The incubation period of the Knot.—The incubation period of the Knot (*Calidris canutus*) has been estimated to be 20 to 25 days in the Western Taimyr (Birula, *in* Pleske, *Birds of the Urasian Tundra*, Memoirs Boston Soc. Nat. Hist., 6: 268, 1928) and 21 to 22 days in Greenland (Bird and Bird, *Ibis*, 5, fourteenth series: 147, 1941; Salomonsen, *The birds of Greenland*, Copenhagen, Einar Munksgaard, 1950–51, p. 227), but apparently no authentic record of the incubation period, defined as the time interval from laying to hatching of the last egg of the clutch (see Beer, in *A new dictionary of birds* (A. L. Thomson, ed.), New York, McGraw-Hill, 1964, p. 396) has been reported for the species.

This note reports the incubation period of one of seven Knot nests found in the summer of 1966 at Hazen Camp (81° 49′ N, 71° 18′ W) on the northwest shore of Lake Hazen, Ellesmere Island, N.W.T., Canada. When found on 19 June in a slightly raised *Dryas integrifolia-Kobresia myosuroides* area of a temporary stream bed, this nest contained three eggs. The fourth egg of the four-egg clutch was laid between 1400 hours, 20 June and 1310, 21 June. By 9 July slight cracks had appeared on the blunt end of all four eggs. At 1700, 12 July three downy nestlings were present, and the bill and a portion of the head of the chick of the fourth egg was protruding out of its shell. When the nest was revisited at 2010 the fourth chick had hatched, but was not yet completely dry. Therefore, the incubation period at this one nest was between 21.5 and 22.4 days.

This record was established during a study of the breeding biology of the Ruddy Turnstone (*Arenaria interpres*) and Knot at Hazen Camp sponsored jointly by the Institute for Northern Studies, University of Saskatchewan, and the Canadian Wildlife Service. The investigation was conducted in association with the program "Studies on Arctic Insects" of the Entomology Research Institute, Canada Department of Agriculture, in collaboration with the Defense Research Board of Canada.—David N. Nettleship, *Department of Zoology, McGill University, Montreal, Canada.*

Aggressive behavior in inexperienced young Ringed Turtle Doves (*Streptopelia risoria*).—During a study in which a large number of Ringed Turtle Doves were hand-raised, we decided to test some of these birds for aggressive behavior toward their own kind. We removed 14 Ringed Turtle Doves from their parents at 8 days of age, hand-raised them, and kept them singly isolated from other doves thereafter. Up to this time they had seen no fighting behavior by their parents, who were engaged in feeding and brooding them. When the birds were between 25 and 35 days old, they were randomly assigned to form seven different rival pairs, and placed into a test situation for 1 test per day for a total of 3 tests. After each test, which lasted for 10 minutes, the birds were returned to their isolation cages. Hence the first pairing represented for each bird the first opportunity for displaying aggressive behavior towards a member of its own species.

The first test was conducted in an unfamiliar cage in a strange room, while the next two encounters took place on successive days about one week later in the respective home cages of the two birds. Each bird thus met its opponent once in its own and once in the other bird's home cage. The unfamiliar cage was kept in a bare, tile-walled room quite unlike that which contained the home cages. In addition, two 100-watt reflector bulbs were placed about 2 feet above and slightly in front of the cage, thus brightly illuminating the cage area and augmenting two rows of bright fluorescent lamps located on the ceiling. The cage itself, though identical in size ($24 \times 16 \times 11$ inches) and construction to the home cages, differed from them

in that its top was covered with transparent plastic, the rear was covered by plate glass, and no perches, food, or water dishes were present.

The home cages, on the other hand, were housed in a room illuminated by one large window and four bare 100-watt bulbs distributed across the ceiling. These cages were identical to one another with respect to size, construction, position of perch, and kind of food and water dishes and their location in the cage. Thus, when one bird was placed into the cage of another for a test, it came into a cage identical in all respects to its own, except for the actual position of the cage in the room (e.g. cage in upper tier or closer to window).

The type and sequence of aggressive behavior components were recorded; the behavior patterns were defined as *rushing at* and *pecking at* the other bird, *pulling its feathers, boxing it with the wings,* and *hopping on* the other bird, all of which constitute typical Ringed Turtle Dove fighting. We also noted which bird in each rival pair was the older and which initiated the encounter, but the birds were not sexed. Each bird was scored as having won, lost, or "tied" in each encounter. A lost fight meant that the particular bird consistently fled from the other; a "tie" occurred when neither bird gave up within the 10-minute period.

The results were as follows: In none of the tests in the unfamiliar test cage was aggressive behavior shown, but all of the 14 encounters in home cages resulted in the exhibition of aggressive behavior by both participants; 3 of these encounters were judged as ties, with the same pair accounting for 2 of them. In the 11 other encounters, 4 birds that were older than their respective opponents won both in their home cage and in their opponent's cage and accounted for 8 of the victories; one bird younger than its opponent won in both cages to account for 2 more of the victories; and one bird older than its opponent won in its own cage to account for the 11th victory.

Separating these results into the two component variables of age and home cage, we see that older birds had a 9–2 record in the 11 encounters in which a decision was reached, while birds in their home cages had only a 6–5 record. Furthermore when initiation of the fight could be clearly identified with one or the other of the participants, it was found that the initiator was always the winner of the encounter, regardless of whether it was in its own cage or that of its opponent. In no instance was there a "friendly" association. In test 1, where no aggressive behavior was shown, the birds moved about, pecked at small objects, and moved towards or away from each other, but none of this resulted in any kind of social behavior. Apparently, the strange surroundings inhibited all such behavior.

We can conclude from this study that the actual outcomes of aggressive encounters may be affected more by the difference in age of the birds than by whether or not the victorious bird was in its home cage. But the familiar cage (i.e. the home cage or an identical one even if it is the home cage of another bird) is an essential determinant in the appearance of aggression to begin with. Inexperienced Ringed Turtle Doves will fight using species-specific behavior patterns if tested in familiar surroundings, but not if placed in an unfamiliar locality. The findings support the view that this kind of aggressive behavior is innate in Ringed Turtle Doves, according to the criteria of the ethological deprivation experiment in which specific information is withheld (here a fighting conspecific). They also illustrate the importance of testing for such behavior in a familiar and not in a strange location.

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