

A NESTING OF BLACK VULTURES

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DURING the 1973 nesting season a pair of Black Vultures (*Coragyps atratus*) nested in an old building on my farm near Virgilina, Virginia. The building was sufficiently isolated to be relatively free from human disturbance other than my own, and afforded me an excellent opportunity to watch the nest life of these birds, which yielded some new information on them.

METHODS AND MATERIALS

The building the birds nested in was on an abandoned farmstead about a mile from a public road. It had log sides and a metal roof and was formerly used for a tobacco packing shed. With the hope that birds could be induced to use it for roosting or nesting, I left an upper window open and removed some of the loft floor to give them access to the ground floor. There were no other windows in that part of the building. I divided a back room on the ground floor into two compartments by installing a canvas partition, with the only route of access to one part through the loft floor, and spread several bucketsfull of sawdust on the floor in a corner of this part of the room as a possible nesting attraction. I entered the other part of the room by walking through two ground floor rooms from outside the building. I watched the nesting vultures through a hole in the canvas as I sat on a chair less than 3 m from them, sometimes much less.

I tried to study the pair's nest life with a minimum of disturbance; thus I hesitated to catch the birds for banding during incubation. Rather I tried to find a method to mark them without capture. At the crucial time one of the birds came to the nest marked with white spots on its mantle, presumably excreta caught while roosting beneath others. The bird retained these markings until the next heavy rainfall 11 days later. When the young vultures were 24 days old, I finally caught and banded one of the parent birds.

I spent all the daylight hours of 25 days at the nest and parts of 28 additional days. I slept in the building on 11 different nights.

NESTING HABITS

The nest.—Although Black Vultures build no nest, the place where they lay and incubate their eggs is properly considered a nest. Because the incubating birds often moved their eggs to new positions within a space about 1½ m², the specific site the eggs occupied was extremely variable and not susceptible to definition in the usual concept of a nest. The incubating birds sometimes reached out with their bills and picked up loose material and later deposited it at their sides, but their habit of moving the eggs frequently to new positions prevented nesting material accumulating at any one point.

Egg laying and incubation.—The two eggs were laid between 05:00

and 08:00 EST on the successive mornings of 30 and 31 March. Incubation started with the laying of the second egg.

When preparing to incubate, the bird worked a central and inner toe of one foot beneath each egg by placing the distal end of a toe on each side of an egg and walking with very short steps. With the toes fully beneath the eggs, the birds further brought the eggs into a side by side position in this walking process. When being incubated the eggs were usually arranged side by side, with the longer dimension parallel with the bird's body. Adjustments were soon made when incubation was started without the eggs in this side-by-side position. The eggs appeared always to be incubated on the toes.

The birds also used the bottom of the lower mandible to position the eggs, particularly to bring them close together. They sometimes pushed and rolled the eggs with the lower mandible 25 cm or more between successive incubation sites. Except in this frequent shifting of the eggs to new sites, the incubating birds were never seen to turn their eggs. It seems probable, therefore, that turning of the eggs was effected by the movement. The eggs were often slid rather than rolled, as could be seen by watching marks on eggs during movement.

As was indicated by their locations in the evenings and the following mornings, the eggs were moved during the night much the same as in the daytime. In the night movements, the incubating bird sometimes lost one egg and did not find it until daylight. I twice saw the incubating bird retrieve an egg thus lost. The lost eggs were 20–30 cm from the one being incubated, and when found the incubating bird pushed or rolled it into position beside the other with the bottom of its bill. It was difficult to know how often eggs were lost, as they were probably often retrieved before I could see them. For fear of frightening the birds, I did not use a flashlight to check for lost eggs.

The parent birds shared incubation about equally, with changes at the nest made at about 24-hour intervals. Of 38 changes witnessed, 5 were made between 08:00 and 08:30; 15 were made between 08:30 and 09:00; 12 were made between 09:00 and 09:30; 6 were made between 09:30 and 10:00. Changes were initiated both by the incubating bird leaving the nest and by the replacement bird coming to the nest. The nest was left unattended as much as 27 minutes when the incubating bird left before arrival of its replacement, but it was usually unattended less than 2 minutes.

Incubation continued into the 38th day, 7 May, when the young hatched several hours apart. I was absent from the nest between 11:00 and 13:00 when the first young hatched, but I was present when the second emerged at 14:25.

Brooding young.—The parents brooded the young much of the time

during the early days after hatching, maintaining the same schedule as during incubation. The parent birds used the bottoms of their lower mandibles to push the young together or into positions suitable for brooding. At first the parents usually covered the young with the breasts, but increasingly with advancing age they covered them with a wing. The young were then on the floor between the parent's body and wing. The parent birds discontinued remaining all night on the nest when the young were 43 days old and thus discontinued brooding at this time.

Feeding young.—The young birds reached into the open mouths of their parents for regurgitated food. I was unable to determine the food of the very young birds, but as the birds became older I was sometimes able to see that it consisted of solid material. Twice both birds seized the same piece of food at the same time, pulling in opposite directions. One such piece, seeming to be an animal intestine or perhaps a piece of bovine placenta, was stretched out between birds for approximately 30 cm before it broke into separate pieces.

The parent birds normally initiated feeding by extending their open bills toward the young. When the young became larger, the parent bird sometimes interrupted feeding by walking away, standing motionless, and returning to feed the young later. In such feeding interruptions the parent birds several times sat down and stretched their necks out against the floor, suggesting that they probably used the interruptions to regurgitate more food within reach of the young.

The young were usually fed one at a time, but they sometimes both sought food in a parent's mouth at the same time. When waiting to be fed they usually stood motionless and quiet, but sometimes they made violent demonstrations, crouching, pumping their heads, beating their wings, and giving a growling vocalization.

When the parent birds were brooding the young and thus remaining with them most of the time, feeding was often repeated, with 15–20 feeding sessions during the daylight period. Also, I heard feeding calls of the young at various hours of the night when I spent nights in the building. After the parent birds stopped brooding the young and came to the nest only to feed them, the young were fed in only three or four daily sessions. Feeding then occurred at various times of the day. The young were not fed during the rainy day of 3 August. The parent birds usually alternated their feeding visits, but several times the same bird made successive visits.

Behavior of young.—During the first 28 days after hatching the young moved around very little and remained at or near their hatching place. With advancing age they often walked about the room, but they spent most of their time crowded into the room's sharpest corner formed by

the canvas partition. The young vultures usually walked, but several times they hopped rapidly across the room to meet their newly arrived parents. The young sometimes flapped their wings, presumably exercising them, chiefly during and following feeding periods.

At 80 days of age the young were able to fly up into the loft of the building and into the open window. The loft was about 2 m above the ground floor and the window a similar height above the loft floor. After they could fly, the young vultures spent much time sitting in the open window. They did not venture farther until 3 days later when they went to the roof of a building about 3 m from the window. Another 2 days later they went higher to the roof of the building containing the nest. Finally, on the 7th day after they had first flown up into the window opening, the young flew to a tree about 50 m from the nest building. In the following 4 days they did much flying about during the forenoons and late afternoons, always remaining within about 50 m of the nest site. They finally left the area on 6 August, the 91st day after hatching.

Nest defense.—On 20 April 1973 when one of the Black Vultures was incubating its eggs, a Turkey Vulture (*Cathartes aura*) came into the loft, entering without stopping at the open window as the Black Vultures always did. The moment the Turkey Vulture entered, the incubating bird left its nest, charged the intruder, chased it across the loft and out of the building, and immediately returned to incubating. This was the only active nest defense I witnessed.

Wariness.—The incubating Black Vultures were relatively tolerant of disturbance, but they were quick to show awareness of any unusual happening. I interfered with them as little as possible and confined my activities chiefly to watching through the hole in the canvas partition. Depending on the intensity of the disturbance, the incubating bird looked toward its source, raised from the eggs, or actually walked away from them preparatory to taking flight. Incubating birds responded only to unusual events, and after several repetitions of a disturbance, the birds gave no apparent response.

After brooding was discontinued, the parent birds became more wary and flew to the loft in response even to the click of a camera shutter. After several shutter clicks a feeding session was discontinued, seemingly prematurely, and the bird left the building.

I spent nearly all of the daytime watching the young after they first flew up into the window. Much of this time I was seated on a chair among some trees about 20 m from the birds on the roof of the building. The young and their parents then became accustomed to my presence. Twice when I left my chair to follow the young after they had flown from the building roof they flew to within 1 m of my head

as if moving to use my head for a perch, veering off at the last moment when I moved to avoid them.

DISCUSSION

The present study was confined to observations that could be made with a minimum of disturbance to the birds; consequently, no information was gathered on some points of interest, notably growth rate of the young. This was omitted because it would have involved handling the young and disturbing the brooding parents. Thus except for capture and banding of one of the parents, disturbance I imposed was negligible.

My observed incubation period of 38 days comes close to supporting the incubation period of 39 days reported by Thomas (1928, *Ohio State Mus. Bull.* 1: 29). On the basis of observations at 21 Florida nests, Baynard (1909, *Oologist* 26: 191) reported incubation periods of 28 to 30 days, usually 28 to 29 days. If the Black Vulture habitually loses its eggs during the night, this could cause some variation in incubation periods, but this cannot be the sole explanation for the reported differences, as greater variation would then have been shown in Baynard's relatively large sample.

Thomas (op. cit.) noted that the parents gave the very small young food in liquid form. The habit of the small young of feeding with their bills inside those of their parents indicates that the food at that time may be chiefly or entirely liquid. I saw larger young take solid food several times.

My vultures were able to fly when 80 days old, but they remained near the nest until their 91st day after hatching. Thomas (op. cit.) reported that one of his birds flew to the top of a piano box used for a blind when about 66 days old. Baynard (1913, *Auk* 30: 240) reported the young being able to fly when about 14 weeks (98 days) old. Bent (1937, *U.S. Natl. Mus. Bull.* 167: 28) quoted a statement to the effect that the young remain at the nest site only about 60 days. The habit of young Black Vultures of leaving the actual nest site before being fully capable of flight may explain the shorter time period in Bent's report.

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SUMMARY

Black Vultures showed nest building behavior in that incubating birds reached out with their bills, picked up loose material, and later deposited it at their sides. Their habit of frequently moving their eggs prevented nest material accumulating at one site. The two eggs were laid

in the early morning on successive days, and incubation started with laying of the second egg. The eggs were held on the toes during incubation. Presumably in the process of egg turning, eggs were frequently moved to new locations. When such moves were made at night the incubating bird sometimes lost an egg which was not retrieved until daylight. Incubation was shared by both parents, with daily changes in midmorning. Hatching was in the 38th day of incubation.

The young were brooded by their parents for 43 days after hatching. Feeding was by regurgitation, with solid food used at least in the later stages of nest life. Feeding was frequent when the young were brooded but later occurred only several times daily. At 80 days of age the young could fly, but they remained near their nest site until in their 91st day after hatching.

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