NOTE ON LARVAL VARIATION.

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In a paper on the Noctuidæ of North America (6th Ann. Rep. Peabody Acad. Sci.) I have stated that we should rather expect the acquirements of fresh character to be more apparent during the period of growth of the Lepidoptera. I have elsewhere (Bull. Buff. Soc., 1, 130) shown that there is proof in the excessive variation in the larvæ of a genus where the adults of the species are remarkably uniform in color and ornamentation, that the larva submits to independent and wide modification from the circumstances of its environment. Under this head I have suggested that all the cases in the Noctuidæ where the larvæ are very different and the imagos very similar of any two forms distinguished by geographical distribution (e. g., *Apatela psi* from Europe and *Apatela occidentalis* from America) may be ranked. And here the numerous cases cited by Guenée from Abbot's drawings of the larva must probably be included. The case of these "representative" species is especially interesting and will receive in time a more thorough working out when we come to know the immature forms of more of our species.

In this first phase of larval variation we have the difference associated with a separate habitat.

In the next phase we have what Mr. Walsh calls a *phytophagic* variation of the larva. He has shown such to exist with *Hal. tessellaris*, and Mr. Hy. Edwards has shown it with regard to the Californian *H. Agassizii*.

Mr. Walsh's observations on *Sphingicampa distigma* and *Anisota bicolor* I have discussed some years ago, giving good reason to show that an error happened in the matter; the larva of his "*bicolor*" (♀ imagos) not having in reality produced the perfect insects with which he associated them. Hence the "generic" differences in the larvæ associated with "specific" identity in the imagos in this case assumed by Mr. Walsh do not in reality exist. But the *phytophagic* variation in *Halesidota* is not associated with a difference of habitat; and Mr. Walsh ascribes it to the food plant as the determining condition of the larval environment inducing the variation. The imagos cannot be distinguished.

We have again a third phase in the "species" of *Datana*. Here the variation in the larva is strong in the last moults, and the imagos though almost are not quite identical. The species may be separated without knowing the larva. The two nearest allied forms, *ministra* and *integerima*, have the one uneven, the other even fore wings. The larva of the latter is black with long silky white hairs, wanting in the former, which remains striped. It must be remembered that in an allied genus, *Nadata*, the two species are also separable by the differing margin in the imago; the larvæ are yet unknown. In *Catocala* we have two forms, *C. crataegi* Saund. and *C. polygama* Guen., quite distinct in the larval and very near in the perfect state.

I have briefly brought these facts together here to show that larvæ are independently subject to variation. The small differences in the imagos are usually attended by much greater differences in the larvæ in the case of closely allied "species." An analogy in the differences between closely allied species in different genera is shown in *Nadata* and *Datana*. We may expect similar facts when the history of our *Ceruræ* becomes known, all bearing on the objective basis for all our "genera" and "species," although certain lepidopterists continue to insist on real distinctions between certain of these artificial divisions. The conceptions of one class of naturalists are treated as corresponding with Nature, the other, not; but with insufficient reason.

NOTES ON THE EGG, LARVA AND PUPA OF SMERINTHUS MODESTA.

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Egg— $\frac{1}{8}$ in. diameter; light green, translucent, smooth, circular, oblate or depressed. Hatched in nine days from extrusion. Larva— $\frac{1}{4}$ in. long; light green, slender; head large, round, slightly depressed medially; face pink, with a purplish tinge; extremity of the body dark sea-green, with a large wart or tubercle, pyramidal in form, upon which rests the horn.