

ON THE NATURE OF THE RELATIONSHIP EXISTING  
AMONG LAND BIRDS DURING SUSTAINED  
AERIAL MIGRATION.

BY CHARLES L. WHITTLE.

THE following article is in part manifestly speculative, but sufficient data are in hand to seem to warrant its publication for the purpose of calling attention to the sort of observations which can be made to test the hypothesis advanced.

My attention and that of Mrs. Whittle was once directed for a period of four hours to the manner Myrtle Warblers (*Dendroica coronata*) were migrating.<sup>1</sup> During this period many detached flocks of ten to twenty or more individuals flew across a narrow strait between two islands, the Isle of Palms and Sullivan Island, lying easterly of Charleston, South Carolina, flying northeasterly up the coast. The total birds of this species moving northward during these four hours was not less than 24,000. These birds were unaccompanied by any other species, or at least negligibly so for no other species was seen, the date (March 4, 1920) being too early to expect "mixed" migration.

A short distance to the southwest at a place on Sullivan Island which forms the first land on the northerly side of the entrance to Charleston Harbor, this mighty host of Warblers, having crossed the entrance to Charleston Harbor, was traveling northeast on the land in a very scattered and disorganized manner, but these same birds when they again took themselves to the air, shortly afterwards, assumed the grouping already described.

A natural question to ask oneself on witnessing this great movement of small groups of a single species of Warbler is: would these groups still remain intact if other species of Warblers in numbers, and, say Vireos, were migrating with them?

The above facts, and other observations made prior to and since that date, to be described, have led to the formation of the hypothesis that had there been another species or several species of Warblers, or species belonging to other families, migrating

<sup>1</sup> "A Myrtle Warbler Invasion," 'The Auk', vol. XXXIX, 1922, pp. 23-31.

with the Myrtles, the grouping of the Myrtles witnessed would have been essentially the same, and it is further premised that other species migrate in this manner as a rule, that is, during the time of actual, sustained, regular migration on the wing. The hypothesis is extended further to include a like grouping of many species when migrating together, the presumption being that the more unrelated the species, the more distinct the grouping. In essentials this hypothesis is merely extending the obvious habit of group formation which in New England begins each year at molting time, or shortly after, and is witnessed so frequently throughout the winter, to include also the periods of migration. On the face of it, for many species to abandon a habit so prevalent during so much of the year (excluding the periods of courtship and nidification) would be a matter of surprise. Specific affinity alone is doubtless potent even when no stronger chord exists to cause aggregation, and it is held that when like species have the opportunity during migration to form groups they will do so.

The hypothesis has nothing to do with migration or movements by day when birds have come to earth for rest and food and are seen in composite, straggling flocks, feeding their way towards their summer or winter home, or are awaiting suitable weather to continue their flight, following the snow or food line, etc. During such times the groupings observed are likely to be due to stagnant gettings-together of several species on a basis of the kinds of food eaten.

In the nature of the case, the study of this problem is hedged about with almost insurmountable difficulties, and I can do little at this time except to mention some of the additional phenomena that have appealed to me as indicating that some species of land birds do not migrate to and from their nesting grounds in a disorganized rabble, but as a whole in something like an orderly, organized way, even when several species are migrating together.

That so little information bearing on the subject appears in the literature, when doubtless many unrecorded and pertinent observations have been made, is unfortunate. Had more observers been afield just before sunrise during migrations, I feel that many observations bearing on this hypothesis would now be available.

Observers commonly view the "migrating hosts" considerably after sunrise when the birds have come to earth and appear in highly complex bodies consisting of several or many species, each individual in search of food and unconcerned with its immediate neighbors. Such complex flocks arise in some instances by various species collecting together, say seed-eaters, in some small area where suitable food occurs in quantity. Various species of Warblers, and other birds requiring insect food, search the tree-tops and are usually seen moving collectively in various directions at such times, but on the whole working towards their objectives. Birds observed at such times are usually devoid of any apparent tendency towards species segregation, but our hypothesis requires that when such heterogeneous admixtures of species get under way in actual migration, they tend to collect into little groups, which either form disconnected parts of great aggregations of the same species, like the Myrtle Warblers described, or which migrate as little groups separated from other nearby groups of other species.

It is of course disclaimed at the outset that such things as stragglers do not occur with other species in strictly aerial migration. Cases of unorganized mixtures of several species must occur with some frequency due to the weather vicissitudes met with in migration, and from other causes. My experience has been that the early morning offers the best opportunity to study certain aspects of bird migration, that is, during twilight or soon afterwards, before the birds have scattered in search of food. At such times little, isolated groups of a single species are often seen, arriving groups they may be called. To see such groups in the morning twilight is next best to actually witness them drop from the sky.

There is little definite information as to the origin of wintering groups of many species, which are familiar to every one much afield at this season, but obviously, the most natural one would appear to be the family. Another theoretical migrating group may have its origin in the family unit plus birds of the same species reared in very local nesting areas, thus constituting a "neighborhood" group. During the spring migration, the habit, believed to be quite wide-spread, of arriving at their nesting grounds

at different times, depending on age or sex (segregated sexes), the males often well in advance of the females and young, may be another factor. Whatever may be the facts, there are some observations that weaken the view that migration takes place in a chance distribution of the contained individuals.

Data of this kind can be obtained best perhaps by observing the habits of migrating species while crossing areas in which they do not nest or do not winter, for in such areas accessions and losses tending to confuse the observer, are reduced to a minimum.

It is appropriate briefly to pass in review a few examples of wintering groups among migratory species as seen on the land, and other groups of birds seen on their nesting grounds just prior to leaving on their southward migration. The following is a very common experience that will serve as typical of many witnessed by nearly every field observer, an experience dealing with what I am beginning to refer to in my notes as "migratory units": On October 25, Mrs. Whittle and I spent the latter part of the afternoon in mixed spruce and pine woods with pasture areas interspersed on the slope of Monadnock Mountain in New Hampshire. The red spruces were shedding their fruit in abundance and this was the food being eaten by most of the migrants noted—Juncos, Red-breasted Nuthatches, Golden-crowned Kinglets, Fox and White-throated Sparrows, the four latter species in small groups of 4-6 in the case of Kinglets and Nuthatches, and 8-10 or more in case of the two species of Sparrows. A visit to this place the following day showed that the group of Sparrows and Red-breasted Nuthatches had left during the previous night, the Sparrows, at least, resuming their migration, and as these birds were present in well separated groups the first day it is probable that they resumed their journey as groups. As Chapman well says: "They (White-throated Sparrows) are always in little companies," that is, during migration in September. These "little companies" are my migratory units and such companies are by no means confined to this species or to the Fringillidae. I have witnessed them in other members of this genus, among Golden-crowned and Harris's Sparrows, and among Tree Sparrows, Fox Sparrows, Rusty Blackbirds, etc.

Bluebirds, both parents and two broods of young, have been

observed to maintain family relations in New England up to the time of their departure in November. One cannot help believing that such a group retains this organization for a longer period than the one observed. i. e. that the birds maintained this grouping on the journey south.

During the winter of 1923-24, a group of seven White-throats wintered near my banding station. They appeared at the station together and often visited the trap together. They remained close together during the day-time and flew to a nearby group of white pines for the night.

In Cohasset during the fall, winter and spring, Juncos occurring in scattered groups, seldom exceeding thirteen or fourteen, may be observed, but at dusk many congregate in the junipers at a common Junco roosting place. In the morning they break up again, and this grouping day after day is approximately the same as is shown at least by the birds feeding at my banding station. Chickadees make their rounds in search of food in groups seldom exceeding seven. Tree Sparrows occur similarly in small groups, though often under certain conditions numbering more birds. I once saw in mid-winter twenty-five of this latter species, which were attracted to a common feeding place where a small stream flowing into a swamp which was kept free from snow nearly all winter, separate into three flocks and fly away in different directions.

Juncos are first observed in the fall about my banding station in small flocks. The rule is that a little flock appears and additions usually consist of the arrivals of more flocks, and what is true of this species is true also of Tree Sparrows and of White-throats. A more detailed record of this species at this station seems pertinent. On the 21st of October, 1925, the first Juncos in the fall migration appeared in my door-yard, seven or eight in number, four at least being banded, and the following day they visited my ground trap and feeding shelf for canary-seed. These were seen off and on until December 19, when a second group of Juncos, eight or ten in number, arrived, among which were four or five more banded birds. This flock like the first one fed ravenously for two or three days, and then came less often to the station. By means of the banded birds the flocks in both groups were kept track of, and on January 9, 1926, all the banded birds

were trapped during a period of five hours and twenty minutes, and their numbers read,—nine returns and second returns. These are mentioned to show the means used to identify the groups, the pertinent part of the matter, however, being the sudden appearance of the two groups of birds and their persistence.

Fox Sparrows, as far as my experience goes, arrive in the spring migration in little groups, usually of eight to twelve birds, which apparently remain together until migration is resumed. Examples of this kind have been observed among Song Sparrows, but much less frequently. One or two examples observed this spring, however, are of interest. The latter part of March, 1926, Song Sparrows appeared at my banding station in numbers, and by April 7, ten were banded. They remained about ten days and suddenly disappeared during the night of April 10, none of the group being seen again up to April 23. About April 7, several more Song Sparrows appeared, four of which were large rangy birds averaging 2.90 grams heavier than the average weight the first group. These remained only a day or two and also disappeared about April 10. Attention is called especially to the unusually heavy birds,<sup>1</sup> which appeared to be an isolated group (a migratory unit) set off as such among the smaller Song Sparrows composing the bulk of the then migrating birds.

On several occasions in an area carefully canvassed I have noted very early in the morning small groups of just-arrived migrants—Yellow Palm Warblers (*Dendroica p. hypochrysea*), Ruby-crowned Kinglets, etc., with no other associated migrants, and such groups are seen both spring and fall.

At Cohasset several pairs of Catbirds which fed at my station during 1924 with young, at least in part, moved to a neighboring

---

<sup>1</sup> Apart from the interest these birds have as constituting a possible migratory unit, there remains the interest due to their apparent greater weight than the average of the Eastern Song Sparrows, as far as I have determined it by weighing in all twenty-two birds, not including the four above mentioned. The fact that four such heavy birds appeared together may have additional significance. At Mrs. Whittle's banding station in Peterboro, N. H., for two successive years in October a few of this type of Song Sparrow have appeared in her traps and have been banded, and her notes describe them as "large rangy birds." We have even come to think of them as constituting a possible example of a northern race of the Eastern Song Sparrow which has never been obtained on its breeding grounds and which at present is represented by the abnormally large birds in our museums, birds collected perhaps only as migrants.

swamp to molt. When this was completed, and migration was in order, the swamp was not depopulated of its Catbirds in a night, but in two or three contingents, the last leaving October 5. It is not unlikely that these leaving groups formed migratory units and were perhaps of the family order.

In Peterboro, N. H., every season beginning about August 9, during molting time and continuing with increasing numbers, to as late as September 15, there is present at Mrs. Whittle's banding station a flock of Chipping Sparrows, sometimes reaching a total of at least thirty. During 1924, such a group contained several of her banded birds, which nested or were raised about the banding station, and every day one or more of them would come to the traps for food, only to return to the flock when their hunger was appeased. Such a group would feed within narrow limits for days, or it would range about and return occasionally. Something determines the complexion of such small groups. In part I know it to be made up of families, or parts of families, of both adult and young birds. It is possible, considering the fact that the coming together begins before migration has begun, that the unbanded members were similarly local birds which did not come to the traps owing to the fact that they nested too far away, say four or five hundred feet from the station, the radius of this species' range during the nesting season being a very restricted one. As these birds kept together for weeks, and disappeared suddenly for the season in September, it manifestly constituted a migratory Chipping Sparrow unit, at least at the beginning of the southward movement. My knowledge of this group for 1924, ends at this point, but I find it difficult to believe that a tie which bound this group together for so long was severed during the journey south. When it shall be shown, as it has been to a certain extent in the case of White-throats and Tree Sparrows,<sup>1</sup> that certain groups of birds of these species winter in certain localities year after year, the presumption that the group migrates as such will be increased.

Regarding Warbler migration, the following observations made

---

<sup>1</sup> See Articles by Wendell P. Smith and Don V. Messer in the Bulletin of the Northeastern Bird Banding Association, Vol. II, No. 2, 1926, pp. 19-22, and pp. 28-31.

by E. H. Forbush on May 11, 1900, at Amesbury, Mass.,<sup>1</sup> are pertinent: "As we walked through the streets of the village many male Blackburnian Warblers were seen \* \* \* . A little later we saw them all about us in the orchards \* \* \* . As we approached the wood, it was everywhere the same. The Blackburnian Warblers had come in the night and were busy hunting for their breakfast. (This period was from daybreak till 7 A.M. when he returned to the village for breakfast.) \* \* \* At 8 o'clock not a single Blackburnian was to be seen. I scoured the country until nearly noon finding all the other Warblers as at daybreak, but not a Blackburnian could be found. They had done their share in the good work (eating insects) and had passed on." To account for the changed conditions between the time Mr. Forbush left the birds and his return (after an absence of an hour) there are two possibilities: (1) that the Blackburnians had, as a species, left their companions and moved along; or (2) that they were when first seen included in a moving stream of other species and during his absence the Warbler stream had moved along, bringing to the same place an hour later a portion of it devoid of this species, the latter view being the more probable one, altho Mr. Forbush appears to have entertained the former explanation. In either case the observations made show definitely that the Blackburnians were not distributed throughout the Warbler "wave." In other words, they were in a measure concentrated in the wave, and it seems probable that when aerial migration was resumed they maintained this relationship, that is, were segregated as a species.

*50 Congress St., Boston, Mass.*

---

<sup>1</sup> 'Useful Birds and their Protection,' page 102.