only one of the two principal types of Bewick's song: the one which has been whimsically transcribed as "Eat a piece of che-ee-eeze!"

After singing for several minutes from three perches in the tree tops, the bird dropped to the ground, where I obtained a fairly satisfactory view of it, although the obstructing stems of shrubbery in which it was foraging prevented critical study. In appearance, it seemed a typical Bewick's Wren, with a conspicuous, whitish superciliary line, white tips to the outer tail-feathers, and the characteristic "tail-wobbling" habits, except that the tail seemed a trifle shorter than that of the average Bewick's Wren, and the flirting of the tail was not so free. Unfortunately my attempt to collect the bird was unsuccessful.

Two possible explanations readily present themselves: (1) the bird was a hybrid, and (2) it was a Bewick's Wren with the ability to mimic the House Wren. Without the bird in the hand, the question must remain a matter of speculation.

The ranges of the two species, geographical and ecological, overlap only to a slight extent. At Columbus, the House Wren is abundant, Bewick's infrequent. It is under such conditions, namely, where one of two species in question is rare in a given locality, the other abundant, that hybridism seems to occur most frequently, since an individual of the rare species then has less opportunity of finding a mate of its own kind. The Blue-winged Warbler (*Vermivora pinus*) and the Golden-winged Warbler (*Vermivora chrysoptera*) are a case in point. I have listened critically on many occasions to songs of the Bewick's Wren and have never heard one which varied far from the usual types. They were always characteristic and never showed the faintest suggestion of mimicry.—EDWARD S. THOMAS, *Ohio State Museum, Columbus.*

**Notes on a Captive Redstart.**—From June 13 to 30, 1942, I studied the growth and activities of a juvenile Redstart (*Setophaga ruticilla*) that I captured when it flew from its nest in an isolated 25-foot Norway maple (*Acer platanoides*) located about 75 feet from a wooded park in Washington, D. C. The nest was situated 15 feet above the outside traffic lane of a principal street, on a small branch that sloped steeply upward. An old Redstart nest, apparently of the previous year, occupied a similar site a few feet away in the same tree. The recent nest, when first discovered May 28, contained eggs; on June 4, it contained two eggs and one small young; and on June 13, two young, which flew from the nest when nearby leaves were touched. While I was photographing the two young on the ground, a heavy thunder storm began. One fledgling flew to a perch on a protected branch, but the other remained exposed to the weather. The parent Redstarts, which had been fluttering excitedly about attempting to lead the young to cover, went away. I took the wet young bird home and retained it for study until June 30, when I released it because of the failure of my mealworm supply.

*Growth.* At 10 days of age, the rectrices, whose tips were barely visible beyond their coverts, began to break out of their sheaths. The yellow patches on the tail feathers became completely exposed on the twentieth day. The remiges seemed to grow at equal rates. At 13 days of age, the yellow areas of the wings first appeared as narrow wing-bars, showing about one mm. beyond the greater primary coverts. These yellow patches were fully visible at 26 days of age, projecting 8 mm. beyond the coverts; the distal secondary was 45 mm. long at 16 days of age and measured 47 mm. on all succeeding days.

*Post-juvenal Molt.* At 22 days of age the slate gray juvenal plumage of the occipital and dorsal tracts was being replaced in quantity by olive-green first-winter plumage. The underwing coverts, yellow in color, also began to appear at this time; previously the underwing areas had been naked. The post-juvenal molt was thus begun before the juvenal plumage was fully acquired. According to Dwight (*Annals N. Y. Acad. Sci.,* 13, 1900:288), the post-juvenal molt of the Redstart does not include the flight feathers.

*Calls.* A loud, vigorous chip and a lower, but still extremely noisy, chippering food call comprised the vocal efforts heard during the study period. From about 14 days of age, the formerly indefinite chipper began to conform to the song pattern of the adult: an ascending, increasingly loud *chip-chip-chip-chip-chirp*. The bird snapped its bill occasionally, especially when being fed.

*Feeding Habits.* I fed the Redstart mealworms in quantity (it would accept 4 or 5 an hour) until all available sources were exhausted. Mushy egg yolk, mashed commercial turtle food (largely ant pupae and small bivalves), and canary "vitamin" seed mixture were offered as alternates.

On several occasions the Redstart squeezed itself through the bars of its cage in order to beg food from a captive juvenile Cardinal. At these times, each bird would beg food from the other, with open mouth and quivering wings, until tired.

At 16 days of age, the young Redstart keenly watched a house fly as it flew about the cage, but made no attempt to catch it. Though the Redstart occasionally picked up small fragments of food, it at first showed no interest in mealworms crawling before it. But at 25 days of age, after several vain attempts, it caught and ate one worm. It would not follow a worm, however, when the worm moved out of reach. The bird seemed able to recognize the several foods offered it, preferring mealworms, dead or alive, above all. Egg yolk was usually acceptable, but vitamin and turtle foods were consistently refused. Upon release at the edge of its home woods, it immediately picked at minute dots on nearby leaves and made a circular flight in weak pursuit of a passing gnat.

*Flight.* In contrast to juvenile Cardinals studied in captivity, the extremely buoyant flight of the young Redstart was amazingly expert. The Cardinals, for almost a week after leaving the nest, were able to fly only along straight, sometimes slightly climbing, routes when escaping capture. Invariably, blind collision with a wall or other barrier terminated their flights. The Redstart, however, from its first attempt, apparently selected its next perch and then landed accurately upon it. On the first day out of the nest, it was seen to look over its shoulder, squirm about to secure a good footing, and then spring into the air to land on a perch a foot behind and above it. On the second day it could climb at a 45° angle on flights of 6 to 15 feet. By the ninth day out of the nest, it could hover expertly and even when hovering, move backward a few inches in the air. (These habits became established in Cardinals only when they were several weeks older.) At this age, it would dart about, hummingbird-like, hovering at several points, in a cage one cubic foot in size.

*"Crawfishing."* For a period of two or three days after capture I noted a peculiar habit, best described as "crawfishing," whenever the bird was lifted from its perch and placed on a flat surface. It would extend its wings as far forward as possible, draw in its head, spread its tail, and run rapidly backwards until halted by collision or until (after moving 2 or 3 feet) it became tired. The exact reason for this reaction was not apparent, but it seemed probable that it was in some way connected with an instinct to withdraw into the nest when the feet are not in a perching position. It did not seem purely a question of balance. This reaction was not tested upon soil or a rough surface, and I saw no evidence of it when the birds were originally captured and photographed on a lawn. The habit was less apparent on the second day out of the nest, and it stopped by the fourth.

*Intelligence.* In addition to its apparent deliberation before flying, the superior intelligence of the Redstart was illustrated by its ability to search for an opening in its cage and to make its way out. Whereas captive Cardinals and Quails would remain perched or repeatedly and blindly attempt exits through openings obviously too small, the Redstart made no futile attempts but searched until it found a practical way of escape. Such an escape route, once discovered, was tried persistently without further searchings until it was blocked. Undoubtedly, more formal experiments would reveal similar superiority of the Redstart, over Cardinals and Quails at least, in escaping from simple mazes.—GEORGE A. PETRIDES, *American University, Washington, D. C.*