COMPARATIVE.

Der Gesang der Vögel, seine anatomischen und biologischen Grundlagen. DR. VALENTIN HAECKER. Jena, Fischer. 1900. Pp. vi + 102.

After presenting a short discussion of the structure of the vocal apparatus of birds and after paying tribute to the contributions of Darwin, Wallace, Spencer, Weismann, Jaeger and Groos on the subject of bird song, the author proceeds to show that the present dimorphism evidenced in the song of male and female is the result of a differentiation, a division of labor, the original condition having been monomorphic. In this process of differentiation a new instinct was evolved, viz., the coquetry, hesitation or passiveness of the female. In the same way it may be said that on the part of the male a new instinct was evolved, viz., the conduct characteristic of courtship. The unusual activity of the male fulfils at least two functions, heightening by a process of auto-stimulation the individual's own sexual excitement and stimulating reflexly certain activities in the female. As in the so-called social gatherings of the paramecia the active movements of the newcomers are inhibited by the carbonic acid excreted by those already present, so the courtship activities of the male act upon the female, *i. e.*, reflexly. Groos had already spoken of *unconscious choice* in this respect; differential reflex action upon the presence of certain stimuli, following the terminology suggested by Lloyd Morgan and the experimentation of Loeb, seems, however, the better term to use. Granted then that the phenomena of courtship in the bird world are instances of reflex action, it follows that sexual selection may be subordinated to natural selection in so far as there would be a survival of those courtship or sexual reactions which possessed the greater survival value for the species.

The utility or survival value of the many specialized, differentiated forms of bird song is discussed with originality. Certain vocal utterances are useful as companionship or flock notes, aiding these most mobile creatures to a closer union and association, their powers of flight giving rise to a dissociating or disintegrating tendency. Warning notes possess survival value in many ways. Many atavistic characteristics, such as the cackling of the hen as explained by Hudson, could be cited. Certain vocal utterances, like human language, are recognition marks of species, of subdivisions of species and of individuals. Attention is called to the differences in meaning in the varying pitch and tone of the same note. Just as orators and singers use those unusual modulations usually associated with emotional life, so in bird life the use

of certain unusual notes induce definite differential emotional reactions. Signal cries are the bugle calls for the migration advance, other notes are pairing notes in the spring. Many notes and melodies which are useful for certain purposes at one time are used at other times and are thus instances of correlation of function. Haecker thinks that these out-of-season notes may be useful as practice. Similar, recurring, seasonal atmospheric conditions may also release reactions which function normally, say, at the pairing time. Song notes are usually intended for other ears than those of the singer. Many other interesting observations are made, such as the growth of the courtship dance out of the struggle and fight of rivals (*Kampf und Tanz lassen sich nicht von einander trennen*), etc.

The term song instinct, it may be mentioned, should be modified to song activity, since notes, melodies and rhythms are sometimes acquired.

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The Basis of Social Relations. DANIEL G. BRINTON. Edited by LIVINGSTON FARRAND. New York and London, G. P. Putnam's Sons. 1902. Pp. xxi + 204. \$1.50.

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