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Which sex leads in paired Mallards?—Among ducks the female is thought to determine the movements of the male during spring migration (Lincoln 1939). During courtship, drakes follow females in apparent attempts to establish and maintain pairbonds (Bellrose and Dzubin 1976), and hens lead when searching for a nest site or laying eggs (Sowls 1955). In Wilson's Phalaropes (*Phalaropus tricolor*) females commonly initiate "Paired Flights" (Howe 1975). Beecher and Beecher (1979) presented evidence that male Bank Swallows (*Riparia riparia*) follow their mates on flights from the burrow for a 7–8-day period following pair formation. They interpret these "chases" as a form of mate-guarding. I studied the relative positions of male and female Mallards (*Anas platyrhynchos*) moving between ponds by observing which sex led during takeoffs, flights, and landings.

Unmarked Mallards near Madison, Wisconsin, were studied from 12 March through 20 May 1977. Until 19 April, observations were restricted to a spring-fed pond at Nakoma Road Arboretum, which commonly held more than 40 Mallards. During mid-April, as the number of pairs decreased from at least 12 to about 7, I started to observe pairs at 4 other locations around Madison including lakes Monona, Wingra, and Mendota. Observations were made with 7 × 50 binoculars from a site 10–30 m from the shoreline. To exclude any possible influence of flights brought on by disturbance, no recordings were made during the first 5 min of each observation period. I used Lebret's (1961) characteristics for a pair on the water, as well as mutual head pumping, copulation with a male not associating with a courting party, and preening, feeding, and loafing in close proximity to distinguish paired birds. In flights, a drake and hen were considered paired when they alone approached the pond or lakeshore from a given compass direction. Thus, trios and larger groups were not included in my analysis.

Leading during takeoffs and landings was determined, respectively, by which individual's body was first to be completely out of or touching the water. In flight, the bird that was leading when a pair was first detected was deemed to be the leader. Subsequent changes in leadership were not recorded.

Females led pairs in 85% of the takeoffs (35 of 41 observations), 83% of in-flight obser-

vations (104 of 125), and 62% of the landings (60 of 97). For all 3 situations females led significantly ($P < 0.025$) more often than expected by chance. Takeoff and in-flight data are not statistically different from each other ($\chi^2 = 0.11$, df = 1, $P > 0.5$), but both differ significantly from landing (takeoff vs landing: $\chi^2 = 7.43$, $P = 0.006$; in-flight vs landing: $\chi^2 = 12.89$, $P < 0.001$). Percentages remained constant throughout the study period (8 periods tested against overall proportions: takeoff: $\chi^2 = 0.50$, df = 7, $P \geq 0.50$; in-flight: $\chi^2 = 0.62$, df = 7, $P > 0.50$; landing: $\chi^2 = 6.87$, df = 7, $P > 0.10$).

The male, if leading in flight, subsequently landed first 13 of 18 times (72%) in which both situations were observed. When females led in flight, males subsequently landed first 25 of 79 times (32%; $\chi^2 = 10.13$, df = 1, $P < 0.005$).

Females may lead in flight because of greater nutritional and energetic constraints on breeding female waterfowl (Krapu 1974, Titman 1981) or, if males are mate-guarding, females may lead by default, as the guarding sex must respond to the movements of the sex that is being guarded. At no time does there appear to be a consistent advantage for male leadership, except during landing, when male choice of a landing site may minimize attempts of forced copulation (Burns et al. 1980; Stewart and Titman 1980) by keeping his female away from other males. Some males appeared to lead females away from landing near other males on the water (pers. obs.; Dzubin, pers. comm.). Females may lead in landings less than in flights because males descend faster or because males pick the local landing spot and lead the female to it.

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