

found it on slush tidal ice 8 m from a salt marsh channel and 28 m from open water. The eider hobbled weakly away and beat the ground with its wings then slumped into immobility when the dog came alongside it. The eider's head and bill were depressed until the tip was 3 cm above the ground. The neck was twisted, body slumped forward, wings folded and tarsi tucked under the body. The bird remained motionless as the dog wandered no more than 5 m away. Closer inspection revealed breast, belly, flanks and undertail coverts were saturated with water. Ventral feathers around the cloaca were stained green, suggesting either lead poisoning or botulism; grit was also concentrated around the cloaca. The eyes were open but "glassy"; they were rolled and exposed much white. The nictitating membrane was not observed to function, and an eye did not respond when I touched it. I twisted the neck, pulled feathers on the back and wings, tapped head and bill with my fingers, let the head and bill drop 4 cm on the ice, and still observed no response. I did not feel the bird breathing. The only sign of life was involuntary pedalling of the tarsus and feet when I inverted the eider. I released it 2 m from open water and walked away 20 m. It remained on the ice in a death-feigned posture for barely 1 min. The head and neck came up suddenly and it appeared to look in our direction. My dog pursued it but the eider escaped to the water, where it preened vigorously and then slowly swam toward shore.

Perry (1938, *in* Armstrong 1965) described death feigning in a male eider which was apparently in good health. Armstrong (1965) records death feigning and injury distraction in a nesting adult female Greater Golden Plover (*Pluvialis apricaria*) suggesting association of these responses. Operational definitions of death feigning, immobility and "freezing" are lacking. Relationships of immobility responses to "freezing" postures have not been investigated (Hinde, *Animal Behavior*, 2nd ed., 1970:420). Laboratory studies conducted by Rafter and Thompson (*Anim. Behav.* 8:186-191, 1960) and Francq (1969) suggest the response develops at the period of emerging physical independence, not sexual maturation. Death feigning may be a response to extreme stress. However, Norton et al. (*Nature* 204:162-163, 1964), studying brain wave recordings in immobile opossums (*Didelphis virginianus*) during "feigned sleep," found no changes between "feigned" and normal states; the animals maintained normal brain wave patterns and heart rates, suggesting the state of shock in the animal is erroneously assumed.

Controlled experiments are needed to define the relationship of death feigning to other similar responses. Natural observations can do little more to provide evidence of the mechanisms of these relationships. Death feigning has survival value to the individual and has almost certainly evolved through natural selection.

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Territorial attachment and mate fidelity by Horned Grebes.—Although territorial attachment has been documented for many migratory birds (see Austin, *Bird-Banding* 20:1-39, 1949; Hilden, *Ann. Zool. Fenn.* 2:53-75, 1965), evidence that grebes (Podicipedidae) return to the same nesting territory in consecutive years is largely circumstantial. This note documents territorial attachment and mate fidelity by individually marked Horned Grebes (*Podiceps auritus*) at Minnedosa, Manitoba (50°15'N, 99°50'W). Seven of 50 grebes (43 adults and seven juveniles) banded in 1974 and 1975 were recaptured in either 1975 and 1976 by using

a submerged gill net (Ferguson, *J. Field Ornithol.*, 51:179–180, 1980). Whether any of the other banded birds returned was not determined. Each pair of grebes mentioned in this note occupied an entire pothole marsh as its territory. Territorial attachment means an individual's return to the same nesting territory. Mate fidelity is defined as breeding with the same mate for more than one breeding season.

Five of the seven recaptured grebes (three males and two females) nested on territories on which they had nested and raised young to fledging in the previous year. On 25 May 1976, I recaptured both members of a nesting pair (pair 20) which had fledged young from the same pond in 1975. Both birds had been banded as adults on this pond on 10 June 1975. Their recapture illustrates both territorial attachment and mate fidelity. Fjeldsa (*Sterna* 12:161–217, 1973) suggested that mate fidelity by Horned Grebes in Sweden may be due to a sustained monogamy. At Minnedosa, this is unlikely in view of the pattern of summer departure of adults. In 1975, the male of pair 20 left the territory between 2 and 7 July, leaving its mate and two unfledged young. The female deserted the territory between 19 and 23 July, at least 12 days after the male had departed. This pattern of dispersal from territories was typical of adult grebes unless a pair attempted to raise a second brood (Ferguson, M.Sc. thesis, Univ. Manitoba, Winnipeg, Manitoba, 1977). Renewal of a pair-bond probably occurs in the following spring (as with pair 20 in 1976), facilitated by territorial attachment. Both sexes demonstrated an attachment to former nesting territories as shown by the following examples.

Two males banded as adults on 1 and 6 June 1975, were recaptured on the same territories on 31 and 25 May 1976, respectively. At least one of these males was paired with a different mate in 1976. This male, whose original mate had been banded in 1975, was paired with an unmarked female in 1976. On 3 June 1975, a nesting female was recaptured on a pond on which she had raised young in 1974. She had been banded as an adult on 19 June 1974. I was unable to capture and band her mate in either year.

Migrational homing, defined as the return of individuals to the same nesting area (Dwyer, Derrickson and Gilmer, *Auk* 90:687, 1973), was documented for two males. On 10 June 1975, a nesting male banded as an adult on 2 July 1974, was recaptured on a pond 3.7 km from his former nesting territory. A second male, banded on 1 July 1974, was recaptured on 24 May 1976, on a pond 0.8 km from his 1974 nesting territory. This male was not observed during 1975. I found no evidence of Horned Grebes returning in their first breeding season to their natal ponds. However, this was inconclusive considering that only seven juveniles were banded.

In summary, it is doubtful that mate fidelity by Horned Grebes is due to year-round pairing. Alternatively, territorial attachment by both sexes may result in contact with former mates and in an opportunity for renewing pair-bonds in spring. Behavioral evidence suggests that some pairing occurs on the breeding grounds (Ferguson 1977). By returning to nest at familiar marshes where nesting was previously successful, grebes may increase both their chances of survival and of raising young. At Minnedosa, ponds which supported a pair that fledged young were occupied more frequently in the following year (8 of 18 ponds) than ponds which initially supported a pair that failed to raise young (2 of 21 ponds).

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