

THE PATTERN VARIATION IN THE PUPA OF *MELITAEA CHALCEDON*.— PLATE VIII.

BY LILIAN RAMSAY, STANFORD UNIVERSITY, CAL.

VARIATION in color pattern is familiar among adult insects. If color pattern is of advantage in the way of aiding insects, by protective resemblance, mimicry, warning, recognition, etc., in the struggle for existence, variations in the pattern are the material seized on by natural selection upon which new types of pattern and ultimately new species are built. That is, this is true if the natural selection theory of species-forming is true.

But insects have a struggle for existence in their immature stages as well as in adult condition and these young stages must be protected as well as the imaginal life. Are variations as numerous and as marked in immature characters as in adult ones? The assumption is, of course, that they are, but as a matter of fact there seem to be few specific proofs of this recorded in the large and rapidly growing literature of variation. As a simple contribution of definite data of variation in an immature character, I present the following brief statement and plate showing the variation in the pattern (black markings on a gray-green ground) of the antero-ventral half of the naked pupa of the checker spot butterfly, *Melitaea Chalcedon*.

The series examined included 127 pupae (chrysalids) obtained from as many nearly full-grown larvae collected at one time in one place on the University campus and reared to pupation in the laboratory. All the larvae were enclosed in a single breeding cage and hence all pupated under identical environment. The variations may be looked on therefore as blastogenic in character.

No two of the chrysalids have exactly the same markings. The pattern variation is typically continuous or gradatory, any two types being perfectly connected by gradatory inter-types. Hence no statistical tabulation of the variation can be made. The twenty-four types figured represent the range of variation and to some one of them can be referred approximately any chrysalid examined. But actually each figure represents accurately the pattern of only one particular specimen. The modal pattern is plainly of the type with numerous large strong blotches, like figs. 8, 16, 6 and the like, rather than of the less strongly marked type, as exemplified by figs. 23, 10, 13 and the like.

As these pupae are naked and wholly exposed to discovery by roving enemies they must depend largely for protection on a dissimulating color pattern. The variation in this color pattern must belong therefore distinctly to the class of slight, continuous variations that offer themselves as 'handles' for natural selection: that is, they must if any such class really exists.



Hindawi

Submit your manuscripts at
<http://www.hindawi.com>

