

its absence, male secondary characters appear. There are innumerable cases on record of female-plumaged birds that have assumed male plumage and, upon dissection, have proved to have abnormal or diseased ovaries. In the extreme manifestation of this condition a female may actually become a functional male (Crew, 1923. *Proc. Royal Soc. London*, 95B:256-278).

It is somewhat more difficult, however, to explain the cases in which a male-plumaged bird acts and functions as a *normal* female. The best explanation seems to be that of Crew (1927. *Proc. Royal Soc. London*, 101B:514-518). According to Crew's theory, the ovaries of the birds in question undergo occasional periods of physiological inactivity, and the production of hormones is much reduced. If such a quiescent period coincides with the period of molt, the new feathers will be of the male type, since the inhibitory influence of the ovarian hormone is absent. After the pattern of the feathers has already been determined, the ovary resumes its normal activity in time to display the ordinary manifestations of the breeding season. Evidence for this theory of irregular production of ovarian hormones was provided by a Rhode Island Red fowl studied by Crew, which molted irregularly into male and female plumages in the following annual succession: male, female, male, male, female. In each plumage, the bird was a good and consistent layer.

In almost all large collections of bird skins there are specimens which, on plumage evidence, have been considered by workers examining them to be incorrectly sexed. It is possible that some of these were specimens like the Bob-white described above. The possibility serves to emphasize the importance of a description on specimen-labels of the condition of the gonads rather than a mere notation of the sex.—FOREST W. BUCHANAN, *Amsterdam, Ohio*, and KENNETH C. PARKES, *Laboratory of Ornithology, Cornell University, Ithaca, New York*.

The eyesight of the Bluebird.—At "The Frith," near Butler, Pennsylvania, we have a pair of 4,000 volt power-distribution wires, crossing several hundred yards of the laboratory grounds, 30 feet up in the air. The herbage below is grass, briars, and low bushes not more than about two feet high.

Bluebirds (*Sialia sialis*) sit on these wires, their heads bent down, apparently intent on the ground below. Suddenly one of them will dive down, sometimes to a point perhaps 10 yards to one side of the point directly under the wire, instantly capturing a caterpillar, which he immediately takes, not to the wire itself, but to the power pole or cross arm supporting the wire, a more convenient perch for battering the grub into pulp. If, after sitting on the wire and watching for a time, he does not dive, he moves 10 or 20 yards along the wire, and sits and watches again. I can see no explanation except that he actually sees the caterpillar, up to 40 or 50 feet away, and deliberately uses the vantage point of the wire to study the area below quite minutely.

One caterpillar, we could see through the binoculars, was a large cecropia or allied form, but others were much smaller.

Hawks, we know, can see mice and other small objects from a much greater height, but we have supposed it was movement on the part of mice that betrayed them. Caterpillars of the cecropia type are very quiescent creatures, remaining motionless for long periods while they digest their food, then moving up the stem of the plant an inch or two to a convenient leaf, mowing it quietly into their mouths, then backing down to the stem and relapsing into a motionless condition. Most other caterpillars are comparably quiet. Yet the Bluebird spots them, even with a brisk breeze blowing so that all the vegetation of the countryside is in motion.

Most passerine birds seem to hunt their food in a myopic way, like the titmice and warblers and vireos, by diligent searching at close quarters. Old

World flycatchers and the American tyrant flycatchers, like these Bluebirds, watch from a vantage point, but it is one thing to see a lively, flying insect in mid-air, and quite another to see a lethargic, camouflaged caterpillar in the brush.—F. W. PRESTON and J. M. McCORMICK, *Preston Laboratories, Box 149, Butler, Pennsylvania.*

Home range and duration of family ties in the Tufted Titmouse.—The Tufted Titmouse, *Parus bicolor*, formerly considered rare in Michigan (Barrows, 1912. "Michigan Bird Life," pp. 692-694), now occurs in moderate numbers throughout the southern part of the State; yet we have little more information on the species than was available in the days when it was rare.

From December 1940 to the end of 1947 (85 months), I maintained a banding station at my home in Ann Arbor, a location favorable to birds, and I did some trapping and banding in every month—usually every week. In that period I banded 26 adult and 3 young Tufted Titmice. With the exception of one, banded March 11, the 26 adults were first taken between October 25 and February 23. Half of the adults (13) were never taken (or even identified) again—even though 17 of the 26 had been color-marked before being released; 11 were retaken or seen repeatedly between late spring and early fall (on 141 occasions in all). There is but one other bander (who traps only occasionally) and few observers in the region I studied; yet 5 of my color-marked Titmice were repeatedly trapped or reliably recorded by others within a .6-mile radius from my banding station. I found two nests of banded birds—.25 and .3 miles from the station. These data seem to indicate that there is no real migration of this species in Michigan (such as several writers have postulated) but that there are two classes of birds: *A*, those that remain in restricted home ranges throughout the year (hence repeatedly recorded in a small radius); *B*, those that wander (hence not recorded after banding). It seems reasonable to suppose that the former are fully adult birds; the latter, birds in their first winter wandering widely before finally settling on a home range.

Adults commonly came to the feeding station in twos, and in several cases I found banded and color-marked pairs remaining together for considerable periods. Such cases are: Pair 1, January 1942 through March, May 1942 through August, October 1942 through January 1943; Pair 2, December 1944 through May 1945; Pair 3, January 1941 through April. During these periods the pairs were seen together frequently, sometimes daily. Gillespie (1930. *Bird-Banding*, 1:113-127) has already presented some evidence for permanent mating of this species.

In the six-year study made in California by John B. Price (1936. *Condor*, 38:23-28) of 64 banded adults and 145 banded juveniles of the nearly related Plain Titmouse, *Parus inornatus*, 45 per cent of the adults (banded after being captured on the nest) were recaptured in subsequent years within 100 yards of the original nest site whereas only 1.3 per cent of the juveniles were recaptured. Most mates remained together for at least two or three years.

A more remarkable characteristic of the Tufted Titmouse was the continued association of the young with their parents. Adults often brought their young to my feeding station, in one case on the day of fledging (July 8)—from a nest a third of a mile away. One or more young sometimes continued to come with the adult pair for many weeks. In one case, two marked young, first brought by the adults (Pair 1, above) to the feeding shelf on June 22 (1942), continued to accompany the parents until November 8; after that date, only one young came with the adults, but it continued to appear with them until January 10 (1943).

The greatest age recorded for any of these Titmice I have banded is five years—for a bird (No. 138-104183) banded December 7, 1941, when it was at least six months old, and last seen four and a half years later (May 26, 1946). Two others were at least two and a half years old when last seen.—JOSSELYN VAN TYNE, *University of Michigan Museum of Zoology, Ann Arbor.*