

The crest-erection and tail-wagging of the male Roadrunner are similar to those of the Striped Cuckoo, *Tapera naevia* (H. Friedmann, *Ibis*, ser. 13, 3: 537-539, 1933). *Tapera* has been placed in the same subfamily, Neomorhinae, as the Roadrunner (J. L. Peters, *Checklist of birds of the world*, vol. 4, Cambridge, Harvard Univ. Press, 1940; see pp. 58-59), but is a nest parasite. Friedmann (*op. cit.*: 533) regarded the Striped Cuckoo as being a critical species in the study of the evolution of social parasitism in birds. Considering the similarities noted in the displays of that species and the Roadrunner, it seems that a more detailed study of the Roadrunner's behavior would be valuable.

A few additional observations on these captive birds should be mentioned since the information is not available from field studies. Several clutches of eggs were laid by two females, in the spring and summer of 1966. The nests were similar to those of wild Roadrunners. The female occasionally begged from the nest. The male responded by bringing nesting material, which the female placed in the nest by passing it under her breast and between her legs. Although both sexes took turns in continuous incubation, the 1965 and 1966 nestings were unsuccessful.

In 1967, four eggs which were artificially incubated at 37.4°-37.7°C hatched in 17-18 days. Hand rearing was unsuccessful. Subsequently, four chicks were hatched after parental incubation. As the clutch and nestlings increased in bulk, the nest walls were built up by the parents to accommodate them. When the chicks did not gape for offered food, the parents invariably uttered a series of soft, low, rolling *coos* to elicit gaping. (I have heard a similar sound from an adult when a young bird was apparently called to fledge from a nest, in the wild in Arizona.) There was no indication that food was regurgitated by the adult. In the early post-hatching period, the adult remained motionless with mandibles inserted in the chick's mouth after the food had been received. On one occasion a flow of clear fluid was observed as it passed down along the parent's bill. Perhaps this contained digestive enzymes; if so it would explain the failure of artificial hand-rearing with the same diet. When feeding was followed by defecation, the adults immediately removed the wastes by ingesting them.

One of these chicks was successfully raised to fledging, which occurred 29 days after hatching. Food was at least as plentiful as in the wild so this period probably approximates that for optimal development. This chick has now attained adult size.

I am grateful to Charles H. Lowe and David Hinds, Department of Zoology, University of Arizona, who obtained as chicks and reared the Roadrunners used in this study. Support was provided by a National Science Foundation graduate fellowship, NIH grant HE-02228, and the Department of Zoology, Duke University.—WILLIAM A. CALDER, *Department of Zoology, Duke University, Durham, North Carolina*. Present address: *Department of Biology, Virginia Polytechnic Institute, Blacksburg, Virginia*.

Occurrence and nesting of the Hook-billed Kite (*Chondrohierax uncinatus*) in Texas.—On 1 May 1964, one of us (Fleetwood) observed a male and a female Hook-billed Kite about 65 miles upstream from the mouth of the Rio Grande, at the point where the river forms the southern border of the Santa Ana National Wildlife Refuge and approximately nine miles south of Alamo, Hidalgo County, Texas (elevation 90 feet above sea level). This appears to be the first record of this species from the United States.

The male was seen first, perched in a dead tepehuaje tree (*Leucaena pulverulenta*) with a snail in its bill. A few minutes later the female flew out of a leafy black

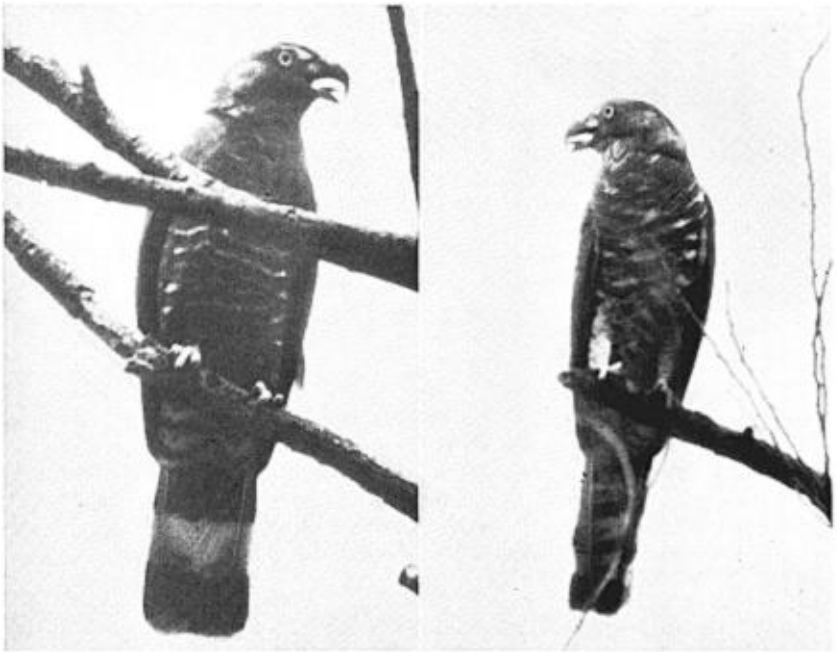


Figure 1. Hook-billed Kites photographed in Santa Ana National Wildlife Refuge, Texas, 1 May 1964, by Hamilton. The male is on the left, the female on the right (copies from Kodachrome slides).

willow (*Salix nigra*) and perched in a small dead tree about 90 feet from the male. The birds were seen later the same day at the same place by Mr. and Mrs. Martin Paulsen and Mr. and Mrs. W. A. Meteer, of Tucson, Arizona, and by Fleetwood, Hamilton, and Mrs. Hamilton. Hamilton photographed the birds (Figure 1). On one occasion the female kite had a common land snail (*Bulimulus alternatus*) in her bill.

With the aid of a 25 \times scope the birds were seen in detail and the following characters noted:

Female—an orange tear drop-shaped “eyebrow” mark beginning in front of the eye and tapering to a point almost directly over the eye; skin in front of eye pale yellow-green; upper mandible slate gray, large, conspicuously hooked; lower mandible rimmed with yellow; cere lemon yellow; irises off-white; breast and belly cinnamon brown, irregularly barred with ivory so that 30 to 40 per cent of the breast was ivory; legs and feet light orange; crown and back pure brownish gray with a rusty collar around the nape; tail distinctly marked with a light tip and dark subterminal bar (perhaps 1½ inches wide) followed by alternate, white and dark, somewhat narrower bars.

Male—facial markings and tail pattern as in the female except that the tail bars were broader and less numerous; head, back, throat, and upper breast slate gray; belly slate gray irregularly barred with off-white up to the bend of the wing.

Both birds were about the same size, with what appeared to us to be a wing spread of about 32 inches (but probably considerably larger, judging from measurements of similarly sized species) and a total length of 18 to 20 inches. The female was bolder than the male, which would fly when approached closer than 40 or 50 yards. In flight both birds showed long, broad, buteo-like wings with blunt tips and primary feathers well separated at the tips. The tail was relatively shorter than the wings, being carried narrow, and was slightly rounded, much like that of the Marsh Hawk (*Circus cyaneus*). The birds flapped and glided alternately; when gliding, they held the wings almost horizontally. The wings appeared the same in basic coloration as the body, without white or light areas; however, on the trailing edges light showed through to give a spotted or checkered effect. The birds continually uttered a loud, rattling call, descending in pitch (possibly an alarm note). After examining the colored slides from which the illustration was prepared, the following ornithologists concurred in our identification: John W. Aldrich, Dean Amadon, Emmet R. Blake, Eugene Eisenmann, George H. Lowery, Jr., Robert M. Mengel, Roger T. Peterson, Lester L. Short, Jr., George M. Sutton, Melvin A. Traylor, and Alexander Wetmore.

On 3 May, Fleetwood returned to the area and, as he approached, the female flew from a large black willow (10 inches diameter at shoulder height) in which a nest containing three off-white downy young about a week old was found near the end of a horizontal limb about 10 feet from the main trunk and 22 feet above the ground. The tree was on a low, dry, sandy terrace about 60 yards from the Rio Grande. The nest, lodged in small branches, was frail compared with the bulky nests of many other hawks, and was composed entirely of dead twigs and branches (none over one quarter inch in diameter) of tepehuaje, hackberry (*Celtis laevigata*), and huisache (*Acacia farnesiana*). These were loosely interwoven to form a platform with a saucer-shaped concavity about 1½ inches deep. The outside diameter of the nest was 15 inches, the inside 7 inches, and the thickness of the material at the center of the depression ¾ inch.

The vegetation in the nesting area was brush characteristic of the flood plain along the Rio Grande. Here it consisted of an 80-foot strip, along the river, of coyote willow (*Salix exigua*) with a luxuriant under-growth of vines, composites, and various herbs and, farther from the river (in the immediate area of the nest), a drier area grown up to scattered retama (*Parkinsonia aculeata*), huisache, tepehuaje, introduced Chinaberry (*Melia azedarach*), cedar elm (*Ulmus crassifolia*), hackberry, mesquite (*Prosopis juliflora*), Texas ebony (*Pithecolobium flexicaule*), black willow, granjeno (*Celtis pallida*), brasil (*Condalia hookeri*), coma (*Bumelia celastrina*), lime prickly ash (*Zanthoxylum fagara*), and Texas persimmon (*Diospyros texana*), with a complex shrubby understory and herbaceous ground cover. The nesting area and the entire refuge are characterized by an interlacing network of resacas or old channels of the river, each bordered on either side by a natural levee of low, loamy ridges, or terraces. Most of the tepehuaje and Texas ebony occur on these ridges, while huisache, retama, ash, and cedar elm generally grow on moist soils in old river channels and other low places. We doubt that water had much to do with the selection of this area as a nesting site; however, favorable nesting cover and numerous dead trees for perching sites, together with the abundant supply of land snails may have been factors in the selection.

On 5 May Fleetwood again visited the nesting site but the adults and young were not to be found despite a thorough search, and some accident had evidently befallen the latter.

Allowing for an incubation period of 30 days (estimate) and 10 days for nest construction and egg laying, the kites must have been on the refuge from at least the middle of March. The nest and a portion of the supporting limb were collected on 14 May and are in the U. S. National Museum.

According to H. Friedmann (*U. S. Natl. Mus. Bull.* 50 [pt. 11], pp. 106 and 109, 1950), *Chondrohierax uncinatus* is a local resident in swamps and marshy areas in tropical Mexico, through Central and South America to as far south as northwestern Argentina, Paraguay, and southeastern Brazil. The northern subspecies (*C. u. aquilonis*), to which our birds presumably belonged, is a resident in most of Mexico, from Tamaulipas to Jalapa, Guanajuato, Jalisco, Oaxaca, Yucatan, and Chiapas. Roger Tory Peterson and Edgar Kincaid (pers. comm.) state that they have never seen this species in Mexico. L. Irby Davis (*vide* Peterson) regards it as "very rare." Melvin A. Traylor (pers. comm.) states that the species cannot be common in Tamaulipas. Herbert Friedmann (*vide* Traylor) did not cite any other than the type specimen for Tamaulipas when he described the subspecies.

The semi-desert habitat of the refuge is very different from the tropical swamp and marsh habitat usually associated with *C. u. aquilonis*. While this may indicate nothing more than the fact that, being the only one available, it was acceptable to our birds (and we must remember that the nesting failed), we still cannot help wondering if the population in Tamaulipas may not be greater than the dearth of records indicates. This would be possible if few collectors and ornithologists have searched for this kite in any but the "typical" habitats. In any case, we think that relatively large tracts of woodland with tall dead trees and heavy populations of land and arboreal snails should be carefully watched for the possible presence of these kites.

In the present instance, certainly, common land snails were the principal food of young and adults; two broken snail shells were lodged on the edge of the nest, and a half pint of shells with their ends broken open was found on the ground under the nest in addition to numerous shells under dead trees where the adults perched.—RAYMOND J. FLEETWOOD, *Santa Ana National Wildlife Refuge, Rt. 1, Box 202-A, Alamo, Texas*, and JOHN L. HAMILTON, *R. R. 2, Huntton Road, St. Joseph, Missouri*.

Interactions of a crow and a fledgling cowbird.—The observations described below were made on 5 June 1965 at Medomak, Lincoln County, Maine. A Brown-headed Cowbird (*Molothrus ater*) was the sole occupant of an Eastern Phoebe (*Sayornis phoebe*) nest and fledged on the morning of 5 June. In the afternoon I saw a Common Crow (*Corvus brachyrhynchos*) alight on the lawn about 20 feet from the fledgling cowbird. The cowbird immediately hopped toward the crow, giving begging movements which included wing fluttering and gaping (and perhaps also vocalizations, although I was too far away to hear). When the cowbird was within two feet, the crow hopped away a few feet. Still begging, the cowbird approached twice more with the same result. Then the crow seized the cowbird, flew a few feet, dropped it, killed it with jabs of the bill, and then finally flew off with it.

Two points about these interactions are of interest. First, the cowbird was definitely unspecific in its begging responses. Although there are many observations in the literature of young birds begging from species other than their parents, in the present case the disparity in size and appearance of the phoebe foster parent and the crow was certainly very great. Begging responses elicited by a wide range of