

## ON THE GEOGRAPHICAL DISTRIBUTION OF NORTH AMERICAN LEPIDOPTERA.

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(Continued.)

Again, the genera *Citheronia* and *Eacles* are a South American element in our fauna, while the typical Attacinae, such as *Actias*, probably belong to the Old World element in our fauna, together with all our *Platypteryginae*. Among the Hawk Moths the genera *Philampelus* and *Phlegethontius* are of probable South American extraction, though represented now by certain strictly North American species. Mr. Robert Bunker, writing from Rochester, N. Y., records the fact that *Philampelus Pandorus*, going into chrysalis August 1, came out Sept. 10 as a moth, showing that in a warmer climate the species would become double-brooded. And this is undoubtedly the case with many species the farther we go South, where insect activities are not interrupted so long and so strictly by the cold of winter. Since the continuance of the pupal condition is influenced by cold, a diminishing seasonal temperature for ages may have originally affected, if not induced, the transformations of insects as a whole. Butterflies and Moths which are single brooded in the North become double brooded in the South. The winter is the season during which the activities of insects cease and the existence of Lepidoptera becomes artificially lengthened by the intervening of the cold. Premature hibernation is a relic of the time when the winters were longer than at present; this habit is seen in the case of the larvæ of several species of Butterflies, and is otherwise inexplicable. Again, the Notodontid genus *Apatelodes* is of a Southern type of this Sub-family of the Spinners, while *Datana* is descended ultimately from Tertiary Arctic forms. In these two cases the genera have probably gradually become distinct from their allies; nevertheless the relationship to existing genera in South America and Europe may be plainly traced. The foreign elements in our Moth-fauna overlap those which may be considered North American *per se*.

From studies of this nature, here briefly summarized and but partially displayed, the Science of Entomology derives an importance not discernable when it is limited to a mere sorting of species classified after their variety and their value according to the collection. It is part of the task