

OBSERVATIONS ON SOCIAL BEHAVIOR IN
TURKEY VULTURES

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ON May 30, 1947, an adult Turkey Vulture, *Cathartes aura*, was found inside the hollow base of a tall sycamore tree, in a densely wooded area near Crawfordsville, Montgomery County, Indiana. Students reported that they had found vultures nesting in this same tree in previous years.

The opening into the hollow tree, being less than five feet above the ground, was convenient for observations of the birds within the tree. Sufficient light came in from above so that the actions of the birds in the nest could be seen clearly. The floor of the nesting area was approximately circular, and about five feet in diameter. No nesting materials were evident; the site was covered mainly with humus and decaying wood.

Death-feigning: When the first observations were made, an adult bird was in the tree with two white downy chicks, a few days old, nestling under its body. The most striking behavior on the part of the adult bird, when disturbed in its nest, was a complete lack of activity, either vocal or muscular. The adult seemed to "freeze" in its position for several minutes and, to superficial observation, appeared dead. The bird lay flat on its abdomen, wings spread out, head down, with no bodily movement. During this time, although the young birds were often quite noisy, the adult never made an audible sound. Although the bird was prodded with a stick from above, and several times actually lifted off the ground, the death feint persisted; only occasional movements of the eyes were seen.

Vocalization: The young birds were noisy. Within a week after hatching they were producing an indrawn hissing sound whenever disturbed. At this age the young would respond to similar inhalant noises made by the observer outside the tree.

Feeding: During an early visit to the nest the feeding of the young was observed. The adult regurgitated food directly onto the floor of the nesting area. The dark semi-liquid material was strongly odoriferous. One of the young birds ate from the ground, the other directly from the bill of the adult bird which was kept open during this period. The young bird thrust its bare head into the mouth of its parent and seemed to work hard on the lower mandible. After feeding there was some pecking between the two young birds, although it did not seem aggressive to the observer, merely a part of the feeding activity. The

downy white birds were usually seen in a relatively clean condition, although their habits of feeding and of defensive regurgitation must soil the plumage constantly.

When first removed from the nest at about two weeks of age, both young birds regurgitated. However, they did not completely empty their bulging crops. The regurgitated food, covering the ground near the nest, produced a strong stench which attracted hundreds of flies within a very short time. The insects fed on this food during that entire afternoon. Although the flies were abundant outside the tree, they were rarely seen within the nest cavity. There was a characteristic odor to the nest, yet the interior of the hole was almost always clean.

Behavior of the young when handled: The most obvious and constant reaction to any disturbing stimulus was the inhalant hissing sound of these young vultures. Although the birds soon seemed to adapt themselves to removal by means of an insect net, they hissed every time they were picked up. When in the nest, they also responded to any external noise by raising their heads and hissing. In contrast, the adult birds in the tree were never heard hissing. By the time the young vultures were five weeks of age the inhalant hissing was more vigorous. It often resembled a type of human snoring; the noise constantly rose in pitch and lasted for at least five or six seconds, being repeated frequently if the young were alarmed. Defecation was a second reaction to being handled, although this was not frequently observed.

Development of locomotion: At two weeks of age the birds could walk on the ground but had obvious difficulties getting around. They used their wings for balance. At approximately five weeks of age the young vultures were about the size of large chickens, with a wingspread of three to four feet. Their bodies were still predominantly white, although black feathers were appearing on wings and tail. At this age the birds could walk well on the ground. When lifted in the net much pecking was attempted. By the next week the vultures were running well. When the birds were almost seven weeks old, they showed themselves to be excellent climbers. In the vicinity of the nesting tree there was a small stream with a steep sand bank on the far side, rising almost perpendicularly to a height of 20 or 30 feet. One of the vultures, trying to escape capture, crossed this stream which was almost dry and climbed straight up the sandy cliff with little apparent difficulty. The ascent at this point was so difficult that the observer had to climb the hill at a gentler slope and was fortunate in being able to locate the bird at the top by its omnipresent hissing.

When the bird was climbing it used its feet, wings, and bill most effectively in the sand of the slope. The huge wings were used for balance while walking and running.

Defenses of young vultures: The young turkey vultures were never observed to feign death as was the adult bird. If removed from the nest and placed upon the ground, the young birds usually tried to run away. There was a decided tendency to hide in dark places and to get under bushes and shrubs. One vulture even squirmed into a slight depression under a rock in an attempted escape.

As the birds became older, aggressiveness developed. They pecked at the net in which they were carried and attempted to peck the observer more frequently than heretofore.

If one of the birds was cornered on the ground, it would stand facing the observer, stretching out its wings to full extent, lowering its head, hissing continually, and regurgitating occasionally. This latter phenomenon was observed less frequently as the birds were handled more often.

DISCUSSION

(1) *The problem of the death feint:* The problem of feigning death is all the more interesting because of its widespread occurrence among animals. Mills (1898: 64) writes that the habit has been observed in many different genera of insects, in snakes, fishes, numerous birds, crustaceans, and several mammals. Romanes (1885: 303) also describes a death feint in spiders, crabs, and cattle. Charles Darwin in an 'Essay on Instinct,' published posthumously in Romanes' book, writes: "Insects are most notorious in this respect" (shamming death).

The author recalls young Piping Plovers, *Charadrius melodus*, and Least Terns, *Sterna albifrons*, feigning death on the beaches of Long Island, New York. Holmes (1911: 96), describing young terns, states that

"the instinct of feigning death which does not occur in the young fledgling now appears on the scene; the young birds will allow themselves to be handled and pulled about without betraying a sign of life and will even suffer their tail or wing feathers to be pulled out one by one without a wince. After a time, as if the bird recognized the futility of the ruse, the death feint is discontinued with a surprising suddenness to be followed by violent struggles, screams and pecking at its captor in its efforts to make its escape. Later, when the birds are able to fly, the crouching and death feigning instincts disappear."

Watson and Lashley (1908), studying the homing instinct in Noddy, *Anous stolidus*, and Sooty Terns, *Sterna fuscata*, at Tortugas Station, described how upon approach the young chicks shammed death until they were touched, whereupon they took to their legs and ran off.

There do not seem to be many descriptive references in the literature to this habit in Turkey Vultures. Coues (1927: 704) writes, "The turkey vulture has a curious habit of 'playing possum' by simulating death when wounded and captured, the feint is admirably executed and often long protracted." Forbush (1927: 91) writes that, "When wounded or entrapped the turkey vulture has two means of defense. It ejects at the enemy the putrid contents of its gullet, and if this is not enough, the bird can 'play possum,' apparently dying. Thus, it simulates the dead in hope, perhaps, of deluding its captor."

The clearest description of this peculiar behavior in the turkey vulture is found in Prentiss (1882: 721) in a discussion of hypnotism in animals,

"In the year 1859, when enthusiastically interested in ornithology, I shot a turkey buzzard (*Cathartes aura*). The bird was winged, and when approached was standing up under a laurel bush, looking brightly about, one wing hanging. As I came up, he first disgorged, then as I continued to approach, his head began to droop to one side, and by the time I reached him he lay upon his side apparently lifeless. Believing that he really was dead, I with difficulty forced him into my game bag and proceeded home, a distance of two miles. He was then taken from the game bag and thrown down in the yard, limp and lifeless.

My surprise can be imagined when calling out the family to view the capture a minute later, he was found running around the yard lively as ever. On our approach, however, the same motions were enacted, and again he lay upon his side dead. This routine followed each approach, until after awhile he became accustomed to the presence of persons, and then would simply hiss and disgorge."

The feigning habit seems to be found in other members of the vulture group. Lacey (1911: 207) describes the young of the Black Vulture, *Coragyps atratus*, characteristically feigning death when disturbed. He also states that he saw an old bird of this species, with the tip of its wing broken, go through the same act.

The death feint has been explained as an effect analogous to cataplexy in which the senses are stupefied by terror and surprise so that the animal is unable to escape. This might be termed the theory of the transfixing effect of fear. It is found described in many accounts of animal hypnotism.

Loeser (1940: 30), writing on this type of animal behavior, states,

"It appears also that the semblance of death as a protection is produced in various ways. Sometimes it is evidently not a calculated action, but simply due to a kind of fainting-fit or stunned condition, as has been observed in birds and mice. With foxes and other intelligent animals, on the other hand, it seems to be a matter of real calculation; but even here the animal seems to know to a certain extent that if it keeps quiet it will not be attacked.—The sole aim of feigning death is immobility; the idea of death and its significance is certainly not present and also not necessary.

The biological aim of this action is not always achieved, as it rarely offers sufficient protection against predatory enemies."

There has been reported a gradual diminution of the duration of the death feint due to fatigue of the motor apparatus. The attitude in this type of response is one of muscular rigidity which would naturally involve fatigue. It is of interest that in lower forms the death feint wears itself out slowly, while in higher animals feigning is carried out only a few times before the animal refuses to feign longer. Here, the factor of intelligence may come into play.

In the Turkey Vulture, death feigning seems to depend, at least in part, upon the type of nesting environment. Kempton (1927: 142), describing a Turkey Vulture nesting in a hollow tree in Wayne County, Indiana, did not report any death feints. He was able to handle the adult bird during incubation. Coles (1944: 219), reporting on nesting of these birds in Ohio caves, does not mention the death feint. In most of the cases he described, the cave had two openings which could serve as exits for any trapped birds. Maslowski (1934: 229) found a Turkey Vulture's nest located some 40 feet up in the cavity of a live beech tree in Clermont County, Ohio. He states that "The bird was exceedingly tame and permitted itself to be stroked and lifted from the eggs in much the same fashion as an old hen. On later visits this procedure was repeated except that the vulture began to protest over our excessive handling by its usual method of defense—vomiting. Only on one occasion did the bird leave the nest without our first removing it." A personal communication from an ornithologist in Indiana who has trapped many adult vultures reports no death-feigning in these birds when confined in large traps.

Clearly, then, there are not only differences in individual reactions to intrusion, but the character of the nesting site and the ability of the adult bird to escape, are factors that must be considered in the problem of death feigning. Wild geese of Siberia, if alarmed during the moulting season when they are unable to fly, have been reported to stretch themselves at length upon the ground with their heads concealed.

J. P. Scott (1946: 379), working on the reactions of mice to restrictions of space, has shown that the mice first try to escape by running away. If this is impossible, they then go through a characteristic defensive stance, and finally become quite immobile, seeming to freeze and often lying helplessly on their backs with their feet up in the air. In analogous fashion, it seems to the author that the death feint observed in *this particular nesting site* was due, in part at least, to the fact that the only possible exit for the bird was blocked by the intruder.

The fact that other observers have not reported death-feigning when the vultures could easily get away and that the young did not go through this immobility reaction, seem to confirm this hypothesis of space restriction, which can and should be tested experimentally.

(2) *Social behavior*: In this paper social behavior will be defined as any type of behavior by which one individual of a given species affects another individual of this species. This would eliminate from consideration interspecific social behavior, as reported by Vogel (1945: 551).

Using the eight types of social behavior suggested by Scott (1945) in his study of sheep, we can classify some of the types of behavior reported in the descriptive portion of this article.

- A. *Epimeletic behavior* (Care of the young by the parents)
 - 1. Feeding young by regurgitating food.
 - 2. Keeping young birds and nesting area clean.
- B. *Et-epimeletic behavior* (Calling for help by young)
 - 1. Vocalization by young, especially when hungry.
 - 2. Young pecking at bill of adult.
 - 3. Open mouth reflexes.
- C. *Sexual behavior*
None observed.
- D. *Allelomimetic behavior* (Mutual imitation)
 - 1. Inhalant hissing by one bird evokes same response from other.
 - 2. Mouth opening seems to be imitation in pair of young.
- E. *Aggressive and defensive behavior*
 - 1. Pecking behavior.
 - 2. Regurgitation of food by both young and adults.
 - 3. Death feint.
 - 4. Inhalant hissing.
- F. *Shelter-seeking* (May be considered social behavior only in certain cases)
 - 1. Types of nesting sites selected.
 - 2. Retreat of young to dark, inaccessible places.
- G. *Feeding*
 - 1. Must be considered social behavior in these birds.
- H. *Aggregation*
 - 1. Bodily contact of young with each other in nesting site.
 - 2. Adults covering young during cold.

GENERAL CONCLUSIONS

The problem of death feigning seems to the author only one part of the larger problem of why different birds, especially when incubating

or with young, react to intruders in such variable ways. There seems to be little in common, superficially, between the death feint here described for the vulture, the inactive placidity of a broody hen, the diving attack of an Osprey, *Pandion haliaetus*, or the rigid, snake-like, neck thrust of a Canada Goose, *Branta canadensis*; all are reactions to disturbances at the nest. It is certain, however, that we are dealing here with several factors and that there are complex causes to these various behavior traits.

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NESTS OF SURINAM BIRDS. (Top left) *Collumbigallina minuta*, NEAR PARAMARIBO, NOV. 8, 1946; (Top right) *Elaenia cristata*, ZANDERIJ, APRIL 24, 1949; (Lower left) *Tolmomyias flaviventris*, NEAR PARAMARIBO, JUNE 15, 1947; (Lower right) *Empidonax varius*, ZANDERIJ, DECEMBER 12, 1948.