The ordinary lines are expressed by metallic scales, and the black edged sub-equal stigmata are filled with similar scales. The female type of the species is not accessible to me and its description varies, as above noted, from my present male. It was, I recollect, not in very good condition; and it has been figured by Glover (Plate 85, fig. 34). From this figure my male differs by the absence of the shallow white median sinus, and white internal annuli to the stigmata, as well as by the narrow black band on the hind wings (even on its inner edge), and less brownish, more grayish black primaries; the orbicular is also more elongate. The yellow abdomen is black at anus and tufted with black scales at base. There is besides a mesial line of black scales on the dorsum. The eyes are naked. On the whole, I am inclined to consider this form as the ♂ of *C. Gloveri*; more material of both sexes and a comparison with the type are needed to make the matter certain. It is not unreasonable to expect some sexual differences, in coloring at least, in this group.

LARVÆ OF *THYREUS ABBOTII*.—In response to Mr. Whitney's article with regard to the supposed sexual distinction in color of the larvæ of this species (CAN. ENT., 8, 75), I can confirm it from my observations made in breeding larvæ of both colors in Brooklyn, L. I. I have never regarded the color as a sexual character and in my Sphingidæ of Cuba (Proc. Ent. Soc. Phil., 1865) I state distinctly that "the larvæ of *Thyreus Abbotii* and certain species of the genus *Philampelus* Harris, possess a tint of brown or green *indifferently* at maturity." I give the same fact with regard to *Eacles*. I regret that I cannot now refer more particularly to observations which were fresh in my mind when I made the above quoted statement.—A. R. GROTE.