

## TOWER'S EVOLUTION IN LEPTINOTARSA.

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One of the most important of the recent studies of evolution, and probably *the* most important of the purely entomological works on this subject, is Wm. D. Tower's "Investigation of Evolution in the Chrysomelid Beetles of the Genus *Leptinotarsa*."\* "In this contribution have been brought together data concerning evolution in the genus *Leptinotarsa*, Stal, as gathered from various sources [during 11 years], and in as far as it applies to the origin of species. In general, the evidence herein presented has been derived from three sources: (1) its *natural history*, including distribution and œcology, variations, habits and instincts; (2) *development*; (3) *experiment*." It is the large number and thoroughness of the experiments which makes the work so valuable, and such a refreshing change from the numerous discussions of pin-stuck data that encumber but do not greatly elucidate the problems of evolution.

Chapter I is an interesting discussion of the geographical distribution of the genus. By the use of four of the criteria given by Adams (Biol. Bull., 1902), the centre of origin of the genus is found to be Southern Mexico. The other six criteria are rather severely criticised. If space permitted, these might be profitably discussed, as some of the criticisms do not seem to be fully justified. Valuable detailed data concerning the spread of the Colorado potato beetle are collected and given here.

Chapter II is a study of variation. A number of laws for the genus are deduced. Variation is found to be determinate. "In the elements of the colour pattern there is a tendency for the spots to spread out or contract peripherally, and the stripes and bands to extend or contract at their ends. The spots, stripes and bands are most variable in the posterior or distal portions of the structures on which they occur, and least variable in the anterior and proximal portions thereof. Increase of pigmentation or modification of colour pattern moves caudalward or distalward, while decrease moves cephalward or medianward." "Large or extreme variations are determinate, and always occur in directions corresponding to the maximum lines of fluctuating variations." "All variations of colour and structural characters are strongly correlated, . . . so that causes which produce a variation in one part bring about either directly or indirectly corresponding variations in other parts."

\*Carnegie Institution of Washington, Publication No. 48, Papers of the Station for Experimental Evolution No. 4.

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