

THE "INJURY-FEIGNING" BEHAVIOR OF THE FLORIDA NIGHTHAWK

BY IVAN R. TOMKINS

THIS paper presents an account and an interpretation of certain behavior in the breeding adult and the nestling young of the Florida Nighthawk (*Chordeiles minor chapmani*). This particular behavior has been called "injury-feigning" and many other names that are based, in part at least, on the belief that the bird actually pretends to be crippled or injured in order to draw the attention of an enemy away from the eggs or young. During the past few years there has been considerable discussion in our scientific journals of this kind of behavior, and several attempts have been made to explain its meaning.

I believe that the behavior of very young Nighthawks, as described here, throws new light on the pattern followed by the adult female in her display, and allows us a better understanding of its meaning.

The account given here is based on the performance of about twenty-five Nighthawk families observed in the vicinity of Savannah during the past six years.

On the open sandhills along the lower Savannah River there is in summer a large and relatively stable Nighthawk population. The birds nest wherever there is open dry ground, that is, ground fairly clear of vegetation. The species is solitary in nesting. It is an easy bird to observe because it is often quite tame and will allow a close approach before leaving eggs or young.

Pickwell and Smith (1938) have given a good account of similar behavior. Wherever mention is made in this paper of their account, it should be remembered that they wrote of a different species, the Texas Nighthawk (*Chordeiles acutipennis texensis*).

BEHAVIOR OF THE FEMALE

The female Nighthawk, according to my observations, incubates the eggs, and she alone hovers the young or shields them from the hot sun. So it is that only the female has a nest-defense display of this character. Not once have I seen the male incubating eggs, hovering young, or in any marked part of the defense display, other than occasionally chuckling while flying overhead when the young were nearly grown. He usually occupies a perch somewhere within a couple of hundred yards, for he remains with the family group at least until the young are able to fly well.

Pickwell and Smith (1938: 209) report that the male Texas Nighthawk sometimes broods the young at night, and sometimes displays as does the female. J. H. Bowles (1921) reports that the male Pacific Nighthawk (*Chordeiles virginianus hesperis*) fed the young at night.

I have not been able to watch our birds at night, hence am unable to report on that phase of activity.

When the incubating female is first approached, she sits quietly in the natural position, with head neither unduly raised nor lowered, and with eyes nearly closed. (Most of my observations have been in full sunlight). This is the "concealment by self" of Pickwell and Smith. Though this term is probably correct from one viewpoint, the bird actually does nothing. It does not draw its head down, as does the Willet (*Catoptrophorus semipalmatus*), for instance. I have watched Nighthawks at considerable distance, then walked up to them, and have



Figure 1. Tail-depressed flight of the Florida Nighthawk as it leaves the nest.

found the normal incubating position held until I was very close, usually until the bird flushed from the nest. Sometimes as the incubating bird is approached, she will—if a relatively tame bird that allows a close approach—give a throaty chuckle or grunt, perhaps opening her mouth a little. At other times she leaves the nest with no preliminary action at all, the first motion seen being the sudden movement of the wings to lift her from the ground. Perhaps this chuckle or grunt is the "intimidation-display" of Pickwell and Smith. I have found nothing else in our birds which could be so described.

Our Nighthawks, when flushed from eggs or young, go through a performance that seems to vary in different individuals, but when it is divided into parts, the parts themselves are quite definite and stable. Nevertheless, I am still not at all certain that these parts have separate and definite meanings. In other words, possibly the whole flushing display is one performance, varying perhaps according to the degree of timidity of individual birds, or with a distinction lying in certain mechanical limitations, such as the impossibility of behaving the same in flight as on the ground.

For the above reason, and for the purpose of the discussion later, the after-flushing behavior will be divided into three parts.



Figure 2. Extreme display by the brooding female Nighthawk.

I. This is the flight performance of the female leaving eggs or the vicinity of the young. In it she flies directly away with her tail pointed down at the ground and somewhat spread. That is, the tail points almost vertically downward, giving the bird an odd and labored flight. Photographs show the position better than words can describe it (Figure 1).

This distinctive and labored flight is very easily observed. The female uses it at all times when flushed from eggs or young, though a very shy bird may show the tail-depressed flight for only a short distance. Since I first noticed about six years ago that it indicates a brooding bird, I have not observed a single deviation—no bird has flushed in such a situation without showing it in some degree, and no bird has shown it when not engaged in incubating eggs or caring for

young. No male has exhibited it in the slightest degree, as far as I have seen.

If the bird is shy, Action I is the only part of the behavior seen, for she soon abandons the tail-depressed flight and leaves the vicinity. A large percentage of the birds remain near by, and go through all or a part of the rest of the performance.

II. This is the part in which the bird alights some little distance away, spreads wings and tail, and cowers there quivering. If one approaches, she flies off or teeters away with wings and tail still spread. If one moves away, she may follow and repeat.

III. The final part is seen when she opens her mouth wide and hisses, generally turning head or body toward the intruder (Figure 2). A very bold individual will hiss and teeter around, all the time moving closer to the nest, until she settles on eggs or young and is quiet again. In the latter case she may continue to spread wings and tail, or may fold them when walking toward the nest.

Mrs. Nice, in commenting on an earlier draft of this paper, suggested that many birds show three different types of reaction to a nest enemy: They may attack, attempt to intimidate, or go through deflection tactics tending to lure it away, depending on the character of the stimuli offered by the situation and the behavior of the enemy. It has so far proven unsatisfactory to divide the behavior of my Nighthawks thus, though the possibilities presented by studies in that direction are interesting to consider.

Pickwell and Smith found one bird that reacted differently when approached by a human walking upright than it did when he approached on hands and knees. They tried the same experiment on other birds, but without results. After reading their account, an approximation of their two ways of approach was tried on three different Nighthawks with negative results. That is, the birds presented the normal flushing behavior to both methods of approach. At another time one of these three birds was tested by sliding a long slim reed toward it much in the way a snake might approach. The bird remained motionless until the reed nearly touched it, then flushed with the usual tail-depressed flight.

BEHAVIOR OF NESTLING YOUNG

Young birds in the nest have a display which is very similar to Actions II and III of the adult female. When teased, some of them will open their mouths, spread wings (and tail, when partly fledged), and hiss at the intruder, often lunging forward to bite at an extended finger. This reaction was obtained from several young birds, from four or five days old on through the pre-flying period. The pattern was constant for all which began the performance (Figure 3).

Bent (1940: 239) quotes an account by Ernest E. Seton (1890: 554) of similar behavior in the young of Sennett's Nighthawk (*C. m. sennetti*), and Pickwell and Smith reported and photographed it in the species they studied, but not before the birds were twelve days old. The behavior they noticed appeared to be somewhat less than found here in the present species.

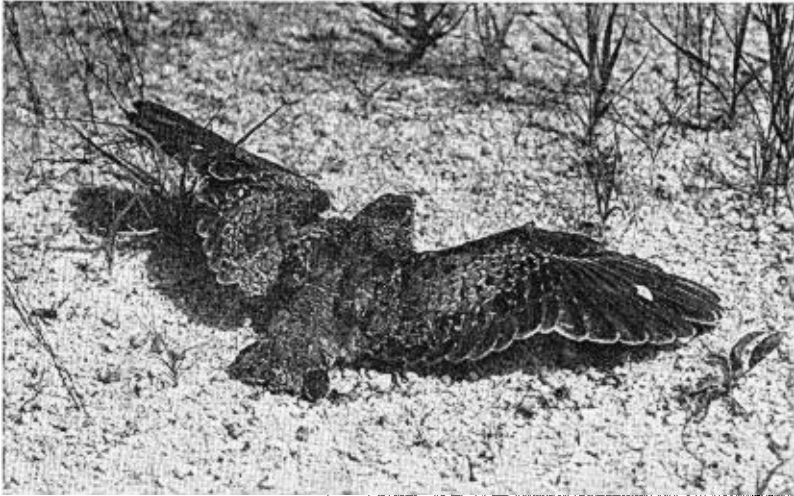


Figure 3. Defense display of the young Nighthawk.

DISCUSSION

The old belief that the display is a theatrical act in which an able bird simulates an injured helpless one, was based on an anthropomorphic concept. It is doubtful whether any scientifically-minded ornithologist of the present day believes in quite this explanation. Yet there is much in the performance to encourage that view.

F. C. R. Jourdain (1936-1937) has reviewed the subject of "injury-feigning," but his account has not been accessible to me. Henry Mousley (1937) has also recapitulated much recent theory in a paper dealing with similar behavior in the Spotted Sandpiper (*Actitis macularia*). Herbert Friedmann's theory (1934) concerning this behavior is that the bird suffers from a conflict between the fear emotion and the reproductive emotion and there results an actual muscular inhibition which makes it impossible for the bird to fly. (See also Stone, 1935).

Mousley considered that the male sandpiper which he observed (this male bird had incubated the eggs and was then caring for the young)

was more likely the victim of an emotional conflict and actually driven crazy or demented, than that he deliberately displayed to attract attention. This is much like the Friedmann theory.

Often it appeared to me that the female Nighthawks used such portion of the display as they wished, that is, it was repeated in part by apparent intention at times. This prevented it being considered as an emotion-conflict. Rather it resembled the "desired reflex action" of Lorenz (1937).

An effort was made to consider the three parts (Actions I, II, and III) and correlate them with the major emotions the brooding bird might be subject to on the approach of an enemy. The result was not a success.

No rational explanation of the display of the adult Nighthawk was found, until the display of the young bird was seen, and the similarity of patterns noticed. The physically weak birds in the nest could not go through all the display of the adults, but the part which they could perform was done in the same manner and under quite similar stimuli. Possibly the tail-depressed flight (Action I) of the adult is also the flight equivalent of the display of the young.

Why should the young bird have a display like that used by the adult? Possibly the question should be turned around to ask why the adult should follow the same pattern as the very young bird. The answer seems to be that the two are identical and are instinctive, a conclusion which is supported by the fact that many different individuals follow the ancestral groove. If it were learned, or an intentional act, there would be much variation.

By acceptance of this conclusion we have two major things involved:

a. An inherited pattern which often to our minds appears like a simulation of being crippled.

b. The use of it by the female Nighthawk in a particular part of the period of reproduction under the combined stimuli of the situation as well as under some volitional control on the part of the individual bird.

This concept of the display has been more satisfactory to me than anything that has been offered. There are many instinctive behavior patterns to be found all through the vertebrate kingdom, and we shall probably never be able to trace the exact origin of this one. It seems to be instinct, pure and simple. "An instinct is a propensity prior to experience and independent of instruction" (Paley).

My thanks are due to Mrs. M. M. Nice for much advice and constructive criticism, and to Dr. J. Van Tyne for his encouragement and assistance.

LITERATURE CITED

BENT, ARTHUR C.

1940 Life histories of North American cuckoos, goatsuckers, hummingbirds, and their allies. *U.S. Nat. Mus. Bull.*, 176.

BOWLES, J. HOOPER

1921 Nesting habits of the Nighthawk at Tacoma, Wash. *Auk*, 38: 203-217.

FRIEDMANN, HERBERT

1934 The instinctive emotional life of birds. *Psychoanalytic Review*, 21, No.'s 3 and 4, July and Oct., 1934, 57 pp.

JOURDAIN, F. C. R.

1936-1937 The so-called "injury-feigning" in birds. *Oologists' Record*, 16: 25-37; 62-70; 17: 14-16.

LORENZ, KONRAD Z.

1937 The companion in the bird's world. *Auk*, 54: 245-273.

MOUSLEY, HENRY

1937 Nesting habits of the Spotted Sandpiper. *Auk*, 54: 445-451, pls. 27, 28.

PICKWELL, GAYLE and EMILY SMITH

1938 The Texas Nighthawk in its summer home. *Condor*, 40: 193-215, figs. 45-58.

SETON, ERNEST E.

1890 The birds of Manitoba. *Proc. U. S. Nat. Mus.*, 13: 457-643, pl. 38.

STONE, WITMER

1935 [Review of work by Friedmann, listed above.] *Auk*, 52: 106-107.

513 EAST DUFFY STREET, SAVANNAH, GEORGIA