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THE NESTING OF A PAIR OF GREEN HERONS

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INTRODUCTION

This study of a nest of the Eastern Green Heron **(Butorides virescens virescens)** was made in 1937 at the W. K. Kellogg Bird Sanctuary[1] in Kalamazoo County, near Battle Creek, Michigan. The writer had hoped to make further studies before publishing this paper, but since she has not done so and since there is almost no literature on this species, the paper is herewith presented.

LOCATION AND DATE OF NEST

On June 22 a nest was found in a willow in the middle swale of the sanctuary. Since it was only 94 cm. (37 inches) above the surface of the water, the nest was in an excellent position for observation. This rough stick platform supported three beautiful greenish blue eggs. It was only 91 cm. (1 yard) from the nest of a Bronzed Grackle **(Quiscalus quiscula aeneus** Ridgway) which contained young ready to leave. Since Forbush (2) lists May 5 as the earliest egg date for New England and Townsend (6) lists May 8 as the earliest egg date for southern New England and New York, probably the nest on which this report is based (Battle Creek being about the same latitude as New York and New England) is a second nest.

Mrs. Wheelock (7) found many Grackle nests in the group of pines in which there were four nests of the Green Heron. The heron nests observed by Mrs. Wheelock were situated at a height of about twenty feet (6 m.). Townsend, in his article contributed to A. C. Bent's Life Histories of North American Marsh Birds (6), states that nests of the Green Heron are usually placed 10 to 20 feet from the ground, but that they may be in the top of a tall tree, in a bush, or even on the ground.

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1. This work was done under Dr. Miles D. Pirnie, director of the W. K. Kellogg Bird Sanctuary. The writer wishes to express deep gratitude for his interest, assistance, and encouragement. She is also grateful to Dr. Peter I. Tack, head of the fisheries work at Michigan State College, who very kindly identified the food collected from the young.

INCUBATION PERIOD

There were three eggs in the nest when it was found on June 22. There were five on June 25, the number on June 24 not having been recorded. The first egg hatched between 11:15 a.m. July 11 and 10:00 a.m. July 12, the second on July 12 between 10:00 and 11:00 a.m., the third on July 13, and the fourth between 4:30 p.m. July 13 and 5 a.m. July 14. The other was infertile. If we suppose the first egg to be the infertile one, from June 22 to July 12 gives an incubation period of about twenty days instead of the 17 days listed by Burns (1) and quoted by Townsend (6) and by Forbush (2).

FEAR, INCUBATION, FEEDING

The blind was completed on July 3, about eight days before the first egg hatched, and observation began immediately. The front of the blind was 2 meters from the nest. Twice during an observation of 2 hours and 35 minutes on July 3 and also during 2 hours on July 4, the heron almost came to the nest but "cucked" in fear and flew.

On July 6 the heron showed a great deal less fear. The bird "cucked" in the nest tree during 30 of the 38 minutes which I watched her on that morning. In the afternoon the Heron came to the nest six minutes after I entered the blind and remained until I frightened it away and left two hours and 24 minutes later. On this hot afternoon the bird shaded the eggs instead of incubating them. The fear of the heron decreased, probably, both because the bird was accustomed to the blind, and because it was a period when the instinct to incubate was strong.

On July 7, during most of the two hours which Dr. Pirnie and the author spent photographing the nest, the bird incubated with almost no evidence of fear. During the six hours which the nest was under observation on July 10, the heron left the nest tree for only two minutes one time and three minutes a second time. If frightened by the observer's motion or the blowing of the blind, the bird stood for a few minutes on the nest limb. Counting the one time it was intentionally frightened from the nest and the two times it flew from the tree, the bird stood on a limb of the nest tree seven times. The heron remained on the nest or in the nest tree for two hours and 53 minutes before flying for the first time and for two hours and four minutes before leaving the second time.

On July 11 the heron began to incubate seven minutes after the writer had entered the blind, and, except for standing five minutes on the limb of the nest tree while the camera was being focused and standing over the eggs for about fifteen minutes, the Heron incubated for two hours and one minute. The bird then left for four minutes. The herons were never

seen changing places on the nest, but both birds may have performed incubation duties.

On the afternoon of July 13 the heron sat on the nest continuously from nine minutes after the observer arrived in the blind until she frightened the bird away two hours and 17 minutes later. But the three nestlings were not fed during this time.

On July 14 I arrived at the blind at 4:50 a.m., but the heron did not come to the nest until 6:16 a.m. During the rest of the 4 hours and 30 minutes which the author spent in the blind that morning, the heron brooded fairly continuously. Both birds were in the vicinity of the nest and showed decidedly more fear than during incubation. On July 17 the author had to wait from 5:30 a.m. to 7:45 a.m. for the heron to come to the nest.

On July 18 the writer arrived at the nest at 6:58 a.m., but the heron did not begin to walk down to the nest until 7:47 a.m. and then flew without feeding or brooding the young. At 8:30 a.m. the observer left the blind and reentered it at 9:05 after having moved the boat a short distance from the blind. This time both adults came to the nest tree within 20 minutes. One of them began to hover, but all nestlings stretched up their necks; one grasped its parent's bill at right angles and food slipped into the bill of the nestling. Thus the process of regurgitation was a mild one as Gabrielson (3) found to be true of the Least Bittern, but in contrast to the severe struggle which he observed in the case of the American Bittern. During the three hours and seven minutes after 9:05 a.m. in which the author was occupying the blind or engaged in coaxing the young to regurgitate, one or both herons came to the nest tree four times, first fed each of the young, the second time fed one a dragon fly nymph, which I interrupted proceedings to take before it was swallowed, the third time fed two nestlings once and one twice, and the fourth time fed two nestlings.

During one hour and 45 minutes (3:20-5:05 p.m.) on July 19 one Heron fed three nestlings. During two hours on July 24 a parent fed two nestlings, flew to a nearby limb, and after about eight minutes returned to feed another. During another two hours of observation a heron mustered enough courage to feed twice, but that courage lasted only long enough for it to feed one nestling each time.

According to Mrs. Wheelock (7) young herons regurgitate their food whenever a person approaches the nest, but the writer found it more difficult to get them to dedicate their food to science. In the writer's experience it was necessary to handle the nestlings from three to 30 minutes before they would regurgitate, and frequently this was insufficient torture.

The following table lists food obtained from the young. It had been swallowed by the parent but not digested.

TABLE 1

REGURGITATED FOOD OF NESTLINGS

Date	Approximate Age in days	Food [2]
July 17	6	1 Bluegill or Bass fingerling.
July 18	5-7	1 Dragon-fly nymph (*Anax* sp.). Leg bones of a frog
July 18	5-7	1 Mud Pickerel (*Esox vermiculatus*). fingerling.
July 20	7-9	Partly digested mass containing 3 Wood Frogs (*Rana cantabrigensis*) and 1 centrarchid fry (probably Black Crappie).
July 20	7-9	2 Large-mouthed Black Bass (*Huro salmoides*) fingerlings.
July 26	14-15	A Salamander (probably *Necturus*).

2. The food collected on July 18 and July 20 was identified by Dr. Peter I. Tack. Through error the other two collections were not submitted to him; the guess of Dr. Pirnie or the writer is used.

Mrs. Wheelock (7) stated concerning the feeding time: "They are fed only early in the morning and late in the afternoon, the wait between mouthfuls being also much longer [than in the case of Passerine birds]. From four to six a.m. and five to seven p.m. are the periods of greatest activity. These are the only hours when the young made any clamor for food although the return of the parent at any hour was heralded by some signs of excitement on the part of the nestlings before we could perceive it even with close watching."

The herons treated in the present report did not follow the same schedule as those observed by Mrs. Wheelock. It was probably fear which prevented the herons from feeding until after 6 a.m. on July 13 and 14 and between 4:25 p.m. and 6:25 p.m. July 25. The parents, however, fed the nestlings throughout the late morning and early afternoon. For example they fed the young four times between 9:05 a.m. and 12:12 p.m. on July 18.

The Green Heron manifested acute fear on July 3, the day the blind was erected (nine days before the second egg hatched), as it did on July 4, but 5 and 6 days before the hatching of the second egg the bird was fairly tame. On July 10, the bird remained on the nest while the writer, with the necessary noise and motion, opened the camera, extended the bellows, and adjusted the stop and shutter speed with her hand and a mirror in front of the blind. After the eggs hatched, fear steadily became more apparent. During incubation the boat had been kept beside the blind after it was found that the herons paid no attention to it. But on July 18, six days after the second egg hatched, when the writer had waited one hour and 32 minutes only to have the herons twice approach and fly, she removed the boat, after which a Heron came to the nest within 23 minutes. Even with the boat away, however, on the following days, about an hour elapsed after the observer had entered the blind before the Herons began to feed the nestlings. At this period, the slightest motion, less than the blinking of an eyelash it seemed, frightened the birds away.

Fig. 1—Parent Green Herons at nest. July 18, 1937.

CALLS

The young frequently called **cheep** or **peep** when they were being described, and, from July 18 on, usually made this low peeping noise whenever a parent was in the vicinity of the nest. This was the only sound I heard them emit, although Oberholser (4) recorded nestlings as "squawking loudly at every move made in their direction." The adults frequently uttered "cuck, cuck" when they approached the nest to incubate or

feed. From time to time during the incubation and after the young had hatched, a heron flew across the swale with a loud call which is recorded by Townsend (6) as **peu-ah** and by Forbush (2) as **scow** or **skeow.** The sitting bird ordinarily gave no indication of hearing this call, but once, on July 10, "she" followed the flight of the heron with "her" bill and eye.

PATH OF APPROACH TO NEST

During incubation, and usually after the eggs had hatched, the heron alit on a willow southwest of the nest and entered the nest by walking down the practically horizontal southwest branch of the nest tree. Sometimes, after the eggs had hatched, a heron alit in a willow north of the nest and slowly walked or flew nearer until it stood on the same southwest branch or a more northern one.

SANITATION

The parents made no attempt at sanitation. When strong enough to walk over the platform, the young voided excreta over the edge of the nest, and, hence by the time they left the nest, the trunk of the willow was thoroughly "whitewashed."

THE YOUNG

Unlike Passerine birds, the eyes of the young are open upon hatching. The nestlings are long billed, long-necked, and long-legged, but an observer grows to think they are very attractive As Miss Myrtle Powers of Augusta, Michigan, who took motion pictures of the nest, brought to the writer's attention, most of the time the young were gaping, almost turning their throats inside out. Every once in a while they seized each other's beaks as if hungry. When the young were eight to eleven days old, they began to clamber out on the limbs at the approach of an observer but returned to the nest a few minutes after he had entered the blind.

On July 26 the young herons were banded. From 7:10 to 8:20 a.m. on July 27 all of the young were in the nest, but when the writer arrived at 1:50 p.m. there were only two fledglings in the vicinity, and one of these was in the water. Probably the approach of the observer frightened them from the nest. At 2:00 p.m. an adult heron flew to the adjacent willows where young "cheeped," but by 2:20 p.m. neither parent had come to the nest. At noon on July 28 the youngest one, which I had replaced in the nest the day before, was dead in the water under the nest tree. The third from the oldest was in the nest as late as the morning of July 29, and at 9:40 a.m. on July 30 all three were on the same willow branch about three meters from the nest. The oldest and the third fledgling

remained in the nest about sixteen days, but the second one stayed only fifteen days.

SUMMARY AND CONCLUSIONS

This study of the Eastern Green Heron was made at the W. K. Kellogg Bird Sanctuary of Battle Creek, Michigan, in the summer of 1937. The incubation period was about twenty days. The latter part of incubation was continuous and without much fear. Incubation may have been performed by one or by both adults. Feeding was shared by both, and the nestlings were fed throughout the day. After the eggs hatched, the herons showed a great deal of fear. If the herons were not frightened away, there was a tendency for them to feed all of the nestlings on each trip. The young remained in the nest fifteen to sixteen days.

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BELTSVILLE, MARYLAND.

THIRTY-EIGHTH ANNUAL MEETING, KALAMAZOO, MICHIGAN, MAY 2-3, 1942

Miss Theodosia Hadley of Western Michigan College of Education has agreed to be responsible for the Annual Meeting of the M.A.S. which will be held at Kalamazoo, Michigan, on Saturday and Sunday, May 2 and 3, 1942. Saturday meetings will be in Room 205, Science Building, dinner in Van Gough Room, Union Building, 6:30 P.M. war time. Miss Laverne Argabright has charge of the dinner. Dr. Kenoyer is making arrangements for a field trip to the Dunes, Sunday, 6 A.M. war time. Mrs. John H. Norton, 2206 Sheffield Drive, has charge of the rooms.

All those desiring to be on the program please write to Dr. L. H. Walkinshaw, 1416 W. Michigan Ave., Battle Creek, before April 10, stating subject, whether movies (16mm. or what), lantern slides (sizes) etc., are to be used.