

**THE BUTTERFLIES OF GREAT
BRITAIN WITH
THEIR TRANSFORMATIONS,
DELINEATED AND DESCRIBED**

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The Butterflies of Great Britain with Their Transformations, Delineated and Described by J. O. Westwood

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MDCCLIV



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BUTTERFLIES OF GREAT BRITAIN,

WITH
THEIR TRANSFORMATIONS,

Delimited and Described.

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this Introduction I have embodied the results of a very minute and microscopical examination of a vast number of species which had been rendered necessary for my completion of the great work on the "Genera of Diurnal Lepidoptera," commenced by Mr. Edward Doubleday, and in which several important characters, hitherto almost or entirely neglected by Lepidopterists, were examined in detail: such as the structure of the palpi and fore legs, the veining of the wings, the articulation of the antennæ, the ungues and their appendages, and the external marks of distinction between the sexes in the different groups. Many of these neglected characters were found to be of great value, not only as indicating family and generic, but often even of specific distinctions.

Two elementary plates, devoted to the illustration of the general characters of the Butterfly tribes, and containing a great number of microscopical details, both of their perfect and preparatory states, have also been added, and which, in conjunction with the full description given of these two plates, it is hoped will be of great service to the entomological tyro, leading him to examine the beautiful organizations of these creatures, instead of resting contented with securing fine specimens for his cabinet; the best methods of doing which are also given at the end of the Introduction.

I. O. W.

December, 1854.

INTRODUCTION.

I. GENERAL CHARACTER OF THE ORDER LEPIDOPTERA.

THE beautiful tribes of Butterflies and Moths constitute one of the primary divisions or orders of winged insects, which has been termed Lepidoptera (Scale-winged) by Linnaeus, the great nomenclaturist of the animal and vegetable kingdoms: a name derived from the Greek, in allusion to the structure of the wings, which are four in number, of a membranous texture, and covered on both sides with innumerable minute scales, resting upon each other like the tiles of a roof, and easily removed. It is to these scales that the insects are indebted for their splendid colours, the membrane of the wing itself being colourless.

The head is free—that is, not received in a frontal cavity of the thorax—and is furnished on each side with a large compound eye, and above with a pair of elongated antennæ, variable in form, not only in the different species, but also often in the sexes of the same species, and which in the butterflies are almost always terminated by a knob-like club. The mouth occupies the lower part of the face, and appears at first sight to consist only of a long tongue, which the insect folds and unfolds in a spiral manner at will, and of a pair of scaly or hairy appendages, serving as a defence to the spiral apparatus when coiled up; but a more minute examination shows that the mouth is much more complicated in its structure, and that it exhibits all the parts (although generally in quite a rudimental state) of the mouth of the biting insects. In fact, by denuding the front of the head of its scales, two minute triangular pieces are observed at a small distance apart above the origin of the spiral instrument, and which are the rudimental mandibles, here apparently useless, as is also the small conical upper lip placed between these two rudimental jaws, below which on each side is an oval plate soldered to the head, from the upper part of which arises one of the lateral halves of the spiral instrument, which in effect is composed of the two lower jaws extraordinarily elongated, and applied together so as to form a sucking tube; at the base of each portion of this tube is a minute tubercle, which in some species is developed into an elongated pair of feelers, or maxillary palpi; the labial palpi being the large feelers between which the spiral maxillæ are placed when at rest, and arising from the sides of the lower lip, which, like the basal part of the maxillæ, is soldered to the head.

The transformations of these insects, which have attracted the attention of the most incurious observer from the earliest period, also serve to distinguish them from all other insects. The females deposit a considerable number of eggs, from which are hatched small worm-like jointed animals or larvæ, furnished with a scaly head, armed with a mouth and powerful jaws; six short scaly legs, attached in pairs to the three segments succeeding the head, and a variable number of short, thick, fleshy legs attached in pairs to the posterior segments of the body. The appearance of these larvæ is extremely variable, some being smooth, others warty, some hairy, etc. Their food consists almost entirely of vegetable matter. Whilst in this state they cast their skins several times, and when full-grown this operation is again repeated; but, instead of the insect reappearing as a caterpillar, it now more nearly resembles an Egyptian mummy; on minutely examining which, however, we can trace the rudiments of most of the limbs of the perfect insect, but closely applied to the body and covered by a general slender pellicle; the future wings occupying the sides of the anterior part of the body, between which are to be observed the leg-cases and the antennæ-cases. The form of these chrysalides, aurelia, or pupæ (as the insects are termed in this state), varies greatly; those of butterflies may almost always, however, be distinguished by having several angular prominences in various parts of the body, whilst those of moths are conical and not angularly tubercled. This peculiarity seems dependent on the circumstance that the caterpillars of the latter tribes enclose themselves in cocoons or cases entirely of silk, or of silk mixed with various extraneous materials, within which angular prominences on the body would be inconvenient to the enclosed insect; the caterpillars of butterflies, on the contrary, rarely form cocoons, but are transformed to pupæ in the open air. After remaining a certain period in this state, the time for the bursting forth of the perfect insect arrives, and, after slitting the pupa skin in several directions, it disengages itself from its exuvie, gradually extends its wings, and assumes all the beautiful characteristics of its perfect state.

The Lepidopterous insects were divided by Linnæus into three primary genera, *Papilio*, *Sphinx*, and *Phalaena*, each subdivided into minor groups, and corresponding with the butterflies, hawk-moths, and moths of English collectors. As, however, the number of species became more and more extended, and a more minute investigation of the characters of the species was made, it became necessary to introduce a much more extended mode of distribution, whereby the order was divided into three principal sections, *Diurna*, *Crepuscularia*, and *Nocturna* (corresponding with the three Linnæan genera). These have been again subdivided into families, and the latter into numerous genera and subgenera. The *Crepuscularia*

and Nocturna, or the hawk-moths and moths, are, however, much more closely allied together than either of them is to the Diurna; so that M. Boisduval, one of the best authorities upon the order, has judiciously proposed to adopt only two principal sections, Rhopalocera, or those with clubbed antennæ (butterflies), and Heterocera, or those with antennæ of variable shape, but never clubbed hawk-moths and moths).

II. CHARACTERS OF THE RHOPALOCERA, LEPIDOPTERA DIURNA, OR BUTTERFLIES IN GENERAL.

Of all the tribes of the animal creation, none, it may be safely affirmed, possess greater powers of attraction than the different species of Butterflies, with some of which all of us have been more or less familiar from our earliest childhood. With birds and flowers they may be considered as maintaining a constant rivalry, partaking of the activity and sprightliness of the former, as well as of the beauty of colour and fragile forms of the latter.

Confined, as our attention must necessarily be in the present work, to the natives of our own island—which cannot, of course, vie with the productions of tropical climates—we still find numerous instances of brilliancy of colour, often contrasted in the most remarkable manner, as well as elegance of markings, which are not surpassed by any other objects in the creation. The imperial gloss of the Purple Emperor Butterfly, the intense black and scarlet of the Red Alderman Butterfly, the vivid golden red of the Coppers, and the delicate blues of the Mazarine and Adonis Butterflies, may bear comparison with the colours of any exotic species; whilst the intricate markings of the fritillary butterflies, the eye-like spots of the Vanessa and Hipparchiæ, and the silvery spots of some of the fritillaries, elicit our warmest admiration.

It is not, however, in the perfect, winged state alone that these insects attract our attention, since the remarkable transformations which they undergo have, in all ages, afforded materials for ingenious observation, and which, although for many ages regarded as instances of an absolute metamorphosis of one kind of animal into another, have still lost none of their marvellous character, since the researches of Godart and Swammerdam have taught us that the change was but the successive throwing off of the outer skin by an animal, which, being in its early states destined to feed upon vegetable matters, had no need of wings to seek its food, but which, when brought to maturity, required those organs to enable it to flit about from flower to flower, seeking a new kind of food in the honeyed nectar