

## NOTES ON BOMBYCIDÆ.

BY FREDERICK CLARKSON, NEW YORK.

The habits of insects present an attractive and fruitful field of discovery, illustrating in many remarkable ways their peculiar instincts governed by heredity, and more or less conditioned by environment. The power which we call instinct, controlling the habits of insects, has a regularity of action governed by ordinary conditions, but there are frequent manifestations of adaptation to circumstance, as conspicuous in the several orders of insects as in the various races of mankind. The extraordinary condition can only be regarded as an obstruction to the usual law that governs instinct, and compels the creature to conform to the changed surroundings. The larvæ of *Bombyx mori* if crowded for space at the time of pupation will associate to the number of three or four in spinning the one cocoon which covers them. The larvæ of *Samia cynthia* under like environment present a similar variation of habit by spinning interior sections one above the other in the silk-lined leaf constituting the one envelope, so that outwardly it has the appearance of a long, single cocoon. The marked feature of this dual cocoon is, that while ordinarily the place of escape for the imago is at the upper end of the cocoon, the inhabitant of the lower section emerges at the lower end of the cocoon, from the lower end of its section. The *Cynthia* worms occasionally, from like necessity, will, to the number of two, spin a cocoon in common and undergo transformation in the one interior section. I have collected the past season very diminutive cocoons of *P. cecropia* and *S. cynthia*, the former measuring one and one-half inches long by one-half inch in diameter; the interior section three-quarters of an inch long by three-eighths of an inch in diameter; the latter was spun on a leaf one and one-half inches long, the cocoon rather less by three-eighths of an inch in diameter. The cocoons contained the larva dead and in a dried condition.

From a cocoon of *P. cecropia* I have obtained a very small male, measuring scarcely four inches in expanse of wing. The kidney-shaped spots on secondaries are reversed from their usual position, the pointed end being directed towards the abdominal or inner margin, instead of as commonly to the exterior margin. The wavy white line, bordered with black, on the exterior margin of the primaries, which is usually more or less pointed into the adjoining lilac, is in this specimen a line corresponding in form with that of the margin of the wing.