AN UNUSUAL FLIGHT OF ARCTIC THREE-TOED WOODPECKERS.

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IN October, 1923, a remarkable flight of Arctic Three-toed Woodpeckers (*Picoides arcticus*) invaded New England and extended as far south as New York City. At the suggestion of Dr. G. M. Allen I have attempted to gather the scattered records and to find, if possible, something of the cause of the flight.

The records of the Nuttall Ornithological Club have been the source of the largest number of these reports. Second only to these are the records generously furnished me by Mr. E. H. Forbush from his capacious files. I am also much indebted to the numerous isolated observers who have answered my many letters and whose names will be found with their respective records.

Before detailing the records of this abnormal invasion I shall summarize very briefly the normal status of the bird on the Northeast.

Maine—Uncommon winter visitor; rare resident in the northern and western counties.

New Hampshire.—Rare resident above 3,000 feet in the White Mountains. Elsewhere a rare visitor.

Vermont.—Rare resident in the north and in the high peaks; occasional winter visitor to the lowlands.

Massachusetts.—Occasional fall and winter visitor.

Connecticut.—Two previous records (winter).

New York City Region.—Two Long Island records in the winter of 1886–87.

New Jersey.—No previous records.

That these Woodpeckers normally do not move southward in winter is shown by the fact that this is the first flight of such proportions that has occured since there have been enough observers in the Northeast to note its occurrence. Perhaps the last such flight was in 1860–61 when Brewster (Bull. Nuttall Ornith. Club, Vol. 8, p. 121) records that George O. Welch found this

Woodpecker "actually abundant" at Lynn (Mass.) where they "remained through the entire winter."[1]

The records have been sifted carefully and only those about which there seemed to be no possible uncertainty are given here. All of the dates of occurrence in this paper are for the autumn of 1923, and the spring of 1924.

MAINE—Eliot.—Arthur H. Howell writes that he saw one on October 7.

Machias.—F. M. Kilburn found the Arctic Three-toed Woodpecker common during the first half of October and saw several during November.

Portland.—Dr. Ada O. Fogg saw one on Peaks' Island, October 3 and 4.

Waterville.—Dr. Edward H. Perkins reports a female seen there from April 1 to 28.

ONTARIO—Kingston.—Edwin Beaupré records three seen at Kingston on October 11 and adds " this is more than I have previously seen at one time."

NEW HAMPSHIRE—Randolph.—Three were reported here on February 11 by J. E. Norton Shaw of New Bedford, Mass.

VERMONT—Wells River.—The only record available from the State is that of one seen by Wendell P. Smith on October 5. His last date for the winter is February 15. This lack of records from Vermont and New Hampshire is probably explainable to a considerable extent by the paucity of observers in the region.

MASSACHUSETTS—Arlington.—On the afternoon of October 27 Norman W. Hall collected a male in good plumage and later mounted the bird. This specimen was also seen by Ralph Lawson.

Ashburnham.—R. W. Merrick of Gardner reports one studied on May 23 as it worked on a dead tree.

Belmont.—The first bird of this flight recorded in Massachusetts seems to be one seen here on October 6 by P. J. Darlington, Jr. On October 16 he also saw a male near the same place. Samuel D. Robbins found a female " in a large dead white pine " in Belmont on April 21.

Boston.—At Jamaica Pond Francis H. Allen and Charles B. Floyd saw a male on November 9. One was seen here again on November 18 (F. H. A.) Dr. A. L. Reagh found a female "working among the white pines" at Stony Brook Reservation on October 22.

East Lexington.—Professor F. A. Saunders saw one here on October 27.

Harvard.—James L. Peters collected a male in Harvard on October 27.

Holyoke.—Arctic Three-toed Woodpecker was discovered by Aaron C. Bagg on March 24 " drilling in a dead white pine."

Hudson.—At Boone's Pond, Hilda N. Olson found one on October 28 " busy on a dead pine."

[1] Of especial interest here is the report of a flight of these birds in the same region in the autumn of 1925 (Bird Lore, 28, pp. 55, 56).

Lynnfield.—Ralph Lawson, S. G. Emilio, and others observed one October 20 and for several days afterwards.

Medfield.—Manley B. Townsend reports one "picked up on the ground during a heavy rainstorm" on October 24.

Medford.—E. A. Brooks saw one November 3 and 5 at Spot Pond.

Nantucket.—The only one ever recorded on the island appears to be a female seen there October 21 by John A. Farley.

Newton Centre.—The greatest concentration of these Woodpeckers recorded at any one point was on the estate of Mr. F. H. Kennard where scores of dead and dying white pine afforded an abundance of their special food. The first one seen was a male collected on October 17. Another individual appeared by October 20 and during the winter at least three males and two females were accounted for, while all indications point toward the actual presence of perhaps twice as many. The most remarkable fact about this group of birds, however, was the length of their stay, for both males and females were seen as late as the middle of May and at least one male stayed through the early part of June and was last seen on June 12.

Newtonville.—Dr. John Brainerd found a male and a female here on April 6.

Northfield.—A female was seen on November 13 by Professor R. T. Fisher of the Harvard Forestry School.

Petersham.—Dr. Charles W. Townsend found a male "on a dead pine" on May 20.

Southampton.—Bessie M. Graves reported two in a census taken December 26 for 'Bird-Lore'. At the same place A. A. Cross of Huntington, Mass., saw one as late as March 9 "at work on dead pines."

Southwick.—Aaron C. Bagg reports a female seen May 25 on Provin Mountain by "three reliable observers."

Taunton.—A male appeared October 21 and was seen daily for several weeks by A. C. Bent and F. S. Hersey.

West Roxbury.—Francis H. Allen saw a female on March 23.

Winchester.—Grace M. Snow and Charles E. Clarke observed a female here January 13 and February 17.

CONNECTICUT—Branford.—Edward H. Armstrong reports a pair seen October 23 and for some time thereafter; also a female seen October 25 and a male taken "at Pawson Park October 27 and now in my collection."

South Windsor.—C. W. Vibert saw a female on January 2 and kept it under observation until February 22 when he collected it and sent it to John H. Sage in Portland.

Wethersfield.—A female was seen here on October 8 by Benjamin Adams and later by D. B. Hoffman.

NEW YORK—New York City.—J. and R. Kuerzi report a female at Bronx Park on October 14 and a male October 18 to 20 (Bird-Lore, 26, p. 181).

Rochester.—Oscar F. Schaefer records in 'The Auk' (41, p. 351) a male seen October 20 and a dead bird found nearby on October 24 and considers these the first county records for the species.

NEW JERSEY—Englewood.—The unusual character of this flight is emphasized by the fact that it provided the first State record for New Jersey. This bird, a male, was found and collected by Ludlow Griscom on November 29 on the old Phelps estate ('Auk' 41, p. 343).

An examination of these records makes it evident that we have here a case of concerted migration in a species normally non-migratory. Some search for the causes of this flight seems justified by the amount of evidence at hand.

One fact that must be taken into account here is that the birds came south first in a distinct wave, not merely straggling southward as winter came on. This main wave probably reached Massachusetts, October 18 or 19, or perhaps even as early as October 16 (Belmont—P. J. D.) and was discovered when the observers took their week-end walks. For the massing of records on October 20 to 21 and 27 to 28 cannot be assumed to mean more than that bird students must toil on week days like ordinary mortals. Also it is to be noted that this first wave carried the maximum distance and by October 21, the Woodpeckers were seen on Nantucket and in New York City.

The first and most obvious cause which has been adduced in explanation of such flights is the oft repeated one of a "hard winter." The fact that this explanation is customarily overworked need be no bar to its validity, but this flight came in October of an autumn decidedly warmer than the average (cf. Monthly Weather Review).

The opposite of this has, rather oddly, been proposed. Aaron C. Bagg in a letter repeats the suggestion he had previously published (Auk 36, p. 421) that an open winter has some connection with the southward movement of this and other Woodpeckers. But he admits that he can conceive of no reason for this.

That the previous summer had been one of unusual drouth in eastern Canada, seemed important at first, but W. L. McAtee points out in a letter that "these birds feed very largely upon wood-boring larvae most of which spend more than one season in the larval stage and which would not likely be affected by any drouth in the North."

J. T. Nichols has discussed this problem of irregular migration in connection with a brief consideration of the origin of bird migration (Science, 48, p. 168). The occasional flights of such species he terms "centrifugal" migrations and says "the centrifugal condition is the original one with the species in a state of unstable abundance." During such a period of unusual abundance, the species overflows into adjoining territory in a futile and wasteful attempt to expand its range. Through the elimination of these stragglers the species, he suggests, evolves to the condition of an adjusted, permanent resident species. What the cause of such periods of abundance may be, he does not mention.

In the present case, such an abundance of the species in eastern Canada previous to the flight is indeed indicated, though not well proven, by the reports available from the region. It is probably true that the Arctic Three-toed Woodpeckers belongs in Nichols' first category, though we might suggest that it has evolved well on toward the second condition. If, then, we accept this tentatively as the most plausible explanation, there arises in turn the question of why the species should have reached a point of such unusual abundance. What may well have been the most important cause has been put forward by J. M. Swaine, Associate Dominion Entomologist at Ottawa. In answer to a request for information he has sent an account of conditions in eastern Canada. Since these Woodpeckers live on a rather specialized diet of coleopterous and other wood-boring larvae which flourish only in recently killed timber the following summary of his account is of especial importance.

Between the years 1909 and 1914 an outbreak of the Spruce Budworm developed over the whole of Eastern Canada and included the greater part of the state of Maine. The actual feeding of the caterpillars died away in the Province of Quebec, gradually, so that they had disappeared from practically all parts excepting the extreme west by 1916. In New Brunswick the feeding had ceased by 1922. As a result of the feeding perhaps three-fourths of the balsam in the southern part of the Province of Quebec has been killed and at least the same proportion in New Brunswick and Maine.

In New Brunswick and in Maine, in addition to the balsam, a

very large amount of red spruce has been killed. Much of this particularly the balsam, died within a year or two after the outbreak of caterpillars commenced, but a very large part of the timber has continued to die, down even to the present time (1924), although, probably the greater part of the mortality is past. "In these dying balsams and spruce," he writes, "insects such an Monochamus scutellatus and Monochamus marmorator, Pissodes dubius, Pissodes affinis and many bark-beetles bred in almost inconceivable abundance, so that for a long period of years" the Woodpeckers "would have had an almost inexhaustable supply of the very best food and apparently must have had ideal conditions for breeding to great numbers. I am quite sure that Woodpeckers have been more abundant in our eastern woods in recent years, but can give no definite figures."

It would surely be fallacious to suppose this to be the only cause, but from the evidence presented above it seems extremely probable that it was indeed an important cause of this almost unprecedented movement of the Arctic Three-toed Woodpeckers. What the other factors may have been, I can not at present surmise, but I present this discussion with the hope that it may be of use in the study of similar problems.

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