GENERAL NOTES

Incubating American Robin repels female Brown-headed Cowbird.—At my home in New Castle, Lawrence County, Pennsylvania, the House Sparrows (*Passer domesticus*) have half a dozen nests every year and Brown-headed Cowbirds (*Molothrus ater*) parasitize several of these nests regularly. There is also a Robin (*Turdus migratorius*) which regularly places her nests in the "S"-shaped offset of the conductor pipe draining the metal gutter at the front of the house. Thus, the nest is sheltered by the roof. By early July of 1954 she had raised one brood, made some repairs to the nest, completed her second clutch of three eggs, and begun to incubate them. The time of day had arrived one morning when she would normally leave her nest briefly for food, drink, and perhaps even a bath. I noticed she was turning her head in a peculiar way, and looking intently for a moment at something at a distance; then she would utter a barely audible "churrup."

Following the line of her gaze, I noticed a female cowbird stalking in the grass at the edge of the street about 30 yards away. I thought the latter was trying to stay out of sight behind a maple tree, but it was plain that it was watching the robin by slight turns of the head every few seconds. This continued for perhaps five minutes and may have been going on for some time before I noticed it.

Suddenly the robin took off across the street toward a small swamp. No sooner was she out of sight than the cowbird flew directly to the robin's nest, perched on the rim for an instant, and then settled down on the nest. At almost the same instant, I saw the robin returning at full speed, with beak outstretched and, when within ten feet or so, scolding vociferously. The cowbird started awkwardly from the nest and had barely taken to flight when the robin hit her with feet, breast, and beak. The cowbird lost altitude rapidly. The robin made a circle and attacked with such force that both birds fell to the ground. Then the robin with wing and beak beat the interloper ferociously while the cowbird seemed to have no notion of defense except for flight. Every time the cowbird tried to rise, the robin pummelled her back to earth. The scuffle continued as they moved further up the street until, after much running and jumping, the cowbird made her escape. The robin did not follow further, but continued to scream and scold before returning to her nest.

I traced the route of the battle and noticed numerous specks of blood on the green grass, and, to my surprise, a cowbird egg. This was warm when I touched it. I left it until the next day to see if the robin would break it, but nothing happened. I then carried it ostentatiously to a point under the nest. The robin watched the performance but did not disturb it and the egg remained there for three days and then disappeared from causes unknown.—CARL L. LEATHERS, *1004 North Jefferson Street, New Castle, Pennsylvania, May 3, 1955.*

Goose-behavior by a White Leghorn chick.—Six hours after leaving the shell, an African gosling (a domestic breed of the Swan Goose, *Anser cygnoides*) was placed in a brooder with half a dozen White Leghorn (*Gallus gallus*) chicks, all of which were between the ages of 18 and 24 hours. One week later, the gosling, together with one of the chicks, was removed from the group and the two were placed in a separate room where a large pen had been prepared for them. Originally, the chick had been kept with the gosling only to provide company, for this gosling gave vent to loud distress cries whenever left alone. The animals were visited by the observer several times each day.

Within one week after hatching, the gosling proved itself imprinted onto humans, the following-reaction being readily elicited. It did not appear to discriminate between different individuals, however, this ability not appearing until it was more than four weeks of age. The chick, in the meantime, had become imprinted upon the gosling, following it, "cheeping" loudly when prevented from following, and fluttering excitedly towards the gosling upon the latter's return after an absence. Initially, the goose showed no overt response to this behavior of the chick, but by the middle of the second week it was apparent that the goose was reluctant to leave its pen to follow its human *Kumpan* unless the chick was permitted to accompany it. The gosling clearly showed ambivalence, following, stopping when the chick's "peeps" reached a crescendo, ofttimes returning to the chick, then following again. By starting the gosling off at a run or very rapid walk, this ambivalence could be overcome. Apparently, the inertia of a more rapid movement overcame the attraction of the chick's distress calls.

At this time, it was noted that the chick was adopting many of the behavioral traits of the goose. When the goose was treated to a handful of freshly cut grass, the chick would join it in pulling the grass from the observer's hands, eating it as eagerly as its Anserine partner. At first, the chick's efforts to manipulate large blades of grass were rather ridiculous, but it soon achieved considerable skill. In addition, the vocalizations of the chick began differing radically from what they had been earlier and from those of normally-reared chicks. Ordinarily, even when reared in isolation, the conversational sounds of chicks when feeding consist of a series of rather short, discrete "pips." In contrast, young goslings emit much softer notes which are run together to a much greater degree. The tone-quality of the chick's voice was not greatly altered, but the phraseology and modulation were clearly that of the gosling. (A tape recording has been made.)

This chick has not, it may be noted, progressed to the stage where it voluntarily will join the gosling in the latter's swim-tub. Regularly, however, it would perch on the rim of the tub while the gosling took its daily ablutions. Dr. Dillon Ripley has observed a hen-mother in the water with her foster brood of goslings.

Such a modification of normal patterns as that shown by the chick underscores the importance of social interaction as a determinant of behavior.—PETER H. KLOPFER, *Osborn Zoological Laboratory, Yale University, New Haven, Connecticut, July 8, 1955.*

Changes in English Sparrow population densities.—The English (or House) Sparrow (*Passer domesticus*) in general is associated with man and his works. When the English Sparrow was introduced and established in North America, the densest populations developed in the cities where human populations were densest. There, horses used for transportation supplied an abundance of waste grain for the sparrows to eat. With the replacement of horse-drawn transport by motor-transportation there was a decrease in the density of sparrow populations in the cities. (See especially Chapman, 1936. "Handbook of Birds of Eastern North America," p. 480, and Taverner, 1939. *Can. Field-Nat.*, 53:99.) Such a decrease is even now taking place in London (Fisher, 1954. "A History of Birds," p. 165).

A similar decrease in sparrow population has presumably taken place in Chicago. The magnitude of the decrease in the horse population is indicated by data from T. Carulin, writing in the Chicago Daily Tribune of May 26, 1955: In 1890 there were 101,566 horses brought into the city for sale; in 1931 there were 4,009 licensed horse-drawn vehicles; in 1955 it is estimated that there are 500 horses, including riding horses, in the stock yards and various stables, and only 52 licensed horse-drawn vehicles.