

local birds (northeastern Kansas) and the Swainson's Hawk and Harlan's Hawk had been shipped from Calgary, Alberta, Canada. All of these birds lived in harmony together. In mid-January, courtship displays between the female Redtail and the male Swainson's Hawk began and lasted approximately one month.

The female Redtail's displays consisted of inviting the male Swainson's by calling and wing-flapping, to the shelter box which seemingly she had come to regard as a nest. The male Swainson's responded by flying over and landing on the box beside her. The female tried to solicit the male by spreading the feathers covering the cloaca and by lifting her tail. This type of display occurred quite frequently and was more intensive in the morning. No food begging, courtship feeding, or nest building was seen. The male responded only by perching next to the female and no copulation was ever observed.

On 26 January 1968, several weeks after the commencement of the female Redtail's displays, a new healthy male Redtail was introduced into the enclosure. This bird had been hand-raised from a day-old nestling and subsequently trained to the glove after the manner of falconers. The bird, thus raised and tamed was more easily intimidated by other birds. The female Redtail attacked the new male so frequently that he was removed on the following day.

It is highly unlikely that such courtship behavior would occur in nature because of the abundant choice of mates of their own species presumably available to free-ranging birds. A. P. Gray (Bird hybrids, A check list with bibliography, Commonwealth Agricultural Bureau, Farnham Royal, Bucks, England, 1958) indicates that definite, proven hybrids between hawks in general and Buteos in particular are rare and that no cases of hybridization between *B. jamaicensis* and *B. swainsoni* are known.

We would like to thank Gary K. Clarke, Director of the Topeka Zoo, for permission to publish this material, and Robert M. Mengel, of the University of Kansas Museum of Natural History, for critically reading this paper.—BRUCE R. WOLHUTER, *University of Kansas Museum of Natural History, Lawrence, Kansas* AND FRANK KISH, *Topeka Zoological Park, 632 Gage Boulevard, Topeka, Kansas, 29 November 1968.*

Food habits of wintering Sparrow Hawks in Costa Rica.—Sparrow Hawks (*Falco sparverius*) begin arriving in Costa Rica from the north in August or September. Some remain there for the winter, occupying the more open habitats, often those under cultivation or cleared for pasture. They depart for the north about April of the following spring. My observations show that during this period they are solitary, apparently territorial and, once in possession of a sufficiently food-rich territory, absolutely sedentary. I recorded several wintering individuals which could invariably be found on their territories and in the vicinity of a few favored perches throughout their stay.

A male bird which arrived on the grounds of the Inter-American Institute of Agricultural Sciences near Turrialba about mid-October, 1967, disappeared on 29 March, 1968. It took up residence in an area about 400 m in diameter which it never left. Usually it could be found along some electric power lines which crossed the area, either perched on the wires or on the tops of the poles. The area was bisected by a paved road parallel to the power lines. One side of the road was occupied by hedged lawns and a short-grass horse pasture; and on the other side was a wet pasture with rank grass, scattered trees, and overgrown fencerows.

The hawk hunted primarily on the lawns and horse pasture, where it generally dropped directly onto its prey from a perch. When it hunted over the high grass, it frequently hovered on the wing after the kestrel fashion. I recorded 97 successful prey captures

out of 246 attempts. All prey were captured on the ground. In 41 cases, the prey item was positively identified through binoculars or by the examination of fragments dropped in feeding. Of the identified items, 9 were short-horned grasshoppers (Acrididae), 19 were long-horned grasshoppers (Tettigoniidae), and 11 were lizards of the genus *Anolis* (probably *Anolis limifrons*). One item was a large cockroach (Blattidae) and the last was a small colubrid snake. This list is probably biased since grasshoppers and other large insects were difficult to identify at a distance but were abundant in the area. In about 30 cases where identity could not be certainly established, it appeared that the bird was tearing off wings as it characteristically did with large insects. The lizards and snake on the other hand, were easily distinguished by their long tails which hung down from the hawk's talons.

I recorded about thirty additional prey captures by other individuals wintering in the Turrialba area, but, because of the greater distance from the observer, only four of these could be identified. Two were *Anolis* lizards and one was a tettigoniid grasshopper. A good-sized *Ameiva* lizard (probably *Ameiva festiva*) was taken by a wintering female. *Ameiva* lizards were present on the territory of the male hawk at the Institute, but no captures were recorded. It may be that the significantly larger size of females permits them to take larger prey, but these few data are not sufficient to justify such a statement. No warm-blooded prey or attempts on warm-blooded prey were recorded. Suitable mammals are uncommon and the place that they occupy in the diets of hawks in the temperate zones is largely filled by the abundant reptiles and large insects. Birds are not molested by wintering Sparrow Hawks and show no great fear of them, often perching on the same tree or power line.

These observations were made while the author was engaged in a study of avian ecology supported by a Harvard University Scholarship, NSF grant number GB7346 (Reed C. Rollins, principal investigator), and by a grant-in-aid of research from the Society of Sigma Xi.—ROBERT E. JENKINS, *Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts 02138, 13 February 1969.*

Marsh Hawk chases crows mobbing owl.—On 5 November 1968, at 08:00, near Shabbona, DeKalb County, Illinois, I observed a Great Horned Owl (*Bubo virginianus*) that was perched on the ground near the edge of a partially picked corn field. A drainage ditch paralleled the border of the field and a dense growth of annual weeds, grasses, and willows (*Salix* sp.) extended for about 30 feet on both sides of the waterway. My attention was directed to the owl by the raucous calls of eight Common Crows (*Corvus brachyrhynchos*) that were mobbing it.

After the crows had been swooping at the owl and calling almost continuously for about four minutes, the owl flew toward the ditch and landed on a fence post. The crows' activity seemed to become intensified during the owl's short flight. Four of the crows landed on fence posts, all in the same direction from the owl, and the others continued flying about near the owl and calling. About two minutes later a female-plumaged Marsh Hawk (*Circus cyaneus*) flew in low over the adjacent corn field and briefly chased each of the four flying crows. The crows maneuvered swiftly and left the immediate area. The hawk then dived at each of the perched crows and caused them to fly. All eight crows flew to a row of large trees about $\frac{1}{4}$ mile north and landed. The hawk left the area immediately and disappeared to the west (08:08). Approximately one minute later the owl (possibly in response to my presence) flew for about 200 yards and landed on the ground in a hay field.