

RECENT LITERATURE

Howard's 'Territory in Bird Life.'—Those who have read Mr. Howard's work on the British Warblers will recall the attention that he gave to the origin and development of various activities connected with reproduction, and the ingenious and suggestive theories and explanations that he presented in this connection. The present volume¹ carries out many of these theories on broader lines linking together various phases of sexual behavior, song and migration under the general impulse of reproduction.

Mr. Howard has produced an intensely interesting volume and while he does not pretend to have sifted the matter to the bottom and while we may think of many exceptions to some of his theories, he has nevertheless presented a mass of observations and clever explanation which will serve as food for thought and demand the careful attention of everyone interested in the study of bird behaviour.

Our author's investigations have led him to regard the establishment of a definite "territory" or domain by each breeding male, as the key note to the whole subject. First there is an organic change which stimulates the male to isolate himself from the flock, involving more or less of a migration; then there is the finding of an environment appropriate for purposes of reproduction, in which the male establishes himself, fighting off any rivals that come within his domain; and finally the arrival of a female with which he mates and together they defend their territory and accomplish the duties of reproduction. It follows, as the author admits, that upon his theory the discovery of a mate rests largely upon the female which reverses the accepted order or procedure. "But after all" he says "what reason is there to suppose that the male seeks the female or that a mutual search takes place; what reason to think that this part of the process is subject to no control except such as may be supposed by the laws of chance?"

The male, he goes on to show, cannot leave his "territory" without danger of its usurpation and as rapidity of mating is essential, some guidance to the female is necessary and here is where song comes in. Male birds rarely sing, especially with full vigor, until established in their "territory" and hence the fully developed song is always an advertisement of a male ready for mating. If singing began before the territory was selected the female would be attracted by a male not yet at the stage for mating, and reproduction would in such case be delayed. It of course not infrequently happens that two females are attracted by the same male and then follows a physical combat just as occurs between males

¹ *Territory in Bird Life.* By H. Eliot Howard, with Illustrations by G. E. Lodge and H. Grönvold. London, John Murray, Albemarle Street, W. 1920. Svo pp. i-xiii—1-308, 11 photogravure plates. Price 21 shillings net.

when they are establishing the boundaries of their respective "territories." Later on paired males will fight when one enters the "territory" of the other or one male and female will unite in the defence of their domain against a neighboring pair, or a male will drive out an encroaching female or vice versa. Only this theory of an established "territory" as the primary cause of conflict can, in the author's opinion, explain the complicated nature of the fighting that is to be seen every season and in every community. Furthermore neutral grounds may be recognized, unsuited perhaps for nesting, but rich in food supply, where various males as well as females will resort in perfect harmony, just as in the winter flockings, although the very same individuals will engage in strenuous combat if they encounter one another within the confines of their respective "territories." Within each "territory" there is a favorite perch from which the male sings and which Mr. Howard terms the "headquarters." This is the station which Mr. H. Mousley has so fully described as the "singing tree" in his paper in 'The Auk' for 1919, p. 339—to which paper by the way our author makes no reference.

The delimitation of the "territory" is accomplished as a result of habit, in visiting certain particular spots or perches, over and over again, in search of food or for other purposes, and while fairly definite the boundaries are of course not absolute.

The need of a "territory," Mr. Howard thinks, lies in the necessity of the parents' securing sufficient food for their young without going so far from the nest as to deprive them of brooding for too long an interval, and he dwells particularly upon the extreme delicacy of young passerine birds and the need of continual protection from cold by brooding.

In other words each nest is by this plan provided with a sufficient food supply immediately around it, which would not be the case were there a community of nests close together. As birds of other species do nest close by and have "territories" of their own with different boundaries, we must naturally suppose that their food is of a different character. No doubt some of our economic ornithologists could furnish data of the greatest interest in this connection and demonstrate why certain species can live in close proximity without affecting each other's food supply.

There are of course species in which many pairs nest in close association. Many of these, as the Guillemots, Mr. Howard considers, represent cases where the question of securing food is subordinate to the question of securing a station suitable for reproduction. With the Guillemots the nearby ocean always provides an abundant food supply, but the narrow rock ledges have to be divided into the smallest possible "territories" to provide nesting space for all and maintain the existence of the species. The cases of community nesting as in swallows may be explained in somewhat the same way or may, as it certainly does in the case of Rooks, involve the factor of mutual protection.

While the "territory" theory is the dominant theme of Mr. Howard's book he has much to say on other topics more or less related to it. In

connection with song he emphasizes the absolute necessity for a "specific" character in the song of every individual of a given species if it is to serve as a guide to the female of that species in finding a mate. This is I think a statement with which all students of bird song will agree, for while the keen ear may be able to recognize a number of *individual* songs in any species, they all have the specific quality so developed that there is never a question as to what *species* is singing. We fail, however, to harmonize with this Mr. Howard's claim of mimicry in so many British birds as the Jay, Wood Owl, Red-backed Shrike, and various Warblers. Surely there is no such wide-spread mocking among American birds and we are led to wonder whether many cases of alleged mimicry are not mere fancied resemblances. If mimicry exists to such an extent it would seem to be a serious hindrance to the development of a specific song.

In Mr. Howard's discussion of migration he makes no mention of Dr. Watson's experiments with the Terns of the Dry Tortugas and in other connections seems to be quite unacquainted with the American literature bearing upon his subject. Americans however cannot afford to remain ignorant of Mr. Howard's interesting work—interesting alike to the student engaged in research along similar lines and to the general reader who appreciates a fascinating discussion of some of the deeper problems of ornithology.

The beautifully drawn plates represent spirited contests between individuals of various species of British birds, a phase of bird behaviour which takes on a great deal of interest in connection with Mr. Howard's theory and which seems to have been much neglected and but poorly understood in the past.—W. S.

Saunders' 'Distributional List of the Birds of Montana.'—In this admirable publication¹ Mr. Saunders presents us with the first comprehensive list of the birds of Montana and at once places the ornithology of the state on a firm foundation. His list is up to date in every respect, consisting of an introduction, a discussion of distributional areas in which life zones and forest associations and their characteristic birds are considered; a fully annotated list of 332 species (with additional lists of extinct, introduced and hypothetical species) and a bibliography.

In the introduction he apologizes for the fact that the present list cannot compare in completeness with those of most of the other western states because there are as yet scarcely any resident ornithologists in Montana, little collecting has been done, and there are almost no series of specimens, while for many sections scarcely any data are available. It may however

¹ A Distributional List of the Birds of Montana, with Notes on the Migration and Nesting of the Better Known Species. By Aretas A. Saunders. Pacific Coast Avifauna Number 14. Cooper Ornithological Club, Berkeley, California. Published by the Club, February 1, 1921. pp. 1-194 and 35 text figures. Price \$6.00, for sale by W. Lee Chambers, Business Manager, Eagle Rock, Los Angeles Co., California.