

*inside* theory to state. It seems more reasonable to conclude that the sun has been the original painter, still improving and beautifying his work. That the deviations from the original pattern and color have been seized upon by Natural Selection and that gradual changes have been fostered, may be conceived under the workings of general evolutionary law.

From a study of the subreniform spot in *Catocala*, I, many years ago, came to the conclusion that the spots in the *Noctuidæ* were modifications of the transverse lines, and this theory will be found stated in my writings. They may be fragments of original transverse lines, or, as the case seems to be with the subreniform spots, they may belong to existing transverse lines from which they have become disconnected. The median transverse shade is interesting, as it still simulates, by its cloudiness, the shade band of the secondaries and of the under surface of both wings in most *Noctuidæ nonfasciatæ* or *Noctuinaæ*. The primitive transverse shade band will have been vague and cloudy, and all fine and cleanly cut markings will prove to be recent in comparison and to have proceeded from nebulous and undefined ornamentation.

The instances where the upper surface of the secondaries resemble the under surface of the primaries occur in the *Ceratocampineæ*, and also in the *Smerinthinaæ*, among other groups. This fact struck me when I was studying the relationship between the Horned Spinners and the Eyed Hawk Moths. As a general rule, the cloudy bands on the under surface of the wings of the *Noctuidæ* or Owlet Moths, resemble those on the hind wings above. The under, or covered wing, bears a certain relationship to the upper, or covering wing, in coloring and ornamentation. We may conclude that it has remained longer plain and unicolorous, that its less exposure in certain groups of the *Lepidoptera* has allowed it to retain more of the primitive appearance. The Spanners, or *Geometridæ*, the Sparklers, or *Pyrallidæ*, carry the under wings more exposed and the markings are continuous and similar on both wings above. This is the case with the lower or geometridous *Noctuidæ*, to a considerable extent. The pattern of the wings seems to follow the exposure, as I have elsewhere pointed out. The conditions of the caterpillar stages are widely different from the environment of the perfect insect, and I have long ago pointed out that each stage varies independently and unequally, as in the case of the representative species of *Apatela*, etc., (see my paper in *Annals N. Y. Lyceum*, N. H.) I have also elsewhere drawn attention to