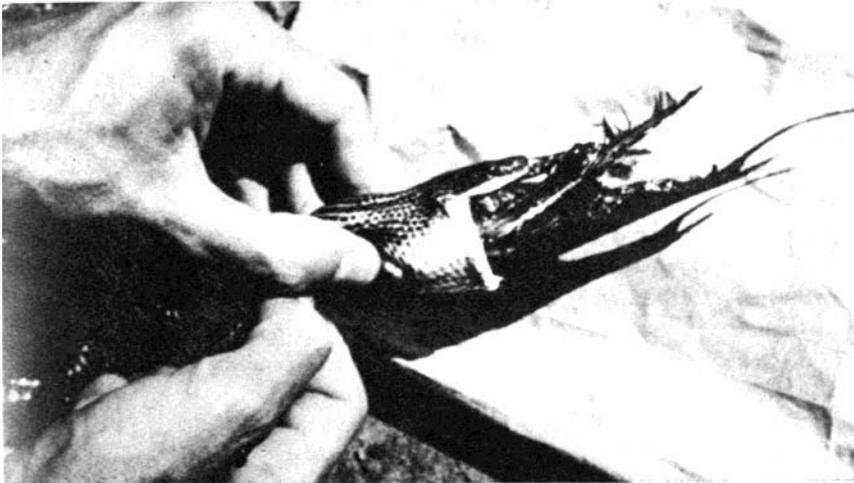


**BLACK RATSNAKE PREDATION
UPON NESTING BARN AND CLIFF SWALLOWS**

BY GEORGE V. OLIVER JR.

SNAKE PREDATION upon nesting birds is not uncommon; many observers have written of it in detail (see, in particular, Walkinshaw, 1943, *Wilson Bull.*, 55: 56; Parmelee, 1959, *Bird-Banding*, 30: 13; Sutton, 1960, *Jack-Pine Warbler*, 38: 50; and Stickel, 1962, *Auk*, 79: 118-19). Comparatively little, however, has been reported concerning snake predation upon swallows. Sawyer (1907, *J. Maine Orn. Soc.*, 9: 83-84) wrote of an "adder" found devouring eggs of "Eaves" or Cliff Swallows (*Petrochelidon pyrrhonota*) under the eaves of a barn in Maine. Since the Hog-nosed Snake or so-called Puff Adder (*Heterodon platyrhinos*) is not scansorial we must assume that Sawyer used the term "adder" very loosely indeed. Cameron (1908, *Auk*, 25: 44) wrote of a "rattlesnake" that "climbed the veranda poles and devoured all nestling [Cliff] swallows within reach" at a ranch in Montana. Here the snake may well have been a "true" rattler of



BLACK RATSNAKE AND ADULT BARN SWALLOW

Photographed by George A. Newman on 21 July 1968 at a culvert near Willis, Marshall County, Oklahoma.

the genus *Crotalus*. Rattlers do not climb much, but the "veranda poles" may have slanted in such a way as to make ascent to the swallows' nests easy for the snake. H. H. Bailey (1913, *Birds of Virginia*, p. 261), writing of the Rough-winged Swallow (*Stelgidopteryx ruficollis*), stated: "The mortality in this section is great, their chief enemy being the black snake." Bailey's "black snake" almost certainly was the species widely known today as the Black Ratsnake (*Elaphe obsoleta*).

Swallows that nest in burrows in banks would appear to be easy prey for snakes, but swallows evidently choose their banks with care. Lunk, in his study of the Rough-winged Swallow in Michigan, observed no actual snake predation, though he did see a "garter snake (*Thamnophis* sp.) about 18 inches long . . . part way up a bank some five feet below Roughwing Nest 39." This particular nest was in a small colony of Bank Swallows (*Riparia riparia*). Lunk watched the snake "as it made repeated attempts to climb a steeper section of the sand bank toward a group of [Bank Swallow] burrows" (Lunk, 1962, *Publ. Nuttall Orn. Club*, 4: 130). Stoner, in his exhaustive study of Bank Swallow colonies in New York, observed no actual predation by snakes though he did find a two-foot garter snake in each of two nest-burrows that were "unoccupied by birds" (Stoner, *Auk*, 43: 208).

Nests of the Cliff Swallow and Barn Swallow (*Hirundo rustica*) are so often built on or above vertical walls at considerable distance above ground-level in or on buildings, in culverts, or under bridges, that they would appear to be inaccessible to snakes; yet in late June and throughout July 1968, in Marshall County, south-central Oklahoma, George M. Sutton, George A. Newman, and I observed considerable ratsnake predation on a mixed colony of Barn and Cliff swallows that were nesting in a concrete culvert under State Highway 99 a quarter of a mile southwest of the village of Willis. The culvert, which ran east and west near the north end of a large bridge crossing Lake Texoma, was 122 ft., 8 in. long, 7 ft. high, and 5 ft. wide. Its walls were vertical and for the most part smooth, though there was a narrow seam at the top of each, and a few narrow, vertical cracks that extended upward 3 to 5 ft. from the concrete floor. During the entire period of our observations, water 1 to 1½ ft. deep stood in the bottom. In late July I counted 29 Barn Swallow nests and 21 Cliff Swallow nests, those of the Cliff Swallow at the junction of wall and ceiling, those of the Barn Swallow a few inches below this junction. Several nests of both species had obviously been repaired, for the mud at the rims was of different color from that of the old part of the nests.

On 21 June, when Dr. Sutton's class in Ornithology at the University of Oklahoma Biological Station first visited the culvert, we saw only a few Cliff Swallows. In one Cliff Swallow nest were five well developed young, one of which flew off strongly while we were removing the brood for banding. The

four banded young stayed in the nest when we returned them to it. In no other Cliff Swallow nest did we find young birds, eggs, or fresh lining. Most of the Barn Swallow nests, on the other hand, were in use. Some contained almost-fledged young, others small young or eggs. A few young Barn Swallows were on the wing. Some of the Cliff Swallows that were flying about might have been young birds.

At 11:35 on 21 June we found a medium-sized Black Ratsnake in a Cliff Swallow nest 60 ft., 9 in. from the west end of the culvert. The nest was so completely filled that it came to pieces while we were removing the snake. Running my thumb along the snake's belly, I forced it to regurgitate four broken swallow eggs and the much digested remains (large wing feathers chiefly) of an adult swallow. We naturally assumed that the remains were of a Cliff Swallow and its eggs, but the opposing facts (1) that most Cliff Swallow nests were empty, old looking, and without lining, and (2) that the closest nest was an empty, fully lined Barn Swallow nest 16 ft., 6 in. away, obliged us to realize that the snake might well have obtained its meal at the Barn Swallow nest and moved to the privacy of the Cliff Swallow nest. Furthermore, we had no way of ascertaining that both swallow and eggs had been obtained at the same nest. During the enforced process of regurgitation the eggs had come out first: that much we knew.

I permanently marked the snake by clipping off the second and fourth right subcaudal scales (thus giving the individual the number 0-2, 4), and released it in the culvert. The water was muddy, so when the snake swam off under water we lost track of it. Before leaving the culvert, however, we found it neatly lodged in one of the above-mentioned vertical cracks, its entire body a little above water-level.

On 12 July at 07:20, we found another Black Ratsnake, about the same size as the first, in a Cliff Swallow nest 4 ft., 6 in. from the east end of the culvert, again on the north wall. I forced the snake to regurgitate two fresh swallow eggs. The closest nest was an empty, unlined Cliff Swallow nest a few feet to the west; farther west (8 ft., 3 in. from the nest in which the snake had been coiled) was an empty, well lined Barn Swallow nest. I scale-clipped the snake (0-3, 6) and released it in the culvert.

On 21 July, at 15:30, again in a Cliff Swallow nest on the north wall (39 ft., 5 in. from the west end of the culvert) we re-took the first ratsnake. This time I "palped" a fresh adult Barn Swallow from the stomach (see photo). The nearest nest was a Barn Swallow nest (1 ft., 8 in. west of the snake's retreat) holding two fresh eggs. On 20 July this nest had held one egg only. Again we had no way of knowing where the snake had obtained its prey; we thought strange, however, that a nest less than 2 ft. away should still contain eggs. After measuring the snake—finding it to be 108 cm. (about 42½ in.) long

—we released it in the culvert.

The climbing ability and arboreal habits of ratsnakes, especially of *E. obsoleta*, are well known. In reaching the swallow nests the two ratsnakes probably did not swim in (though most snakes swim well), but made their way along the half-inch-wide seam at the top of the north wall. The seam appeared to be too narrow to accommodate a snake 42 in. long, but when we held one of the scale-clipped snakes against the seam it took hold immediately and clung there without difficulty. It did not, however, attempt to move forward, possibly because of the traumatic palpating it had just experienced.

In Oklahoma the Black Ratsnake is largely nocturnal in summer. The snakes we captured may well have made their way into the culvert and captured the swallows at night. I feel fairly sure that they did not inhabit the culvert continuously, for on six occasions between 21 June and 21 July I checked every swallow nest and examined every crack without finding a snake, and on only three occasions during that same period did anyone observe a snake there. Even on bright days the culvert was a cool, rather dark place. For a well-fed snake a Cliff Swallow nest was a made-to-order retreat.

I wish to thank Dr. Charles C. Carpenter of the Department of Zoology at the University of Oklahoma for his critical comments on my paper; Dr. William A. Lunk of the University of Michigan at Ann Arbor for checking certain references; and George A. Newman, of the Department of Biology at Hardin-Simmons University in Abilene, Texas, for the excellent photograph of the ratsnake forfeiting its meal.

1601 MONUMENT ROAD, PONCA CITY, OKLAHOMA 74601, 31 MAY 1969.

THE BLACKPOLL WARBLER IN THE SOUTHERN GREAT PLAINS

BY CHARLES A. ELY

THE BLACKPOLL WARBLER (*Dendroica striata*) is a transient through the Southern Great Plains. It occurs regularly, often commonly, in the spring but only irregularly and rarely in the fall. In spring it is much more common along the wooded eastern edge of the plains than in the restricted wooded areas of the plains themselves. In Kansas it is considered "common" in the east, "uncommon" in the west (Johnston, 1965, A directory of the birds of Kansas, Univ. Kansas Mus. Nat. Hist., Misc. Publ. 41, p. 48), a status similar to that reported for Oklahoma (Sutton, 1967, Oklahoma birds, p. 509).

Dendroica striata breeds in the northern spruce forests from Alaska to Labrador and in the mountains of New England and eastern New York; it winters in northern and central South America (AOU Check-list of North American birds, pp. 500-501). Most spring migrants funnel northward through the West Indies and Florida, then fan out over the eastern United States, the

Mississippi Valley, and the Northern Great Plains (see map in Lincoln, 1939, The migration of American birds, p. 35).

At Hays, in Ellis County, west-central Kansas, the species' spring migration is characterized by moderate to large numbers for a very brief period, and it is usually associated with overcast skies and rain. At such times, Blackpolls may be really numerous along wooded streams and in towns. They are chiefly treetop birds, however, and only 48 of them were caught in mist-nets during three seasons—38 of these during a warbler "wave" or "fallout" on 20 May 1967. Extreme migration dates for Hays are 2 and 26 May. Peak numbers have been recorded regularly between 20 and 25 May.

In the fall most Blackpolls migrate eastward, concentrating along the Atlantic coast of the United States and funneling southward through Florida and the West Indies. As Burleigh (1934, *Wilson Bull.*, 46: 145) so aptly states, the Blackpoll in fall is "at best merely a straggler over much of the area it occupies in the spring migration." Apparently very few birds move southward across the Great Plains. The only fall specimen for Oklahoma was taken by Sutton (1934, *Ann. Carnegie Mus.*, 24: 11) along Texacoet Creek near Kenton, Cimarron County, at the western end of the Panhandle, on 3 October 1932. Sutton states further (1967, *Oklahoma birds*, p. 509) that the species has neither been taken nor seen in fall during the years 1952-1966 "despite efforts of several observers." Nice (1931, *Birds of Oklahoma*, p. 195), who called the species an "uncommon transient in May and November" in Cleveland County, central Oklahoma, mentioned nine sightings (one to three birds at each sighting) spanning the period 4-16 November between 1919 and 1926, but the continuing failure of the species to appear in fall anywhere in Oklahoma during recent decades has led to understandable belief that the birds seen by Dr. Nice might have been misidentified. There is no fall record for Colorado (Bailey and Niedrach, 1965, *Birds of Colorado*, 2: 694) and only one fall record for New Mexico—one seen at Clayton, in the northeastern corner of the state, on 3 October 1954 (Ligon, 1961, *New Mexico birds and where to find them*, p. 308). Additionally there are but single fall records from Arkansas and Texas. Douglas James (letter of 4 February 1970 to G. M. Sutton) reports a sight record from Ashley County, southeast Arkansas on 23 October 1965. Edgar Kincaid Jr. (letter of 24 February 1970 to G. M. Sutton) reports (Oberholser manuscript) one collected at Brownsville, Cameron County, Texas by J. C. Merrill in August 1876 or 1877.

Fall records for Kansas are nearly as scarce. I have no sight records for Hays during the periods 1960-1963 and 1966-1969, despite a considerable amount of local field work. At the Hays mist-netting station only three Blackpolls were captured during 175 days of operation in September and October from 1966 to 1969. A total of 799 warblers of 20 species (including the Blackpoll) was handled during that period. In south-central Kansas, Max C. Thompson

(personal communication) netted only one Blackpoll (an immature bird, 27 September) in 31 days of netting during the fall of 1969 near the Arkansas River 4.5 miles west of Udall, in Sumner County. During this period he netted 829 other warblers of 15 species. These September dates are of interest in view of the fact that Johnston (*op. cit.*) reported fall movement southward "in late October."

The three Hays specimens are apparently the only fall specimens of *D. striata* for Kansas, as there are none in the University of Kansas Museum of Natural History collections (Robert M. Mengel, personal communication). The three specimens were taken singly on 15, 16, and 22 September 1969. All were immature (one male, two females) with moderate to heavy fat deposits and very small gonads. They were netted in young box elders and tall annual weeds (sunflower and giant ragweed) along Big Creek near the Fort Hays Kansas State College campus.

Although the Blackpoll Warbler appears to be very rare and irregular in fall throughout the Southern Great Plains, more intensive field work may reveal that there is a regular spillover of birds from the northern migration route. Such a spillover has been documented since 1961 for California by DeBenedictis (1968, *Audubon Field Notes*, 22: 8). Specimens, recognizable photographs, and in-hand identifications by observers experienced with fall warblers are urgently needed to clarify further the status of the Blackpoll in the Southern Great Plains. Casual identification of fall-plumaged warblers is often erroneous; as pointed out by Burleigh (*op. cit.*) and Mengel (1965, *Birds of Kentucky*, p. 415) this misidentification badly confuses the distributional problems bird students are trying to solve.

DEPARTMENT OF BIOLOGICAL SCIENCES, FORT HAYS KANSAS STATE
COLLEGE. HAYS, KANSAS 67601, 9 MARCH 1970.

GENERAL NOTES

Banded five-year-old Ruby-throated Hummingbird recaptured in Oklahoma.— On 14 August 1969 at my banding station at Silver Lake, along the west edge of Oklahoma City, in Oklahoma County, central Oklahoma, I captured with a feeder-snare an adult male Ruby-throated Hummingbird (*Archilochus colubris*) with fully red throat-patch. This same bird I had caught and banded on 23 August 1964. On that date its throat was white, marked with rows of dusky spots and with one tiny iridescent red dot where, presumably, an "immature" feather had been replaced by an "adult" feather. On the date of the bird's recapture it was at least five years and nine days old. The etched numerals on the band (X-7278) were still sharply defined. The band showed very little wear.

Since 1962 I have had a total of 16 Ruby-throated Hummingbird "returns." Six "returns" in the summer of 1964 gave me my greatest total for

any one season. Each of two individuals I retook two years after banding. With the exception of the above-reported five-year "return," each of the rest (13 birds) was taken one year after banding. Never have I retaken a banded bird on two occasions.

I have banded also three male Black-chinned Hummingbirds (*A. alexandri*), but I have never had a "return" of that species. Female Ruby-throated and Black-chinned hummingbirds resemble each other so closely that I despair of distinguishing them with certainty even when I have them in my hand. To the best of my knowledge every female hummingbird that I have banded has been a Ruby-throated Hummingbird.—V. J. Vacin, *Route 2, Box 123, Oklahoma City, Oklahoma 73114, 19 December 1969.*

Premature departure from nest of young Common Ravens.—The Common Raven (*Corvus corax*), a hardy species of remarkably widespread distribution, is known to nest very early in some parts of its range. In Maine, P. F. Ekstorm collected a set of five eggs on 28 March 1940; in Virginia, W. B. Tyrrell observed "just hatched" young on 26 March 1939; and in Pennsylvania, S. S. Dickey found nests "finished as early as 25 February" though most nests were not "ready for eggs" until March (Bent, 1946, *U. S. Natl. Mus. Bull.* 191, pp. 186-88). On the Labrador coast, W. W. Perrett collected a set of six fresh eggs on 15 May 1900, an early date for that cold, foghung part of North America (see Austin, 1932, *Mem. Nuttall Orn. Club*, 7: 166). Authors seem to agree that the incubation period of *Corvus corax* is about three weeks and that fledging requires "5-6 weeks" more (see Witherby *et al.*, 1948, *Handb. British Birds*, 1: 9), but there is a surprising dearth of information concerning dates on which departure of young from the nest has actually been observed. This is largely, no doubt, because nests are hard to reach or see into. J. R. Forbes reported seeing "four young just out of a cliff nest at Port Manvers [Labrador] on July 14, 1937" (Todd, 1963, *Birds of the Labrador Peninsula*, p. 520), but it is impossible to know from such a statement how long the brood had actually been out of the nest or whether they could fly. There are few concise nesting data for either Colorado (see Bailey, A. M., and Niedrach, 1965, *Birds of Colorado*, 2: 564) or New Mexico (see Bailey, Florence M., 1928, *Birds of New Mexico*, pp. 487-88; and Ligon, 1961, *New Mexico birds and where to find them*, p. 202) despite the fact that *Corvus corax* breeds widely in montane parts of those states. A photograph in *Birds of Colorado* (*op. cit.*) showing a raven's nest and almost-fledged young was taken by A. M. Bailey on 29 May 1937 on Gunnison Island in Great Salt Lake, Utah. As regards Oklahoma, neither Nice (1931, *Birds of Oklahoma*, p. 127) nor Sutton (1967, *Oklahoma birds*, pp. 374-76), mentions a single date for eggs or young birds. A nest found by D. F. Parmelee *et al.* on 22 April 1967 at the east end of the Black Mesa near Kenton, Cimarron County, Oklahoma, held three apparently fresh eggs (almost certainly an incomplete clutch) on that date, and a clutch of five eggs containing "embryos about a week old" on 26 April 1968 (see Parmelee, 1968, *Bull. Oklahoma Orn. Soc.*, 1: 22-23). Exactly a year later, on 26 April 1969, Dr. Parmelee found six eggs in the same nest, one of them pipped, the others at the point of hatching. This clutch was preserved for the University of Oklahoma collection.

On the afternoon of 8 June 1969 my friend Ronald Gibson and I drove

home to central Oklahoma from a weekend spent in looking for Prairie Falcons (*Falco mexicanus*) in the Black Mesa country. About 8 mi. east of Kenton we noticed well north of the highway a mesa at whose west end there was a cliff that looked promising. Hoping that a climb there might give us a look at a Golden Eagle (*Aquila chrysaetos*) as well as a falcon, we decided to investigate.

Walking along the bottom of the cliff, we put to flight two Sparrow Hawks (*Falco sparverius*)—a pair that almost certainly had a nest in a hole in the rock, though we failed to find it. Ronald decided to climb the cliff, leaving me to watch from below. As my friend worked his way upward, feral pigeons (*Columba livia*) continued to fly noisily from holes and ledges above or to one side of him.

As I proceeded along the base of the cliff I spotted a large mass of sticks about 30 feet above me and ten feet down from the top. In doubt as to what species of bird had built the nest, I looked at it closely, seeing that it held well developed young ravens. I could not be sure, from where I was, how many young there were. I yelled to Ronald, telling him where the nest was. With great difficulty he climbed down to within a few feet; but he could not reach the nest itself. He told me that there were five young birds and that they were almost ready to fly. Even as he was talking, one of them jumped from the nest. Unable to keep its altitude, it glided to a rough landing well downslope. Ronald shouted that he wanted the bird. Then a second young raven jumped out, gliding off in another direction. I had taken no more than ten or twelve steps toward the first "fledgling," when a Prairie Falcon flew out from the rocks about 50 feet from the raven nest. When I saw the falcon I became so excited that I almost tumbled down the slope. The young raven I was after made no attempt to fly, but it hopped and flapped with surprising speed down the mesa side. When finally I caught it, the parent birds were croaking their disapproval loudly and circling very close overhead.

With the raven in my arms, I scanned the cliff, hoping to locate the falcon's eyrie. I located two more big stick nests, each of them empty. These may have been raven nests, though the Red-tailed Hawk (*Buteo jamaicensis*), a species that builds a large nest of sticks, frequently nests on cliffs in the Black Mesa country (see Sutton, *op. cit.*, pp. 102-103).

Ronald and I found no evidence that Prairie Falcons were nesting on the cliff, but above the northernmost end of the mesa we saw two Golden Eagles circling on what was probably an updraft from the cliff.

June 8 cannot be considered a fledging date for *Corvus corax* since neither of the young ravens that left the nest on that date could fly.—John O. Langford, *Oklahoma Geological Survey, University of Oklahoma, Norman, Oklahoma 73069, 15 December 1969.*

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