

are plainly present in the fourth and fifth instars of the flat larva shows that these are *not Gracilarian* instars.

However, even conceding that there is no great structural difference between the types of larvæ, the very appreciable modification of form in the fourth and fifth instars and the non-functional character of the mouth-parts in the sixth and seventh instars of the flat group still await explanation. Remembering that the imagoes of *Lithocolletis* (typical) and *Cameraria* are structurally identical, the question resolves itself into a consideration of how much reliance should be placed upon these larval characters in determining the phylogeny. It is true that in the absence of imaginal characters, larval characters may furnish a basis of classification, but before accepting the testimony they afford as final, we should examine them critically to determine whether they represent the phylogenetic divergence of the group or are merely cenogenetic larval modifications adapting that group to different life conditions.

A phylogenetic tree which shows the independent origin and parallel descent of two groups, distinguished by the larva of one being flattened, the other cylindrical, must be based on the assumption that, e. g., those characterized by a flattened larva are descended from genera or groups, now extinct, which possessed this characteristic. This line of reasoning rests on the hypothesis, which has repeatedly been shown to be unreliable for free-living larval forms,* that the individual recapitulates in its ontogeny, the history of the race. This, it seems to me, is the fundamental weak point in such a phylogenetic tree as that proposed for the group under discussion by Mr August Busck (Proc. Ent. Soc. Wash., XI, 100, 1909). On the other hand, we are justified in concluding that the common possession of at least two Gracilarian instars is proof, additional to that furnished by the imagoes, of the common descent of the group from Graciliariad ancestry, because this characteristic has been handed down through so many modifications of imaginal structure and environmental conditions that it may well be assumed to be conservative. In the flat-larval group, we have no such basis of comparison to determine whether the later two flattened stages constitute such a conservative character or not, and hence can not accept the evidence afforded by the ontogeny.

If the flattened form of the larva in the fourth and fifth instars and the slight modification of mouth-parts in the sixth and seventh instars,

*See Montgomery, "The Analysis of Racial Descent in Animals."