

and not extending so far forwards, feathers of the alula rather broadly tipped with white, and there are other minor differences.

*Description.*—Above warbler green; an indistinct loreal streak yellowish citrine; small chin spot picric yellow; throat pale gull gray with a few yellowish streaks; chest and upper breast pale neutral gray, streaked sparingly with yellow; lower breast, belly, under tail-coverts and flanks, pyrite yellow or a little brighter; rump feathers very full, like the back in color with rather broad lemon yellow tips; tail saccardo olive; wings chaetura drab, the feathers edged outwardly with the color of the back or slightly darker; the innermost remiges saccardo olive; two feathers of the alula rather broadly tipped with white, forming a conspicuous mark. Wing, 50; tail, 24; culmen, 17; tarsus, 19; middle-toe, 9.5 mm.

*Remarks.*—The specimen of *Macrosphenus flavivans flavivans* used for comparison is from the River Ja, Cameroon. It measures as follows: wing, 60.5; tail, 45.5; culmen, 19; tarsus, 20.5; middle-toe, 11 mm. The scapular and rump feathers on the River Ja specimen are conspicuously pinkish buff basally, while in *Macrosphenus collinsi* they are yellowish and hardly noticeable. It seems strange that a second species of *Macrosphenus*, so closely resembling *M. flavivans*, except in size and minor details, should come from practically the type locality of the latter.

U. S. National Museum.

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## FURTHER OBSERVATIONS ON THE GROUP HABIT AMONG BIRDS.

BY CHARLES L. WHITTLE AND LAURENCE B. FLETCHER.

As this paper will have to do largely with ornithological observations made at four bird-banding stations in Cohasset, Mass., a word regarding them is necessary for the sake of clearness and facility of reference.

Roughly speaking, the four stations are one mile apart and they are so located as to form very nearly the capital letter L. They will be referred to as A, B, C and D. Station A is L. B. Fletcher's and was established in 1921. It is located at the free end of the bottom line of the L. Station B, now one year and five months old, is operated by C. L. Whittle and is located at the intersection of the bottom line and the perpendicular. Station C is approximately half-way between B and the free end of the perpendicular and has been operated by Conover Fitch since the fall of 1923.

At the top of the L (D) is Mr. and Mrs. Richard B. Harding's station which was established in 1922. Stations A and D in a straight line are about two and one-half miles apart.

Between October 1, 1922 and April 17, 1923, there were trapped and banded at Station A a total of fifty-seven Slate-colored Juncos (*Junco h. hyemalis*). Of these, twenty-three were banded on January 25, 1923, three were banded prior to this date, and thirty-one were banded after this date. The number of traps, their kind and location were the same throughout the period—a pull-string and two automatics (a Dodson and a Government sparrow-trap).

For several months just previous to January 25, 1923, Juncos were extremely scarce about this station. The winter of 1922-23 was of great severity all over New England, both as regards average temperature and in the matter of numerous and heavy snowfalls, the ground remaining snow-covered continuously with a few days' exception.

On the night of January 23 the temperature in Cohasset reached a minimum of seven degrees above zero, but by the 25th of the month the weather had moderated and a snow storm was in progress, the wind being very light. Bird-wise, a radical change suddenly took place on the morning of the 25th. At 8:30 A. M. Juncos in quantity flocked to Station A and began entering an automatic trap, and by 3 P. M. the twenty-three Juncos taken on this date were trapped and banded, all but four entering the trap by 11:30 A. M. Of these twenty-three birds, eight repeated once before all the Juncos left Cohasset in April for their nesting grounds and three repeated several times.

The fall of 1923 and the early part of January 1924 were characterized by an abnormally high average temperature and the snowfall was extremely small, both in Cohasset and throughout Massachusetts and southern and central New Hampshire and Vermont. In fact bare ground obtained practically all the time during this period in the region in question so that ground-feeding birds had little incentive to leave much of their nesting area either to escape low temperatures or deep snows, or to search for productive feeding areas, and this condition existed up to January 26 when snowy conditions set in, followed by cold weather on

the 27th, which continued with little interruption until February 24th.

Juncos at Station A appeared with some steadiness, but in limited numbers, from October 21, 1923 to February 3, 1924, thirty-one being banded during this time, averaging about one bird every three days, but on February 4, following low temperatures in Cohasset and throughout New England, conditions at this station again suddenly changed. By 11:30 twelve Juncos not previously seen, at least about the station, during the winter of 1923-24, were taken together from an automatic trap, the birds having entered the trap between 10 A. M. and 11:30 A. M. Of these twelve birds, three were unbanded and nine were returns,<sup>1</sup> and of these nine returns, six were banded on January 25, 1923! Six days later, on February 10, four of these six Junco returns were again retaken at the same time in the automatic trap in which they were trapped on February 4. Ordinarily birds retaken so soon are known as repeats, but, as they were in addition returns of six days standing, it seems desirable to speak of them as return-repeats. In order that the records of these nine returns and the four return-repeats may be easily consulted, we have prepared the following table which also includes the additional Junco returns for the winter of 1923-24 taken at this station, fourteen in all.<sup>2</sup>

DETAILS OF FOURTEEN JUNCO RETURNS TO SHOW GROUP  
RELATIONS.<sup>3</sup>

No.	Date of Banding (1923)	Time	Date of Return (1924)	Time
75429	Jan. 10	4:15 P. M.	Jan. 5	4:00 P. M.
75431*	" 25	8:30 A. M.	Feb. 4	11:30 A. M.
75433*	" "	9:00 A. M.	" 4	11:30 A. M.
75434*	" "	9:00 A. M.	" 4	11:30 A. M.

<sup>1</sup> For convenience in keeping our station records, we are restricting the use of the word "return" to birds which, banded at one station, are retaken at the same station after having returned from an annual migration or migrations for the first time.

<sup>2</sup> An additional Junco return, the fifteenth, No. 35809 occurred February 28, 1924, after this article went to press.

<sup>3</sup> Those birds having a single star opposite their number were banded on the same day and returned the same day over a year later as a group. Those having double stars were not banded on January 25, but returned with those having a single star. Those having triple stars are one-star birds taken again six days later as a group.

No.	Date of Banding (1923)	Time	Date of Return (1924)	Time
75435*	" "	9:30 A. M.	" 4	11:30 A. M.
75438	" "	9:30 A. M.	Feb. 12	
75439*	" "	9:30 A. M.	" 4	11:30 A. M.
75444*	" "	11:00 A. M.	" 4	11:30 A. M.
75445	" "	11:00 A. M.	Nov. 17 (1923)	2:00 P. M.
104509	" 26	8:15 A. M.	Jan. 6	4:30 P. M.
35808**	Feb. 7	5:00 P. M.	Feb. 4	11:30 A. M.
35811**	" 10	8:30 A. M.	" 4	11:30 A. M.
35814**	" "	1:00 P. M.	" 4	11:30 A. M.
35821	" 14	7:30 A. M.	Jan. 6	4:20 P. M.
On February 10, 1924, return-repeats were:				
75431***	3 P. M.	} These birds entered trap within a period of 15 minutes and were taken together.		
75434***	3 P. M.			
75439***	3 P. M.			
75444***	3 P. M.			

The first appearance of these Juncos and others, coming as they did shortly after a general snowfall over New England, the first snow of any importance up to this time during the winter, is believed to have been due to a southward movement from a region which until about that time had been free from snow or nearly so.

Having the above general observations and the remarkable banding records in mind, what is their significance, noting first in particular the striking fact that a number of Juncos, at least six, were banded on the same day in January, 1923 and were re-taken together over a year later on the same day? Shortly after the birds were banded all of this species at Station A migrated to their more northern nesting grounds where all trace of them was lost until they again appeared suddenly the next winter at Station A and entered the same trap within one and one half hours of one another. That this coming as a group was not fortuitous is shown by the fact that after a lapse of six days four of the same six birds, or 66 per cent, again were taken together in the same trap. It would be difficult to obtain more competent testimony of the existence of the group habit among birds of this species, at least while in their winter quarters, a habit, in this instance, which has endured for two successive winters.

The facts submitted in addition have a bearing, and this an important one, (1) on the manner the individuals of such a group

migrate; and (2) on the question of how the members keep track of one another during the nesting season. In 'The Auk', Vol. XXXVIII, pp. 236 and 237, Baldwin has written of his wintering group of White-throated Sparrows (*Zonotrichia albicollis*) near Thomasville, Georgia, which he refers to as a "neighborhood group," birds which winter in the same spot year after year. Baldwin believes such groups migrate north as a unit and return to winter quarters as a unit, and he raises the question if they do not also nest as a group. For a discussion of the latter phase of the matter, see reference below, based in part on the occurrence of albinistic Sharp-tailed Sparrows (*Passerherbulus caudacutus*) for twenty-two successive seasons at their winter quarters at the same spot in South Carolina.<sup>1</sup>

The case of the Juncos greatly increases the presumption that the integrity of a wintering group of this species is not wholly lost during the nesting season. This view is supported by the evidence furnished by the mere existence of the same migratory birds in a group for two successive winter seasons, and by the manner these birds first appeared at Station A and reappeared there one year and ten days afterwards. The evidence does not indicate, either in 1923 or 1924, that straggling Juncos from widely-separated nesting places accidentally assembled at this banding station in January, 1923, only to disperse in the spring and then accidentally to reassemble there on a particular date and at a closely similar hour. Rather, to us it appears that the birds came to their winter quarters in a group, a habit hardly possible unless their nesting grounds were related in such a manner that the coming together of the birds at the close of the nesting season was easy and customary. That groups of uncolonizing birds nest in close proximity to one another was shown near Hillsboro, N. H., one day in June during the height of the nesting season. Here, within an area of perhaps twenty-five acres, more than a half dozen Whitethroats were in full song, and there is little doubt that they were nesting birds.

The case of these Juncos furnishes us with no evidence as to the makeup of the group, whether of one family, or parts of several

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<sup>1</sup>"Some Aspects of the Group Habit Among Birds," By C. L. Whittle. 'The Auk,' Vol. XL, pp. 224-240.

families; whether an organized or an unorganized relationship. Bird-banding, however, has enabled Jack Miner, at his station in Kingsville, Ontario, to prove not only the existence of a migrating family of Canada Geese (*Branta c. canadensis*) but that this family group migrated to their winter quarters from their nesting grounds by way of his station and back to their nesting grounds by way of his station. The family consisted of father and mother and four young-of-the-year.<sup>1</sup> This example of a family group is probably not an exceptional one among this species and the custom is likely also to exist with other members of the Anatidae. It is well known to be a habit with the Bob-white (*Colinus v. virginianus*) and the Ruffed Grouse (*Bonasa u. umbellus*).

It is interesting to note that the habit of families remaining together through the fall and winter is not unusual among some of our less generalized, non-migratory species, and is, therefore, to be regarded as a primitive custom. The problem however of analyzing the organization of migratory groups, such as Juncos, is beset with difficulties, but it may be solved perhaps in time by banding families of nestlings together with their parents. A case in point is the partially migratory Chickadee (*Penthestes a. atricapillus*) that in winter time travel about commonly in little groups of six to eight individuals, which in number agree fairly well with a theoretical estimate of the size of the average surviving family of this species during the first winter. At station B, during the present winter, sixteen Chickadees, all banded, have been regular daily visitants. They usually come to the station in two groups of eight birds each, commonly alighting first in the tree tops nearby and then dropping to the traps. It is obvious that the habits of this species lend themselves to prompt and accurate analysis of the makeup of such groups as these which we believe to be of the family order.

The four Cohasset stations on account of their number and special relations are beginning to yield data regarding certain wintering species which we did not anticipate. These species are the Junco, the American Goldfinch (*Astragalinus t. tristis*) and the Purple Finch (*Carpodacus p. purpureus*).

The observations indicating, if not proving, the group habit

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<sup>1</sup> 'Jack Miner and the Birds,' by Jack Miner. pp. 118-122.

among the Juncos, yield also other information of interest. At Station A fifty-seven of this species were banded during the winter of 1922-23, and up to February 23, 1924 there were fourteen returns, or 24.56 per cent,<sup>1</sup> showing a pronounced tendency to re-visit or to rewinter in the same area as during the previous winter, and also to return to the exact spot where they were banded. If we could know the number of fatalities among the fifty-seven birds after leaving the station in the spring of 1923, the percentage of returns, based on the remaining living birds, would undoubtedly be greatly increased. At station B the Junco returns for the same period were 14.92 per cent.

It is also of interest to note that up to February 23, 1924, no Juncos, banded at Stations A or B during the winter of 1922-23, were taken during the following winter season at any other banding station in Cohasset, and that we have but one case in this town of a bird of this species visiting another station at any time. Contrast this behaviour with the erratic wanderings of our Goldfinches and Purple Finches. Of the latter species the returns thus far have been almost negligible, whereas recoveries<sup>2</sup> between stations during the same winter season, or after an absence of months, are not infrequent. In the case of the Goldfinches we have had little opportunity to secure comparable data in all respects for the reason that previous to the present winter very few of this species were banded in Cohasset. During the present winter, however, Goldfinches are being banded plentifully at Stations B, C and D, and recoveries of one another's birds are matters of nearly every-day occurrence.

Thus far we have detected no evidence of fixed groups among the Purple Finches, and little evidence of a tendency to return to the same wintering place year after year. At this season both species roam at large in separate flocks, which seem to know no law, over their chosen territory, the makeup of the flocks being inconstant, even for a day, both as to the number of birds and the individuals composing them.

*King Street, Cohasset, Mass.*

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<sup>1</sup>As stated above the record on February 28, 1924, amounted to fifteen returns or 26.31 percent.

<sup>2</sup>For convenience in keeping our personal records, we make a distinction between birds banded at one station and captured at another station or place, and those captured at the same place they were banded, and these records are filed under a master card marked "Recoveries."