

Spread-wing posturing in cathartid vultures.—The assumption of certain definite postures relative to the sun, widespread within the class Aves, is of interest from both functional and evolutionary standpoints. Within recent years Clark (1969), Curry-Lindahl (1970), and others have documented the occurrence of similar and perhaps homologous spread-wing postures in several families of birds in the orders Falconiformes, Ciconiiformes, and Pelecaniformes. Kahl (1971) in his discussion of spread-wing postures in storks has provided a useful classification of the several types of spread-wing postures presently recognized. These are: (1) wing-drooping posture, (2) delta-wing posture, and (3) full-spread posture. Wing-drooping is probably of little phylogenetic significance as it is widespread throughout the class. As delta-wing and full-spread postures are apparently of more restricted occurrence, their presence in various groups should be fully documented.

Full-spread posture has been reported in the Pelecanidae, Phalacrocoracidae, Anhingidae, Ciconiidae, Aegyptiidae, and Cathartidae (Clark 1969). The name delta-wing posture has been applied only to the Ciconiidae (Kahl 1971), but Meyerriecks (1960) described a "sunbathing" posture in the Ardeidae, and my observations of this behavior indicate that the name delta-wing posture is applicable.

In the Cathartidae full-spread posture has been reported in all five genera: in the Andean Condor (*Vultur gryphus*) by Poulsen (1963), in the King Vulture (*Sarcoramphus papa*) by Kurz (1970), in the Black Vulture (*Coragyps atratus*) by me (this paper), in the Turkey Vulture (*Cathartes aura*) by Heath (1962) and Clark (1969), and in the California Condor (*Gymnogyps californianus*) by Koford (1953). Delta-wing posture has not been previously reported in the family, but I have seen it in both Black Vultures and Turkey Vultures in southern Florida.

My observations were made at an alligator pond in the Big Cypress Swamp during a low-water period when a fish kill concentrated dead fish along the drying shore (Kushlan 1972). Black Vultures and fewer numbers of Turkey Vultures attracted by these fish roosted nightly near the pond. At dawn on 15 May 1970, several Black Vultures flew from their roost to the top of fish traps in the pond. These remained in the shadow cast by the cypress trees until 07:45. Soon after the sun first shone on the vultures, they began to assume wing-drooping, delta-wing, and full-spread postures. Several Turkey Vultures acted similarly on 19 November 1970.

Hamilton and Heppner (1967) hypothesized that birds may utilize sunlight to reduce their energy expenditure in maintaining body temperature, which Ohmart and Lasiewski (1971) confirmed in the Roadrunner (*Geococcyx californianus*). As Heath (1962) and Hatch (1970) demonstrated nocturnal hypothermia in the Turkey Vulture, I believe the vultures I watched assumed the various spread-wing postures to increase the effectiveness of the sun's radiant energy in raising their body temperatures.

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Canada Goose goslings leaving cliff nest.—There are several records of the Canada Goose (*Branta canadensis*) nesting in trees and on cliffs (Craighead and Stockstad 1958, *J. Wildl. Mgmt.* 22: 206), but very few published accounts of goslings leaving tree or cliff nests. On 7 June 1971 Hugh Crawford and I discovered a goose on an old Ferruginous Hawk (*Buteo regalis*) nest in Dinosaur Provincial Park, Alberta. The nest was on an ironstone outcropping of a cliff about 50 feet up near the top of rilled sandstone strata. When the goose left the nest it revealed 5 goslings and 1 egg.

Gosling 1 almost immediately walked off the edge of the nest and fell down the cliff. It slid, bounced, and fell down the cliff, turning several somersaults. Gosling 2 left the nest 5 minutes later. It landed on an ironstone outcropping some 10 feet below the nest, tried to climb back up, but was unable to do so and continued its tumbling descent. Gosling 3 left the nest 1 minute after gosling 2 and goslings 4 and 5 left almost simultaneously 5 minutes after gosling 3. All 5 goslings left the nest within a total of 11 minutes. After coming to rest at the base of the cliff each gosling lay stunned for from 30 seconds to 1 minute. After all goslings were conscious they moved away in a group. Gosling 6 hatched 14 minutes after goslings 4 and 5 left the nest. We watched gosling 6 for another 10 minutes and it made no move to leave the nest.

It is interesting that both Craighead and Stockstad (*ibid.*) and Hornocker (1969, *Auk* 86: 764) refer to goslings jumping from nests. A more apt description of the departure of the Dinosaur Park birds would be to say the goslings walked off the nest. The goslings Hornocker (*ibid.*) observed left a nest 50 feet up in a cottonwood, landed in soft sand and immediately walked away, except for one that lay stunned for 2 or 3 minutes after striking a limb near the bottom of the tree. Probably all the Dinosaur Park goslings were stunned by the frequent blows they received on the way down and because the landing surface was sandstone.

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