MEASUREMENT OF NEST ATTENTIVENESS IN THE RING-NECKED PHEASANT

FRANCIS KESSLER

FOR many years investigators have been concerned with the attentive behavior of birds during the incubation period. Several studies have been conducted to determine the amount of time birds spend incubating, the number of times off the nest, feeding times, etc. These have been summarized by Kendeigh (1952). Most of them have involved nongallinaceous birds, but there are two notable exceptions. Fant (1952) studied the attentive behavior of the wild partridge (*Perdrix p. perdrix*) in England. He obtained records throughout the incubation periods of four hens and learned that during the egg-laying period the hen visited the nest only between 09:30 and 15:00, and that the average egg-laying time was 45 minutes. Absences from the nest during the incubation period varied from two to five periods per day, the earliest absence being at 07:30, and the latest at 21:15. The duration of each daily period of absence varied from 15 to 155 minutes. Fant also found that the greater the number of times the hen left the nest per day the shorter were the inattentive periods; the average duration of absences per day was 140 minutes.

Klonglin *et al.* (1956) recorded the nesting activity of pheasants by means of an instrument similar to that used by Fant. They gathered data on the attentive behavior of pheasants with clutches incubated more than 10 days. They noted that the hens left their nest once each day; the inattentive period varied from eight to 115 minutes and averaged about 30 minutes in length. The majority of the inattentive periods occurred between 15:00 and 18:00. Inattentive periods in the morning were inconsistently taken, but, when taken, they were between 07:00 and 10:00. Nearly all recorded instances of egg laying occurred between 10:00 and 15:00.

METHODS AND MATERIALS

The present study was conducted during 1955 and 1956 at the Delaware Farm Game Experiment Station, Delaware, Ohio, with a population of semiconfined Ring-necked Pheasants (*Phasianus colchicus torquatus*). The measurements of attentive behavior were made in an endeavor to determine the length of the incubation period, the time and duration of inattentive periods, and whether there was a relationship between the time a hen spent off the nest each day and the stage of incubation.

Motion within the nest was recorded by an instrument similar to that used by Yates (1942). This instrument consisted of a photo-cell and light source installed in a waterproof mounting. An infra-red filter was attached

TABLE 1
DURATION OF PERIODS OF NEST ATTENTIVENESS AND INATTENTIVENESS, 1955

Nest	*Interval of incubation period*	*Duration of incubation period, days & hours*	*Number of inattentive periods*	*Average duration of inattentive period, minutes*	*Average air temperatures °C during incubation period*
13	5/10–6/2	22–23	43	36	18.1
23	5/15–6/7	22–23	26	78	18.8
19	5/13–6/5	23–15	37	54	18.3
26	5/18–6/11	23–21	46	49	19.2
22	5/15–6/8	23–3	41	72	18.8

to the light source, and the instrument was arranged to close a relay when the beam of light projecting across the nest was broken. The recording segment, a relay-operated pen recording on a continuous chart driven by an electric clock motor, was housed in an instrument shelter near the center of the study area. A chart moving 18 cm per hour gave a continuous record of movements of the hen entering and leaving the nest and of vertical movements sufficient to allow the beam of light to pass under her body, while on the nest.

The area was searched for nests containing unincubated clutches. When a nest was found before the completion of egg laying, it was assumed that the incubation period had not started, and the record subsequently obtained was for the entire incubation period. Whether the hen was on the nest, the temperature of the eggs and the general appearance of the nest and eggs were also used to determine the date at which the incubation period began.

RESULTS

Complete records of nest attentiveness were obtained for five hens in 1955 and for five in 1956. Tables 1 and 2 summarize these data.

During 1955 the duration of the incubation periods varied from 22 days and 23 hours to 23 days and 21 hours.

The number of periods of inattentiveness for the hens studied varied from 26 to 46.

TABLE 2
DURATION OF PERIODS OF NEST ATTENTIVENESS AND INATTENTIVENESS, 1956

Nest	*Interval of incubation period*	*Duration of incubation period, days & hours*	*Number of inattentive periods*	*Average duration of inattentive period, minutes*	*Average air temperatures °C during incubation period*
15	5/19–6/14	23–11	43	40	17.0
33	5/17–6/10	22–22	33	53	17.3
34	6/15–7/10	23–2	41	48	15.4
18	5/19–6/11	22–6	47	78	16.4
23	5/30–6/23	24–7	112	43	20.7

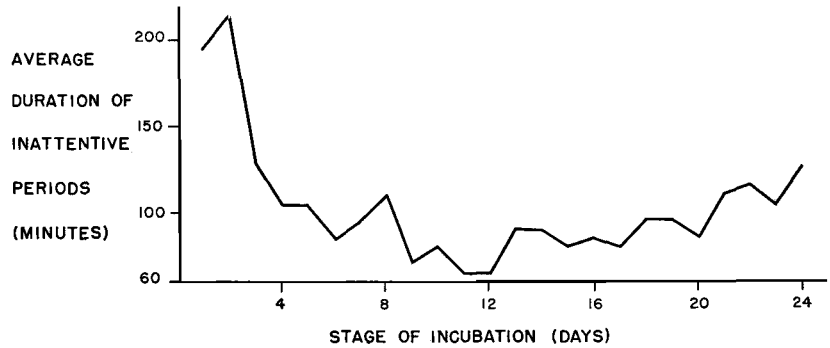

Figure 1. Average duration of daily inattentive periods during the various stages of the incubation period. Data shown are for 10 hens.

During 1956 the duration of incubation periods varied from 22 days and 6 hours to 24 days and 7 hours. The number of periods of inattentiveness for the hens studied varied from 33 to 112.

Inattentive periods occurred throughout the day; but most inattentive periods occurred between 07:00 and 09:30 and from 16:00 to 18:00. All hens were inconsistent as to the time at which they left the nest. Leopold (1933) gave dawn and 16:00 as the time that the pheasant leaves the nest. Baskett (1947) found no definite time at which a particular pheasant left the nest. Klonglin *et al.* (1956) found that the majority of inattentive periods occurred between 15:00 and 18:00 and that a given hen was very consistent in the time that she left the nest. He also found that when morning absences were taken they usually occurred between 07:00 and 10:00.

The relationship of daily inattentiveness to the stage of incubation was also investigated. Statistical analysis of the data revealed that nest attentiveness was consistently parabolic with time. This indicated that the incubating pheasant spent a greater amount of time off the nest during the early and late stages of incubation than during the intermediate period (Figure 1).

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CONCLUSIONS

1. During 1955 the interval of incubation varied from 22 days and 23

hours to 23 days and 21 hours. During 1956 the interval of incubation varied from 22 days and 6 hours to 24 days and 7 hours.

2. During 1955 the number of inattentive periods for the hens studied varied in number from 26 to 46, and in 1956 they varied in number from 33 to 112.

3. Inattentive periods occurred throughout the day, but most inattentive periods occurred between 07:00 and 09:00 and from 16:00 to 18:00.

4. During this study the hen pheasants spent a greater amount of time off the nest during the earlier and later stages of incubation than during the intermediate period.

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Department of Zoology and Entomology, The Ohio State University, Columbus, Ohio.