

MIGRATION AT ITHACA IN SPRING 1958

I. C. T. NISBET

Most systematic studies of the relation between migration and weather have been carried out on islands or other coastal areas, or in city parks. The advantage of working in such isolated places is that there is usually a very small population of breeding birds, and that migrants usually halt there for only brief periods before continuing their journey; there is thus little danger of confusing newly-arrived migrants with residents or birds "off-passage", and the migration can be sampled easily, without elaborate census techniques. There is a danger, however, that these observations may over-emphasize the importance of the dramatic "waves" of migrants halted by adverse weather, since in good weather the birds may avoid stopping in isolated places altogether. Observations are badly needed of the migration at inland places where there is unlikely to be an abnormal concentration of resting migrants.

During the spring of 1958, with the help of friends, the writer carried out a survey of the arrival of spring migrants in a single wood at Ithaca, New York. The area chosen was the Renwick Bird Sanctuary, a swampy mixed wood of about 60 acres at the head of Cayuga Lake, with other extensive woodland in the area which offered ample alternative cover for migrating birds. The wood was surveyed by a different person each day for a period of one hour (increased to 1½ hours after May 5th as the trees came into leaf) between 6 and 9 a. m., and the total number of migrating birds (whether positively identified or not) located in this period was compared from day to day. The purpose of the survey was twofold: (i) to determine whether reliable comparative results could be obtained by different observers, without a careful attempt to standardize the methods of observation; (ii) to obtain some information on the relation of the arrivals of the migrants to the weather.

With the exception of April 28th, a count was made each day between April 19th and May 27th. I am greatly indebted to Miss Barbara Lund, and to Messrs. Neil Case, Roger Clapp, Martin Michener, Richard Sandburg and David West for their help in the field.

Results

Omitting the scarcer and less obtrusive species, the table below gives a digest of the results for the main part of the migration.

Although the counts were made by different observers, examination of the results suggests that they can be compared reasonably well from day to day, and reveals few fluctuations larger than those to be expected from normal migration. For example, the counts of most species that breed in the wood, after two or three weeks of fluctuation indicating active migration, varied little from day to day, even when the weather was unfavorable for observation. In a few cases (e. g. Wood Thrush) these later counts scarcely varied at all, while in others (e. g. Redstart) the figures suggest that the counts may be inaccurate by up to 30%. After taking into account the results of counts by two independent observers on the same days, it is believed that day-to-day changes by a factor of two are certainly to be regarded as significant, and that smaller changes may or may not be significant, depending on the conspicuousness of the species concerned.

Using this criterion of significance, there is evidence of immigration by one species or another on almost every day during May, the main period of migration (exceptions are May 4th and 21st). This is perhaps the most important conclusion to be drawn from the observations. However, it is clear that the amount of immigration varied greatly from day to day: there was a major peak on May 12th, and smaller, but still well-marked peaks on May 2nd, 5th, 10th, 15th and 19th. Examination of the Daily Weather Maps published by the U. S. Weather Bureau shows that no fewer than four of these peaks (those of the 2nd, 12th, 15th and 19th) followed the same type of weather situation — the passage of a front, extending more or less from west to east, through upstate New York during the previous night. They thus provide examples of the classical type of "arrested wave" that has been recorded on many occasions in North America (see, e. g., Bagg 1950): in each case it seems likely that northward-flying birds were stopped by the rain and drop in temperature at the front, and were thus concentrated in the area through which the front has passed. The other two peaks took place in calm anticyclonic weather, and there is nothing in the weather maps to suggest any similar concentrating action: more probably the birds were taking advantage of the calm weather and good flying conditions, despite the low temperature due to polar air and clear night skies. (Fuller details of the migration in this period are given by Bagg, 1958.)

The fact that most of the peaks were associated with frontal weather is of some importance. The entire populations of some species (e. g. Wood Pewee, Red-eyed Vireo) must have passed through after May 12th, the date of the only major local migration wave. Yet so few of these birds were seen on the census that it is difficult even to be sure on which days most of them arrived. Moreover, on some days (e. g. May 11th) very little migration was detected at Ithaca although large migration was recorded not far to the north (Bagg, 1958). This suggests the possibility that the greater part of the migration took place in such a diffuse way as to pass largely undetected, while migrants were only seen in large numbers as a result of more or less abnormal concentrations, which may not have reflected real peaks in the migration. Since local observers remarked on the lack of waves and the small number of birds to be seen in 1958, these conclusions may apply to other years as well.

However, it would be unwise to draw too definite conclusions from records from only one place, in a season of perhaps unusual weather (a cold, wet spring with few warm spells resulting from northward flow of tropical air). It is possible that in years when the weather is more varied the migration may be more clearly broken into waves, with many more days when there is no migration at all. There is clearly scope for much more work of the same kind, and it is greatly to be hoped that others will undertake similar investigations in the future. Little special skill or organization is required, merely the ability and enthusiasm to spend an hour afield each day, and the additional knowledge to be gained provides its own reward.

References

- BAGG, A. M. *et al.* 1950. Barometric pressure-patterns and spring bird migration. *Wilson Bulletin*, 62:5-19.
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21 Wendell St., Cambridge 38, Mass.