

flight and returning to shore to be fed, but he was unable to observe the changeover to self-feeding. Tomkins (Wilson Bull., 71:320, 1959) noted that in the Least Tern flying young accompany the adult, who catches a fish and alights on the water to give it to the young. In view of the scarcity of information on this critical period, observations I made on Great Gull Island, Suffolk County, New York, may be of interest.

On 29 September 1969, in the mouth of the Thames River at New London, Connecticut, about 7 miles north of Great Gull Island, many terns were resting on the exposed rocks and old pilings near shore. One juvenile Common Tern (*Sterna hirundo*) was begging with head directed upward, apparently toward an adult overhead. The young bird flew suddenly upward, circled once and landed on the water. The adult landed in front of the chick and put its bill into the water. The young bird, very close in front of the adult, put its bill into the water, then raised it and swallowed a fish. The adult had apparently passed a fish to the young under water.

On 26 September 1970, after most of the terns had left Great Gull Island, I noticed four Common Terns fishing near the western end of the island. There were two adult-juvenile pairs, as Tomkins (loc. cit.) reported for the Least Tern. For approximately 10 minutes I observed the adults skimming, diving, flying just above the surface and circling the area; they were closely followed in these maneuvers by the young. Fish must have been abundant and near the surface as both adults caught fish easily. After about 10 minutes the original four birds were joined by another adult—young pair of Common Terns and by an adult—young pair of Roseate Terns (*S. dougallii*). These eight birds continued the follow-the-leader actions described above for another 20 minutes before leaving the vicinity of the island.

During the 30 minutes of observations the young terns were never seen to actually enter the water, always halting their dives abruptly just short of the surface, nor were they seen to catch a fish. Once an adult caught a fish and flew up with it until it was in front of the young, dropped it and caught it again before it had fallen more than a few feet. While adult terns do occasionally drop fish and catch them in this manner, it seemed significant that the adult flew to the young before dropping the fish.

A Common and a Roseate Tern caught as downy chicks and offered live killifish regularly for several weeks in captivity, watched the live fish from a distance but never ate one, although both learned to eat cut up fish from a bowl. This behavior and the observations reported above lead me to believe that the young tern must learn to respond to living fish as an item of food and must then learn and perfect the technique for catching them. Presumably the learning period is lengthy. Hays and Donaldson in a study of post-breeding dispersal (in prep.) report a young Common Tern nine weeks of age being fed by an adult. Partial dependence on the parents may extend even to the wintering quarters (Ashmole and Tovar S., Auk, 85:90-100, 1968) especially for chicks hatching late in the season.

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Lek behavior in the Broad-tailed Hummingbird.—I recently observed behavior in the Broad-tailed Hummingbird (*Selasphorus platycercus*) which I interpret as communal male displays, or lek behavior. These observations were made daily from 11-14 June 1971 at Moraine Park in Rocky Mountain National Park, Colorado, at an elevation of about 8,000 feet. I observed three male Broad-tailed Hummingbirds performing their

characteristic U-shaped climbing and diving display flights along a steep, semi-wooded hillside of ponderosa pine. The three birds were separated from each other by about 7 meters and while I was unable to recognize individuals, identical locations were occupied on each of the four consecutive days. During these four days, I observed the display performance for a total of seven hours, during which time a single female approached to within about 2 meters of one of the end males on the second day (12 June). She remained quietly on a branch for 55 seconds and remained within sight of the display area, with occasional brief departures, for 39 minutes. At no time did she associate directly with any of the males, beyond her initial, brief approach.

The appearance of the female resulted in an increase in the frequency of courtship flights by each of the three males: I obtained a group mean of 4.8 seconds per complete display circuit per individual ($n = 18$, $s.d. = 0.8$) from arbitrarily-chosen samples during a ten-minute period beginning 15 minutes after the female's departure and a group mean of 3.5 seconds per display ($n = 11$, $s.d. = 0.6$) while the female was in the immediate area. The differences were significant ($p < 0.01$, t -test). An equivalent increase in display "intensity" upon arrival of females has been reported for the gallinaceous lek species.

I observed seven aggressive incidents among the three displaying males. Six of these were obviously initiated by the arrival of one male in the immediate vicinity of another. In all these cases, the intruding male retreated to his own display area following a brief confrontation in which the victorious proprietary male flew quickly at the intruder and then hovered immediately in front of him. In two cases, this was followed by a brief, mid-air scuffle lasting less than 3 seconds, while in the remaining four incidents, the intruder retreated immediately following this mid-air encounter. The seventh aggressive incident occurred in apparently "neutral" territory, following which both participants returned to their display areas with no obvious victor.

Isolated male-female courtships may still be the rule in the Broad-tailed Hummingbird. Thus, I observed four other examples of male courtship displays in which there was a female nearby and no other males were apparent. The frequency of display at this time appeared to be greater than in the lek with the female absent but lower than in the lek with the female present. It may also be significant that I never observed isolated males displaying in the absence of a female, while the three lek males described above displayed steadily with no female present.

I believe this to be the first report of lek behavior in a North American hummingbird. Possible selective advantages of lek behavior include providing greater stimulation to the female and hence increasing the probability of a successful mating by one of the participating males, possible stimulatory effects on the males themselves—hence resulting in a greater probability of a successful mating than if each were courting independently, greater range of selection for the female with a minimum of energy expenditure and/or facilitating location and recognition of males. Balanced against this would be the possible disadvantages of attracting greater numbers of predators to a commonly-used display area and the evolutionary disadvantage to individual males which may be consistently discriminated against in favor of a possible "master" within each lek.

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