fish were caught in the Matapica swamps in 1980 than before. As a result nearly all fishermen had left the area. The cause of the reduction in fish numbers is unknown. Further research on the subject is necessary when the situation for the birds does not improve.

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Status of Sibling Aggression in Florida Sandhill Cranes.—Sibling aggression or "cainism" has been frequently reported in chicks of northern, migratory populations of the Sandhill Crane (*Grus canadensis*) (Prill 1922, Hyde 1957, Harvey et al. 1968, Littlefield and Ryder 1968, Miller et al. 1972, Drewien 1973, Miller 1973, Walkinshaw 1973a, 1973b, Quale 1976, Voss 1976, and others); but the status of this behavior in the Florida Sandhill Crane (*G. c. pratensis*), a nonmigratory subspecies and the southernmost population of Sandhill Cranes in the United States, is unknown. During a study of Florida Sandhill Cranes from 1972 through 1979 in an area of south central Florida including all or parts of 10 counties (Charlotte, DeSoto, Glades, Hardee, Hendry, Highlands, Manatee, Okeechobee, Polk, Sarasota), I made a special effort to observe sibling rivalry.

According to Erickson (cited by Miller 1973), sibling aggression in captive Sandhill Crane chicks is pronounced within 2 days after hatching, further increases by day 4 or 5, and subsides after 3 months of age. Thus, I gave particular attention to families with 2 young less than 1 month of age, as sibling rivalry should be most intense during this period. Because young chicks are often difficult to see in heavy cover, I was able to make relatively detailed observations on only 8 family groups with chicks in this age group. Each family was observed on 1 to 6 days for continuous periods of 15 min to 3 h for a total of 15 h. The cranes occurred in improved pastures or native prairie with scattered marshes and patches of pines or hardwoods. The most complete data were provided by a family that could usually be easily observed at distances ranging from 30 to 100 m from a well-travelled road (Layne 1981). I watched this family for periods of 15 min to 3 h each day (total 10 h) from 14 to 19 March. One of the young disappeared, presumably taken by a predator, between 20 and 22 March.

When first observed, the young, estimated to be not more than 2 days old, were with the adult female on an accessory nest platform. The male was nearby. A few minutes later the female walked a short distance away from the nest. During the time the female was with them and after she left, the young moved freely around the nest and rested close together with no sign of animosity. On the following days, the chicks stayed together on accessory nest platforms, sometimes by themselves and sometimes accompanied by an adult, or followed the parents as they foraged near the nest. On the second day, one chick briefly pecked at the other as they accompanied the adults. Thirty minutes later, when the chicks had moved to an accessory nest, they engaged in a vigorous mutual pecking bout that lasted 5 or 6 sec. The adult female, standing beside the nest, ignored the contest. Each chick did an equal amount of pecking, and there was no indication of dominance of one over the other. They appeared to direct their thrusts at each other's beak rather than body. My impression of this behavior was that it was more in the nature of a sparring contest rather than serious fighting. A short time after the pecking bout one of the chicks pecked at a grass stem sticking up from the nest platform in the same way it had pecked at its broodmate's bill earlier. Except for the possibility that the 2 incidents of pecking represented agonistic behavior, I saw no other behavioral interactions between the young that could be interpreted as aggressive during the 6 days they were together.

During the time both chicks were present, the parents made no apparent attempt to keep them separated. The chicks often stayed close together when accompanying the

adults, frequently walking or standing with their bodies apparently touching. Sometimes the family moved together as a compact unit, while at other times both young followed one parent while the other adult foraged alone some distance away. Frequently each chick followed a different adult when the parents moved apart to forage separately, only to be reunited a few minutes later when the parents rejoined. Occasionally one chick would start to walk toward an adult accompanied by the other young then turn back and seek the other parent. In such cases there was no indication that the chick that turned back did so as the result of any action by the other sibling or adult it was with. In fact, the adult and young that were together often did not even seem to be aware of the approach of the other young.

The remaining 7 families with young chicks were observed for a total of about 5 h. Six families were observed once for periods of 15 min to 1 h and one was watched for 15 to 30 min on 3 separate occasions during a 9-day period. Approximate ages of the young in these families were 4 days, 7 days, 7–16 days, 10 days, 14 days (2 broods), and 30 days. As in the case of the family observed most intensively, the chicks of all families usually remained closely associated and showed no sign of dominance or aggressiveness toward each other. The chicks generally stayed near one or both parents but sometimes became separated from the adults by as much as 10 m. Occasionally the chicks would each follow a different adult when the parents walked apart to forage separately, but usually within a few minutes the adults and chicks would coalesce again into a compact group. The chicks appeared to take the initiative as to which parent to follow when the pair separated. I saw no indication of adults doing anything that might be construed as an intentional effort to keep the chicks separated.

In addition to the above families, I made more casual observations on approximately 100 other 2-young crane families with young older than 2 months and again saw no evidence of aggressive behavior between siblings or of parents apparently attempting to keep young separated.

These observations suggest that sibling aggression is rare or nonexistent in Florida Sandhill Cranes, in apparent contrast to northern populations of the species in which sibling rivalry has been frequently reported. However, available information is not sufficient to allow a firm conclusion concerning the existence of such a geographic trend. In addition to the limitations of the present data for Florida, the level of sibling aggression and its effect on juvenile survival in northern populations are not well established despite numerous references to this behavior in the literature. Although sibling aggression, in which fighting may be severe enough to lead to death of one of the chicks, has been frequently recorded in captives (Hyde 1957, Drewien 1973, Miller 1973, Archibald 1974, Quale 1976, Voss 1976), there have been few published observations, and no quantitative data on frequency of occurrence, of this behavior in the wild. Drewien (1973) saw aggressive interactions between siblings of Greater Sandhill cranes on 9 occasions (total number of observations not stated) at Grays Lake, Idaho. All encounters occurred during feeding and 4 involved the same brood. In only 3 instances did the dominant chick actually peck or attempt to peck and chase its sibling, and no apparent injury resulted from any of the interactions. Littlefield and Ryder (1968) also reported aggressive behavior between 2 *G. c. tabida* chicks once at Malheur National Wildlife Refuge, Oregon, but gave no details.

Much of the evidence for sibling strife in wild Sandhill Cranes is circumstantial, based on observations of adults apparently keeping the young separated (Prill 1922, Harvey et al. 1968, Littlefield and Ryder 1968, Drewien 1973, Walkinshaw 1973a, 1973b) and the supposed rarity of 2-young families (Hyde 1957, Miller et al. 1972, Miller 1973). Drewien (1973) noted that each member of Greater Sandhill pairs often took charge of a young and remained separated by several to over 100 m. He also encountered adults roosting separately with a young on a few occasions. Littlefield and Ryder (1968) stated that *G. c. tabida* chicks were kept apart by the parents for several weeks after hatching. Other accounts of adults keeping chicks separated are vague as to how long the separation was maintained and how it was determined to be an intentional act rather than a casual occurrence as noted in the Florida Sandhill families. Miller et al. (1972) and Miller (1973) emphasized sibling rivalry as a major cause of brood reduction and cited rarity of 2-young broods as evidence of a high level of sibling aggression. However, this conclusion can be

questioned for 2 reasons. First, the contention that cranes normally raise only 1 young is not borne out by the literature; most studies of Sandhill Crane productivity have reported a significant proportion of 2-young broods (e.g., Buller 1979, Drewien 1973, Littlefield 1976, Tebbel and Ankney 1979, Walkinshaw 1973a). Second, as loss of eggs and young from other causes were not taken into account, it is impossible to know the extent to which sibling aggression contributes to brood reduction. Thus, although sibling aggression in the Sandhill Crane may be more frequent in northern parts of its range than in Florida, it may not be as important a mortality factor in these populations as sometimes assumed.

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Egg Retrieval by Clapper Rails.—Pettingill (1938, Auk 55:411-415) reported that a Clapper Rail (*Rallus longirostris*) returned displaced eggs to the nest by picking them up in its bill. The number of rail eggs lost during egg laying and incubation is largely due to tidal inundation and storms (Ferrigno 1967, Some aspects of nesting biology, population dynamics, and habitat associations of the Clapper Rail. M.S. thesis, Rutgers University, New Brunswick, New Jersey). This method of egg retrieval by the rail may be one means of adapting to such threats.

I studied Clapper Rails at Corson's Inlet (near Ocean City), New Jersey from May to July in 1977 and 1980. To approximate the displacement of eggs from the nest due to tidal inundation and storms, I marked one egg and placed it 1 m from the base of each of 18 nests. The average nest height from the ground to the rim of the nest cup was 26.72 cm (range 10–50 cm). Experimental movement of the eggs was done at low tide