BEHAVIOR OF A YOUNG GYRFALCON

BY TOM J. CADE

IN THE course of field work supported by a grant from the Arctic Institute of North America and the Office of Naval Research, I had an opportunity in the last week of August, 1950, to visit the Kougarok region of Seward Peninsula, Alaska. I spent the week at the Rainbow Mining Camp, owned and operated by Frank Whaley and Sterling Montague and located on the Nuxapaga River at its confluence with Boulder Creek. These men owned a pet Gyrfalcon (*Falco rusticolus*), which I was permitted to handle and observe during my stay at the camp.

The history of this bird's capture and treatment in captivity is about as follows. On July 4, while on an excursion up the Nuxapaga River, Mr. Montague discovered a falcon aerie located on a steep bank in a bend of the river near Goose Creek. One of the parent birds, presumably the female, was shot on the nest. A single downy nestling found at the nesting site was taken back to camp and kept in a chicken-wire enclosure 3×5 feet in surface area, 3 feet high, and with an open top. Later, when the fledgling became active, a cross-bar perch was provided. Also a rag dummy was affixed to a pulley affair, by which it was jerked up and down in front of the falcon to "tease" her. (I judged the bird to be a female on the basis of size.) During the first weeks of captivity the bird was fed entirely on grayling trout and pike, and later, when she began to refuse this diet, on ground squirrels. The young bird had been fed by hand until I intervened and began requiring the falcon to tear her own food and feed herself, a habit which she was reluctant to acquire. As she began to fly, no restrictions were placed on her movements and according to Mr. Montague she had been in the air about a week before my arrival on August 23.

This Gyrfalcon was very gentle and seemed actually to seek human company. Because of this her actions were easy to observe.

Four days after my arrival, I introduced the falcon to the regular lure used by falconers in training their birds. Because of this bird's preference for being fed directly from the hand—and probably also because she was too fat—I had only mediocre success in getting her to respond to the lure. She did learn to eat from it, though never heartily, and she would fly to it from 25 or 30 yards, always landing on the ground by the lure, never attacking it directly with her talons. She would, however, respond readily to almost any other object that I might have at hand to toss into the air, including such things as a hat, gloves, an old sock, a crumpled piece of paper, or a stick. At most times of the day, whether well-fed or hungry, she would

chase such objects vigorously, striking them hard with her talons wherever they fell to ground. She would clutch my hat just as a wild falcon does its prey and attempt to tear it to pieces with her beak. By tossing a hat she could almost invariably be called from distances up to about 300 yards.

Because she would not respond well to the lure I decided to leave her alone until she had developed more interest in attacking and plucking her own prey.

As she began to develop speed and assurance in her flying, I often saw her attacking low bushes or clumps of grass. She would swoop suddenly down a slope, strike a bush, usually breaking off a branch, which she carried away in her talons, and then rise back up to her former position, all the while uttering high-pitched, rattling screams. Or she would fly into a clump of grass, strike it hard with both feet, tussle with it as though it were trying to escape, and go through the motions of breaking the neck or biting the head of her imaginary quarry, spreading her wings and tail over the clump in the characteristic attitude of a hawk hovering over its kill. Clods of dirt, conspicuous stumps, almost anything obvious in its relief received the same attention. She entered into these activities with an aggressive attitude.

During the latter stages of this period I once saw her chase a Robin (*Turdus migratorius*), and on several occasions Fox Sparrows (*Passerella iliaca*), Savannah Sparrows (*Passerculus sandwichensis*), and ground squirrels (*Citellus* sp.).

On August 28, the falcon followed me down to Goose Creek to the location of her parents' nesting site. Sitting on an outcropping of the lava flow across the river from the aerie was an adult Gyrfalcon—presumably the surviving parent. As soon as the wild falcon saw the tame bird in the air, it flew up to meet the newcomer. It rose above the pet bird and stooped in an attack, but the young falcon easily avoided the stoop by quickly maneuvering to one side, the attacking falcon thus falling below, leaving the advantage of altitude to the younger bird. The pet falcon then stooped at her parent (the first real stoop I had seen her execute), but pulled out of her dive before striking the older bird. There continued for several minutes the most spectacular and intense aerial "combat" that I have ever witnessed between two birds, each falcon attempting to rise above the other for the advantage of a stoop. Neither bird ever scored a hit and that did not seem to be their intention.

In the air the two were readily distinguished by their marked difference in size, the pet bird being considerably larger. This seemingly confirmed my opinion that the young bird was a female, while the parent seemed to be a male. They were also easily distinguished by their cries—those of the young falcon being much higher in pitch and more "squeaky" than those of the mature male.

In this combat the young falcon clearly had the advantage a larger percentage of the time, making three or four stoops to every one of the other. On two later occasions these two Gyrfalcons met in the air over Rainbow Camp to do battle. In each of these instances the juvenal bird appeared to come out victor, finally driving the adult away.

In the next few days the young falcon also had encounters with a Rough-legged Hawk (*Buteo lagopus*), a Marsh Hawk (*Circus cyaneus*), and a Pigeon Hawk (*Falco columbarius*). The Rough-legged Hawk and the Marsh Hawk were helpless against her attacks and could do nothing but flounder through the air until she tired of her activity. As far as I could determine she did not actually strike either of these birds, though presumably she could easily have done so. The Pigeon Hawk, however, was a different matter. Being smaller and more maneuverable, and perhaps just as swift, this little falcon easily kept above the Gyrfalcon and drove her mercilessly for several minutes until she was forced to seek shelter on the porch of the cook shack.

Two Herring Gulls (*Larus argentatus*) flying up and down the Nuxapaga River were attacked by the young falcon in the manner described above and were forced to take refuge by alighting in the water and waiting there until the falcon left the vicinity. Seven young Red-throated Loons (*Gavia stellata*) huddled in a group in the river were attacked and forced to retreat by diving.

On August 31, I left Rainbow Camp and could make no further observations on the behavior of this falcon.

Discussion

Two aspects of this falcon's behavior are worthy of additional comment—her attacks upon inanimate objects and her abortive attacks upon living animals with no apparent intent to kill. These behaviors possess most of the "commonly accepted characteristics" of play critically reviewed by Beach (1945:523–524): (1) they appear to express emotion or pleasure; (2) they are characteristic of an immature animal; (3) they do not terminate in immediate biologically significant action; and (4) they appear to be youthful attempts at adult activities. Beach rightly points out, however, that no one criterion, or one set of criteria, can be applied generally to playful behaviors in animals. This is especially important to keep in mind when comparing the behavior of birds and mammals, as Thorpe (1951:23) has indicated in regard to juvenile play.

Thorpe (1951:29) mentions in a footnote a paper in Dutch by L. Tinbergen in which he describes almost exactly the same sort of "playful hunting of inanimate objects by young Kestrels [*Falco tinnunculus*]," mentioning specifically such objects of attack as pine cones and grass roots. It should be pointed out, however, that these falcons were already engaged in the normal

amount of hunting activity for food. Bond (1942:87) discusses some similar activities of a captive young Goshawk (*Accipiter gentilis*) under the heading "Play," although he was not sure that a close analysis of the behavior would warrant the use of the term. M. W. Nelson (letter and oral communication) tells me he has frequently seen the same behavior indulged in by eyass Peregrines (*Falco peregrinus*) and Prairie Falcons (*Falco mexicanus*) in the Western States—mentioning specifically such objects of attack as sticks, clods of dirt, and horse manure. I have seen comparable antics performed by young Peregrines about their aeries along the Yukon River. Finally, Munro (manuscript) has observed a Prairie Falcon, of undetermined age, in British Columbia "playing" with cow manure, alternately swooping down, picking it up, dropping it, and picking it up again. Such behavior, therefore, seems to be frequent and widespread among the falcons, particularly among the juveniles, although Thorpe (1951:29–30) reached the conclusion that play generally is more prevalent among adult birds. M. W. Nelson (letter) tells me of one trained adult Peregrine that was extremely playful, and Bond (1942:87) mentions the case of Stabler's trained Goshawk, which showed "no diminution of play" at nearly five years of age.

Accounts of falcons and other hawks attacking live animals in a sportive or playful manner are so numerous in the literature that I think they need not be reviewed in this paper. Bent's "Life Histories" (1937; 1938) contain several.

These two kinds of aggressive behavior were categorized by Groos (1898: 120) under "Hunting Plays." The behavioral similarity of these responses to those of actual hunting led Groos (1898:75–76) to assume that they provide exercise and practice in perfecting the necessary skill to secure food. There seems to be little factual evidence to support this assumption at present, and it has been experimentally demonstrated that youthful practice is not necessary for the perfection of some types of behavior (Beach, 1945:535). But even should it be shown that play does perfect utilitarian behavior this would not explain the stimulus-response relationship involved.

Rand (1951:524–525) has shown the futility of attempting simple explanations of this type of behavior, pointing out that it may be "at times, the attack on an enemy; at times a response to a strange object; at times the result of over-belligerence; and at times play." He stresses variable and multi-factorial causation.

In the instances of attack upon inanimate objects, one wonders whether or not such behavior derives largely from "internal stimulation" and is akin to the type of behavior called *Learlaufreaktion* by Lorenz and "energy-accumulation activity" by Armstrong (1947:119). If such attack is primarily an instinctive reaction, one might hope to explain this behavior in terms of the

"releaser" school of thought. (See Tinbergen (1948) for a review of the basic concepts.) But then one is left in ever greater wonder, as Munro (manuscript) suggests, as to just what the stimulating nature of such objects as a hat, a sock, a clump of grass, or a clod of dirt might be to release aggressive behavior so nearly like actual hunting attacks. If one attempts an explanation in terms of recent conditioning theory (Skinner, 1938; 1950) then one must wonder how the probability of such behavior is increased by the "reinforcement" of non-utilitarian objects.

In the case of the young Gyrfalcon's attacks on living birds, the "combat" between the adult and the juvenile and between the young falcon and the other hawks might be ascribed to some sort of territorial defense on the part of the juvenal Gyrfalcon; and her attacks upon potential prey species merely as abortive or precocious attempts to secure food. There might be a strong case for the first point except that it seems unusual for an established adult falcon to be defeated by a young inexperienced juvenile, especially on the former's own ground. The second point seems to be negated by the fact that the young falcon at this stage of development did not appear to recognize intact birds as food, although it might be argued that the attacks showed recognition of moving objects as food.

The whole category of behaviors called play, particularly as manifested by birds, needs clarification. Beach (1945:538) emphasizes the importance of experimental definitions, and Thorpe (1951:28–30) has recently discussed play in birds in relation to learning abilities, pointing out on the one hand the need for distinguishing between cases of *Leerlaufreaktion* and true play and, on the other hand, between play and behavior that appears in the normal course of maturation. It seems to me that falcons and other hawks, birds that have highly developed and variable behavioral responses, are excellent subjects for such inquiry.

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Summary

The behavior of a young, pet Gyrfalcon was observed from August 23 to 30, at a mining camp in the Kougarok region of Seward Peninsula, Alaska. This behavior consisted of (1) attacks on inanimate objects and (2) abortive attacks on living animals. References to similar behavior for other species of falcons and for the Goshawk are cited for the first type. It is shown that these behaviors fall within the category of responses generally called "play." Various possible interpretations of this type of behavior are discussed, but the present data are too meager for positive conclusions.

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