

2. Pseudogynes may arise without any effort at transmutation but from female larvæ that have been merely neglected and left unfed after they have passed the stage at which such treatment would lead to the formation of workers. "That the pseudogynes are not the result of pathogenic conditions in the egg or mother queen has been proved experimentally by Viehmeyer (1904) who removed an aged *sanguinea* queen from a colony that for years had been producing pseudogynes, owing to the presence of *Lomechusa* larvæ and caused her to be adopted by a new set of unusually healthy workers from an uninfested colony. Under the changed conditions her eggs developed into larvæ that gave rise to perfectly normal workers" (Wheeler, 1910). It would appear, therefore, that pseudogynes result from an upset in the nutritional balance due to the presence of parasites, although it is impossible to state positively whether they are transmuted females or over-developed workers.

The pterergate falls into the third group of abnormal ants, i. e. freaks and atavistic forms. As there are only a few cases of such forms on record (nine prior to 1920) their sporadic appearance would indicate that they are extremely unusual and thus may be classified in the third category. Dewitz (1878) has shown that in *Formica* the embryonic vestiges of wings are retained until the larval and pupal stages, and it is not surprising, therefore, that we should occasionally find some workers which retain them until the adult stage. No doubt this phenomenon occurs more often than has been suspected, and the minute vestiges are broken off during emergence from the pupal case, or during the mutual stroking of their bodies with their antennæ, to which the ants devote so much of their time. Since the retention of a character that usually disappears among the normal forms is in the broad sense of the term a freak, pterergates or workers possessing vestiges of wings, though in other characteristics exactly like the true worker, fall readily into the third group of abnormal ants suggested by Creighton.

The difference between pseudogynes and workers is very distinct when a large series of forms is available for study, and many comparisons may be made between them. The