

tailed Hawk (*Buteo jamaicensis*) from the vicinity of the 1980 Prairie Falcon eyrie. After pursuing the hawk nearly 1 km west, the falcon returned to the eyrie cliff by flying along the cliff rim while performing a flapping flight with slow, deep, exaggerated wingbeats reminiscent of the flight of a nighthawk (*Cordeiles* sp.). The wings of the falcon nearly touched at the top and at the bottom of each stroke.

On 24 February at 1010 H, on the East Tactical Military Range south of Gila Bend, I saw an even more elaborate performance of this same display. An adult Prairie Falcon (probably female by size) flushed from her eyrie cliff after the third pass by a pair of A-10 military jets about 100 m from the cliff. She soared in front of the cliff for 6 min, then performed five series of the exaggerated deep-flap display. Each series consisted of one to four flaps. After the display, the falcon soared briefly, then lit on the cliff rim near the 1980 eyrie.

The third observation of the deep-flap display occurred on 17 March near a traditional Peregrine Falcon eyrie in Pinal County. During the day, four falcons (two peregrines and two Prairie Falcons), two Red-tailed Hawks, and two Golden Eagles (*Aquila chrysaetos*) were observed attending the same cliff, a massive wall about 1 km long and over 150 m high. During the 7 hr 46 min observation period, many territorial interactions were observed. In one of these encounters (1157 H), one of the falcons left the cliff and stooped on a distant hawk or eagle. Then, while circling back toward the cliff, it performed one bout of the deep-flap display. The bird performing this bout was at such a great distance that, although I thought it to be one of the Prairie Falcons, it may have been one of the peregrines. In fact, later in the day (1441 H), the adult male Peregrine Falcon led its mate toward the eyrie cliff as it performed a brief bout of exaggerated flaps that was similar to the Prairie Falcon's deep-flap display.

It may be that this, and perhaps other yet undescribed social displays, have gone unobserved, or at least unreported, for so long because the courtship phase of the breeding cycle of even well-studied raptors has been under-emphasized. From my own work with large falcons over two decades, all observations of deep-flap were in a two-month period when the peculiar demands of my study required that I concentrate on the pre-laying stage.—**David H. Ellis, U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center, Laurel, MD 20708.**

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AN UNUSUAL DEATH OF A NESTING GOLDEN EAGLE

On 16 May 1991, while flying nesting surveys for Golden Eagles (*Aquila chrysaetos*) in Sheridan County, Wyoming, we observed a dead adult eagle in a nest. The nest site was located in a shallow cave of a clay bank approximately 200 m above Big Goose Creek, west of Sheridan, Wyoming, and had been active for at least 10 years. Closer inspection of the nest from the ground showed that a large rock measuring 71 cm × 43 cm × 28 cm and weighing approximately 45 kg had broken loose from the clay bank directly above the nest and fallen over the torso of the incubating bird. The dead eagle was an adult female that had been banded near the nest in February 1988. Remnants of one egg were found under her body. We estimated that the bird died in late April following a series of wet snowstorms, which contributed to loosening the rock from the bank. The rock was removed from the nest so that the site could be used again in future years. Incidents of this type are undoubtedly rare throughout the entire range of the Golden Eagle. However, mortality associated with the erosion of banks supporting nests may be common in parts of Wyoming, Colorado and Nebraska where Golden Eagles use creek banks as nest sites.—**Robert L. Phillips and John L. Cummings, U.S. Department of Agriculture, P.O. Box 25266, Denver, CO 80225-0266. John D. Berry, Kiewit Mining Group, Inc., P.O. Box 3049, Sheridan, WY 82801.**

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CHICKS OF BLACK KITES ATTACKED BY ANTS WHILE HATCHING

In 1988 while routinely visiting nests of Black Kites (*Milvus migrans*) the following observations were made at two nests in the north of Doñana National Park, South West Spain (37°N 6°W) which show that ants have some influence on the survival of chicks at hatching. In one nest, on 15 June, one egg had already hatched, and the second egg of a clutch of two was in an advanced stage of hatching with half the shell already open. The adult was not incubating

when I arrived at the nest and the embryonic membranes were dry. The hole in the egg was pointing downward and the shell around it had collapsed inward suggesting that the egg had been slightly crushed. The whole nest was covered with ants (*Tapinoma niger*) many of them going in and out of the egg. On 16 June the chick had completely broken the shell but still had not emerged, probably due to the very dry membranes strongly adhering to its body. The exposed part of the body was completely covered with ants showing clear signs of having been bitten. I freed the chick from the eggshell. On 17 June the chick was observed ridding itself of ants with its beak or by rubbing itself with nest material. Although the nest continued to be full of ants, there seemed to be fewer on the chick. This chick survived subsequently until fledging.

In a second nest, on 22 June, the first egg of a clutch of two had been hatching for three days, after which the shell was only $\frac{2}{3}$ open. It was not in the center of the nest but placed between sticks at the edge of the nest and completely infested with ants (*Crematogaster scutellaris*). A large part of the exposed area (wing, neck, breast, leg and especially the face) was nibbled to expose raw flesh. Twice I saw ants go in and out of the mouth. The egg also appeared to have been crushed and the head of the chick was slightly misshapen. I removed the chick from the egg. It was cold with a moribund appearance. The second egg was also at the edge of the nest, with the shell very scratched, possibly from rubbing against the nest sticks. When I arrived at the nest an adult flew from it, and during the nest check, I saw it circling the nest. On day two, the chick was dead and half eaten by ants. The remaining egg had fallen below the nest, and I did not see any adult near the nest. As far as I know, this is the first recorded observation of an attack by ants on chicks of raptors, at least in a temperate area where these insects are more gatherers and carrion eaters than hunters (W.M. Wheeler 1960, "Ants, their structure, development and behavior," Columbia Univ. Press, New York). It must be of infrequent occurrence as I have only been able to observe these two instances despite following hatchings in 57 Black Kite nests in the same area over two years. Nonetheless, a high proportion of trees with active nests were infested with these ants, especially *Crematogaster*. The unusual weather in Doñana in 1988 could have led to these occurrences. The spring was exceptionally wet, with rainy and unsettled conditions until June. When these observations were made the days were very hot following a stormy period, and at this time much ant activity could be noted. This suggests the ants might have been more inclined to use food sources not regularly exploited. Also, an abnormal behavior of the parents or chicks on hatching could have had an influence. In the first nest the incubation may have been somewhat irregular, as indicated by very dry membranes. In the second nest the chick took more than two days to hatch, a longer period than the normal 24–48 hours (unpubl. data). Both crushing of the eggshell and the positioning of a hatching egg at the edge of the nest were only observed in these two nests. It is possible that the parents, in order to avoid the infestation, either crouched more against the nest to impede the ants' entry or pushed the egg away from the ants. If so, these actions appeared to be of little use, or, in the instance of the crushing of the shell, were counterproductive and probably made hatching more difficult. Possibly this type of attack can only be successful at the critical time of hatching since soon after hatching the chick appeared able to defend themselves against insect attacks. I thank A.M. Jones for a translation of the first draft and F. Hiraldo and A. Coole for their helpful comments.—**Javier Viñuela, Museo Nacional de Ciencias Naturales, %/José Gutierrez Abascal 2, 28006 Madrid, Spain.**

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THESIS ABSTRACTS

CHANGES IN THE BODY MASS OF AMERICAN KESTRELS (*Falco sparverius*) DURING THE BREEDING SEASON

I monitored the changes in the body mass of adult American Kestrels (*Falco sparverius*) during the breeding season to determine: 1) whether changes in the mass of breeding kestrels occurred, and 2) what factors influenced these changes in mass. I first examined the relative influences of environmental and reproductive factors on the changes in body mass of breeding kestrels. I then examined whether food provisioning by adults was a physiological stress on the physical condition of adults or whether changes in mass could be related to an adaptive strategy of mass loss. I conducted my research on a breeding population of American Kestrels at Besnard Lake, Saskatchewan (55°20'N 106°00'W). In the two years of my study (1988 and 1989), 643 measures of mass were collected by live-trapping techniques from April