

Post-Copulatory Display in Fulvous and Black-bellied Tree Ducks.—The courtship display of tree ducks has been characterized as simple, resembling that of the swan (Delacour, 'Waterfowl of the World', vol. 1, p. 32, London, 1954). However F. Finn ('Bird Behaviour', p. 262, London, 1919) called attention briefly to the fact that "there is frequently a marked display after, but not before, pairing, both parties executing a step-dance in the water with one wing held aloft." So far as we know, this curious display has not been described in detail nor pictured.

The accompanying photographs illustrate post-copulatory display as regularly performed, (several times daily over a period of four months), by captive Fulvous Tree Ducks (*Dendrocygna bicolor*). Wild birds on a small pond near Rio Hondo, Texas, were observed by the authors to go through this identical procedure on several occasions in May 1957. When the photographs were made (March 1957) the female was 19 months old and the male 8 months. Both birds were obtained at an early age from the Louisiana rice fields.

Copulation has been observed by the writers only when birds were in the water. The male with quick movements grasped the back of the female's neck to assist in mounting. Seconds later, the male dismounted and was back in the water beside its mate, both treading water very fast, bringing bodies up above the surface, breasts puffed, necks arched, and with one wing lifted (usually the outer wing, the wing not next to the partner). Occasionally birds have been observed facing in opposite directions during this display.

The post-copulatory display of the Black-bellied Tree Duck (*Dendrocygna autumnalis*) was recently compared with that of the Fulvous Tree Duck on the same lake in the Lower Rio Grande Valley of Texas (Cameron County). The display of the Black-bellied Tree Duck was somewhat similar, but as observed by the writers it occurred in water which was too shallow for churning. Only once was there the slightest indication of lifting of the wing. The entire demonstration consisted of strutting for a few steps side by side, breasts puffed, heads and necks curved in an "S" shape.—BROOKE MEANLEY, *U.S. Fish and Wildlife Service, Laurel, Maryland*, and ANNA GILKESON MEANLEY, *Baltimore, Maryland*.

Further History of some Bald Eagle Nest Sites in East-Central Florida.

—This report is one of a continuing series each of which provides an index by which to compare the then current Bald Eagle (*Haliaeetus leucocephalus*) population in this area with that of the year 1935 when the study was initiated. Each report is based on a visit to 24 sites at which a nest was observed in 1935. These visits, with one exception, have been at intervals of five years. To refer to the most recent report see the Auk, 71: 306–309, 1954. In 1956 a ground search of all but two of the sites (numbers 1 and 6) was made December 20, 21, and 22. On December 26, 1956, a check was made from a cub-type airplane of each of those sites where the status was not satisfactorily determined during the ground search.

In the interest of brevity, this report uses the nest site numbers and the notations given in the 1954 report. These notations are: O—occupied sites, at which there was a nest judged to contain eggs or young; A—active sites, at which at least one adult was seen but at which there was not a nest judged to contain eggs or young; and U—unoccupied sites, at which no adult was seen. Below, each nest site is referred to by its number which is followed by a notation indicating its 1956 status: 1, U; 2, O; 3, A; 4, A; 5, U; 6, U; 7, U; 8, O; 9, U; 10, U; 11, U; 12, U; 13, U; 14, U; 15, O; 16, A; 17, O; 18, O; 19, U; 20, O; 21, U; 22, U; 23, O; and 24, O. The percent, of occupied nest sites in 1956 was 33 as compared with 58 (based on the ground search or 67 including additional occupied nest sites observed from the air) in 1951, 54 in



(Above and left) Post-copulatory display of Fulvous Tree Duck. B. Meanley and A. G. Meanley. (Right) Nest of Rose-throated Becard found in Guadalupe Canyon, Arizona. S. H. Levy.

1946, 46 in 1940, and 83 in 1935. The thoroughness of the 1956 searches was excellent, probably the best in any year. The nest at site 8 had been robbed shortly before my visit as indicated by climbing iron scars on the nest tree but is listed as occupied.

In 1956 the nest at site 16 had a pair of adult eagles perched nearby and both eagle down and green pine boughs could be seen on the edge of the nest indicating that eggs probably would soon be laid. At nest site 4 an adult eagle flew silently from (or from close to) a massive nest having grass such as is used as a nest lining visible on its rim and some old droppings beneath it. Probably this site had been occupied earlier in the year but was not occupied when visited. Nest site 14 contained a new nest along the rim of which could be seen eagle down and green pine boughs and beneath which there were many droppings. This nest must have recently been occupied or possibly it was about to be occupied even though no eagle was seen at the site. The nest at site 7 was in excellent repair and there were many droppings beneath it. Since there was no eagle down about the edge of the nest, it is probable that the nesting attempt was broken up at some time early in the present breeding season.

In view of the conditions at the above four sites it is possible that 50 percent of these 24 nest sites may have been, or would have been, occupied during the 1956 breeding season. In 1951 no nest sites were listed as being active or unoccupied which had as great a probability of being occupied during the breeding season as did these four nest sites in 1956.

In 1951 two occupied nests were found at sites not originally observed to have been utilized by eagles. Each of these new sites was within two miles of one of the original 24 nest sites which was occupied also in 1956. In 1956 each of these two nest sites was again occupied. A new, additional, occupied nest site was found in 1956 within less than a mile of nest site 16 at which a nest and a pair of birds were observed. These three new nest sites may represent nest sites that were overlooked during the searches carried out in 1935 and 1940, or they may be nest sites established by eagles new to the area. If the latter is true these new eagles may represent additions to the total eagle population or they may be pairs formerly occupying other areas.

The rate of population change is not the same in all parts of the study area. One area of about three square miles in 1956 contained four occupied nests, a fifth nest with a pair of birds apparently about to lay their eggs, and a sixth nest which probably had been, or would be occupied. In 1935 there were three occupied nest sites in this area and a fourth unoccupied nest site.

In no previous five-year period in this history of this study area has there been such sweeping ecological change. It is now considered profitable in Florida to clear away from the land almost all natural plant communities. Scrub and saw palmetto may be uprooted by bulldozers. Power equipment has made draining marshes and swamps relatively speedy and has further made it practical to fill in such drained area. In this section of Florida more and more land is being cleared for agriculture, chiefly the growing of oranges, and for housing.

The Bald Eagle has a very strong attachment to its nest site. In 1956 one Bald Eagle incubated its eggs in a nest that was within a hundred yards of a number of houses and had two roads within 100 feet of it which were used often daily. A number of occupied nests were close beside orange groves. Other occupied nests have had houses built within a quarter of a mile.

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To summarize: a group of 24 nest sites visited in 1935 has been revisited at intervals of about five years since then to determine the percent of these 24 nest sites which is occupied. The percent of occupied nest sites for the years on which visits were made is: 1935, 83; 1940, 46; 1946, 54; 1951, 67; 1956, 33 (or possibly as high as 50).—JOSEPH C. HOWELL, *Department of Zoology and Entomology, University of Tennessee.*

Nest of the Military Macaw in Durango.—The Military Macaw (*Ara militaris*) is a conspicuous inhabitant of the pine-oak forests of the Sierra Madre Occidental in the Mexican state of Durango. On July 2, 1957, Leslie C. Drew, John K. Greer and I were collecting in these mountains at a place approximately 8800 feet in elevation, located twenty-nine miles south and twenty-eight miles west of Vicente Guerrero. On an eastward-facing slope, we found three Mexicans engaged in felling a large, dead pine tree (*Pinus* sp., probably *montezumae*). These men, had located the nest of a pair of Military Macaws in a cavity in the tree and wished to obtain the young birds to sell. As the chopping continued, the parent birds, calling loudly, either flew up and down the canyon or perched in dead pines nearby. When the tree was felled, the cavity was found to contain two crushed, white eggs with embryos no more than 100 hours old.

The nest tree measured 80 feet high and 31 inches in diameter four and one-half feet above its base. The nest cavity was situated about 60 feet above the base at a place where the tree was 22 inches in diameter. The opening of the cavity measured 11 inches wide and 6½ inches high. The cavity was 29½ inches deep and 13 inches in diameter at the widest place. There were a few green feathers and coarse sawdust as nest material on the floor of the cavity. The hole, according to the men, had been excavated by the "pitorreal" (local name for the Imperial Woodpecker, *Campephilus imperialis*) and subsequently taken over by the macaws.

Macaws are widely sought by residents of the mountains, because they are marketable as pets. The woodcutters told us that nestling birds bring as much as 25 pesos from buyers in the mountains and as much as 60 pesos in the city of Durango. Financial assistance for the field trip on which these observations were made is acknowledged from the Michigan State University Development Fund—ROLLIN H. BAKER, *Michigan State University, East Lansing, Michigan.*

Why Two Breast-Bands on the Killdeer?—When renewing acquaintance with American birds last summer, I was puzzled by the fact that the Killdeer (*Charadrius vociferus*) possesses two black breast-bands, while many other species of the genus, like the Semipalmated Plover (*C. semipalmatus*), the Piping Plover (*C. melodus*), Wilson's Plover (*C. wilsonia*), the Ringed Plover (*C. hiaticula*) and the Little Ringed Plover (*C. dubius*) have only one.

On reflection, I concluded that this must be the effect of scale. The breast-bands (and other dark markings) of these plovers are clearly cryptic in function, serving primarily to break up the bird's outline and also to assimilate its pattern to that of the background. We can presume that the scale of the visual components of the background is approximately the same for all species (except perhaps for the more uniform background of *C. melodus* and perhaps other forms). Too great an increase in absolute size of ruptive markings would make for conspicuousness. If so, a large increase in size, as in the Killdeer, cannot be adaptively met by increasing the width of a single band, but only by replacing one band by two of approximately the same width.

The surface areas of these plovers will be roughly proportional to the square of the length. The following table, based on the "Handbook of British Birds" and Peter-