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Frank McKinney was born in Ballymena, Northern Ireland, on 23 October 1928, and died 12 June 2001, in St. Paul, Minnesota. He is survived by his wife of 38 years, Meryl, and his mother, Nin. Frank received his B.A. in Zoology from Oxford (1949) and his Ph.D. from Bristol (1953) before doing a post-doctorate with future Nobel laureate Niko Tinbergen at the Wildfowl Trust in Slimbridge. Twelve years as Assistant Director of the Delta Waterfowl Research Station in Manitoba brought him to a new hemisphere and taught him that administration was not his calling, so he moved on to the James Ford Bell Museum of Natural History at the University of Minnesota in 1963, where he remained as Curator of Ethology and Professor in the Department of Ecology, Evolution, and Behavior until retiring in 2000. He enjoyed a distinguished professional career as an inspiring teacher and ground-breaking researcher. A member of the AOU since 1955, he gained recognition as an Elective Member in 1960 and a Fellow in 1975, and was awarded the Brewster Award in 1994 for his many contributions to waterfowl social behavior. He was also a Fellow of the Animal Behavior Society.

Frank enjoyed a worldwide reputation as the foremost authority on social behavior of dabbling ducks. He presented over 80 research talks and participated in dozens of symposia and workshops on topics ranging from wildlife management to sperm competition to the behavioral adaptations of southern hemisphere waterfowl. He was a fixture at AOU, Animal Behavior Society, International Ethological Conferences, and International Ornithological Congresses. Many of his comparative and experimental studies on ducks were conducted in special flight pens he designed and built at the Cedar Creek Natural History Area just north of the twin cities, but he also did field studies of free-living ducks in Canada, South Africa, Australia, New Zealand, and the Bahamas. Frank sought (and identified) many of the key selection pressures likely to have shaped the social behavior patterns of dabbling ducks, especially their remarkable diversity of territorial behavior, promiscuity, and parental care patterns.

Due to my own fortuitous timing, I noticed that Frank actually had two major research careers. Initially trained as a classical comparative ethologist, he learned the disciplines of meticulous observation and objective description. To Frank, the behaviorist's first duty was to know the animal under study as well as possible and the only way to do that was to put in countless hours of quiet observation. There was nothing flashy, hyped, or pretentious about him. He prided himself on doing careful, indeed cautious work. During the 1950s and 1960s, Frank was oriented mainly on the macroevolutionary aspects of duck social signals and other behavior patterns, which he studied tirelessly with both captive and free-living subjects. But by the late 1960s, some of his excitement with that approach had begun to fade and Frank later admitted to me that he had gone a bit flat. So he reinvented himself. The centennial commemoration of Darwin's book on sexual selection (Campbell 1972) set Frank off in a series of new directions. The concept now called ''sexual conflict'' (basically, recognition of the fact that males and females often have noncongruent fitness interests) immediately cast doubt on the old notion of ''pair-bonding.'' Bob Trivers's unexpected proposal that the two sexes could almost be regarded as belonging to different species recast courtship as a process of mutual assessment and simultaneously sparked fresh interest on the practice of extrapair matings, consensual and otherwise, for which ducks were especially puz-

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(Frank McKinney weighing a New Zealand Blue Duck [*Hymenolaimus malacorhynchos*] while conducting a behavioral study of this species. Photograph taken by his wife, Meryl McKinney, in 1981.)

zling. Of course, Frank had a wealth of painstaking notes on such behavior already in hand, and they provided a rich vein of information on how real animals fit the emerging theories. In particular, Frank realized that the famous ''three-bird-chase'' behavior, which he had interpreted previously as primarily a territorial defense phenomenon, was virtually always composed of two males flying rapidly after one female. He reanalyzed the phenomenon as attempts toward usurpation of an already-paired female and resistance efforts by her partner. Thus, Frank's interests shifted more to questions of behavioral function and he embarked on a 20 year stint of continuous research support from the National Science Foundation, during which he explored sperm competition, mate-replacement, and many related topics.

Of his many important publications spanning a half-century, several stand out as contributions for which he was justifiably proud, including *Science* (201:281–282), *Zeitschrift für Tierpsychologie* (48:349–400), *Auk* (97:875–879), *Auk* (100:302–310), and review papers on the subject of sperm competition (McKinney et al. 1983, 1984).

As a teacher, Frank taught nine different formal courses and eight different graduate seminar topics across 48 academic terms at Minnesota. He served as major professor to more than 30 graduate students that completed M.S. and Ph.D. degrees and was in such demand for Ph.D. committees that he ended up serving on more than 150! Although most of his regular teaching was at the graduate level, Frank also supervised nearly 50 undergraduate research projects on behavior of animals ranging from fish to iguanas to primates. What I remember most about his graduate-level behavior course that I took in 1970 was the incredible historical perspective built into each topic. Because Ethology really came of age right after WWII, precisely when Frank was being educated, he was at ground zero and actually knew all the major players personally.

Frank retired with the intention of writing a comprehensive book on duck social behavior. It never materialized. On Christmas Day of that same year, he suffered a heart attack that nearly proved fatal. Recovering gradually from that ordeal, he and Meryl planned to move to a new home that would make daily life easier. Frank went out for packing boxes and died quickly from a second attack.

On a personal note, I wish to describe a gift Frank once gave me without knowing it. Midway through my first year at Minnesota, Frank invited me out one weekend to see his winter pens at Cedar Creek. It was well known that such ventures involved cleaning a bunch of duck droppings out of their cages, but I went along cheerfully, knowing that I would also learn something about the birds in the process. Sure enough, after the janitorial tasks were finished, we sat quietly side-by-side and watched a dozen or so Green-winged Teal (*Anas crecca*) swimming around a pond and performing a terrific number of courtship displays. The whole scene was an epiphany for me: like a muted sportscaster, Frank gave a rapid-fire account of the ducks' behavior, but with one crucial difference: in his version of a play-by-play you learned what each duck was going to do, not what it had just done! I had no idea anybody could get to know a group of birds so thoroughly. But many years later I found myself doing the same trick at a Great Blue Heron (*Ardea herodias*) colony with a field class and I realized where he had led me. Mine is but a very small part of Frank's legacy.

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