

in water and wrapped up in a piece of corduroy. When I was within nine feet of the first nest, one end of the strip was laid on the ground, and standing on it, I began unrolling the cambric and walking forward upon it at the same time until I reached the nest. After I had examined its contents, I retraced my steps, picked up the miniature carpet and dowsed it thoroughly in the lake before going to the next nest.

This method was used most successfully for all close-range observation of five Veeries' nests, one Oven-bird's nest, one Chestnut-sided Warbler's and a Black-throated Blue Warbler's nest. These eight broods all left their nests safely to the best of my knowledge, while four other ground nests (three Veeries' and one Warbler's) which were visited only once without the use of the wet cambric, were robbed overnight, probably by some prowling animal which followed the scent of the footsteps leading to the nests.

This precautionary measure was not infallible, however, as one clutch of Black-throated Blue Warbler's eggs and a brood of three day-old fledglings vanished mysteriously. Both nests were in exposed positions, however, and Crows or squirrels may have been the culprits.

The cambric was particularly useful in observation work from a blind, and for two weeks I approached a Veery's and a Black-throated Blue Warbler's nest, at least once a day and frequently more often.

If any similar way of protecting nests is already in use, I should be very glad to hear of the results obtained. Also I hope that other observers may be interested in trying this device and reporting whether they find it has any real merit in safe-guarding ground nests under observation.

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THE LURE OF BIRD MIGRATION

BY HARRY C. OBERHOLSER

THE attractiveness of the study of bird migration arises from more than one circumstance. In the popular mind the migration of birds derives much of its charm from its mystery; and while to a considerable degree this is the attitude also of the seeker after knowledge, it is likewise true that were all the facts of migration known, our present interest in its mys-

teries would undoubtedly turn to an increased and equally eager admiration for the birds and their accomplishments. The unknown concerning bird migration falls into two categories: the facts relating to the subject, and the causes of these. One of the chief attractions of all kinds of bird study is the pursuit of information; and we know relatively so little about our feathered friends that the reservoir of unknown things has not been appreciably lowered by what we have discovered. The gathering of facts about anything is of course much easier than the determining of the causes of these facts.

So far as bird migration is concerned, some of the knowledge that has already been gained is so intriguing that it greatly increases the desire to learn more, indeed, it often suggests other lines of inquiry. Some of these facts are among the most astonishing things known about birds.

For instance, migration itself, with all its complexity, is one of the most astounding kinds of bird activity. One of the factors that enter into this is the great length of the journey performed by many birds. The travel of a tiny bird from the Arctic regions to the south temperate zone over thousands of miles and return each year is something to astound even a casual observer. Furthermore, in pursuing these annual journeys many birds make long individual flights, at least from 600 to 2,500 miles, and these flights are not confined to the birds that we commonly think of as powerful flyers, for even the small Warblers and Thrushes travel across the wide open stretches of the ocean for hundreds of miles. The difference in the length of the route followed by various species is also a remarkable circumstance. Still more so is the roundabout route taken by some species, such as the Cliff Swallow, the Ross's Goose, and some of the Scoters; and in the same category is the well-known and frequently mentioned case of the Golden Plover which moves southward along the eastern coast to South America, and back again through Central America and the middle United States. Long years of observation have shown that the appearance of migratory birds on both their northern and southern journeys is remarkably regular, and this consistency of travel challenges our admiration as well as our interest. Again, the times at which birds migrate are so different that we almost unconsciously speculate on the causes of this. Some birds begin to move southward from their summer home as early as July, at times even in June; and others do not start until two or

even three months later; while a similar condition exists in the spring movements. One would think that all birds would of course fly by day when they could see their way and more easily obtain food, but, as is well known, hosts of birds travel at night, even when it is darkest and most stormy. Furthermore, the young in many instances begin their migratory travels before their parents, over a route that they never have traveled, and without guidance of other birds. Yet in spite of all this, except for untoward accident, they unerringly find their way for thousands of miles to the south, to spend the winter and return to us again in the spring, often to the same spot.

Much more progress has been made in the discovery of facts regarding bird migration than in working out the causes of the various phases of these movements. However, there are multitudes of problems of observation which still need solution and which will keep observers busy for many lifetimes. In fact, there will practically always be something left unknown.

Some of the problems of bird migration upon which much more light is needed, particularly regarding certain individual species, are those which might be considered the mechanics of migration, that is, the times and methods by which they perform the various parts of their journeys. Also whether the young, the males, and the females travel together or separately, and which arrive earliest in spring or autumn, as the case may be. Another interesting line of inquiry is the effect of the weather, particularly of storms, on the movements of birds.

The solution of some of the problems of migration relating to the causes of these movements is much more elusive than the facts themselves, and requires decidedly more careful, long continued, and patient study. Probably we shall never fully know some of them. Among the most attractive of these are the problems that relate to the causes of migration itself; and there are many other questions that we should like to ask of ourselves as problems for solution. Why do birds pursue circuitous routes? Why are some of these routes changed from time to time? Why do some birds migrate northward while the majority go southward? Why do some individuals of certain species migrate northward and some southward to winter? Why are the migratory routes of some species narrow, while others are broad? Why do some species stop frequently by the way, while others go

over wide areas of both land and water without stopping? Why do some pass by one route and return by another? Why do some small birds fly over water, instead of making a comfortable journey by easy stages over land? Why do the young in certain cases precede the parents? Why do birds fly at night instead of by day? And many more.

And finally, to puzzle and attract us, there is that probably greatest problem of migration, how the birds find their way through darkness and through storms over wide expanses of land and water to a far distant home without guidance other than an inherited instinct. This element of bird migration alone would serve to make it one of the most alluring phases of ornithology.

PURPLE FINCH AND CATBIRD RETURNING RATIOS

BY CHARLES L. WHITTLE

In this Bulletin for July 1926, p. 48, paragraph 2*, attention was called to the increasing returning ratios of Purple Finches (*Carpodacus p. purpureus*) from year to year as the birds advance in age. These ratios are doubtless connected with the numbers of birds surviving from year to year, though how accurately they represent the survival ratios will only be known after many such investigations have been made. From this article I quote part of the table on page 49:

PURPLE FINCH RETURNING RATIOS

(1924—June 5, 1926)

Year of Banding	No. Banded	Returns-1	%	Returns-2	%	Returns-3	%
1923	166	25 (1924)	15.06	17 (1925)	63.00	10 (1926)	58.82

As the majority of the returning birds for the Peterboro station have now (June 13, 1927), been recorded for the current year, it is interesting to note the continually increasing percentage of returns-4 over the percentage of the returning birds in 1926, namely 58.82 percent. Seven of the ten returns-3 in 1926 are back this year, or 70 per cent. Of these seven

* "Returning Ratios in Their Relation to Annual Mortality Among Birds" by Charles L. Whittle and Helen G. Whittle