

Migrant tree swallows may commonly aggregate to prey upon swarming insects. Several years ago in late winter Fred Lohrer (pers. comm.) saw an aggregation of tree swallows feed on winged termites or ants as they emerged from the ground in Highlands County, Florida. Flocks of tree swallows perform similarly when ants, moths, and other small insects swarm over wetlands, hammocks, and cultivated fields in the state (Howell 1932, Bent 1942). This behavior may be extensive within the Hirundinidae, for migrants of this and other swallow species also assemble in large aggregations in the fall to feed aerially on large swarms of midges in Illinois (Grabber et al. 1972). Aerial predation of this sort might be difficult to detect from a distance, even with binoculars. Swarming also occurs in the absence of insect foraging (Robertson pers. comm.) and perhaps without any relationship to immediate foraging (Kilham 1980). It therefore may have several functions.

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Vigorous digging by a Brown Thrasher after disturbance at the nest and comments on the species' behavior.—On 23 April 1981, I observed a Brown Thrasher (*Toxostoma rufum*) perform a behavior to my knowledge not reported previously in the literature. The bird was an especially pugnacious thrasher nesting in an abandoned citrus grove, 4.8 km S of Oviedo, Seminole County, Florida. When I approached its nest located in a small oak, the incubating bird flew immediately from the nest onto the ground in a sandy area

nearly devoid of vegetation. The sandy area was about 4 m from the nest tree. The thrasher began immediately plunging its bill up and down into the sand with forceful and rapid movements of the head. After digging into the same spot six times, the bird moved a few centimeters to another area and repeated the process. The digging behavior was repeated in about eight different locations within an area of about 1 m². Some of the holes dug were over 2 cm deep. During the entire digging process, the thrasher gave a constant low pitched, sass call, which is apparently the hissing sound mentioned by Bent (1948, U.S. Natl. Mus. Bull. 195). After about 1 min of digging, the bird then flew to a low branch of a nearby tree. It gave the familiar "tick" call and wiped its bill several times on the branch, apparently removing adhering sand. The bird then flew back to the nest tree, producing both the sass and tick calls but returned quickly to the original area on the ground where again the digging process was repeated for about 1 min before flying away. The thrasher never pulled grass or similar material with its bill which has been reported for grackles, jays and ravens during displacement activities (Welty, J. 1975, The life of birds, 2nd ed., W. B. Saunders Co.).

All species of *Toxostoma* do much of their foraging on the ground and use their bills during the process. However, bill use differs among the North American species of thrashers. Engels (1940, Univ. of California Museum of Vertebrate Zoology 42: 341-400), in his comparative study of structural adaptations in thrashers, concluded that one of the common feeding behaviors of the Curve-billed (*T. curvirostre*), California (*T. redivivum*), Crissal (*T. dorsale*), and Le Conte's (*T. lecontei*) thrashers is that they dig with their bills much like using a pick, which is unlike the typical feeding behaviors of the Brown Thrasher and Bendire's Thrasher (*T. bendirei*). Usually the Brown Thrasher during foraging will thrust its bill in debris and loose soil and toss the material with lateral sweeps of the bill (Clark 1971, Wilson Bull. 83: 66-73). Also, an individual will thrust its bill straight into the ground with repeated sharp blows or hammers a seed into the ground in an attempt to crack the seed, a behavior that also occurs in Blue Jays (*Cyanocitta cristata*) and the Tufted Titmouse (*Parus bicolor*). However, the Brown Thrasher does not normally use powerful, deliberate digging strokes that result in holes two or more centimeters in depth.

A possible interpretation of this unusual behavior might be that of a hungry bird being efficient by vigorously searching for food at a time when a direct return to the nest was perceptively dangerous. However, I have no evidence that the thrasher was digging for food items; the bird never opened and closed its bill to suggest that food was being sought or consumed. It was quite clear to me during this and subsequent observations that this thrasher's behavior was especially belligerent and that the digging behavior was in response to my disturbing the bird from the nest.

The digging behavior prompts the following observations on thrasher behavior because little information is available describing differences in the behavior between individuals of the same species and between different species of the same family. Having observed several hundred thrashers at their nests located throughout the species' range, it is apparent to me that some individuals are more bold and pugnacious than others. Some individuals are reluctant to leave their nests when approached, whereas others slip away quietly from their nests with the least disturbance. Although I do not have data that indicate the percentage of thrashers observed that display belligerency and

pugnacity toward intruders at their nests, I suspect that the percentage is high. On several occasions I have had individuals with eggs or young in their nests dart quickly and directly at me and strike my hand, arm, and head with their bills. It is not uncommon for the bill strikes to draw blood. Bent (1948) cited similar instances where individual Brown Thrashers have struck observers at their nests. Compared to my observations on the Northern Mockingbird (*Minus polyglottos*), the Brown Thrasher certainly demonstrates more pugnacity and boldness in defending its young and nest site. The mockingbird usually sounds its tick call or performs repeated dive bombs at a human, cat, or dog; however, I have never had an individual dart quickly from the nest and come directly at me striking with its bill with such force as to produce blood. Again in certain individual Brown Thrashers at least, their distress vocalizations produced when an intruder is at the nest are more intense than those of the Northern Mockingbird.

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Marine birds injured by welding rods.—The Marineland Research Laboratory of Marineland, Inc., St. Johns County, Florida, has been operating an avian rehabilitation project since July 1976. While the vast majority of birds rescued had ailments typical of a coastal environment, on two occasions marine birds were found that had been injured by welding rods.

In the first case, Mrs. Sandy Gleeson reported a large bird on the beach 400 m north of the Marineland complex on the morning of 26 March 1981. Upon investigation, a live, adult Northern Gannet (*Sula bassanus*) was found in a weakened and listless condition. The bird was taken to the facility for recovery where a gross physical examination revealed no cause for the bird's condition. The only abnormality noted was a stiff lower neck, but no injury was found by palpatating the neck. The gannet was placed on supportive therapy of intubations of liquids and forced feedings of fish. Observations throughout the day suggested that the bird may have been improving by the end of the day. It was rather surprising that the gannet was found dead the next morning.

A general necropsy showed both the external and internal aspects of the bird to be grossly normal. However, a large foreign body was found lodged between the beginning of the esophagus and the apex of the stomach. Later identified as a stainless-steel welding rod, it measured 44.8 cm long and just under 1 cm in greatest diameter (Fig. 1). I believe it was responsible for the gannet's condition. The cranial end of the rod had become wrapped in a large fold of esophageal tissue and was lying along the neck vertebrae where it could not be felt externally. The rod had induced erosion in the mucosae, which had nearly punctured the esophagus. The mucosae in the stomach showed no gross pathological lesions, but the rod had distended the apex of the stomach to the point where it partially occluded the vent. While a large amount of fecal material was present in the cloacal bursa, the presence of the rod did not greatly impare functioning of the gastro-intestinal system in that