

## GENERAL NOTES

**Observations on Birds "Hawking" Insects.**—Cayonette (Auk, 64: 458, 1947), Hodges (Auk, 67: 242, 1950), Tucker (Auk, 67: 243, 1950), and Brackbill (Auk, 69: 88, 1952) have described the activities of the Starling (*Sturnus vulgaris*) as it catches flying insects in either flycatcher- or swallow-like flight. Snyder (Auk, 68: 507, 1951) has described aerial feeding by the Ruby-throated Hummingbird (*Archilochus colubris*); and Schaefer (Auk, 70: 411, 1953) says of the Swallow-Tanager (*Tersina viridis*) "Tersinas are accustomed to catching their insects flycatcher-like, on the wing." Cade (Wilson Bull., 65: 52, 1953) has described aerial feeding on mosquitoes by the Rusty Blackbird (*Euphagus carolinus*).

This note describes the flycatcher-like activity observed for four additional species, the Blue Jay (*Cyanocitta cristata*), Catbird (*Dumetella carolinensis*), Bronzed Grackle (*Quiscalus quiscula*), and English Sparrow (*Passer domesticus*). Also a swallow-like flight of the Cedar Waxwing (*Bombycilla cedrorum*).

The evening of June 5, 1953, was warm (80° F), clear to slightly hazy, humid, with a mild variable westerly breeze. At 7:00 P.M. E.D.S.T., I first noted several birds hawking insects from large trees at the rear of our house in Amherst, Massachusetts. Blue Jays, Catbirds, Starlings, and Bronzed Grackles were all noted in this activity until 7:25 P.M. The pattern was essentially the same for each of the species involved. Each bird "took off" from an exposed perch, flew outward and upward to grasp a flying insect, then returned to a limb which was usually in quite a different spot from its original perch. One Blue Jay was seen to return to a limb before swallowing the insect which it had caught. Robins (*Turdus migratorius*) and Wood Thrushes (*Hylocichla mustelina*) were also present in the trees and on the ground, but were not observed in the hawking activity. Hawking ceased at 7:25, although flying insects could still be seen as late as 7:45 P.M.

On August 13, 1953, a group of English Sparrows was seen in the top of a tall elm tree about four miles north of Middlebury, Vermont. From 6:50 to 7:05 P.M. E.D.S.T. many individuals were seen to fly out and up, flutter as though to catch an insect, then return to the same or a near-by tree. Distance and light were such that I could not be sure that they actually captured flying insects, but their flight pattern indicated that they were feeding. On one occasion, a bird appeared to miss its prey, turned quickly, and made another "pass" at something before returning to the tree. Temperature was 74° F, wind fresh SW, sky cloudy, about three hours after a hard rain. A similar action by a single bird was observed on May 25, 1954, in Amherst, Massachusetts, at 3:45 P.M. E.D.S.T. The weather was warm, humid, and cloudy.

Late in the morning of July 24, 1954, a number of Cedar Waxwings were observed hawking insects over Leverett Pond, Leverett, Massachusetts. Several individuals were observed along the edge of the pond performing in a flycatcher-like manner as described above. In addition, one individual was observed flying back and forth over the open water of the pond. Its flight was much like that of a swallow except that it was not nearly as graceful. Its turns were jerky and slurring, and its flight in general much slower than that of a swallow.

Tucker (*loc. cit.*) indicates that a "swallow-like" flight of the Starling is common in England, and wonders whether it is really rare in the United States, as implied by Cayonette (*loc. cit.*). Brackbill (*loc. cit.*) records 43 observations of the swallow-like pattern as against 29 of the flycatcher-like pattern in 15 years of observations. Hodges (*loc. cit.*) feels that the swallow-like pattern is less common than the flycatcher-like pattern. I have noted aerial feeding by Starlings as they gather in

trees at a roosting site in Amherst, Massachusetts. During 35 evenings of observation I have not seen any actions which I would call "swallow-like," but have often seen them fly up, hover, then glide back to a perch, after the fashion of an "awkward" flycatcher.

Cade (*loc. cit.*) feels that aerial feeding by Rusty Blackbirds occurs more frequently when crawling insects are scarce and flying insects are abundant. The relationship between availability of "satisfactory" food items and the actual food taken has been amply demonstrated for other species and undoubtedly plays a part in determining the frequency with which a particular species resorts to an aerial feeding habit.

Beecher (Auk, 70: 270, 1953) has recently suggested a phylogeny of the Oscines which would derive the Sturnidae and the Hirundinidae from a common ancestry. If this relationship is correct, it would not be surprising to find a swallow-like aerial feeding habit common to the two groups. However, the Bombycillidae, Corvidae, Icteridae, and Ploceidae, and to a lesser extent the Miminae, are farther removed from the Sylviidae which form the starting point of Beecher's phylogeny. It should be noted that "hovering" to pick off insects is a characteristic habit of sylviiids. This may well be a basic behavioral pattern which has become variously modified in the many lines radiating from the sylviiids. It would seem worth while to collect additional records of the aerial feeding habit to determine the distribution and patterns of this habit among the Oscines. If this is to be done, some standardization of terminology is desirable. I therefore propose the following classification of terms as a starting point:

I. *Aerial Feeding*. Any feeding accomplished while the bird is "on the wing."

A. *Hovering*. The method commonly seen in the Kinglets, Chickadees, Vireos, and Wood Warblers, in which the bird jumps up a few inches from one branch, and hovers on fluttering wings while picking off its food from another twig.

B. *Hawking*. Any feeding during the flight of a bird while it is more than three feet from a perch (the "three feet" is purely arbitrary).

1. *Swallow-like* (Hirundinoid). A continuous series of passes through an area. This would imply the completion of a flight pattern at least approaching a double figure "8."

2. *Flycatcher-like* (Tyrannoid). A single sortie from an exposed perch back to another perch, broken in the middle by a fluttering flight during which the insect is captured.—L. M. BARTLETT, *Department of Zoology, University of Massachusetts, Amherst, Massachusetts.*

**Notes on Courtship Behavior of Wild and Tame Blue Jays.**—Courtship behavior of Blue Jays (*Cyanocitta cristata*) as described below, was witnessed in wild birds which nested close to my home and jays confined indoors in Bethesda, Maryland. A pair of jays appeared in the yard on March 18, 1953, and on March 31 began nest-building in a clump of honeysuckle (*Lonicera japonica*) hanging 12 feet up in a pine tree. At 7:30 a.m. on April 9 both jays were 15 feet up in a hickory, about 25 feet from the nest tree. The female sat on a limb while the male hopped from one limb to another, keeping within a foot of her, with his feathers ruffled up and making "quick, quick" notes. She perched stiffly upright. After a few moments the jays stood facing each other on the same limb with bills open and touching briefly. Then the male mounted and coition, lasting several seconds, took place. Afterward the male flew away. The female, however, remained on the same limb, fluttering her wings. She did not appear to be preening or smoothing out her feathers. That evening one jay was observed to feed the other, a performance witnessed on subsequent days but not prior to coition. I did not disturb the fairly inaccessible