No. 42827A on July 5th, on which date the young were also banded (Nos. 42823A–42826A).

We are eagerly awaiting the 1927 arrivals and indulging in speculation as to the likelihood of our No. 8396A's returning either with this year's mate or a new one. It is also our intention next summer to make a survey of as many nesting pairs in this community as possible, with a view to determining if any more of our banded Warblers have returned to this particular vicinity. Further observations in connection with this interesting experiment will be recorded and published from time to time.

Wolfville, Nova Scotia.

TREE SPARROW RETURNS AND MIGRATION*

BY WENDELL P. SMITH

THIS paper is a further development of two articles published in the *Bulletin of the Northeastern Bird-Banding Association*: one by the author entitled "A Study of Tree Sparrow Migration in the Connecticut Valley", the other entitled "Tree Sparrow Returns: A Comparison," by Mr. Richard Horsey, of Rochester, New York.

The stations have points of resemblance and of dissimilarity. The Connecticut Valley at Wells River is comparatively narrow, the enclosing ranges of hills being from one to three miles apart. Altitudes of fifteen hundred feet or more are reached within ten miles of the river. The Genesee River south of Rochester flows through flood plains. Wells River is about sixty miles farther north than Rochester. Both are in the Transition Zone, but Wells River, being located at the end of a narrow tongue of this zone which extends for some distance up the Connecticut Valley, has a slightly boreal avifauna. Rochester has a slight admixture of Carolinian forms.

At both stations the first Tree Sparrows to appear arrive between October 22d and October 28th. These apparently are birds of passage, as they disappear usually within a week. Several weeks elapse before the appearance of the wintering

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flocks of this species. The latter usually arrive between December 10th and December 29th. At both stations an interval is noted between the last repeat of the winter residents and the disappearance of the species. Both departures usually occur in April, and the interval varies from one to twenty-one days in length.

The evidence is not so conclusive for the spring migration, owing to such factors as new sources of food uncovered by the melting snow which might prove more attractive to some individuals than that supplied at the station, and the difficulty of distinguishing winter residents from migrants. But making due allowance for these factors, there seems to be considerable evidence that the winter residents move northward in advance of many migrants.

The stations are singularly alike in the number of returns. At Wells River, fifteen individuals returned once, two returned twice, and one returned three times. At Rochester, thirteen individuals returned once, three returned twice, and one three times. This makes a total of eighteen returning individuals for Wells River and seventeen for Rochester.

Neither station has had returns from migrants of this species. Mr. Horsey is inclined to believe that this indicates no fixed route between wintering and nesting areas. Much work remains to be done before exact knowledge of migration routes can be ascertained. Observation has indicated that birds follow certain broadly defined routes such as river valleys, sea-coasts, chains of islands, or even across large bodies of water.

Bird-banding in Europe and in America has furnished data for certain species confirming the evidence of observation. For example, the migration route of the White Stork has been traced from its nesting-grounds in northern Europe down the valleys of the Elbe and Oder, through passes in the Carpathians, across the Balkans, and around the eastern shore of the Mediterranean to the Nile Delta and from thence southward to its wintering grounds in Central and South Africa. The routes of several other species have been ascertained by this method, and even in the case of a family with the wandering habits of the Gulls a fairly definite line of flight was found for some species.

In America banding has not yielded as definite results, but, in the case of the Caspian Tern, returns indicate the Atlantic Coast and the Mississippi Valley as routes of migration.

Not enough data have accumulated for positive statements

regarding movements of passerine birds. The disappearance of certain individuals from a station just before the nesting period may indicate their migration, or it may be due to a restriction of range that seems to take place while nesting activities are in progress.

At my station the apparent migratory status is indicated in a number of returning individuals of several species. In the case of some species these apparent migrants have yielded more returns than have summer or winter residents. O for more bird-banders, that reasonable explanations might give place to observed facts! At my own station I have had returns from several species which were apparently birds of passage.

Of twenty-nine wintering Purple Finches banded in 1923 none has returned; but of nineteen apparent migrants banded the same year one returned April 20, 1925, repeated the following day, and disappeared.

Of twenty-five adult Chipping Sparrows banded during four years, three have returned and these were seemingly migrants. Of sixty-seven adult Song Sparrows banded during the same period, four have returned, two of these apparently migrants.

My evidence for the migratory status of these individuals is that they were banded during the migration season and did not repeat or, at most, for only a day or two. They returned during spring or fall migration, repeating only a few times if at all. In several instances these individuals returned at approximately the date of their first appearance.

We have had no returns from Slate-colored Juncos, a fact which is comparable to the failure of migrant Tree Sparrows to return to Rochester. This species is especially common at Wells River during migration, but it is not always common near my station. In 1924 large flocks passed the station and I banded a number; in 1925 migrating flocks largely avoided the station, passing from a quarter to a half mile west, and in 1926 a similar condition prevailed.

It seems apparent that a flyway cannot be compared to a pathway, and that birds traveling a regular route do not necessarily follow a narrow path.

The writer realizes that theories must have facts to prove them. Bird-banding seems to be an excellent method of securing evidence, but it must be carried out on a large scale to be most effective. We have often wished for a line of stations to the northward where the course of our Tree Sparrows might be traced after they leave their winter home in Wells River.