

THE MIGRATION OF BIRDS*

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The natural phenomenon of bird migration must appeal as interesting and mysterious to every thinking person, especially to the lover and observer of nature. But I fear the mysterious part of it must remain so to a greater or lesser extent, even after all that can be, has been said on it. A flood of new light, however, has been shed on this subject recently by the publications of the Biological Survey of the Department of Agriculture at Washington, D. C. This department has for about 20 years been sending out blank question sheets to competent ornithologists all over America, on which are to be noted the names of all the migrant birds passing through certain localities, the first and last dates when seen in spring and fall, etc. I may say also that a member of the Ottawa Field-Naturalists' Club has for many years been sending in these sheets, well filled out, from this section, namely that very competent and indefatigable ornithologist, Mr. George R. White. This vast amount of data and statistics on migration is now being systematically worked over and has already yielded highly interesting and unexpected results, as witness the writings of Prof. Wells W. Cook, of the Biological Survey, Washington. To these I am indebted for many of the statements I am here able to make.

The first question suggesting itself in regard to migration is: *Why* do birds migrate at all? Why do they leave us? Some will answer: "Because it would be too cold for them in winter." That this cannot be the whole reason we can at once see from the fact that the tiny Chickadee, the Snowflake, frequently the Pine Siskin and Redpoll remain with us all winter. Besides, some birds, also their young which never experienced a winter any-

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where, begin to leave us in August, when there is no sign of cold. And why would they then leave again the warm South-land where there is no cold to be feared at any time? Some will say: "It is because their food gives out in winter." This is, of course, a better reason than the first, though the two are inter-related. But that even the very important food question cannot be the sole motive for their migrating can be seen from the fact, that many birds start away from here in August and early September when their food is most abundant, and the same can probably be said of the places they leave when returning north. So this point is somewhat mysterious. We have to fall back on instinct, which of course, while being a handy word to use, does not explain anything to us. The birds seem to have an instinctive desire for seclusion during their nesting time, which could not be obtained in the south, where the millions of birds from the north are crowded together with the teeming faunal life there resident. This, together with the evident love for the place where they were born, seems to be the motive, at least for the northward migration. Besides, we notice an instinct or impulse for migrating in other animals also, as among the lemmings, the salmon, eel, herring, etc.

Then we ask, "*When* do birds migrate?" No any one answer will suffice for this question. We have a spring migration, the birds travelling northward, and a fall migration, southward. Each extends over a long time, as some species come and go early, others late. There are probably only two months when no migration of any kind or at least wandering and roving about takes place, these being January and June, the latter the nesting month over a large part of the northern hemisphere. With us the beginning is made in the spring migration by the Prairie Horned Lark and the Crow, which come about the last week of February. During the second half of March come the Song Sparrow, Bluebird, Robin, Tree Swallow, etc., in April the Phoebe, Kingfisher, gulls, ducks, blackbirds, Meadowlark, etc., but May is the leading month in the spring migration. Then, huge waves of warblers, finches or sparrows, fly catchers and vireos come. The last migrant here is the Blackpoll Warbler, which can be heard into the first few days of June. The fall migration is started by some

warblers and shore birds as early as July, by more in August, but the bulk of it takes place in September; the number of birds decreasing rapidly during October, and a few bringing up the rear in November.

Now, as to the time of the *day* in which the migrations take place. The rule here seems to be: The weak-winged and timid birds, such as rails and some sandpipers, etc., birds finding their food under cover, as the warblers, some finches, thrushes, vireos, etc., migrate during the *night*, so they can rest during the day and find their food more easily than they could at night. Other birds, strong of wing, fearless, finding their food more in the open, as the blackbirds, the robin, etc., travel partly during the day or night, making use of either or both times to suit their pleasure. A third class, such having long wings, expert tireless fliers, which find their food while flying, as the swift, the swallows, also the gulls, terns, hawks, etc., travel by day exclusively, for apparent reasons.

Over what *distances* do their migrations take the birds? That is again extremely variable. When our Ruffed Grouse (*Bonasa umbellus togata*) leisurely walks from its summer haunts on top of one of the Laurentian hills to the north of us and goes down a mile into the nearest cedar or spruce swamp, that may also be called a migration. The same can be said, when some birds breeding in the Rocky Mountains near the summit or the timber line, leave these *quasi* boreal regions and by descending a mile or two enter the temperate or even subtropical zone. Some of our breeding birds go further, as the Purple Finch, Junco, etc., and winter 2-300 miles south in New York State. From that the distances increase rapidly to as much as 8,000 miles for one trip, as in the case of the Golden Plover, the Knot, the Eskimo Curlew and many more.

Over what *routes* do they travel? As a general rule we may say, that the birds breeding from Labrador and Ungava southward, go to Florida, as their first stage of migration, many species of course wintering north of that. Those breeding west of Hudson Bay and east of the Rocky Mountains in the great Mississippi water shed, go towards and to Louisiana. Those breeding in and west of the Rocky Mountains travel overland entirely into

Mexico. That there are many exceptions to this is evident. Thus, some Alaska birds, instead of joining the western or middle contingent, seem to travel to the east, as the Blackpoll Warbler ; and the Bobolink, which has advanced from its eastern habitat as far west as Utah, has been shown to travel back east in migration, over the way its species originally extended its range westward, instead of going the shorter way by land into Mexico ; thus adhering to family traditions. The same is done by the Wheatear, a European species, having come by way of Iceland and Greenland to Labrador, now breeding there. That migrates back to Europe over the same route the species has come. Now, how do those that want to go further south proceed from the Gulf coast ? Not as we might suppose via the Greater and Lesser Antilles to South America, that being to our mind the easiest route ; they would always be in sight of land, near food, etc. Of about 25 species which make a start over this route, only about six finish it to the South American main. Nor do a great many take another apparently easy route, *i.e.* from southern Florida to Cuba, on that island to its western point and then by a short flight of about 100 miles to Yucatan. No, one main route is from Florida to Cuba, thence to Jamaica, at both of which many species remain, and thence by a 500 mile flight over the Carribean Sea to South America. Another route is from northwestern Florida straight south to South or Central America or Yucatan. Another from Louisiana south and south-west to Mexico. These routes also seem to show that the birds cannot, as a rule, be greatly exhausted by long flights, otherwise they would dread them and rather make use of all the islands they could and travel from Louisiana, or at least from Texas by land into Mexico, which most birds scorn to do, thereby not even cutting off much distance or time. It has also been discovered by these late investigations, that some species coming north from Mexico, etc., do not alight as soon as they have land under them, but rather fly many miles inland before doing so.

An interesting question in connection with migration always has been, "*How do the birds find their way ?*" It has been held that the configuration of the land below, the physical features of it, play an important role in this. That this can be true only to a slight extent, we can at once see, when we bear in mind tha

many birds migrate at night, some high up ; that the young birds going the first time can have no knowledge and experience of the route ; when they leave here in September the trees are yet full of leaves and the fields not empty, whereas the landscape looks entirely different in April or May, when no leaves are out and the fields are bare, etc. Some seem to follow the coast line or the rivers, especially day migrants, but this can not explain all. The solution of the problem seems to be, that they have *a sense of direction*, and their instinct—whatever that is—seems to impel them in the right, usually for them best direction. That they must have such a sense, we can see from the Carrier or Homing Pigeon. This may be put into a box, taken aboard a train and carried on it hundreds of miles to a place where it never has been, neither can it see the physical features of the way, yet on being liberated it will find its way back with most unerring directness.

At what *height* do the birds travel during migration? A balloonist has seen an eagle soaring about at a height of 9,000 ft.—which does not say it was migrating. Some observers have seen large bands of migrants at an altitude of 5,000 ft. An experimenter with kites has seen large migrations of ducks at from 1,300 to 1,500 ft. high. Many birds are killed by flying against lighthouses no more than 100 ft. high. So, no one answer can be given to this question. Some species always, and others perhaps only when the air is heavy and foggy, fly very low, not more than perhaps 100 ft. over all trees and houses. We can hear their voices plainly at night during migration. But the bulk of it seems to be going on at a *height of from 500 to 1,500 ft.* They want to stay below the lowest clouds. That they are sometimes bewildered and driven out of their course by fog and strong winds is equally certain.

At *what rate of speed* do the birds proceed southward and northward? That this must be very variable we can see at once when we look at the wings of the warbler, thrush or rail and at those of the swallows, gulls and hawks. If we divide the distances travelled by the number of days spent in migration, we obtain a rate of from about *25 to 150 miles a day*. This does, of course, not mean, that the birds get up into the air, fly straight ahead for a day and then are only so much farther on than the day before.

No, they can fly that fast and faster in an hour and probably do that at times, especially when crossing large bodies of water. It simply means that by either one long or several short flights interrupted by leisurely feeding in between, they proceed so far in a day. They take it very easy during the first days or weeks of their journey, accelerating the speed towards the end. That the relative position of the masses of birds, also those of one species, breeding at the various latitudes, is much changed and shifted, owing to difference in speed, can easily be imagined, also that the migrants of a southerly species may be overtaken and passed by more northerly ones. Thus the southern form of Maryland Yellowthroat is passed and left behind by its more northerly congeners.

That many casualties may occur during migration, that disaster overtakes single birds as well as whole flights, is not to be wondered at. When the air is heavy and full of fog the birds fly very low and then strike high objects, steeples and especially lighthouses. Prof. W. W. Cooke notes that one morning in May 150 dead birds were picked up at the foot of Washington Monument, 555 feet high. When the light on the Statue of Liberty in New York harbor was still burning, 700 dead birds a month was the usual crop of fatalities during migration, as reported by Chapman. Some time ago an item of news was making the round of the papers, that on two mornings during the last fall migration 6,000 birds had been killed against a lighthouse on the north coast of France. Even if there were only 600 it was bad enough. Or when birds flying northward, say over the Gulf of Mexico or Lake Erie, are met by a fierce gale from the north, that then hundreds, if not thousands are occasionally hurled into a watery grave, can well be understood, especially of the weaker-winged species. That some of the hawks reap a rich harvest during migration, especially the little Sharpshinned, Cooper's, Duck and Goshawk is also clear.

Now, as to some anomalies and curiosities of migration. Some of our hardy Canadian birds perform, instead of a migration in the accepted sense, a series of apparently aimless, eccentric roving and wanderings, not only southward, but in various directions and without all regularity. Thus the Pine Grosbeak and

Bohemian Waxwing may be present at a place in one winter and then not be seen again there for years. This case is more mysterious than the others. The same holds good of the Canada Jay, the various redpolls and the Pine Siskin, though in a lesser degree. Then there are the herons, which before starting south in fall from their breeding places, seem to go on a little excursion northward first, and are sometimes taken far north of their range. The extraordinary route of the Golden Plover (*Charadrius dominicus*) and several more shore birds should here be noted. These birds breed in the bleak lands near and beyond the Arctic circle. In August, when the young are able to fly well, they proceed from north-central Canada to Labrador, thence by easy stages to Nova Scotia, etc., from there south over the Atlantic Ocean, to the Bahamas, to South America, through Brazil, still south through Argentine to Patagonia, 8,000 miles. After a short stay in that dreary place, they proceed northward again, but by a different route, further west in South America, through Central America, into the wide Mississippi valley, and in that north to their breeding place, near the Arctic circle, 16,000 miles in all.

There are several other birds which go from and back to their breeding range by different routes. Thus I found the rare Cape May Warbler common in fall in western Maryland, but none in the spring. Another curious fact brought to light by the data accumuluting at Washington is the case of the Nashville Warbler. This breeds here and northward and proceeds in fall southward with other warblers, travelling by easy stages, feeding in day time along the way, like any other well-behaved warbler would. But south of the southern boundary of Virginia it is practically unknown, only turning up again in its winter range, Mexico, near Vera Cruz. The only inference left seems to be, that it rises up high into the air at about the latitude of Virginia and flies without alighting again over all the intervening land and the Gulf. Who knows? The well known and abundant Chimney Swift offers another mystery. It moves southward in fall, its flocks becoming enormously large when they reach the Gulf coast. Then they disappear as though the Gulf had swallowed them, until they turn up again next March bright and cheerful as ever. Where they spent the winter months is a complete mystery so far, and the world is

rather thoroughly explored ornithologically, at least as far as large masses of birds are concerned. Nor are these the only unknown things in migration.

So we see that in spite of the large mass of data and statistics at hand, and the multitude of workers and observers, there is still much to be learned and better understood in that fascinating natural phenomenon: the migration of birds.

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The "Auk"; my own notes.

BIRD NOTES.

PRAIRIE HORNED LARKS.—We first saw the Prairie Horned larks this year on March 4th, and as the season advanced they appeared to become more numerous. On April 1st, while walking across the country on Isle Jesus, we were surprised by seeing a lark flying about our heads. As the open country was practically bare of snow, we thought it not unlikely that the bird had a nest nearby. About 50 or 60 feet away we found the nest, which was snugly placed near a stone. The nest contained no eggs. On the same day we located another nest of this species on a hillside nearby, which was also empty.

On April 8th we visited these nests again, and they both contained full sets—four eggs in each. Later in the day we were successful in finding three other nests, two of which contained four eggs each and the other was just about ready for eggs.

All of these nests were placed in "bald-headed" fields, *i.e.*, in pastures where the dead grass was only about an inch high and was entirely free of weeds, etc. In the majority of cases the birds could not be seen when the nests were found. The young birds had begun to form in the eggs of two of the sets.

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