

**Blue racers prey on Field Sparrow nests.**—Snakes are among the important nest predators on the Field Sparrow (*Spizella pusilla*). Walkinshaw (1968, U. S. Natl. Mus. Bull. 237: 1231) saw a milk snake swallow Field Sparrow eggs, while Nauman (1929, Bird-Lore 31: 330) reported a rattlesnake eating an adult and a nestful of nearly grown young. The blue racer (*Coluber constrictor*) has been suspected of destroying Field Sparrow eggs and young (Sutton 1960, Jack-Pine Warbler 38: 59), but to my knowledge there are no actual accounts of it in the literature.

During the summer of 1972, I conducted a population study of the Field Sparrow at Allerton Park, near Monticello, Illinois. While watching parents feed nestlings from a blind about 25 feet away, I saw two incidents of nest predation by blue racers. A mirror positioned above the nest permitted direct observation of its contents. The first was on 5 July near noon at a nest 9 inches above the ground in black raspberry (*Rubus occidentalis*) briars. The nest contained two young 6 days old, one 5 days old, and one unhatched egg. The second incident was 14 July in the late afternoon at a nest 9 inches above the ground in a small Iowa crabapple (*Malus ioensis*) bush. This nest contained three young 6 days old and one 5 days old. Both snakes were approximately 2 feet in length.

The snake removed the young from the nest effortlessly and without disturbing the nest or surrounding vegetation. With only about 3 inches of its body appearing over the nest, the snake grasped each nestling around the body and pulled it from the nest. Left undisturbed, the snake removed one nestling approximately every 5 minutes. While one nestling uttered a brief distress call, none tried to struggle in the snake's grasp.

When I disturbed the snake in the process of predation and drove it away, it returned within a few minutes for the remaining young. During the 5 July incident I immediately approached the nest following the removal of the third nestling. The snake disappeared in the surrounding grass, leaving the young bird lying on the ground beneath the nest. The swallowing process apparently occurs typically on the ground near the nest. I put the nestling back in the nest, but the snake removed it again about 3 minutes later. On 14 July I approached the nest 3 minutes after the fourth nestling was removed. Finding the snake stretched out on the ground in the immediate vicinity, I tried unsuccessfully to grasp its tail. After I chased it for several yards, it disappeared in the vegetation, leaving the nestling about one foot from the base of the nest. Its skin was perforated in several places, apparently by the snake's teeth as it started swallowing. The snake returned 10 minutes later to remove the nestling, which I had replaced in the nest.

The snake had difficulty picking up the egg, last to be removed from the nest. With about 3 inches of its body extended over the nest, it tried several times to take the egg in its mouth from above without success. It finally succeeded by turning its head upside down in the bottom of the nest and letting the egg roll into its open mouth. It then broke the egg and chewed it, dropping a portion of the shell to the bottom of the nest. It picked up this shell fragment twice, only to discard it after holding it a few seconds. After the snake left, the female Field Sparrow returned to the nest and flew away shortly with the shell fragment in her beak. About a minute later she returned again and started pecking at the nest lining, possibly removing small shell fragments.

During both incidents the snake returned to the nest within 10 minutes after removing its contents. After passing its entire body directly over the nest, it

left. On 5 July the snake returned to the empty nest a second time, came up through the bottom of the nest and passed its entire length through the  $\frac{1}{2}$ -inch diameter hole. During both incidents the parent birds chipped excitedly and approached within 2 feet of the snake, but made no overt attack.

These incidents explain other happenings noted during the study. Several nests found empty of the eggs or young they contained the preceding day showed no sign of disturbance other than an occasional circular hole in the bottom. Blue racers were common in the area and were undoubtedly responsible for much of this predation. Crooks and Hendrickson (1953, Iowa Bird Life 23: 12) also reported two nests, each with a hole in the side about 1 inch in diameter, from which the young had been removed without disturbance. The fact that snakes will return to a nest even if disturbed may explain my finding nests with part of their contents gone, only to return later and find the nest empty.—LOUIS B. BEST, *Department of Zoology, University of Illinois, Urbana, Illinois 61801*. Accepted 26 Feb. 73.

**Birds associating with hippopotamuses.**—From July to September 1971 we undertook a general survey of the population of hippopotamuses in that part of the Mara River that lies within the boundaries of the Serengeti National Park, Tanzania (Olivier and Laurie, 1973). During this period we frequently noted the following bird species on the backs of hippos: Common Sandpiper (*Tringa hypoleucos*), African Pied Wagtail (*Motacilla aguimp*), Red-billed Oxpecker (*Buphagus erythrorhynchus*), and Yellow-billed Oxpecker (*Buphagus africanus*).

The Common Sandpiper has often been noted on the backs of hippos (Rice 1963, Thomson 1964) foraging from there for aquatic organisms. Pooley (1967) gives further records of birds fishing off hippos. Although Curry-Lindahl (1961) records 28 species of birds associating with hippos, including *M. aguimp* that he saw alighting on hippos for a few seconds, we do not know of any previous record in the literature of this wagtail feeding extensively while on hippos, despite the fact that this is undoubtedly a common association for this typically waterside species, at least on the Mara. The birds we observed displayed similar behavior to those on land, and appeared to be chasing insects hovering over the hippo.

Of particular interest is that we observed almost every day both species of oxpecker feeding simultaneously on the same hippo. They fed entirely on tissue gleaned from wounds, often to the extreme discomfort of the hippo. Both species on the same animal have previously been recorded by Attwell (1966), who considered it a possibility that they may be an example of the rare phenomenon of two species making the same demands on their habitat. Certainly analyses of stomach contents by Moreau (1933) and van Someren (1951) failed to indicate significant differences in the diets of the two species.

There are few places where the ranges of the two species overlap, and our observations would support a view that there is little ecological separation between them, and that despite this they appear tolerant of each other. We know nothing of their comparative feeding habits around this region of the Mara, apart from on hippos, but accepting that their main intake is from large game mammals in both species (Attwell 1966), one concludes that they are as likely to feed together off other species in the area (e.g. buffalo, giraffe, zebra, elephant) as off hippo, although at the time these were very scarce in comparison to hippos, and anyway do not represent such a potentially rich food source when assessed in terms of