

spruce tree only a short distance away. He allowed me to approach within 50 feet, then flew. I did not see him again. On June 7 I found the female on the nest at 10:00 a.m. and at 3:30 p.m.; at 5:17 p.m. she was still on the nest, and I watched her from then until dark. It was a cold cloudy day with a moderate northeast wind. At 8:43 p.m., in the dusk, the female suddenly flew directly from the nest, disappearing into a thick spruce-tamarack swamp. At 9:06 p.m. she again landed on the little spruce stump above the nest and dropped onto the eggs after looking carefully about her. It was nearly dark then because of the heavy clouds but was not entirely dark until 10:30 p.m. On June 9 I was back at the nest at 4:00 a.m., shortly after daybreak; the female had probably left and returned earlier, for she remained on the nest during the next eight hours. During two visits in the afternoon on the same day and two mid day visits on the following day (June 10), she was on the eggs. Thus during 12 hours' observation, she incubated for 11 hours and 37 minutes and fed 23 minutes on June 8 and 9, the 23 minutes being just before dark. She always sat on the nest facing out from the stump.

Female Spruce Grouse were observed along the roadway near our cabin on June 8 at 2 p.m. and June 9 at 1:30 p.m. They were dusting in some sand in the roadway.

Other birds in close proximity to the nest were Greater Yellow-legs (*Totanus melanoleucus*), Richardson's Owl (*Aegolius funereus*), Nighthawk (*Chordeiles minor*), Canada Jay (*Perisoreus canadensis*), Ruby-crowned Kinglet (*Regulus calendula*), and Myrtle Warbler (*Dendroica coronata*). On June 9 the Canada Jays landed only two feet in front of the Spruce Grouse on her nest, but she did not move; they hopped about her for several minutes. Red squirrels ran about her on numerous occasions, and two snowshoe hares scampered up and down the roadway at times, but she showed no sign of disturbance.—LAWRENCE H. WALKINSHAW, 1703 Central National Tower, Battle Creek, Michigan.

A female Bob-white in male plumage.—On June 3, 1944, F. W. Buchanan collected a Bob-white, *Colinus virginianus*, in the valley of Elkhorn Creek, Lee Township, Carroll County, eastern Ohio. In all outward appearances, the bird was a typical male, but upon dissection, the specimen proved to have a somewhat enlarged and apparently functional ovary. The carcass was unfortunately not preserved; the skin (C.U.21567) has been deposited in the Louis Agassiz Fuertes Memorial Collection at Cornell University.

Mr. Herbert L. Stoddard informs us (*in litt.*) that in all of his experience with the Bob-white he has never collected an individual exhibiting such a condition, although on two or three occasions he has seen Bob-whites in the field whose behavior seemed to indicate a reversal of sex characters.

Two similar cases in wild birds of other species have come to our attention: one in the Spurred Towhee, *Pipilo maculatus montanus*, reported by Bergtold (1916. *Auk*, 33:439), and one in the Bay-breasted Warbler, *Dendroica castanea*, reported by Stoddard (1921. *Auk*, 38:117). In both cases, the birds, although wearing male plumage, possessed apparently normal, undiseased ovaries, with ova in various stages of development.

The plumage-determining mechanisms have been studied most thoroughly, as would be expected, in the domestic fowl. Whereas the results may not be applicable to birds in general, they are probably valid for a galliform species such as the Bob-white. Professor F. B. Hutt, of the Department of Poultry Husbandry, Cornell University, kindly directed our attention to the pertinent literature.

It is now well established that the secondary sexual characters, including plumage characters, of female birds are determined by a hormonal secretion of the ovary, which acts as an inhibitor to male secondary sexual characters. In

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