NOVEMBER OBSERVATIONS ON *PIERIS PROTODICE*
VERNALIS EDW. IN MISSOURI (LEPID. PIERIDÆ)

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The spring forms of some species of butterflies are occasionally seen in the fall. Scudder¹ says that the butterflies of *Pieris protodice* Bdv. & Lec. appearing late in the fall approach in coloration the spring type, and he attributes this to the cool nights. Comstock² mentions a similar occurrence in *Eurymus eurytheme* Bdv.; late fall individuals, presumably affected by the cold while in the pupal state, develop into the spring form *autumnalis* Ckll. instead of the summer form *eriphyle* Edw.

A noteworthy instance of this occurred in November, 1930, on the Ranken Estate near Valley Park, Missouri, when large numbers of *Pieris protodice* were seen, all of which had the coloration of the spring form *vernalis* Edw. Many of both sexes were observed on the mornings of November 9th, 16th, and 23rd, and all of the butterflies seen on the three days were flying in one small area; the west slope of a small valley that was exposed to direct sunshine and protected from the wind. Random collecting showed that there were nearly equal numbers of both sexes on each day of observation; nevertheless the eagerness of the males to mate caused them to cluster about the females as they were issuing from the pupæ, and make unsuccessful attempts to mate with them, even though their wings had just begun to expand. Several pairs were found *in coitu* on stems just above the voided pupal skins of the females, whose newly inflated wings were still soft.

Although the nights were chilly, this was an unusually mild November, and warm, sunny days continued nearly to the end of the month. If the coloration of the form *vernalis* is due to the effect of cold on the pupæ, then the observed

occurrence of this form can be regarded as a direct effect of the cool nights, while the late fall emergence was no doubt caused by the warmth of the sun on the sheltered hillside where the butterflies were seen. This was, therefore, an abnormal emergence of a brood that should have remained in the pupal stage until spring.

Any caterpillars resulting from the matings could hardly have been able to endure the cold weather and lack of food, though it was an unusually mild winter. However, such a winter would be very favorable to the survival of the adults, the females of which, having already been fertilized, would be able to oviposit quite early.

REFERENCES

- ¹Scudder, S. H. The Butterflies of the Eastern United States, p. 1169.
²Comstock, John A. The Butterflies of California, p. 51.