

FURTHER NOTES ON THE NESTING OF THE BARN SWALLOW

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IN a former article in 'The Auk' (vol. 50, October 1933), we gave a record of intermittent observations on a nesting pair of Barn Swallows (*Hirundo erythrogaster*). So interested did we become in the many unsolved problems suggested, that we have continued the study as time and opportunity offered.

In 1933, fire destroyed the building used for years as a nesting site by this species. But later in the season, a new building replaced it, too late, however, for nesting although many a fall migrant swallow found its metal roof a convenient place for resting. The barn itself was not open to birds but a shed, open on three sides, adjoined the larger structure. This was fifty feet long by ten feet wide with a height of twelve feet. In addition to being more accessible, it afforded a better opportunity for observation.

On May 22, 1934, a pair of Barn Swallows was seen flying about the structure, the male in pursuit of the female. This was the first indication of interest on the part of any individuals of the species in the building as a nesting site. Two days later, on the 24th, work on a nest began. The site selected was the top of a large beam under the roof, close to the wall of the barn and about fifteen feet from the end of the shed. By nightfall of the 24th, a shell of mud, one inch in height, had been constructed, forming three-quarters of a circle, while the fourth quarter was formed by the barn wall. During the morning of May 25, the pair was seen inspecting another part of the beam but the birds soon returned to carrying material to the location first selected. During the 25th and 26th, another half-inch was added to the mud wall, the work being carried on at intervals with frequent intermissions. May 27 saw the structure increase approximately one-half inch in height although more material was added to the center of the mud shell and progress was by no means uniform. The 28th of May witnessed an acceleration of activity, with work moving rapidly and much more regularly. The resting and feeding intervals, however, were longer and more numerous during the afternoon. Bits of straw were first used as material on the 28th. May 29 saw a continuance of activity with the structure apparently completed by nightfall. But this was not the case from the birds' standpoint as work was carried on during the four following days. On May 31, the female was seen shaping the interior by movements of the body, pressing her breast against the sides, moving about from side to side. Some work, both in bringing new material and in moulding into shape, was continued until June 2, when the structure was completed in the morning of that day. Both sexes took part in procuring material, but

the female only was observed shaping the nest and she alone seemed active in securing material as the structure neared completion. In the earlier stages the male carried less material but was more active than the male described in the previous article.

The spring, which served the pair of the preceding article, also afforded this pair a source of mud in part, although a nearby drainway was also visited. Straw was secured within thirty feet. The female was seen flying to the nest with a piece of straw ten inches long, rather too heavy a load as it impeded her flight. Frequently the bird would take bits of straw and mud at the same time, picking up the former and then flying to the source of the mud supply before returning to the nest. Considerable picking was required to complete a load and often a bird would leave for the nest apparently dissatisfied with the amount of material secured.

On June 3, the day following the completion of the nest, the first egg was laid and one was added each day until the completion of the clutch of five on June 7. Incubation began in part at least with the laying of the second egg on June 4, as the female was seen sitting a number of times throughout the day. At daylight on this date and subsequently at nightfall, the male was perching on the beam within two feet of the nest.

Evidently the shed was held as territory, for on June 6, when a Phoebe (*Sayornis phoebe*) attempted to investigate the beam at the opposite end of the structure, thirty-five feet distant, it was driven away by the male several times. This was repeated a number of times during the succeeding ten days, for the Phoebe seemed bent on finding the second nesting site in the shed. On May 29, another Barn Swallow (a female) was driven away by the male. Subsequently a female of this species was seen about at intervals and was usually driven away by the male of the nesting pair but not always. On the 17th of June a pair appeared and their coming brought forth both individuals of the nesting pair to do battle. The male in possession flew at the intruding male and, after a few feints and angry twitterings, the intruders departed.

Four eggs hatched on June 20, and the fifth on June 21. This would allow fourteen days for the incubation of the egg last laid. It is probable that despite the intervals of sitting on the 2d of June, incubation did not begin until after the laying of the fourth egg on June 6.

Perhaps typical of the incubation period is the following forty-five-minute schedule observed: June 17, 10.20 a. m., both male and female perching on wire, sixty-five feet from nest, the former taking flight at intervals to hover over the female while uttering soft, twittering notes. The female enters nest at 10.22 and remains until 10.45. Meanwhile the male also, leaving the wires at 10.22, flies over the fields until 10.28, when he returns to the same resting place where he utters those few feeble notes that pass for song

in this species. Off again at 10.30 for another flight afield, lasting four minutes, he is back again at 10.34, this time perching on the barn roof. At 10.36 he flies again and continues coming and going at intervals of a minute or less until 10.45, when he flies directly to the nest and the female leaves. She spends three minutes flying about adjoining field and returns for a two-minute rest on the barn roof. At 10.50 she leaves again but returns at 10.54 in company with another pair of Barn Swallows. The male left the nest at 10.55, driving away the intruders, and with his mate flew to the nest but we were unable to see what was done there. A three-minute period of rest on the roof followed and the nest was again visited by both individuals. Both left at 11.03 and the female returned alone at 11.05 to enter the nest.

Owing to nest location, we were able to observe in more detail than formerly the departure of the young and the events preceding. The evening of July 4 witnessed a break in the parents' habit of spending the night near the nest. They were last seen flying about at 8.00 p. m., and investigation with a flashlight at nine o'clock verified the absence of the female from the nest and the absence of both parents from the shed. The search was repeated just before dawn with similar results. Where they spent the hours of darkness on the night in question and on the following nights preceding the departure of the young, is a mystery, but that they had a definite roosting place is indicated by their disappearance at dusk and reappearance in the early morning from a particular direction at approximately the same distance. On the morning of July 6, the male appeared at 3.52:30'' a. m. and the female at 3.58:30''. On the 7th of July the parents were last seen in vicinity of the nest at 7.46 p. m.

On July 6 and 7, the heads of the young were protruding well above the rim of the nest and on the date first mentioned one of the brood ventured to perch on the nest's edge. On the following day three were seen in that position.

At 7.57 a. m., on July 8, both parents approached, and flew slowly on hovering wings back and forth through the shed, at times coming to rest in mid-air near the nest and throughout the performance uttering soft, coaxing notes, urgent in character despite their persuasiveness. After about four minutes of this activity one young bird suddenly sprang into the air from the nest. Instantly both parents followed it, flying in and out, above and below their offspring, the while encouraging it by voice and light contacts. A flight of one minute ended in rest upon the barn roof and another brief flight was followed by a similar period of rest. The young swallow flew well, but seemed somewhat unsteady while banking and turning against the wind. It rapidly gained confidence and appeared to enjoy the exercise while the parents clearly evinced satisfaction. After seventeen

minutes spent with this bird, the parents returned to the shed at 8.18 a. m., and began a repetition of their flight around the nest, but two minutes of this failing to arouse any response from the young they ceased temporarily. Intermittent attempts throughout the day ended in failure so that at night-fall the four occupants were still in the nest. The parents left them at 7.25 p. m. The second young swallow left on July 9 (the following day) between the hours of 6.00 and 8.00 a.m., and all five left before 12.30 p.m.

Prior to leaving, the young had been banded, numbers L33489-493 inclusive, and as this brood was the only one banded, the young could be recognized whenever a band could be seen. This made it possible to follow the family fortune in a measure. At 6. 40 p. m. on July 9 (date of departure for four of the brood), the whole family returned to the shed, flying around under it and about the barn. By 7. 15 p. m., three had settled in the nest. At 7.30, the two remaining young had perched just outside the structure but at 9.00 p. m. a flashlight revealed all five packed into the nest. On the 10th, they came at 6. 00 p. m. and again spent the night in the nest and on the 11th, they used the nest again as a roost for the last time. They came back to the shed at sunset on the 12th, but after flying about the shed for a time, they left to seek some other place for the night.

During the first few days subsequent to leaving the nest, the young swallows remained for the most part within view of the nesting site. When not flying they spent the time resting on wires, two perches being located respectively within thirty feet of the former nest and four hundred feet distant. On July 12, another family of Barn Swallows entered the area, resting on the wires near the nest in company with the family possessing the territory. No resentment was shown by the parents of the banded brood and, while apparently merged in one flock, each family group kept its identity, for when certain parents approached with food, the banded young remained quiet while those unbanded opened bills and fluttered wings and vice versa. On the 13th, the two families were still together with the relationship unchanged. The first evidence of the breaking up of the family was noted on July 15, when only two of the young were seen together. A decrease in feeding by the parents was also noticeable on this date. The family separation was only temporary, however, for the five were together daily until the 18th, and feeding by the parents was continued. The alien swallow family left on the 16th. Five young were observed together on July 20, and three of them were wearing bands. The parents accompanied them. Three banded young were seen in the same location on the 21st, in company with seven young of the same species, but their behavior did not indicate coherence. One banded individual was recognized in a flock of four young on July 25, and one, also marked, in a group of fifteen on August 6. Five young with two adults were flying around the old nest on July 26, but presence or absence of bands could not be determined.

These activities may be compared with the behavior of the species in general in this vicinity as follows. Flocking evidently began about July 15, as flocks larger than family units were first seen on that date. Migration seemed under way by August 2, and local breeding birds seemed largely gone by August 18.

There was no second nesting, although on July 14, the adults were seen flying about in the shed which supplied the former nesting site. On the 15th they were inspecting an old Phoebe's nest in another building 125 feet away. Investigation of one or both sites continued until the 18th, but after this date no interest was seen to be displayed until July 29, when the female sat for some time in the old Phoebe's nest. During the period of July 14-18, the male frequently displayed great interest in the search for a new nesting site, hovering over the female and twittering excitedly. After the 18th, interest on the part of both individuals rapidly waned.

A third individual, an adult female, seemed to take some part in rearing the young. We have already mentioned this bird briefly, as having been driven away a number of times. On July 6, the two females were seen sitting side by side within two feet of the nest and the male sat about fifteen feet away. Their relations were amicable despite the fact that two hours before, the male had driven away this superfluous female several times. On the 7th, this third individual was still about, but only once was the male seen to show any displeasure over her presence. The following day witnessed even more frequent visits but the male drove her away more often and she was not seen in the vicinity again. At no time was this female seen feeding the young or brooding. We wondered what her status could be but it remains one of the many mysteries which we hope further observation may solve.

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