area (Balgooyen 1989). During the breeding season (December to April), high humidity, high temperatures, and moderate breezes along a NS axis persist in the general area of study. Lands have been cleared for cattle production with intensive management by tilling and planting of non-native grasses.

Palms held 14 of 29 (48.3%), araguaney (*Tabebuia chrysantha*) and ceiba (*Ceiba pentandra*) trees possessed excavated cavities for the remainder. Nesting at the base of palm fronds provided an opportunity for kestrels nesting in all compass orientations. A working hypothesis that kestrels avoid heat by nesting into the wind and away from direct sunlight needs testing. The G-Test with a William's correction (Sokal and Rohlf 1981) statistically compares the frequencies of nest orientation (Table 1) in the compass corridors of N-S, E-W (90°), NE-SW (45°), and NW-S (120°). Depending upon local conditions, the windy corridor consisted of nests oriented N-S (N = 13), NW (N = 1), and NE (N = 1) or 15 of 29 nests faced into the prevailing winds. The "sun" corridor of E-W included 4 of the total nests. In two cases of nest destruction, pairs selected new sites similar to their former cavities with directions avoiding heat. Analysis by the G-Test (G_{adj} = 9.75, $\chi^2_{(0.05)} = 7.82$) indicates that kestrel nest sites are not uniformly distributed ($P = 0.025$). The windy corridor seems favored by tropical kestrels.

One palm held a wasp's nest oriented to the N, a yellow-headed parrot (*Amazona orchocephala*) nest oriented to the NW, a tropical screech owl (*Otus asio choliba*) nest oriented to the SE, and a kestrel pair was the last to breed which may have limited the nest orientation to the vacant "hot" position in the East. Three eggs were laid and hatched, one young died, and two individuals fledged.

While further study is in order, kestrels may select a nest with an orientation in relation to the thermal demands of the environment in both North and South America. My thanks to Martin G. Raphael for comments and to Bill Bros for statistical analysis on this communication.

RESUMEN.—Mientras que los gavilanes primitivo (*Falco sparverius*) de la Sierra Nevada en California prefieren cavidades para sus nidos con orientación hacia el este y oeste, gavilanes de los llanos de Venezuela ocupan nidos que cavean los vientos (de norte a sur). Los gavilanes pueden seleccionar cavidades para sus nidos en relacion a las características termales del ambiente.

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CANNIBALISM BY BLACK KITE (*Milvus migrans*)

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Acts of cannibalism by birds are difficult to witness because of their brevity and thus may be underrecorded at nests. Among raptors, cannibalism has been considered rare and incidental to brood reduction (Mock 1984) but may be selected for if food is in short supply or unpredictable (see Alexander 1974).

We report on an adult Black Kite (*Milvus migrans*) eating a Black Kite nestling, indirect evidence of cannibalism by Black Kite in the same area and discuss a possible influence of food shortage. Black Kite nestlings have previously been found partly eaten by siblings in the Biological Reserve of Doñana on 4 occasions (Delibes 1975)

Observations of nesting Black Kites were made in the Pinar del Faro and elsewhere in Doñana National Park, Spain (36°48'N, 6°22'W). On 18 June 1987 at 1130 H

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GMT we flushed a feeding adult kite from a nest located in a stone pine (*Pinus pinea*). A freshly dead nestling was retrieved from the nest which contained no other food item. The dead nestling's left femur was picked clean of flesh and the head, viscera and part of the left side of the body were missing. The carcass weighed 141 g and the crop was empty. Using wing feather growth, we estimated the nestling was 12 d old (see Hiraldo et al. in press). The adult, which did not attempt to carry the carcass, showed attachment to the site and may have been a parent at this nest, which was unoccupied in 1988.

Two other nests 200 m from one another contained nestlings and prey remains on our visit on 18 June 1987. Ages of the young were estimated from wing feather growth (see Hiraldo et al. op cit.). Young at the first nest were approximately 25 and 29 d old and 22 and 25 d old at the second. On 27 June 1988 a color band from the oldest nestling of the second nest was found beneath the first nest in good condition, unopened. The first nest contained 1 nestling close to fledging age, and the second nest was unoccupied. Prey remains accumulate beneath kite nests and we suspect the band arrived beneath the first nest after its owner had been taken from the nest as a nestling and eaten there in 1987. We consider an alternative possibility, that the dead nestling was carried as, or attached to, an item of robbed nest material from which the band later fell, unlikely.

Food shortage could drive parents to eat their own young or to leave nestlings unguarded, thereby increasing the probability of cannibalism or nest predation. In Pinar del Faro in 1987, where we observed cannibalism, there was a mean of 1.94 nestlings/successful nest (17 successful, 2 unsuccessful), very similar to the mean of 1.95 nestlings for successful nests elsewhere in Doñana in 1987 (92 successful, 8 unsuccessful) where cannibalism may have been overlooked; but below the value for the adjacent area of Marismillas (2.22 nestlings/successful nest, 18 successful, 2 unsuccessful; brood sizes not significantly different, $\chi^2 = 1.6$, df = 2, $P > 0.05$). We found no significant differences between brood sizes in Pinar del Faro in 1987 and later years (for 15 successful nests in 1988, $\chi^2 = 1.96$, df = 1, $P > 0.05$, mean = 1.4 nestlings/successful nest; for 11 successful and 1 unsuccessful nest in 1989, $\chi^2 = 0.19$, df = 1, $P > 0.05$, mean = 1.81 nestlings/successful nest).

Information on the circumstances and incidence of cannibalism of nestlings by adult raptors is scant but suggests the phenomenon is common where nestlings are weak or hunting is difficult. Thus, a female European Sparrowhawk (*Accipiter nisus*) killed and then probably ate the youngest and most underweight of its brood (Newton 1978) and cannibalism in this species can be associated with wet weather (Moss 1979). The disappearance of Peregrine Falcon (*Falco peregrinus*) nestlings and recovery of nestling remains at plucking posts close to nests at inland sites in southwest Scotland, indicating parental cannibalism, occurred in 1976, when it was exceptionally wet during the main hatch period (R. Mearns, pers. comm.). We cannot rule out difficult hunting conditions as a factor in the cannibalism we observed but such behaviour may be less exceptional in a versatile and opportunistic feeder like the Black Kite than the absence of earlier records (see Cramp and Simmons 1979) indicates.

RESUMEN.—Hemos observado un milano negro (*Milvus migrans*) alimentando en el nido a un polluelo de 12 días de nacido. El ave adulta se comportaba como si fuera el dueño del nido. Un polluelo desapareció de cada uno de dos nidos adicionales, a causa de lo que, por las circunstancias presentes, se sugirió fuera canibalismo. Se supuso que la carencia de alimentos hubiera sido la causa para que los adultos comieran sus polluelos, o abandonaran el nido por largos períodos de tiempo, causando así la muerte de los pequeños.

[Traducción de Eudoxio Paredes-Ruiz]

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