

modified both in the case of species and of individuals as to render it certain that the habit of making the extended northward migrations now undertaken by certain of our American birds has been acquired recently and by degrees. We know that until about thirty years ago such birds as the Meadowlark, Bobolink, Baltimore Oriole and others did not extend their flight beyond our southern borders, because the interior and northern part of the province was then heavily wooded and unsuitable to their requirements, but now these birds migrate in increasing numbers every year as far north as and even beyond the Ottawa River. They have taken advantage of the clearing of the forest and the cultivation of the land to disperse themselves over an area which was previously not adapted to their way of living. In the early eighties I noticed a similar movement in Manitoba. As the land there was brought under cultivation and the prairies were peopled, Bluebirds, Purple Martins, Cliff Swallows, and other birds which were previously unknown came in as migrants and established themselves as regular summer residents. Failure of the food supply and the severe cold of these northern regions drive these birds southward for the winter, where they remain until returning spring gives the impulse for their return flight to the north.

If all the individuals of the so-called migratory species were in the habit of entirely leaving their winter quarters and resorting to some northern region peculiarly adapted to their requirements during the breeding season, we might well assume that migration was an inherited instinct transmitted from remote ancestors who had acquired it by reason of climatic changes, which had forced them at certain seasons to leave what had been originally their permanent habitat. This is true, however, of only a few American species, the majority of which, in greater or lesser numbers, breed almost all through their range.

It seems to me, therefore, that the impulse to migrate is the result of a natural law which provides for the dispersal of birds over the world during the season when their services are most required in maintaining the balance in nature, and that when the physical features of a country are changed, as ours have been, from heavy forests to open fields, the species of birds which migrate into it will change also, so that the land will be occupied by those best specialized to perform the functions required of them in nature's economy.

As the study of migratory birds has progressed and the peculiarities of method adopted by each species have been traced the difficulty of assigning any general cause for the habit except that already stated becomes greater. The movement from the north in the autumn presents many instances showing that various species act upon an impulse which differs from that of others closely allied to them. Generally speaking, it is assumed that birds leave the northern regions, where they have nested, at the approach of winter; when cold weather is imminent and their food supply is failing. Many species do linger in their summer homes, until it would seem as if they required to be driven out, but others again leave while food is most abundant and the temperature at its highest. Among the Thrushes this difference is very marked. Wilson's Thrush, the Hermit Thrush, and the Olive-backed Thrush resemble each other very much in appearance and in all their habits except their migration. Wilson's Thrush arrives here early in May and breeds abundantly from our southern border northward. About the middle of August their return flight begins and by the twenty-fifth of the month they have all gone. The Hermit arrives early in April, breeds sparingly in Southern Ontario and remains until the beginning of November. The food of these two species is exactly the same, consisting of insects and such small berries as are to be found in the woods. The Olive-backed Thrush moves at the same time as the Hermit, but goes further north