head, antennæ, thorax and fore wings of this color. Primaries with three transverse darker lines, the t. a., median shade and t. p. lines, all indistinct, the t. p. line followed by faint blackish points. Orbicular small, round, pale centered. Reniform large, vague, sometimes with a few blackish scales inferiorly. T. a. line perpendicular, undulate ; t. p. line even. Abdomen and hind wings above, very pale silky yellowish ; beneath a little darker, the latter with orange spot and median and terminal lines ; fringes concolorous. Fore wings with line and dot faintly shown. *Expanse* 30 to 31 m. m.

ARGYNNIS MYRINA AND ITS ALLEGED ABNORMAL PECULIARITIES.

BY W. H. EDWARDS, COALBURGH, W. VA.

In the Am. Nat., Sept., 1872, Mr. Scudder published an essay entitled "The Curious History of a Butterfly," in which it is stated that in two N. American species of the "genus Brenthis," namely, *myrina* and *bellona*, occurs a phenomenon considered by the author to be quite unique among butterflies : there being two sets of individuals, each following its own cycle of changes, apparently with as little to do with the other set as if it were a different species ; each set having its own distinct seasons and thus giving rise to the apparition of two or three successive broods in the course of the year. At the very end of the season one of these sets, which the author calls the "aestival," lays eggs which hatch in a few days ; the larvæ at once commence hybernation, to awake and begin to feed early the next season, attaining their growth by the end of June, and emerging as butterflies about the middle of July. These butterflies continue on the wing till the end of September.

The second set, called the "vernal," hybernate as half grown caterpillars, and the butterflies from them appear about the middle of May, sometimes earlier, but are hardly common before the end of May, and also live till September. These lay their eggs the last of July and early in August, the eggs hatch, the larvæ moult twice, and beyond that, behave differently, some at once entering on their hybernation, giving butterflies

in May again ; the others proceeding to chrysalis, from which the butterflies emerge in September, "*doomed to an untimely end. Their sisters of the aestival series are busily laying eggs to perpetuate the race, but to them is this boon denied; the cold autumnal blasts sweep them away before the eggs are half developed in their ovaries.* It is, in fact, a vain effort of Nature to develop a second brood." Elsewhere this is spoken of as a "waste of energy on the part of Nature."

It is expressly stated that "*in this butterfly the eggs are wholly undeveloped at the birth of the female.*" The above statement of facts leads the author to conclude that "we have here two independent series in the same species, each single-brooded, but one making an effort towards a second generation, *invariably ending in disaster;* that it is improbable that the blood of both series ever commingles through the union of the butterflies of the two series, because, although the generations overlap, *the males of a brood are the first to disappear*, and the *females the last to appear*, and at best there would be few that could thus mate ; moreover, *since the eggs of the freshly emerged females are not fully developed for weeks or even months*, the effect of such a union would be questionable. Yet if there is no union between the two series, then are the vernal and aestival groups practically as distinct from each other as any two species. The two groups *show a difference such as usually characterizes somewhat distant genera.*"

Mr. Scudder's observations on these species were so different from those on an allied European species, *euphrosyne*, as related by Doubleday, that he could not comprehend the statement given, and says : "By this account the butterflies *(euphrosyne) lay their eggs on their first appearance; either they differ in toto from their congeners in America, or there is some error in this statement* (of Doubleday).

When I first read Mr. Scudder's paper it occurred to me that possibly there was error in his statement of facts. But as these butterflies are not inhabitants of my district, I have had no opportunity to put Nature to the question till the last season, and the result is as I anticipated. She may dry her tears, unveil her blushing cheeks, and walk forth acquitted of the horrid charge. I think it will appear that the history of the butterfly, although curious, as I find the history of every species of butterfly which I have studied, is not unlike that of many of the double-brooded species, and certainly runs parallel with some of them.

In July, 1875, I was at Hunter, in the Catskill Mountains, and both

myrina and *bellona* were rather abundant. The females of both species were more or less worn and were heavy with eggs. I shut up half a dozen of each species in a muslin bag, which was drawn over the top of a flower pot in which I had set plants of wild violet. Between the 20th and 25th inst. both species laid many eggs, and these hatched in about five days. I lost nearly all the *bellona* eggs by mailing them to Coalburgh, but three which I sent Miss Peart for drawings gave larvæ, and in due time the larvae became chrysalids and yielded butterflies on or before the 1st of September.

But as I kept the larvae of *myrina*, my observations relate to them only. These grew very rapidly, moulted five times, and the first of them reached chrysalis on the 27th of August, about thirty days from the egg. The butterfly emerged on the 3rd of September, and was a female. Next day five emerged, three ♀ and two ♂ (I mention the sex to show that the females emerge as early as the males, and this is so in all species of butterflies which I have made observations on, except one, *Apatura clyton*, and in this the male has been found to appear about a week in advance of the female). The other butterflies emerged at intervals till September 9th, by which time twenty-five had appeared. Not one of this brood of larvae hybernated after the third moult, or at all, and all the chrysalids gave butterflies. On opening the abdomens of the newly emerged females, *they were found full of nearly mature eggs*. These eggs were soft, but nearly or quite full sized, and distinctly ribbed, which would not be so if they were not almost ripe for deposition. I have never found this to be the case in the larger species of *Argynnis*, there being so far as I have examined, and I have done this in very many instances, no appearance of the egg for weeks after the females are on the wing. But in some other butterflies, as *Papilio ajax*, the eggs are almost ready to deposit when the female issues from the chrysalis, and it is certain that she deposits them within a few days—say a week—from chrysalis.

So far I have given my own observations upon *myrina*. Adding to them such as are related by Mr. Scudder, and not involving the error as to a long period of time being required to mature the eggs, and the history of the species resolves itself into this shape.

The butterfly of the fall brood emerges from chrysalis about the 1st of September, lays eggs on or before the 15th, the larvae hatch between the 20th and the 24th, and go at once into hybernation, to awake in May, and reach chrysalis about the middle of June, and the butterfly about the 25th

of June. If, however, any of the last brood of larvae, instead of at once beginning hybernation, incline to feed for two or three weeks, there is plenty of time before severe frosts come to do so and reach the third moult, at which time, in all five-moulting species that I have experimented on, the hybernation occurs, if at all. In such case the larvae would also awake in May, and would reach the butterfly stage two or three weeks earlier than the 25th of June. If any of the summer brood of larvae hybernate after their third moult (a fact which I had no opportunity to establish), then the larvae of both broods would awake at the same time and become butterflies at the same time, making the summer brood. It is to be observed that the several stages of the same brood of larvae do not occur in exactly the same periods of time. From eggs laid on the same day, by the same female, some of the larvae hatched will reach chrysalis several days before others. In the larger *Argynnis* there will be such a difference, amounting to two or three weeks. Therefore some of the larvae which hybernate at the third moult may be retarded so that their butterflies shall emerge contemporaneously with those which proceed from the larvae that hybernate as soon as they leave the egg. The case is parallel with that of *Phyciodes nycteis* and with that of *Apatura celtis*, both double-brooded species, both discovering larvae from the summer brood which hybernate when half grown, while a part of the brood go on to chrysalis and give the fall brood of butterflies, these again producing larvae which also hybernate. (In both these the last hybernation begins after the larva is half grown, the third moult in *nycteis*, the second in *celtis*.) Mr. Scudder has made a hypothetical case which is precisely the actual case that I have set forth above. He says: "Should the season be so long that the *second brood could lay eggs*, the caterpillars would then be forced to hybernate as those of the aestival series and *become members of that series the next year. Thus the vernal series would continually feed the aestival*," &c. Moreover, in no species do the several preparatory stages of its members run even. On the contrary, in any, whether single or double brooded, there will be found by different females eggs freshly laid, eggs ready to hatch, young larvæ and mature larvæ, all at the same time. By this means there is kept up for a long period, often for weeks, a succession of newly emerged butterflies of the same brood, and the newer and older are constantly mating. On one day in September of this year I cut a branch of Wild Senna *(cassia)*, on which at the moment were newly laid eggs of *Terias nicippe*, larvæ in every stage of growth, and a butterfly of the same species just emerged and still resting on the empty shell of its chrysalis.

I have bred from the egg four of our larger species of *Argynnis*, viz., *diana*, *cybele*, *aphrodite* and *idalia*, and have had the egg and chrysalis of *atlantis*, and have drawings of the several stages of each species; and now having bred *myrina*, I can say that so far as I have seen of the preparatory stages of all these species, they are congeneric The simple difference that is found among them is not in the shape of the eggs, or the forms and habits of the caterpillars, or the forms of the chrysalids, but merely in the behavior of *myrina* as regards the second brood, each of the others being, so far as is yet known, single brooded.* And neither in the preparatory stages nor in the butterflies themselves do I see any reason for separating *myrina* and the smaller species from the genus *Argynnis*, or making more of them than a group. A group is as expressive as a genus, and a genus with its groups should present at one view an entire class with all its families, inter-related, though in differing degrees, as having had a common ancestor, and any system of arrangement which elevates what are properly groups into independent genera, destroying the unity of the class, strikes me as unnatural, and therefore unphilosophical.

But in passing we may as well look into the facts about this genus *Brenthis*—*Brenthis* Hübner (Scud. Syn. List, 1875) and learn something about the manufacture of modern genera.

The species *myrina* is closely like *euphrosyne* of Europe, and congeneric with it, no matter how *Argynnis* be split up. Hübner, in his Verzeichniss, amused himself with assorting the known butterflies into batches or parcels, as a child would sort his alleys and taws, by color, stripes and shape, putting blues into one lot, browns into another, one-striped into a third, two-striped into a fourth, regardless of characters which would be generic, that is. *which would indicate blood relationship or a common descent.* It is a very rare thing to find one of his batches —which he called a coitus, meaning a batch or assemblage, and which is in no sense a genus, for the element of common descent does not enter into this whimsical system—co-extensive with a genus. It is by the merest chance if it is so. Nor does the coitus correspond with a natural

* Though there are some reasons for suspecting that in West Virginia the other species must be double brooded also. That, however, is not determined, and I do not assume it. But this difference in the same genus as regards the number of broods, supposing it exists in *Argynnis*, is paralleled by the *Apaturas celtis* and *clyton*, the former being here double, the latter single brooded.

group under a genus. At first sight it may sometimes seem to do so, the species being assorted in twos and threes, but it will be found that whether the coitus embraces two or twenty species, the butterflies under it are most likely such as belong to distinct genera, and sometimes so distinct that one hundred or two hundred pages of Kirby's Catalogue separate them. And an instance of this mis-assortment is found in the coitus *Brenthis*. Under this head are ranged five species, viz., *hecate*, *dictynna*, *thore*, *daphne* and *claudia*, the latter as much out of place in such company as a horse in a drove of asses. But the horse is dapple and the asses are dapple, each has one tail and two ears, and behold a Hübnerian coitus! The definition of *Brenthis* is "the hind wings below gaily clouded, pale spotted," and it is ranged under the first family of the fifth stirps. This family is called Reticulatæ, and embraces two coitus only, viz., *Phyciodes*, under which our *tharos* comes, and *Brenthis*. The definition of the family is thus given: "The wings above striped like a grating; the hind wings below spotted with colored spots on a pale yellow ground, marked with eye-like spots." *Thore*, an European species very much like our *bellona*, and congeneric with it as *myrina* is with *euphrosyne*, is placed in *Brenthis*, along with *claudia*, and these are separated from the batch which includes *myrina*, *not merely by the limits of a coitus*, *but of a family even*, *in order to get them among the Reticulatæ by the side of tharos*. This next family, the Phalaratae, is thus defined: "The wings differently spotted, the under side ornamented with pearl-colored spots." And the first coitus under it is *Argynnis*, the definition of which is: "the hind wings below variegated, spotted with shining white." Under this coitus comes *euphrosyne*, and therefore *myrina*, included in this loose definition solely because it has white spots. Two more coitus are made, called *Issoria* and *Acidalia*, which include the larger species of *Argynnis* (not Hübner's), *lathonia*, *cybele*, *diana*, &c. Of these absurd divisions, Mr. Edward Doubleday (Remarks on the genus *Argynnis*) says: "they are so unnatural that they can in no case be adopted."

But suppose these batches were not unnatural, but were co-extensive with genera, how comes *myrina*, which, as it agrees with *euphrosyne*, is placed by Hübner under *Argynnis*, filling in some little degree the requirements of that coitus, to be remanded to the coitus *Brenthis*, which belongs to another family even, placed along side of *Phyciodes tharos*, and the requirements of which coitus it does not fill at all? It is an unwarranted use of Hübner's name, applying it to what he expressly says it shall not be applied. It is taking one of his blue taws and dropping it among the

striped ones, doing violence to all his notions of symmetrical arrangement. He would have rejected the blue taw with abhorrence. What does the word "*Brenthis* Hübner" mean, if not that the genus *Brenthis* was created by Hübner, and that his definition includes the species sought to be placed under it? If it has any other meaning I am ignorant of it, and if it does mean that it is false. This is a fair sample of the uses to which Hübner's absurd and worthless Catalogue has been put. Very few Lepidopterists in this country know anything of Hübner's books, and most are disposed to accept in some degree the dicta of any one who sets up to reform the nomenclature. But if reform be needed, which is very questionable indeed, it is not to be brought about by lugging Hübner into the arena. To go back at this time of day to the Verzeichness is to go back to the balls and tops and games of school-boys.

NOTE ON DATANA PERSPICUA G. & R.

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

Since the original illustration and description of this species, ten years ago, in the Proceedings of the Entomological Society of Philadelphia, it has not been noticed, except by the late Mr. B. D. Walsh, in the same Proceedings, vol. 5, p. 194-5. I have been since last year indebted to Prof. C. V. Riley for a number of specimens of *perspicua*, raised from larvæ found on Sumach. It is enough to say that the specimens bear out the specific validity of a form which is perhaps the most easily recognized among the difficult species of this genus. I was able to separate the imagos of a number of the species bred by Prof. Riley, by the characters laid down by the late Mr. Robinson and myself in our revision of the genus. Specimens of *contracta*, *integerrima*, *ministra* and *perspicua* were sent me by Prof. Riley; no true specimens of *angusii* were included. I observed the larva of *integerrima* at Detroit, August 13, and again on Grand Island, Niagara River, Aug. 19, apparently nearly full grown. I have not had hitherto any specimens of *perspicua*, before receiving those sent me by Prof. Riley, who will, I hope, give us some observations on the genus before long. I am glad also to be able to find that the facts