

THE TECHNIQUE OF STUDYING NESTING SONG SPARROWS

By MARGARET MORSE NICE

IN order to study a population of nesting birds it is essential to band the adults on their territories and the young in the nests. To deal successfully with these problems one needs to be well acquainted with the life-history of the species. For my work in 1930 on more than thirty pairs of Song Sparrows in Columbus, Ohio, the intensive observation of one pair the previous year was a necessary basis for it gave me a key to the birds' behavior.

Banding Adults. The colored bands originated by Dr. W. K. Butts were indispensable to me for distinguishing the birds in the field. The majority of celluloid toys are too frail for bands, ten- and 25-cent dolls and sometimes rattles proving the best material in my experience. Pale colors faded to white after a few weeks of exposure to the weather. For holding the celluloid around the nail in boiling water I use forceps; the resulting band is slightly elliptical, but works satisfactorily.

Each pair was trapped on its own territory as a rule, although sometimes one location would attract a neighboring male. The territories of *Melospiza melodia melodia* in my area average about two-thirds of an acre, and each pair stays faithfully on its plot of ground until the fall migration, a period of seven to eight months. I baited the birds for several days before placing the trap, often choosing a spot near one of the male's "singing trees." A Government sparrow trap and a pull-string trap were used. Trapping was never carried on during incubation nor until the young were two-thirds grown for fear of disturbing the birds. Song Sparrows come to a feeding station about once every twenty or twenty-five minutes.

If possible, banding should be done early in the season, both because it is easier to attract the birds to a feeding-place before vegetation has grown, and also so as to obtain a complete record of the survival of individuals and of the constancy of the pair. During the nesting-season of 1930 about a fourth of the nesting adults disappeared. As to shifting of mates (when both survived), there was only one case in which it might have happened, and this cannot be proved because one of the birds was unbanded. Eleven pairs, I know, stayed together throughout the season.

I cannot distinguish the sexes in the trap, but depend upon watching their behavior afterwards. Before nesting has begun

and while the male is singing very little, he can usually be told by his tendency to mount bushes and she by her habit of keeping to the ground. One cannot be sure that two adults taken in the trap with young are the parents; in one case they turned out to be the father and a strange male that was trying to establish a home in the vicinity.

Banding the Young. In order to know ancestry and exact age, the young should be banded in the nest whenever possible. I prefer to do this at the age of six days, but sometimes it can be done at eight days without frightening them from the nest. If a nest is discovered with four or five young evidently ready to leave, I have found a cotton stocking a convenient place to stow the brood, extracting them one by one for banding.

Of the 61 nests of this species located in 1930, 9 were found by seeing the female building, 13 contained young, and 39 contained eggs. In general the early nests are easier to find than the later ones, because, although they are well hidden, the actions of the parents can be seen, whereas late in the season the female can come and go entirely concealed by the heavy growth, and the male has little zest for singing. Yet, because late nests are usually built above the ground, they are sometimes more conspicuous than the early ones.

It is not easy, as a rule, to find a nest with young, for the parents are suspicious then; they may descend to the ground at some distance from the nest, and during the latter part of nest-life there is no flushing female to give away the site. One has to watch at a considerably greater distance than during incubation and may not be able to find any satisfactory vantage-point. The parents show more concern over young recently out of the nest than over those still in it.

Most of my nests were discovered while they contained eggs. To get a clue to the site, I select a seat overlooking as much as possible of the territory and wait, watch in hand. The male normally does a good deal of singing while his mate is on the eggs; as long as the song is fairly continuous, it helps little as to the nest location. Usually he stops singing and disappears into the grass, and then after some minutes he flies to a new perch and gives one or more songs suddenly and loudly as a signal to his mate. The female in response often leaves the nest immediately, sometimes after a minute or two, and occasionally not until some time later. She may utter the characteristic *chink* as she appears. The "signal song" may be given as near as five feet or farther than fifty from the nest; the singer usually faces it, but sometimes per-

sistently looks the other way. He very rarely visits the nest while it contains eggs. The female returns to the nest in about eight minutes. Keeping the places of appearance and disappearance both in mind, I then begin the search, getting the final clue from the female, who flushes only upon close approach. The routine of incubation is about twenty to thirty minutes on the nest, and seven to nine minutes off throughout the day, but both periods are sometimes longer or shorter. At times this method of nest-discovery fails because it is impossible to get a satisfactory view-point for watching the birds; also late in the season the male has so little energy for singing and the female so much cover that the birds may be able to keep their secret to themselves. It will be interesting to know whether this practice of the male singing his mate off the nest obtains with other birds.

Resumé of Nesting Activities. Song Sparrows near Columbus attempt to raise three broods, often laying a fourth set if one or more nests meet with disaster. Territories were taken up by the males between February 5th and March 15th this year, the females arriving between February 21st and April 16th. The male sings a great deal before the arrival of a mate and almost none after that until nesting starts. He sings with enthusiasm during incubation but little while feeding the young in the nest, beginning once more with incubation of the second nest, his zeal gradually diminishing with the approach of the molt. Both birds carry nesting-material in preliminary activities, but when the site is finally decided upon the work is done entirely by the female. Incubation lasts 12 days; the young normally stay in the nest from 9 to 11 days, usually 10, and are fed by their parents for 14 to 18 days more on or near their territory, except in the case of the last brood, when the whole family may wander away. After a nest has been broken up, the new set of eggs is usually complete in 9 days, and the brood leaves from 28 to 30 days after the date of the disaster. When two successful nestings follow each other, the later brood leaves the nest from 30 to 41 days after the flight of the first.

Records. For a field record of the nests I use large sheets of lined paper divided into nine columns, each column being devoted to a pair, and each horizontal line to a day, so that one page gives a brief account, useful for ready reference, of nine pairs for three weeks or so. Each day that I positively identify one of the adults, seeing the bands or recognizing a song, I underline the notation, as "♂ sings," "♀ feeding young," so that if one of the birds disappears later there is a

record of when it was last seen. For detailed observations I use large note-books. In the one I carry with me there are the daily records written in full, a map of the region with the location of each pair, inside the back cover each bird's field number, sex, banding scheme, and band number, and opposite it a key to the birds arranged according to the color of the band. In another note-book several pages are devoted to the summarized history of each pair.

In designating my birds the band-numbers are disregarded entirely in practice, for they are cumbersome to use and difficult to read, moreover they show neither sex nor relationships. Besides, a bird has to have a name before it is banded, and some that I dealt with never reached that distinguished stage.

My birds are numbered from 1 on, the position of each pair being recorded on a map. Since the male is the one that takes up the territory and has the distinctive songs, he is given a number that belongs to him alone, a successor on his territory being given a new number. Females are named according to their first mates, *i.e.* 25f. When it is necessary to distinguish different mates, the year is given, as 1f28, 1f29, 1f30; if there are more than one in a season, they are labelled 4f30a, 4f30b, 4f30c. But if one is considering only one season, 4fa, 4fb, 4fc will be sufficient. When a female changes mates, her second name is added to her first, as 1f29:5f30—the bird that was 1's mate in 1929 and 5's mate in 1930; 27f30:26f30b—27's mate early in 1930 and later the second mate of 26. If 26 and 27 remate next year, her formula will be 27f30:26f30b, 31. These double and triple names are only for the records; the second female can be known simply as 27f since 27 disappeared unbanded, but the former will have to be 1f29 since 1 has had other mates.

Ancestry can be shown by parentheses after the bird's first number, for instance—13f30(1, 1f29):30f30b, *i.e.* 13's mate was the daughter of 1 and 1f29; after 13's death she mated with her neighbor 30, who had lost his first mate. Grand-parents can be given in brackets after each parent, great-grandparents in parentheses within these, etc. For example, here is a hypothetical case: 113(60[17, 17f30], 60f31[13, 13f30(1, 1f29)]), which means that 113 is hatched in 1931, the son of 60 who was the son of the 17s in 1930, and of 60f the daughter of 13 and 13f, who in turn was the daughter of 1 and 1f29. Young birds receive no field numbers unless they return and nest.

A complete designation of the bird includes the band-

number, the manner in which it is banded, the field number and its marital and ancestral relationships, but for everyday use all that is needed is the shortest form of the field number. This scheme of nomenclature is convenient in practice and distinctive for each bird; it shows sex, and mates each year, and when necessary can give all known information as to progenitors.

Now that we have the Biological Survey bands that tell us whether individuals return and the celluloid bands that enable us to recognize them in the field, the way is open for endless possibilities in life-history studies.

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FURTHER BANDING NOTES FROM TERN ISLAND, MASSACHUSETTS¹

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THE seventh season's work among the Common Terns (*Sterna hirundo*) and the Roseate Terns (*Sterna dougalli*) at Tern Island, Chatham, Massachusetts, began on July 5th of this year. Prior to that date, in June and July, 1930, many immature birds of both species were banded by Warden Everett Eldridge, Jr., and a member of the Northeastern Bird-Banding Association. Upon the writer's arrival on the 5th most of the young were flying and could be observed about the island and near-by beaches in large numbers. The first day was spent in banding the young, and 704 Common and 101 Roseate Terns were handled. There were few nests with eggs or young, and the number of dead seemed unusually small, which indicated that the weather had been favorable for the successful rearing of thousands of young Terns (June was a month of warm weather with little rain), that the adults were finding food in abundance and were able to keep the young well fed, and that the birds in this rookery were not subject to the enemies that attacked those in many of the near-by colonies. At Billingsgate Island, lying approximately twenty-five miles northwest, the Terns were robbed of their eggs in 1929 by a party of egg-

¹ For previous papers on banding operations on this island, see *Bulletin Northeastern Bird-Banding Association*, Vol. I, p. 58; Vol. II, pp. 32 and 68; Vol. III, p. 95; Vol. IV, p. 125; and Vol. V, pp. 43 and 144.