

A CONTRIBUTION TO THE LIFE HISTORY OF THE CLAY-COLORED SPARROW

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DURING the summer of 1959 I made a study of the Clay-colored Sparrow (*Spizella pallida*), near Kindersley, Saskatchewan. I observed seven nesting pairs of unmarked birds during the breeding season. The only published studies of this species in recent years are those of Walkinshaw (1939 and 1944).

ENVIRONMENT

The study area, approximately six hectares (15 acres), was prairie grassland, surrounding a large dam. A shelterbelt of Box Elder (*Acer negundo*), approximately six meters in height, surrounded the study area. In addition to prairie grasses, shrubby vegetation in this area included snowberry (*Symphoricarpos*), rosebush (*Rosa*), sage (*Artemisia*), and willows (*Salix*).

The study began on 16 May 1959 and continued until 28 June 1959. A total of 80 hours was spent in observation, usually from 0630 to 0900 m.s.t. daily and about 10 hours per day on week ends.

TERRITORY

Censuses made on 22 May and 6 June, showed that there were 12 pairs of Clay-colored Sparrows on the study area. The minimum distance from each nest to the nearest nest of another pair among the seven nests studied varied from 20 to 900 meters. The mean distance was 385 meters.

Several male Clay-colored Sparrows were observed to chase intruding Clay-colored Sparrows from their territories. One male Clay-colored Sparrow chased from his territory a Song Sparrow (*Melospiza melodia*), but showed no aggressiveness toward Eastern Kingbirds (*Tyrannus tyrannus*), which occasionally perched beside him on his singing perch.

MATING

Copulation took place on a horizontal branch of a tree or bush from 0.3–2 meters above the ground. Two pairs were observed copulating. One copulation was observed on 7 June 1959. The female crouched in soliciting posture with head and tail slightly raised and wings vibrating;

the male approached, hovered momentarily and dropped upon her while the female uttered a *tit, tit, tit* call. The first egg of that pair was laid on 11 June 1959. Copulation was not observed after the beginning of egg laying.

On 6 June 1959 a flight display was observed before the act of copulation of another pair. The pair flew from their perches and looped upwards, meeting each other and making contact with the ventral area at the bottom of each loop. Both sexes called *tit, tit, tit* constantly during the display in which they rose to a height of about six meters. They then copulated on a small bush.

NESTS AND NEST BUILDING

In five pairs observed, nest building was by the female only, usually during the morning. The female frequently was accompanied by the male on her trips for nesting materials, which she gathered within 100–150 meters of the nest. During a one-hour period—1010–1110 c.s.t., on 6 June 1959, during the first day of nest building—one female brought materials 22 times. On 11 of these visits she was accompanied by the male. The female uttered a *tit, tit, tit*, while gathering nesting material. Nest construction required two to four days in four pairs observed.

The female first constructed a platform, then sitting with tail erect she turned in the nest, molding it to fit her body contour. She arranged the material in the rim with her bill as she turned.

Of nine nests I measured, dimensions were as follows: inter. diam.—55 mm. (50–70 mm.); exter. diam.—80 mm. (70–95 mm.); inter. depth—45 mm. (40–50 mm.). These measurements may be compared with Walkinshaw's (1944): inter. diam.—45.9 mm (40–54 mm.); exter. diam.—105 mm. (80–140 mm.); inter. depth—37.6 mm. (25–48 mm.). These measurements were taken in Michigan.

The distance of the nest above ground was 80 mm. A typical nest contained an outer cup of 450 pieces of grass and an inner cup of 155 pieces of plant fibers, fine roots, and hair. Walkinshaw (1939) counted 384 pieces of grass in one nest. Seven nests were located in snowberry, one in grass, and one on the ground under a tussock of grass.

RENESTING

Apparent renesting was observed twice in 1959. Although none of the birds was marked, the two males involved were assumed to be the same by their use of characteristic singing perches, nesting territory,

and feeding area. Both second nests were located in the original territories.

1. The original nest site was deserted on 6 June 1959 on the second day of construction. On 13 June I found the second nest containing five eggs, 16 meters from the old nest and 18 cm. above the ground. Both nests were located in Snowberry. The second nest was deserted on 17 June after four eggs had been removed by an unknown predator.

2. The female laid eggs in the original nest on 10 and 11 June but was not seen near the nest during these days. During this time she was observed in the vicinity of a second nest and was seen carrying nesting materials. On 13 June the second nest was located 23 meters from the old nest; but the female was incubating three eggs of the Brown-headed Cowbird (*Molothrus ater*). The new nest was unlined and 45 mm. closer to the ground, being situated in a tussock of grass rather than in Snowberry. The second nest was similar in size to the original nest but lighter and contained less material. The three cowbird eggs were incubated for six additional days before the clutch was destroyed and the female deserted.

EGGS, EGG LAYING AND INCUBATION

Dates of nest completion and the first egg laid for three nests were as follows: 6 and 7 June, 8 and 10 June, 9 and 11 June. In these three nests the eggs were apparently laid in the early morning and at 24-hour intervals, as an increase always occurred between 2000 and 0630 the following morning. Eight nests (one a renesting) contained four eggs, and one contained five. In the three nests observed, incubation commenced with the laying of the final egg (observed in one nest) or the day prior to the laying of the last egg (observed in two nests) in the clutch.

The incubation period in one nest was 11 days. On 10 June the nest contained three eggs. The following morning it contained four. No further increase was observed. When it was visited on 20 June it still contained eggs, but on the next afternoon, it contained three young.

The female did most of the incubating, the male (singer) assisting for short periods only. The female would fly away from the nest, and the male, who was always nearby, would fly directly to the nest and commence to incubate. During a three-hour period, 1400–1700 c.s.t. on the first day of incubation, one female was on the nest 81 per cent of the time, the male (singer) replaced her for 13 per cent of the time, the nest being uncovered 6 per cent of the total time.

While off duty the male darted out from his singing perch "Fly-

catcher fashion" and captured insects. During a rain one male drank the water from the leaves as he moved about his territory. On an extremely hot day one off-duty bird was observed drinking from a body of water adjacent to its territory.

COWBIRD PARASITISM

Of nine nests studied, eight (88.8 per cent) were parasitized by Brown-headed Cowbirds. In six of these nests (75 per cent) the cowbirds' eggs were laid when the sparrow eggs were fresh. Of these six nests four contained two cowbird eggs, and two contained one such egg. In one nest the cowbird egg was laid after the four young sparrows had hatched. Three cowbird eggs were laid in a replacement nest before the female sparrow was able to finish the nest or lay eggs.

In two nests, both of which contained four eggs of the Clay-colored Sparrow, I believe the cowbirds may have eaten or removed the eggs of host. Shells were found at the base of the nest after the cowbirds had laid their eggs in the nests that had formerly contained four sparrow eggs. Three nests containing one, two, and four eggs, respectively, were deserted after they were parasitized by cowbirds, and four others were destroyed by an unknown predator. None of the cowbird eggs hatched. No Clay-colored Sparrows hatched in nests parasitized by cowbirds before the young hatched.

YOUNG AND THEIR DEVELOPMENT

In the only successful nest in the study area in 1959, three young hatched on 21 June and were observed daily. The newly hatched young were covered with a sparse, light-gray down. The skin and legs were pinkish. The rectal area was white, the mouth lining was a bright orange-red with a black and yellow palate. The eyes were closed. Gaping occurred at the slightest movement.

At one day of age the alar, humeral, caudal, spinal, capital, and ventral tracts showed as dark dots beneath the skin. Changes in color of the gape were noted on the third and fourth days, when the mouth lining darkened and the rectal area turned yellow.

The eyes opened slightly at two days, defecation began at four days of nest life.

The primaries measured one mm. at three days of age and eight mm. at five days of age.

The tarsus measured six mm. at hatching and 16 mm. on the fifth day of nest life. The culmen measured four mm. at hatching and six mm. on the fifth day of nest life.

All three nestlings left the nest at seven days (28 June), when they were completely covered with unsheathed feathers. They were in the nest 27 June at 1830 but had left by 1600 28 June.

PARENTAL CARE

The presumed female did most of the brooding, the presumed male (singer) brooding occasionally for short periods. On the second day of brooding, 22 June, one female was on the nest 71 per cent of the time, the male (singer) replaced her for 9 per cent and the young were uncovered 20 per cent of the time over a two-hour period, 1345–1545 C.S.T.

At this same nest, over the same period of time, the female made one feeding visit per hour while the male averaged six visits per hour. The length of the interval between feedings averaged nine minutes.

NESTING SUCCESS

Out of 27 eggs laid in nine nests in 1959, four eggs in one nest hatched. Of the failures, 25 per cent seemed to be due to parasitization by cowbirds. The other failures, or 59.3 per cent, were due to unknown causes.

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