

## WINTER OBSERVATIONS AND A STUDY OF THE NESTING OF ENGLISH SPARROWS\*

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### INTRODUCTION

DURING the winter of 1936-37 and the summer of 1937, the writer caught 2,825 English Sparrows on the campus of Cornell University. 972 were banded and released. The banding was sanctioned by the United States Biological Survey because of the unusual opportunity to capture and observe easily a large number of the birds.

The beef barn at the college harbored an estimated 6,000 sparrows during the most severe periods of the winter. Here the birds could be enclosed in the stalls, driven into the interior of the barn, and finally captured in a small room that could be darkened. A funnel trap over a pair of sliding doors was also found to be successful. (See Fig. 1.) Aluminum bands as well as white tail plumes were used for marking. The additional feathers aided greatly in following flock movements, and in estimating the total number of birds. Counts were made quite regularly of birds in small areas and the number of plumed birds compared with the non-plumed ones. As many as 200 birds were captured and marked at one time.

Another area, two miles from the barns, located at the head of Cayuga Lake, in the Louis Agassiz Fuertes Bird Sanctuary, was used for comparison. A park pavilion in the sanctuary provided nesting sites. There were never more than 250-300 birds observed here.

### FLOCKING

By the time that the last eggs were hatching in late August, 1936, flocks of young birds with a few adults were observed to roam about the fields in the vicinity of the college barns. Adults became much less obvious at the cessation of nesting when molting was under way. Fields of shocked grain and weeded thickets had to be scoured to collect adult specimens in the process of molting.

In October the birds were observed in small flocks of twenty or thirty individuals feeding about the buildings. These flocks contained more adults than those observed in August. At night they congregated by the hundreds on the ivy-covered walls of the stone and brick buildings. Here they found shelter as long as the leaves remained upon the vines.

By late November and early December practically all the leaves on the vines had fallen and the birds moved elsewhere. By this time

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they were feeding about the barns in much larger flocks, picking grain from the cattle pens and the open food troughs. The number fluctuated greatly, increasing with the severity of the weather and reaching the maximum of approximately 6,000 birds several times in February and March.

Contrary to expectation, the birds did not roost in the barn. It seemed an ideal place and yet at dusk each evening small flocks left the barn and flew in the direction of an arboretum of hawthorns nearby. By dark, only four or five birds could be found in the rafters of the barn. However, never more than a few birds could be flushed from any one of the hawthorns at night.

As spring approached, the birds started to leave the area of concentration, coming back only for short periods during severe weather. By mid-March some courting activity became evident in the flocks, and by April many of them mated and prepared to nest. When the time for nesting actually arrived, few large flocks were observed and not more than one hundred birds could be seen about the barn. Small flocks of birds were observed throughout the nesting season, and it is believed that some of the first year birds did not nest the first season or at least waited until late summer for their first nests. Perhaps this occurred only in the last broods of the previous fall. As nesting progressed, the small flocks of young birds were increased by the young of the first broods.

#### WINTER RANGE

The unusual concentration of birds about the beef barn is indicative of the effect of an unlimited food supply in winter. Birds congregated here from an area three or four miles in diameter and possibly more. Banded birds were observed and several collected on farms one and one-half miles to the east and north and two miles to the south and west in parts of the city of Ithaca.

Some of the birds, decorated with red, blue or yellow feathers, were transported to distances of five, ten, twenty, and thirty miles from the place of banding. Individuals returned from these distances but when transported farther than that were not retrapped at the barns. A few of the birds released in Elmira and Watkins Glenn, New York, were observed to remain in the areas for several weeks. One was found dead in Jamestown, New York, several months after being released there.

In numerous instances birds that were banded together were retrapped together. Likewise birds released at distant points at the same time were observed together later at the original place of capture.

#### SEASON OF NESTING

The nesting season started in Ithaca in 1937 the first week of April and extended through the third week of September. Figure 2

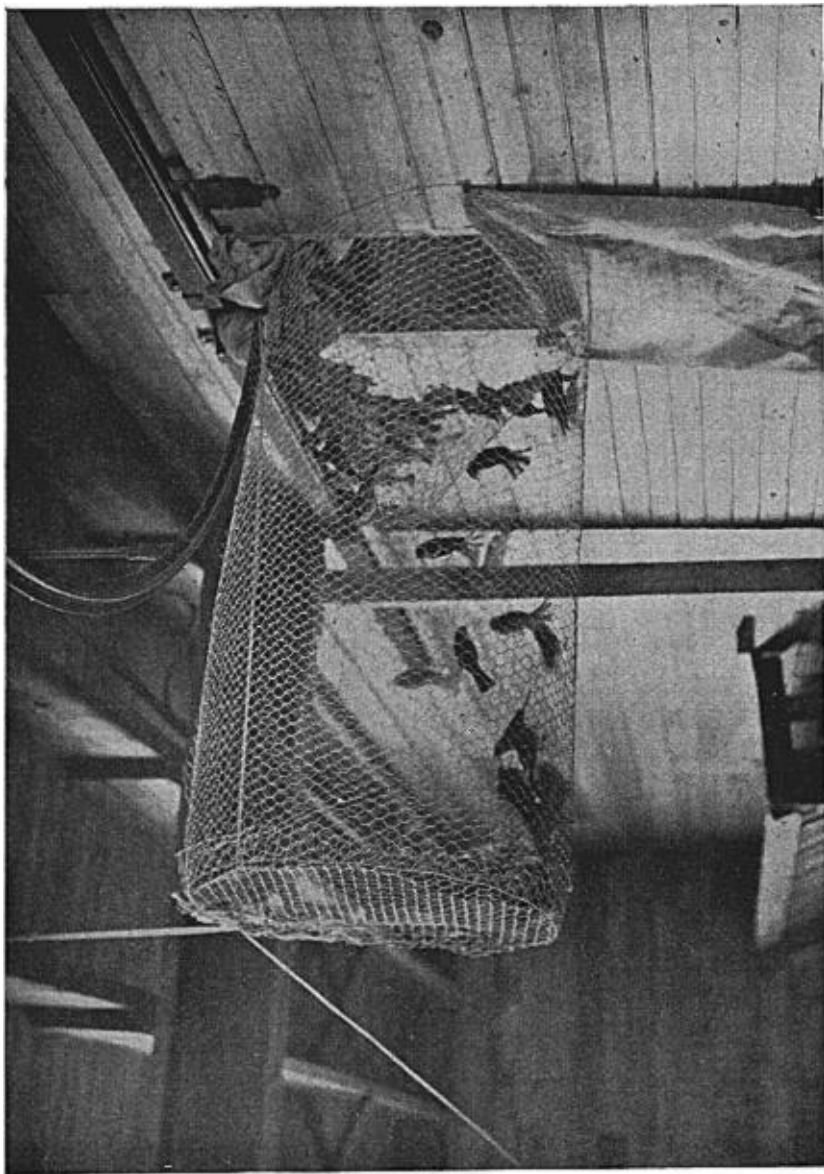


Figure 1. Funnel trap used in beef barn for catching some of the Sparrows.

is a graph prepared by recording the dates of the laying of the first egg in each clutch, grouped in weekly periods.

The graph shows four major peaks during the nesting season. The first peak appeared in the latter part of April, followed by a sharp decrease the second week of May. This was due to the occupancy of most of the available nesting sites for a period of 28 to 31 days after nesting had begun. As these first broods left, other adults were able to start their egg laying in the same sites. Therefore, the second increase starting the middle of May, indicates roughly the reoccupancy of the sites. This likewise required about one month.

Adults that nested during the first period did not nest during the second period unless the first broods were interrupted. The young required their attention for a period of two or three weeks after leaving the nest. These adults were free to nest again during the third period of nesting and some of them did so.

The third rise occurred the middle of June and early in July and was about as extensive as the former ones, but was spread out over a little longer period. The low that follows reached the bottom in early August. The fourth peak occurred in the middle of August and was much smaller. These adults were the last to lay, the last pair laying the initial egg on August 25. Young of the last broods

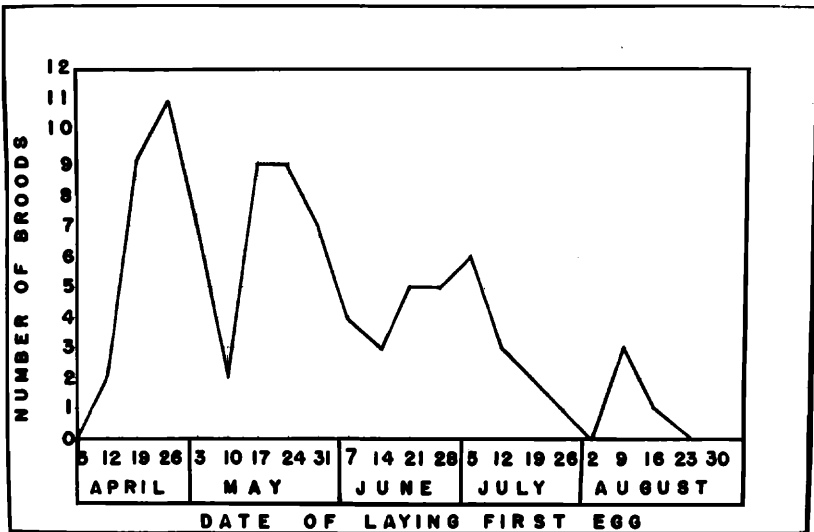


Figure 2. Graph showing number and distribution of broods of English Sparrows raised in two areas at Ithaca, N. Y.

were therefore in the nest beyond the middle of September and required the attention of the parents into October.

The evidence obtained from marking 22 of the adults occupying nests under observation indicates that where broods were raised successfully other adults immediately occupied the sites. Only six or seven days elapsed between occupancies in the early part of the season. Near the end of the season, a whole month might elapse before the site was reused. Very few nests were constructed after the middle of the nesting season, there being enough old sites to supply the demand.

#### SELECTION OF THE NEST SITE

Nest sites were chosen both before and after mating had occurred. If before, the male selected the site and performed his courtship from there, but if afterward, the female helped with or probably did most of the choosing.

They often inspected the sites together, both going in and out of crevices or old nest sites until one was chosen. The female then began to place nest materials. One, and sometimes both adults, would carry a piece of nesting material during the initial inspections.

There were only a few essential requirements for selection of a nest site. None of the nests studied were lower than six feet from the ground, and sites over eight feet were chosen most often. Most of the sites were also characterized by being rather inaccessible. Sites that permitted the nest to be partially or entirely hidden were preferred to an open site. Boxes were not preferred to natural sites if the natural ones were well hidden. This was shown at the sanctuary pavilion where the boxes were placed beside the natural sites. Only five of the twenty-five broods raised there were in boxes, the others being in rafters under the overhanging porch.

An interesting change occurred at the beef barn. None of the boxes were occupied during the first broods. The birds nested in the rafters of the barn. When the second broods were started the boxes were chosen and thereafter became the favorite sites. In the middle of the nesting season only a few nests were located in the barn. At the sanctuary pavilion, boxes were not used until most of the natural sites were occupied. Boxes or natural sites were not occupied at the same time if closer than three feet. A box of many compartments to determine how many nests are used simultaneously, should make an interesting study.

Three boxes were placed several inches from each other in two instances but none of the boxes were occupied for a complete nesting period, although one female did lay two eggs in each of two houses and then deserted both of them.

Five nests were reported in trees during the 1937 season in Ithaca. Five others were observed in vines on one of the buildings.

## SELECTION OF NEST MATERIALS

The variations in nest structure resulted mostly from the presence or absence of certain nesting materials. The commonest form of nest was one with an outer structure of coarse hay or dried weeds, and a lining of finer materials such as feathers, cord, hair, and frayed rope.

Hay and dried weeds were preferable to straw. Feathers were preferred to other lining materials and the birds often traveled several hundred yards to the chicken yards to obtain them. However, the nests in the barns were usually found with very few feathers and those at the sanctuary pavilion with many feathers. Chickens were not found around the beef barn but ducks were common in the sanctuary area. Several nests placed in boxes at the sanctuary were built almost entirely of feathers.

In some cases, sparrows were observed to tear old Robin, Song Sparrow and other English Sparrow nests apart for materials. If materials were scarce the lining was eliminated or partially constructed.

## NEST BUILDING

Males spent much time about the nest sites before nest building actually began. They often added nest materials to old sites or placed a few strands in new sites, but they never built much of the nests. The females played the major role in nest building. The males accompanied the females on trips for materials and often carried some to the nest site, but the females performed most of the construction work.

Coarse materials were brought to the site selected and layed down rather loosely for a foundation. When a strong support was necessary many stiff stems of hay or weeds were forced into small crevices around the sides and bottom of the nest. As the bulk increased upwards, the female formed the cup by turning round and round in the center. This movement caused the long strands to bend into a "U" shape. The ends were, therefore, forced up along the sides and helped to support the roof, which was added next. After the outer shell was constructed, the lining was added.

The nests were usually covered over and the entrance was placed to one side. However, if the nest was in a box, or other roofed enclosure, the dome-shaped roof was not always added.

The males often performed the final lining alone, or at least brought the feathers to the nest and the female placed them. The female laid her eggs before the final lining was added and while she incubated, the male gathered lining materials.

## NESTING POPULATIONS

The nests in and around the beef barn, and the bull barn which was located nearby, were inspected weekly and usually oftener.

Records were also made on all the nest sites around the park pavilion in the Fuertes Bird Sanctuary. 5,000 to 6,000 birds wintered in the vicinity of the barns while only 200 to 300 wintered about the sanctuary.

Additional nesting sites were placed around the two areas. Seventy-five boxes made of roofing paper were erected in various positions in both areas.

The distribution of nests and the number of sites that were used in the two areas were as follows:

<i>Location</i>	<i>Nest sites used</i>	<i>Broods in ordinary sites</i>	<i>Broods in boxes</i>
Area I—Beef barn.....	25	21	16
Bull barn.....	8	23	(no boxes)
Area II—Sanctuary Pavilion.....	12	20	5

The availability of nesting sites seemed to be the prime factor in determining nesting populations. If there is a scarcity of sites, the ones that are available will be used more often during the season. This was illustrated at the bull barn, where no boxes were placed and few sites were available. With only eight sites used, there were 23 broods produced.

Boxes added in both areas, received the most use in the area with the larger winter population. Many boxes and numerous ordinary sites remained unused in both areas.

The winter population had some effect upon the nesting population but not as much as expected. A total of sixty broods were raised in Area I while twenty-five broods were reared in Area II, making one brood to every one hundred wintering birds in Area I and one brood to every ten wintering birds in Area II. If the study were to be extended to include all the nesting sites within the general area in both cases, a greater effect would undoubtedly be found to exist.

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