

the thick foliage no leg-band was visible, and all behaved in the manner natural to this species. I have hopes, when family cares are over, that Grouse No. 332439, on hearing the sound of my axe on a dead tree, or my hurrying foot-beats on the woodland trail, will again have a desire for human companionship, or better yet, to influence her family likewise to show themselves, and have their pictures taken.

Babson Park, Wellesley, Mass.

THE BEARING OF A KNOWLEDGE OF NEST-SPACING AMONG BIRDS ON THE WORK OF THE BIRD- BANDER

BY CHARLES L. WHITTLE

It has not been explicitly defined just what is meant by the "return" of a bird to the place of its birth for nesting purposes, nor is it easy to do so. We speak, for example, of the failure of young birds, meaning in this case the young of the previous year, to return to their place of birth. How close to the place they were born must the young birds nest the following year to constitute such a return? Must they be found nesting in the same old box in which they were born, in the same old apple tree, barn, yard, or immediate neighborhood, to comply with the prevalent view or views of the meaning of the word?

Some of the bird-banders use the word "return" in quite a different sense, meaning a bird which reappears at the banding-station where it was banded after an absence during which it migrated to and from its summering or wintering area. Even here there is a certain looseness of expression since banding-stations vary greatly in size from large ones of ten thousand square feet or more in area down to only three hundred square feet, such as my own in Cohasset, Massachusetts.

In the following discussion only the first-mentioned use of the word will be considered, the purpose, and a very pressing one at the present juncture, being to call attention to the need of securing answers to the following questions: What is the average nest-spacing distance that each species of birds tolerates, and what bearing does this nest-spacing

have on our efforts to answer the question: Do young birds return to their birthplaces to nest?

H. Eliot Howard¹ has written at length on the fact that pairs of many species of birds require, and possess themselves of, a certain area during the reproduction period, and that they defend such areas against all comers of the same species. It is contended that such areas are essential to the successful raising of a family and that the size of the area defended is such that at the critical time of the appearance of the young it will yield the necessary food to raise them; that to allow additional families of the same species to nest therein would be to endanger the food-supply. It is pointed out also that there is a limit beyond which parent birds cannot radiate from the nest in search of food for the hungry young; that a dependable supply must occur within a circle of a certain radius. It is obvious that the nest-spacing habits of many species vary to a considerable extent, ranging all the way from that of Eave Swallows, whose nests often touch one another, and those of Terns and Gulls, whose nests may be three feet apart, through those of Barn Swallows and Catbirds and so on to birds whose nests are widely spaced, as are those of the Hawks.

The subject is of importance to bird-banders in particular because they are in a position to help answer the question: To what extent do birds born the previous season return to their places of birth to nest? It is commonly assumed if banded young are not taken at the place of their birth, that they do not return. In fact it is held by many that old birds do not allow their young to nest with or near them, the view being that it is of biological importance to extend the range of a species as much as possible. While not combatting this view, it seems desirable to investigate the possibility that our frequent failures to secure returns of the young born the previous year may be due in part at least to other causes. I have in mind two possible reasons why young of the previous year are so infrequently taken as returns. These two reasons are (1) that the range of many species of nesting birds from their nests during the period from the beginning of nest-building to the time the young have learned to fly is very restricted and rather rigidly adhered to, with the result that banders whose traps may be close to but just outside the limits of the nesting-range of a species may fail throughout

¹"Territory in Bird Life."

the nesting-season to capture the young of the previous year; (2) since the territory insisted upon by pairs of different species is highly variable, but presumably fairly constant for each species, it may well be that the young, say of the Barn Swallow, may return to the barn in which they were born the previous season only to find that the requirements of this species as to nest-spacing are fulfilled, the parent birds having arrived earlier and occupied the edifice to the fullest degree permitted by the species.

In this connection attention is called to the important but rather meagre returning ratios of Purple Finches described in the last *Bulletin* of this Association,² which indicate also a survival ratio of old birds to young of the previous year of approximately four to one. The article also calls attention to the apparent fact that after Purple Finches attain an age of one year or more their chances of living to return succeeding years are greatly increased over those of the young birds born the year previous. These data, if applicable to Barn Swallows, would emphasize the probability that each season a preponderating percentage of adults which nested in the barn the year previous would survive and would return to the old quarters the following year, leaving on the average each season limited spaces to be filled by young born there the previous year or by others, the ratio being, as already stated, say four old birds to one young bird. It is of course not claimed that this ratio has been determined for Barn Swallows: its use here is to illustrate the fact that if Barn Swallows return to the same barn year after year, as I believe to be the case, the number of pairs nesting in any barn being determined by the degree of sociability practised, we should expect as a rule to secure few returning young. Without doubt cases would occur occasionally when the population of a barn might consist for more than one year of the identical adult individuals, the young thus being automatically excluded. On the other hand, if a large proportion of the old birds fail to survive, opportunity would be had for some young birds to nest in the barn.

Now if the spacing law illustrated in the supposititious case of the Barn Swallow be operative, it will probably be true also of all less social species; that is, they too, though less conspicuously, rather strictly space their nests so that returning young to any area may not be found occupying nesting-

² "Return Ratios in their Relation to the Annual Mortality Among Birds," by Charles L. Whittle and Helen G. Whittle, pp. 48-50.

sites seemingly available excepting to the extent that the area happens to be unoccupied by the parent birds or other adults of the previous season.

It appears to the writer that banders should not only have the above considerations in mind but that they should determine the spacing law for as many species as possible, (that is, what is the average minimum distance between occupied nests?), (1) because in itself the matter is of biological importance, and (2) because the information will aid them to place a proper estimate on the return data at their stations during nesting-time.

NOTES ON THE NESTING OF THE PHOEBE

BY A. W. HIGGINS

ONE night in April, 1925, while on an errand under my barn, and carrying a lantern, I noticed that the Phoebes (*Sayornis phoebe*) which nest there were attracted by the light and came flying about me. I noticed also the position of a Phoebe's nest and that one bird roosted on a spike. The effect of the light brought to my mind the idea that I might band these birds by the use of a flashlight. So the following evening, April 18th, I again visited the cellar with a flashlight and found the female Phoebe on the nest covering two eggs, and banded her (No. 155135). The male was roosting on the same spike driven in one of the floor timbers, so I banded him (No. 155134), thus getting them as a pair with the sexes determined. The process of using the flashlight was as follows: Entering the cellar with the light off, and knowing the approximate locations of the nest and spike, I worked as closely as possible, and then used the flash for a second to locate the nest. Then in the dark, I clasped the bird in my hand and banded her. The same method was used on the male bird.

During the season of 1925 Phoebes No. 155134 and 155135 hatched two broods of five each. The first brood was destroyed by some enemy soon after the birds were hatched, and I banded only three of the second brood, Nos. 155151, -52, and -54. Each brood contained five birds.

On the evening of June 26, 1925, I again visited the barn on the next place to mine and banded the female, No. 155144, and a brood of five young, Nos. 155145, -46, -47, -48, and -49.