

# Kansas Ornithological Society

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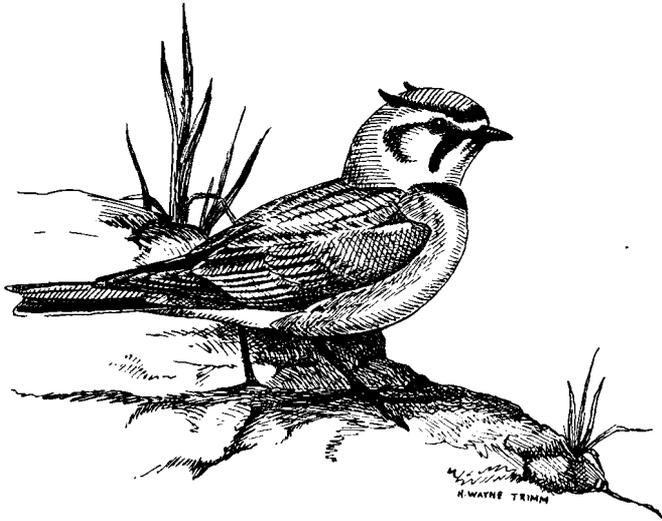
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## BEHAVIOR IN THE PURPLE MARTIN

ABBOT S. GAUNT

Observations on the behavior of the Purple Martin, *Progne subis* Linnaeus, were made at three colonies in Lawrence, Kansas, in the spring of 1959. The colony at which most of the observations were made included two houses about 100 feet apart. The larger was a three-story structure containing 14 apartments and set about 18 feet from the ground. The smaller was a converted nail keg containing six apartments and set about 10 feet from the ground. The over-all weather was cool and rainy during the early portions of the study, but cleared and was uniformly mild during the latter half.

*Arrival.*—Olmstead (1955:8) reports that Purple Martins arrived in the Lawrence area on March 26 in 1949, March 22 in 1950, March 26 in 1951, and one aberrant pair on March 8 in 1949. According to persons living near the main martin colony, martins arrive there usually between March 15 and 24. First martins arrived at this colony on March 22 in 1959.

Adult males arrive first and go directly to colony houses that have been used in previous years, where the birds set up territories. They are followed within a few days by the first females. Later, more females and first-year birds arrive, usually in groups, continuously until the latter part of April. After mid-April, the only arrivals are first-year birds.

This pattern of arrival probably has several effects upon the population. First, since adult males arrive earlier, they have first choice of nesting sites and frequently attempt to defend more than one. Thus, new arrivals must either drive away an established male, or wrest one of the extra sites from him. If they fail in these alternatives, they can only move to less preferred locations. This would seem to indicate that the strongest and/or most experienced birds, in any event those most likely successfully to obtain mates and rear a brood, are in the most favorable positions early. Second, because surplus males are forced to seek breeding sites away from established colonies, there is a better chance that every available colony site will be occupied.

*Pair-formation.*—Pairing in Purple Martins occurs with little or no formal "courting." The first territory set up by the male is a pairing territory, which he defends from other males, but not at the intensity with which he defends the nesting territory after pair-formation. Vocalizations are integral in territorial defense, and, at this time, consist primarily of the "male call," a series of short chirps in an ascending scale ending with a rasping note, which sounds like a slipping ratchet or a stick run across a picket fence. This early singing serves to attract not only females, but also males to the locus of a prospective colony. Only some incoming females choose to remain at the sites used by the males. When one does, a pair is formed. As reported by Allen and Nice (1952:618), "When a female arrives at an established colony, each male remains near his own room and calls loudly. If she alights on his porch, his excitement is redoubled. She seems indifferent to him, but peers into different rooms. . . . Finally the female seems to settle upon one place, and the male that has chosen that room or the one nearest it has a mate. From start to finish the whole process seems to be more a house hunting than a mate hunting." "Courtship," then, seems to consist chiefly of a male's attempts to call a female to his site.

In the area studied, martins nested exclusively in martin houses. Of the many houses in the area, most containing martins were painted white, provided with porches before the rooms, at least eight feet from the ground, and usually clearly in the open. None was directly under the canopy of a tree. A hollow tree trunk 12 feet tall having a natural cavity and a hole, placed experimentally near one colony by Richard F. Johnston and John William Hardy, failed to elicit any response from birds in the colony, even after the trunk around the hole was painted white. This, in addition to avoidance of conspicuous natural cavities in trees, might indicate that the birds do not respond to a hole, or to a dark hole on a light background, or to a series of holes when they select nesting cavities. It may well be that factors important in the selection of nesting sites are obscured in Lawrence, owing to the abundance of colony houses.

*Nesting.*—The process of nesting does not commence immediately upon the formation of the pair-bond, but is generally delayed until the colony is somewhat, although not completely, settled. This may be owing partly to the weather and partly to the unsettled state of the colony. The female begins the construction of the nest. Allen and Nice (1952:620) report that males begin the gathering of nesting material, but such was not the case at the colonies I studied, nor at those observed by Johnston and Hardy. Straw, small twigs, string, feathers, pine needles, any generally soft, fibrous material, and mud go into the matlike nest on the floor of the box. All materials, with the exception of mud, sometimes for which longer trips are necessary, are gathered from the immediate vicinity of the colony. No opportunity for stealing material from a neighbor or the nest of a House Sparrow (*Passer domesticus*) is overlooked.

After nesting is finished, and immediately prior to or coincident with the laying of eggs, the birds begin to bring fresh leaves to the nest. Contrary to recent comment (Raynor, 1959:362), this habit is well documented (cf. Allen and Nice, 1952:622–623 for references), although its function is not understood. It may be a means of regulating the temperature and/or humidity of the nest box. If so, then the habit must be an adaptation to minimal conditions, for I found no correlation between the weather and the amount of leaf bringing. Both sexes carry leaves, but the habit is more prevalent in males and, indeed, constitutes a major portion of their morning activity. Interestingly enough, the birds did not bring leaves to the nest in the evenings, even in the hottest weather.

*Aggressive behavior.*—Territorial behavior in Purple Martins varies with time, space, and sex. As mentioned above, the unpaired male first establishes a rather vague pairing territory. This frequently includes several nest boxes and the strips of porch in front of them. Roofs, corners, and porches not in front of holes are seldom, if ever, involved in any territorial activity. The male defends this first territory mainly by his presence and calling. After pair-formation, the male increases his defensive activities and restricts them to one or two boxes and, frequently, their attendant porches. The nesting territory is defended by both sexes, especially early in the season. At this time, some females defend more than one box and join in fights on the porch. As nesting progresses, the female tends to restrict her defense to the immediate area of the hole of the nesting box. After the eggs have been laid, an intruder is able to approach the hole and even peer in without eliciting any response, although any attempt to enter is immediately repulsed.

Behavior in fighting includes calling, posturing, and attacking. Calling is done by the male and consists of chirping, singing, and rasping. The latter is done as the bird gapes. The least aggressive posture is pointing, in which the male slicks down, retracts his neck, hunches his shoulders, and assumes a horizontal position with beak pointed at the intruder; this seems clearly a threat or warning posture. The next stage is the gape, which is also a warning, and is employed by both sexes. Snapping the bill, the third stage, is also employed by both sexes and is not only visual, but audible for some distance. The ultimate stage is attack; this is by no means uncommon. An intruder is grasped in the beak and beaten by the wings of a defender. Females seldom pursue an attack beyond the porch; males often fall off and flutter toward the ground before separating. If the colony is in an excited state or at the peak of territorial activity, the defender sometimes chases the intruder several hundred feet and aerial combat ensues up to 50 feet from the house. After any aggressive event, the defender flips its wings, pumps its tail, and rasps if male or chuckles if female. Wing-flipping and tail-pumping are not associated with agonistic behavior only, but are symptomatic of general unrest.

*Group behavior.*—Martins exhibit various patterns of group behavior, among them "approach calling." This occurs as the birds approach the house and is most obvious at roosting time. The incoming birds chirp several times and are answered by most of the colony, or at least those on the side approached. This type of calling may "announce" that a bird is flying in the immediate vicinity of the house. Even so, collisions are not infrequent, especially on or near crowded porches or wires.

Roosting is another group activity that follows a generalized pattern. About dusk, the birds gather on wires and television antennae near the colony and preen. From there they move to the porches, and the females go directly into the boxes. Males

follow within a few minutes. At this time, strays often become evident as they attempt to enter the boxes and are repulsed. After several unsuccessful attempts to gain entrance, they either fly off or spend the night outside on some neutral area.

*Interspecific relationships.*—Two competitors of the Purple Martin are House Sparrows and Starlings (*Sturnus vulgaris*). Although some reporters have found the sparrow a major source of conflict (Allen and Nice, 1952:643-644), they were not especially troublesome at the colonies I studied. Little attention was paid them by the martins unless the sparrows attempted to enter a nest, when a gape or snap drove them away. A sparrow nest in a box desired by a martin was simply pre-empted and rearranged. Starlings were a serious problem. While they were unable to nest in houses occupied by healthy colonies, they entered many boxes and ate the eggs. Martins avoided them and were nervous in their presence.

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*Museum of Natural History, The University of Kansas, October 28, 1959.*

#### NOTES AND NEWS

The Fall Field Trip of the K.O.S. was held October 11, 1959, at Emporia, Kansas, and vicinity. From 7 a.m. to 1 p.m. the weather was cool and fair with brisk wind; ponds were full. Eighty-seven species were seen at least once; these were:

Horned Grebe, Eared Grebe, Pied-billed Grebe, Double-crested Cormorant, Great Blue Heron, White-fronted Goose, Mallard, Black Duck, Gadwall, American Widgeon, Blue-winged Teal, Shoveller, Redhead, Ring-necked Duck, Lesser Scaup, Ruddy Duck, Turkey Vulture, Cooper Hawk, Red-tailed Hawk, Swainson Hawk, Rough-legged Hawk, Marsh Hawk, Osprey, Sparrow Hawk, Greater Prairie Chicken, Bobwhite, Ring-necked Pheasant, American Coot, Killdeer, Common Snipe, Spotted Sandpiper, Solitary Sandpiper, Lesser Yellowlegs, Pectoral Sandpiper, Least Sandpiper, Dowitcher (Long-billed?), Franklin Gull, Rock Dove, Mourning Dove, Screech Owl, Great Horned Owl, Barred Owl, Chimney Swift, Belted Kingfisher, Yellow-shafted Flicker, Red-shafted Flicker, Red-bellied Woodpecker, Red-headed Woodpecker, Hairy Woodpecker, Downy Woodpecker, Scissor-tailed Flycatcher, Eastern Phoebe, Horned Lark, Barn Swallow, Blue Jay, Common Crow, Black-capped Chickadee, Tufted Titmouse, Bewick Wren, Carolina Wren, Mockingbird, Robin, Eastern Bluebird, Ruby-crowned Kinglet, Loggerhead Shrike, Starling, Tennessee Warbler, Orange-crowned Warbler, Myrtle Warbler, House Sparrow, Eastern Meadowlark, Western Meadowlark, Redwinged Blackbird, Common Grackle, Brown-headed Cowbird, Cardinal, American Goldfinch, Rufous-sided Towhee, Savannah Sparrow, Vesper Sparrow, Lark Sparrow, Clay-colored Sparrow, Field Sparrow, Harris Sparrow, Lincoln Sparrow, Song Sparrow.

The Kansas Breeding Bird Survey now has nearly 9,500 nesting records in its files. 5,000 records refer to one colony of Cliff Swallows, 3,300 come from the notebooks of Dr. John W. Porter, and the remaining 1,200 have been submitted in the past two years by members of the K.O.S. Records this year were submitted by Merrill McHenry, Jon C. Barlow, Katherine Kelly, T. W. Nelson, Max C. Thompson, Laurence Binford, Galen and Ruth Abbott, Bessie Boso, J. W. Hardy, and Marno McKaughan. 134 species are now represented by at least one, usually unpublished, record.

Members of the Society are urged to enroll at least one new member into the Society in the coming year. The Society is healthy in direct proportion to the number of members it has. Blank forms suitable for enrolling new members will be distributed to you this month.

The blank form on which observers detail the accounts of winter bird censuses has been prepared and will be distributed to all members sometime this month. Members living in a region in which counts have been made in earlier years are urged to combine forces; consult recent volumes of the Bulletin for the localities and the names of people active at these spots.—R.F.J.