

are scarce. Lizards of the genera *Urosaurus*, *Sceloporus*, *Cnemidophorus*, and *Phrynosoma* were plentiful throughout the area where the sparrow hunting took place. We have seen lizards moving about both before and after the Roadrunner's captures. It would

seem that House Sparrows and other small passerines are at times easier to capture than are the nimble lizards we customarily think of as Roadrunner food.

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AMERICAN KESTREL, *FALCO SPARVERIUS*, EXHIBITS RELIC NEST BUILDING BEHAVIOR

GERALD L. RICHARDS

Biology Department
Wisconsin State University
Whitewater, Wisconsin 53190

It is generally accepted that members of the genus *Falco* do not build nests as such, but may occupy the old nests of other species, or merely make a shallow scrape in the debris of a ledge or on the ground. This is generally true for American Kestrels (*Falco sparverius*) with the exception that kestrels frequently lay their eggs in hollows excavated by woodpeckers. Bent (U.S. Natl. Mus., Bull. 167, 1937) states that kestrels habitually use their chosen cavity as they find it. They add little if any nesting material, and lay their eggs either on the bare floor or on whatever the previous occupant has left behind.

In the course of breeding experiments with the American Kestrel under confinement, several female kestrels exhibited what appeared to be nest building behavior. During the last week of March 1969 a captive female kestrel laid four eggs in a modified natural log cavity. After the last egg had been laid and the female began to incubate, it was noticed that the nest materials had been rearranged. The scrape had been deepened, forming a well shaped cup about two inches deep; wood chips forming the litter at the bottom of the cavity were placed horizontally and tangentially around the eggs, giving the appearance of

a well ordered nest. At this point I removed all the chips lining the cup and placed them with a few others in a pile six inches away from the eggs. By the following day all the chips had been placed back into the cup by the hawk, and nearly all were again aligned with their long axis to the horizontal.

Later when two other female kestrels were laying eggs, wood chips about $1 \times \frac{1}{8}$ inch were placed in their nest boxes to see if they followed the same pattern. During egg laying no manipulation of the chips occurred, but, as soon as incubation started, the birds arranged the chips to form a well ordered cup.

The fact that kestrels lay pigmented eggs, while most cavity nesters lay white eggs, has led to the notion that kestrels may have only recently evolved to the habit of nesting in hollows, and that during the past they used open nests of some type. The evidence that kestrels have considerable skill in manipulating nesting material, as indicated by this study, tends to support the idea that kestrels may have at one time built their own nests, or at least remodeled the stick nests of other species. It should also be noted that kestrels have sometimes utilized the old nests of magpies, and that the European Kestrel, *Falco tinnunculus*, a close relative of the American Kestrel, often lays in the open nests of rooks.

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TEMPERATURE MEASUREMENTS AT THE NEST OF THE DESERT LARK (*AMMOMANES DESERTI DESERTI*)

YOSEF ORR

Kibbutz Mashabei-Sade
P.O. Ramat-Negev
Israel

The Desert Lark (*Ammomanes deserti deserti*) is a small, sparrow-sized bird which occurs in desert areas of North Africa, Arabia, and east to India (Meinertzhagen, Birds of Arabia. Oliver and Boyd, Edinburgh, 1954). It is mainly a seed-eater, but it also includes insects in its diet. It nests on the ground, usually in early spring, but occupied nests may be found as late as the end of May.

The nest is interesting because its orientation and structure seem helpful in avoiding high mid-day temperature extremes in the nest, and also appear adjusted to take advantage of early morning sun and late afternoon wind to provide favorable incubation conditions while the female is absent for foraging. Microclimatic measurements were made in two nests in order to obtain information about temperature conditions in the nest as compared with ground surface and air temperature. The two nests were located in the Central Negev of Israel near Avdat ($30^\circ 47' N$,

$34^\circ 46' E$). This is close to the northern distribution limit of the Desert Lark.

All four nests observed in this area were facing north and were shaded against the mid-day sun by a bush (1 nest) or an overhanging stone (3 nests). Nest number one (see fig. 1) was situated on a rather steep north-facing rocky slope in a shallow depression under an overhanging stone. It was lined with the long and hairy seeds of *Geranium* sp. to a thickness of 1–2 cm. The inner diameter of the cup-shaped nest was about 10 cm, and its depth, 5.5 cm. The overhanging stone acted as a "roof," leaving the east, north, and west sides open to free air-flow. A semi-circle of small stones—a pebble glacis—was built on the open sides of the nest, forming a wall up to 4 cm high, enclosing the nest to its full height.

Nest number two was situated on a more gentle north-facing slope. The area was covered by smaller stones and the vegetation coverage was denser than near nest number one. The nest was built in a depression on the northern side of an *Artemisia* bush about 30 cm high. The encircling wall of pebbles and the lining were similar to those of the first nest, but the wall encircled the nest on all sides, and there was no overhanging stone. Two more nests under overhanging stones had the same general characteristics as nest number one.