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## CHAPTER XI. INSECTS, Continued- ORDER LEPIDOPTERA. BUTTERFLIES AND MOTHS.

IN this great Order the most interesting points for us are the differences in colour between the sexes of the same species, and between the distinct species of the same genus. Nearly the whole of the following chapter will be devoted to this subject; but I will first make a few remarks on one or two other points. Several males may often be seen pursuing and crowding round the same female. Their courtship appears to be a prolonged affair, for I have frequently watched one or more males pirouetting round a female until I was tired, without seeing the end of the courtship. Mr. A. G. Butler also informs me that he has several times watched a male courting a female for a full quarter of an hour; but she pertinaciously refused him, and at last settled on the ground and closed her wings, so as to escape from his addresses.

Although butterflies are weak and fragile creatures, they are pugnacious, and an emperor butterfly\* has been captured with the tips of its wings broken from a conflict with another male. Mr. Collingwood, in speaking of the frequent battles between the butterflies of Borneo, says, "They whirl round each other with the greatest rapidity, and appear to be incited by the greatest ferocity."

\* *Apatura iris*: *The Entomologist's Weekly Intelligence*, 1859, p. 139. For the Bornean butterflies, see C. Collingwood, *Rambles of a Naturalist*, 1868, p. 183.

The *Ageronia feronia* makes a noise like that produced by a toothed wheel passing under a spring catch, and which can be heard at the distance of several yards: I noticed this sound at Rio de Janeiro, only when two of these butterflies were chasing each other in an irregular course, so that it is probably made during

the courtship of the sexes.\*

\* See my *Journal of Researches*, 1845, p. 33. Mr. Doubleday has detected (*Proc. Ent. Soc.*, March 3, 1845, p. 123) a peculiar membranous sac at the base of the front wings, which is probably connected with the production of the sound. For the case of *Thecophora*, see *Zoological Record*, 1869, p. 401. For Mr. Buchanan White's observations, the *Scottish Naturalist*, July, 1872, p. 214.

Some moths also produce sounds; for instance, the males *Thecophora fovea*. On two occasions Mr. F. Buchanan White\* heard a sharp quick noise made by the male of *Hylophila prasinana*, and which he believes to be produced, as in Cicada, by an elastic membrane, furnished with a muscle. He quotes, also, Guenee, that *Setina* produces a sound like the ticking of a watch, apparently by the aid of "two large tympaniform vesicles, situated in the pectoral region"; and these "are much more developed in the male than in the female." Hence the sound-producing organs in the Lepidoptera appear to stand in some relation with the sexual functions. I have not alluded to the well-known noise made by the death's head sphinx, for it is generally heard soon after the moth has emerged from its cocoon.

\* *The Scottish Naturalist*, July, 1872, p. 213.

Giard has always observed that the musky odour, which is emitted by two species of sphinx moths, is peculiar to the males;\* and in the higher classes we shall meet with many instances of the males alone being odoriferous.

\* *Zoological Record*, 1869, p. 347.

Every one must have admired the extreme beauty of many butterflies and of some moths; and it may be asked, are their colours and diversified patterns the

result of the direct action of the physical conditions to which these insects have been exposed, without any benefit being thus derived? Or have successive variations been accumulated and determined as a protection, or for some unknown purpose, or that one sex may be attractive to the other? And, again, what is the meaning of the colours being widely different in the males and females of certain species, and alike in the two sexes of other species of the same genus" Before attempting to answer these questions a body of facts must be given.

With our beautiful English butterflies, the admiral, peacock, and painted lady (*Vanessae*), as well as many others, the sexes are alike. This is also the case with the magnificent *Heliconidae*, and most of the *Danaidae* in the tropics. But in certain other tropical groups, and in some of our English butterflies, as the purple emperor, orange-tip, &c. (*Apatura iris* and *Anthocharis cardamines*), the sexes differ either greatly or slightly in colour. No language suffices to describe the splendour of the males of some tropical species. Even within the same genus we often find species presenting extraordinary differences between the sexes, whilst others have their sexes closely alike. Thus in the South American genus *Epicalia*, Mr. Bates, to whom I am indebted for most of the following facts, and for looking over this whole discussion, informs me that he knows twelve species, the two sexes of which haunt the same stations (and this is not always the case with butterflies), and which, therefore, cannot have been differently affected by external conditions.\* In nine of these twelve species the males rank amongst the most brilliant of all butterflies, and differ so greatly from the comparatively plain females that they were formerly placed in distinct genera. The females of these nine species resemble each other in their general type of coloration; and they likewise resemble both sexes of the species in several allied genera found in various parts of the world. Hence we may infer that these nine species, and probably all the others of the genus, are descended from an ancestral form which was coloured in nearly the same manner. In the tenth species the female still retains the same general colouring, but the male resembles her, so that he is coloured in a much less gaudy and contrasted manner than the males of the previous species. In the eleventh

and twelfth species, the females depart from the usual type, for they are gaily decorated almost like the males, but in a somewhat less degree. Hence in these two latter species the bright colours of the males seem to have been transferred to the females; whilst in the tenth species the male has either retained or recovered the plain colours of the female, as well as of the parent-form of the genus. The sexes in these three cases have thus been rendered nearly alike, though in an opposite manner. In the allied genus *Eubagis*, both sexes of some of the species are plain-coloured and nearly alike; whilst with the greater number the males are decorated with beautiful metallic tints in a diversified manner, and differ much from their females. The females throughout the genus retain the same general style of colouring, so that they resemble one another much more closely than they resemble their own males.

\* See also Mr. Bates's paper in *Proc. Ent. Soc. of Philadelphia*, 1865, p. 206. Also Mr. Wallace on the same subject, in regard to *Diadema*, in *Transactions, Entomological Society, London*, 1869, p. 278.

In the genus *Papilio*, all the species of the *Aeneas* group are remarkable for their conspicuous and strongly contrasted colours, and they illustrate the frequent tendency to gradation in the amount of difference between the sexes. In a few species, for instance in *P. ascanius*, the males and females are alike; in others the males are either a little brighter, or very much more superb than the females. The genus *Junonia*, allied to our *Vanessae*, offers a nearly parallel case, for although the sexes of most of the species resemble each other, and are destitute of rich colours, yet in certain species, as in *J. oenone*, the male is rather more bright-coloured than the female, and in a few (for instance *J. andremiaja*) the male is so different from the female that he might be mistaken for an entirely distinct species.

Another striking case was pointed out to me in the British Museum by Mr. A. Butler, namely, one of the tropical American *Theclae*, in which both sexes are

nearly alike and wonderfully splendid; in another species the male is coloured in a similarly gorgeous manner, whilst the whole upper surface of the female is of a dull uniform brown. Our common little English blue butterflies of the genus *Lycaena*, illustrate the various differences in colour between the sexes, almost as well, though not in so striking a manner, as the above exotic genera. In *Lycaena agestis* both sexes have wings of a brown colour, bordered with small ocellated orange spots, and are thus alike. In *L. oregon* the wings of the males are of a fine blue, bordered with black, whilst those of the female are brown, with a similar border, closely resembling the wings of *L. agestis*. Lastly, in *L. arion* both sexes are of a blue colour and are very like, though in the female the edges of the wings are rather dusky, with the black spots plainer; and in a bright blue Indian species both sexes are still more alike.

I have given the foregoing details in order to show, in the first place, that when the sexes of butterflies differ, the male as a general rule is the more beautiful, and departs more from the usual type of colouring of the group to which the species belongs. Hence in most groups the females of the several species resemble each other much more closely than do the males. In some cases, however, to which I shall hereafter allude, the females are coloured more splendidly than the males. In the second place, these details have been given to bring clearly before the mind that within the same genus, the two sexes frequently present every gradation from no difference in colour, to so great a difference that it was long before the two were placed by entomologists in the same genus. In the third place, we have seen that when the sexes nearly resemble each other, this appears due either to the male having transferred his colours to the female, or to the male having retained, or perhaps recovered, the primordial colours of the group. It also deserves notice that in those groups in which the sexes differ, the females usually somewhat resemble the males, so that when the males are beautiful to an extraordinary degree, the females almost invariably exhibit some degree of beauty. From the many cases of gradation in the amount of difference between the sexes, and from the prevalence of the same general type of coloration throughout the whole of the same group, we

may conclude that the causes have generally been the same which have determined the brilliant colouring of the males alone of some species, and of both sexes of other species.

As so many gorgeous butterflies inhabit the tropics, it has often been supposed that they owe their colours to the great heat and moisture of these zones; but Mr. Bates\* has shown by the comparison of various closely-allied groups of insects from the temperate and tropical regions, that this view cannot be maintained; and the evidence becomes conclusive when brilliantly-coloured males and plain-coloured females of the same species inhabit the same district, feed on the same food, and follow exactly the same habits of life. Even when the sexes resemble each other, we can hardly believe that their brilliant and beautifully arranged colours are the purposeless result of the nature of the tissues and of the action of the surrounding conditions.

\* *The Naturalist on the Amazons, vol. i., 1863, p. 19.*

With animals of all kinds, whenever colour has been modified for some special purpose, this has been, as far as we can judge, either for direct or indirect protection, or as an attraction between the sexes. With many species of butterflies the upper surfaces of the wings are obscure; and this in all probability leads to their escaping observation and danger. But butterflies would be particularly liable to be attacked by their enemies when at rest; and most kinds whilst resting raise their wings vertically over their backs, so that the lower surface alone is exposed to view. Hence it is this side which is often coloured so as to imitate the objects on which these insects commonly rest. Dr. Rossler, I believe, first noticed the similarity of the closed wings of certain *Vanessae* and other butterflies to the bark of trees. Many analogous and striking facts could be given. The most interesting one is that recorded by Mr. Wallace\* of a common Indian and Sumatran butterfly (*Kallima*) which disappears like magic when it settles on a bush; for it hides its head and antennae between its closed wings, which, in form, colour and veining, cannot be

distinguished from a withered leaf with its footstalk. In some other cases the lower surfaces of the wings are brilliantly coloured, and yet are protective; thus in *Thecla rubi* the wings when closed are of an emerald green, and resemble the young leaves of the bramble, on which in spring this butterfly may often be seen seated. It is also remarkable that in very many species in which the sexes differ greatly in colour on their upper surface, the lower surface is closely similar or identical in both sexes, and serves as a protection.\*<sup>(2)</sup>

\* See the interesting article in the *Westminster Review*, July, 1867, p. 10. A woodcut of the *Kallima* is given by Mr. Wallace in *Hardwicke's Science Gossip*, September 1867, p. 196.

\*<sup>(2)</sup> Mr. G. Fraser, in *Nature*, April, 1871, p. 489.

Although the obscure tints both of the upper and under sides of many butterflies no doubt serve to conceal them, yet we cannot extend this view to the brilliant and conspicuous colours on the upper surface of such species as our admiral and peacock *Vanessae*, our white cabbage-butterflies (*Pieris*), or the great swallowtail *Papilio* which haunts the open fens- for these butterflies are thus rendered visible to every living creature. In these species both sexes are alike; but in the common brimstone butterfly (*Gonepteryx rhamni*), the male is of an intense yellow, whilst the female is much paler; and in the orange-tip (*Anthocharis cardamines*) the males alone have their wings tipped with bright orange. Both the males and females in these cases are conspicuous, and it is not credible that their difference in colour should stand in any relation to ordinary protection. Prof. Weismann remarks,\* that the female of one of the *Lycaenae* expands her brown wings when she settles on the ground, and is then almost invisible; the male, on the other hand, as if aware of the danger incurred from the bright blue of the upper surface of his wings, rests with them closed; and this shows that the blue colour cannot be in any way protective. Nevertheless, it is probable that conspicuous colours are indirectly beneficial to many species, as a warning that they are unpalatable. For in certain

other cases, beauty has been gained through the imitation of other beautiful species, which inhabit the same district and enjoy an immunity from attack by being in some way offensive to their enemies; but then we have to account for the beauty of the imitated species.

\* *Einfluss der Isolirung auf die Artbildung, 1872, p. 58.*

As Mr. Walsh has remarked to me, the females of our orange-tip butterfly, above referred to, and of an American species (*Anth. genutia*) probably show us the primordial colours of the parent-species of the genus; for both sexes of four or five widely-distributed species are coloured in nearly the same manner. As in several previous cases, we may here infer that it is the males of *Anth. cardamines* and *genutia* which have departed from the usual type of the genus. In the *Anth. sara* from California, the orange-tips to the wings have been partially developed in the female; but they are paler than in the male, and slightly different in some other respects. In an allied Indian form, the *Iphia glaucippe*, the orange-tips are fully developed in both sexes. In this *Iphia*, as pointed out to me by Mr. A. Butler, the under surface of the wings marvellously resembles a pale-coloured leaf; and in our English orange-tip, the under surface resembles the flower-head of the wild parsley, on which the butterfly often rests at night.\* The same reason which compels us to believe that the lower surfaces have here been coloured for the sake of protection, leads us to deny that the wings have been tipped with bright orange for the same purpose, especially when this character is confined to the males.

\* *See the interesting observations by T. W. Wood, the Student, Sept., 1868, p. 81.*

Most moths rest motionless during the whole or greater part of the day with their wings depressed; and the whole upper surface shaded and coloured in an

admirable manner, as Mr. Wallace has remarked, for escaping detection. The front-wings of the Bombycidae,\* when at rest, generally overlap and conceal the hind-wings; so that the latter might be brightly coloured without much risk; and they are in fact often thus coloured. During flight, moths would often be able to escape from their enemies; nevertheless, as the hind-wings are then fully exposed to view, their bright must generally have been acquired at some little risk. But the following fact shews how cautious we ought to be in drawing conclusions on this head. The common yellow under-wings (Triphoena) often fly about during the day or early evening, and are then conspicuous from the colour of their hind-wings. It would naturally be thought that this would be a source of danger; but Mr. J. Jenner Weir believes that it actually serves them as a means of escape, for birds strike at these brightly coloured and fragile surfaces, instead of at the body. For instance, Mr. Weir turned into his aviary a vigorous specimen of *Triphoena pronuba*, which was instantly pursued by a robin; but the bird's attention being caught by the coloured wings, the moth was not captured until after about fifty attempts, and small portions of the wings were repeatedly broken off. He tried the same experiment, in the open air, with a swallow and *T. fimbria*; but the large size of this moth probably interfered with its capture.\*(2) We are thus reminded of a statement made by Mr. Wallace,\* (3) namely, that in the Brazilian forests and Malayan islands, many common and highly-decorated butterflies are weak flyers, though furnished with a broad expanse of wing; and they "are often captured with pierced and broken wings, as if they had been seized by birds, from which they had escaped: if the wings had been much smaller in proportion to the body, it seems probable that the insect would more frequently have been struck or pierced in a vital part, and thus the increased expanse of the wings may have been indirectly beneficial."

\* *Mr. Wallace in Harwicke's Science Gossip, September, 1867, p. 193.*

\*(2) *See also, on this subject, Mr. Weir's paper in Transactions, Entomological Society, 1869, p. 23.*

\*(3) *Westminster Review, July, 1867, p. 16.*

Display.- The bright colours of many butterflies and of some moths are specially arranged for display, so that they may be readily seen. During the night colours are not visible, and there can be no doubt that the nocturnal moths, taken as a body, are much less gaily decorated than butterflies, all of which are diurnal in their habits. But the moths of certain families, such as the Zygaenidae, several Sphingidae, Uraniidae, some Arctiidae and Saturniidae, fly about during the day or early evening, and many of these are extremely beautiful, being far brighter coloured than the strictly nocturnal kinds. A few exceptional cases, however, of bright-coloured nocturnal species have been recorded.\*

*\* For instance, Lithosia; but Prof. Westwood (Modern Class. of Insects, vol. ii., p. 390) seems surprised at this case. On the relative colours of diurnal and nocturnal Lepidoptera, see ibid., pp. 333 and 392; also Harris, Treatise on the Insects of New England, 1842, p. 315.*

There is evidence of another kind in regard to display. Butterflies, as before remarked, elevate their wings when at rest, but whilst basking in the sunshine often alternately raise and depress them, thus exposing both surfaces to full view; and although the lower surface is often coloured in an obscure manner as a protection, yet in many species it is as highly decorated as the upper surface, and sometimes in a very different manner. In some tropical species the lower surface is even more brilliantly coloured than the upper.\* In the English fritillaries (Argynnis) the lower surface alone is ornamented with shining silver. Nevertheless, as a general rule, the upper surface, which is probably more fully exposed, is coloured more brightly and diversely than the lower. Hence the lower surface generally affords to entomologists the more useful character for detecting the affinities of the various species. Fritz Muller informs me that three species of Castnia are found near his house in S. Brazil: of two of them the hind-wings are obscure, and are

always covered by the front-wings when these butterflies are at rest; but the third species has black hind-wings, beautifully spotted with red and white, and these are fully expanded and displayed whenever the butterfly rests. Other such cases could be added.

*\* Such differences between the upper and lower surfaces of the wings of several species of Papilio may be seen in the beautiful plates to Mr. Wallace's "Memoir on the Papilionidae of the Malayan Region," in Transactions of the Linnean Society, vol. xxv., part i., 1865.*

If we now turn to the enormous group of moths, which, as I hear from Mr. Stainton, do not habitually expose the under surface of their wings to full view, we find this side very rarely coloured with a brightness greater than, or even equal to, that of the upper side. Some exceptions to the rule, either real or apparent, must be noticed, as the case of Hypopyra.\* Mr. Trimen informs me that in Guenee's great work, three moths are figured, in which the under surface is much the more brilliant. For instance, in the Australian Gastrophora the upper surface of the fore-wing is pale greyish-ochreous, while the lower surface is magnificently ornamented by an ocellus of cobalt-blue, placed in the midst of a black mark, surrounded by orange-yellow, and this by bluish-white. But the habits of these three moths are unknown; so that no explanation can be given of their unusual style of colouring. Mr. Trimen also informs me that the lower surface of the wings in certain other Geometrae\*(2) and quadrid Noctuae are either more variegated or more brightly-coloured than the upper surface; but some of these species have the habit of "holding their wings quite erect over their backs, retaining them in this position for a considerable time," and thus exposing the under surface to view. Other species, when settled on the ground or herbage, now and then suddenly and slightly lift up their wings. Hence the lower surface of the wings being brighter than the upper surface in certain moths is not so anomalous as it at first appears. The Saturniidae include some of the most beautiful of all moths, their wings being

decorated, as in our British emperor moth, with fine ocelli; and Mr. T. W. Wood\*(3) observes that they resemble butterflies in some of their movements; "for instance, in the gentle waving up and down of the wings as if for display, which is more characteristic of diurnal than of nocturnal Lepidoptera."

\* See Mr. Wormald on this moth: Proceedings of the Entomological Society, March 2, 1868. \*(2) See also an account of the S. American genus *Erateina* (one of the Geometrae) in Transactions, Ent., Soc., new series, vol. v., pls. xv. and xvi. \*(3) Proc Ent. Soc. of London, July 6, 1868, p. xxvii.

It is a singular fact that no British moths which are brilliantly coloured, and, as far as I can discover, hardly any foreign species, differ much in colour according to sex; though this is the case with many brilliant butterflies. The male, however, of one American moth, the *Saturnia io*, is described as having its forewings deep yellow, curiously marked with purplish-red spots; whilst the wings of the female are purple-brown, marked with grey lines.\* The British moths which differ sexually in colour are all brown, or of various dull yellow tints, or nearly white. In several species the males are much darker than the females,\* (2) and these belong to groups which generally fly about during the afternoon. On the other hand, in many genera, as Mr. Stainton informs me, the males have the hind-wings whiter than those of the female- of which fact *Agrotis exclamationis* offers a good instance. In the ghost-moth (*Hepialus humuli*) the difference is more strongly marked; the males being white, and the females yellow with darker markings.\* (3) It is probable that in these cases the males are thus rendered more conspicuous, and more easily seen by the females whilst flying about in the dusk.

\* *Harris, Treatise, &c., edited by Flint, 1862, p. 395.*

\*(2) *For instance, I observe in my son's cabinet that the males are darker than the females in the *Lasiocampa quercus Odonestis potatoria*, *Hypogymna dispar*, *Dasychira pudibunda*, and *Cycnia mendica*. In this latter species the difference in colour between the*

*two sexes is strongly marked; and Mr. Wallace informs me that we here have, as he believes, an instance of protective mimicry confined to one sex, as will hereafter be more fully explained. The white female of the *Cycnia* resembles the very common *Spilosoma menthrasti*, both sexes of which are white; and Mr. Stainton observed that this latter moth was rejected with utter disgust by a whole brood of young turkeys, which were fond of eating other moths; so that if the *Cycnia* was commonly mistaken by British birds for the *Spilosoma*, it would escape being devoured, and its white deceptive colour would thus be highly beneficial.*

*\*(3) It is remarkable, that in the Shetland Islands the male of this moth, instead of differing widely from the female, frequently resembles her closely in colour (see Mr. MacLachlan, Transactions, Entomological Society, vol. ii., 1866, p. 459). Mr. G. Fraser suggests (Nature, April, 1871, p. 489) that at the season of the year when the ghost-moth appears in these northern islands, the whiteness of the males would not be needed to render them visible to the females in the twilight night.*

From the several foregoing facts it is impossible to admit that the brilliant colours of butterflies, and of some few moths, have commonly been acquired for the sake of protection. We have seen that their colours and elegant patterns are arranged and exhibited as if for display. Hence I am led to believe that the females prefer or are most excited by the more brilliant males; for on any other supposition the males would, as far as we can see, be ornamented to no purpose. We know that ants and certain lamellicorn beetles are capable of feeling an attachment for each other, and that ants recognise their fellows after an interval of several months. Hence there is no abstract improbability in the Lepidoptera, which probably stand nearly or quite as high in the scale as these insects, having sufficient mental

capacity to admire bright colours. They certainly discover flowers by colour. The humming-bird sphinx may often be seen to swoop down from a distance on a bunch of flowers in the midst of green foliage; and I have been assured by two persons abroad, that these moths repeatedly visit flowers painted on the walls of a room, and vainly endeavour to insert their proboscis into them. Fritz Muller informs me that several kinds of butterflies in S. Brazil shew an unmistakable preference for certain colours over others: he observed that they very often visited the brilliant red flowers of five or six genera of plants, but never the white or yellow flowering species of the same and other genera, growing in the same garden; and I have received other accounts to the same effect. As I hear from Mr. Doubleday, the common white butterfly often flies down to a bit of paper on the ground, no doubt mistaking it for one of its own species. Mr. Collingwood\* in speaking of the difficulty in collecting certain butterflies in the Malay Archipelago, states that "a dead specimen pinned upon a conspicuous twig will often arrest an insect of the same species in its headlong flight, and bring it down within easy reach of the net, especially if it be of the opposite sex."

\* *Rambles of a Naturalist in the Chinese Seas, 1868, p. 182.*

The courtship of butterflies is, as before remarked, a prolonged affair. The males sometimes fight together in rivalry; and many may be seen pursuing or crowding round the same female. Unless, then, the females prefer one male to another, the pairing must be left to mere chance, and this does not appear probable. If, on the other hand, the females habitually, or even occasionally, prefer the more beautiful males, the colours of the latter will have been rendered brighter by degrees, and will have been transmitted to both sexes or to one sex, according to the law of inheritance which has prevailed. The process of sexual selection will have been much facilitated, if the conclusion can be trusted, arrived at from various kinds of evidence in the supplement to the ninth chapter; namely, that the males of many Lepidoptera, at least in the imago state, greatly exceed the females in number.

Some facts, however, are opposed to the belief that female butterflies prefer the more beautiful males; thus, as I have been assured by several collectors, fresh females may frequently be seen paired with battered, faded, or dingy males; but this is a circumstance which could hardly fail often to follow from the males emerging from their cocoons earlier than the females. With moths of the family of the Bombycidae, the sexes pair immediately after assuming the imago state; for they cannot feed, owing to the rudimentary condition of their mouths. The females, as several entomologists have remarked to me, lie in an almost torpid state, and appear not to evince the least choice in regard to their partners. This is the case with the common silk-moth (*B. mori*), as I have been told by some continental and English breeders. Dr. Wallace, who has had great experience in breeding *Bombyx cynthia*, is convinced that the females evince no choice or preference. He has kept above 300 of these moths together, and has often found the most vigorous females mated with stunted males. The reverse appears to occur seldom; for, as he believes, the more vigorous males pass over the weakly females, and are attracted by those endowed with most vitality. Nevertheless, the Bombycidae, though obscurely-coloured, are often beautiful to our eyes from their elegant and mottled shades.

I have as yet only referred to the species in which the males are brighter coloured than the females, and I have attributed their beauty to the females for many generations having chosen and paired with the more attractive males. But converse cases occur, though rarely, in which the females are more brilliant than the males; and here, as I believe, the males have selected the more beautiful females, and have thus slowly added to their beauty. We do not know why in various classes of animals the males of some few species have selected the more beautiful females instead of having gladly accepted any female, as seems to be the general rule in the animal kingdom: but if, contrary to what generally occurs with the Lepidoptera, the females were much more numerous than the males, the latter would be likely to pick out the more beautiful females. Mr. Butler shewed me several species of *Callidryas* in the British Museum, in some of which the females