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Brown-headed Cowbirds parasitize Loggerhead Shrikes: first records for family Laniidae.—Friedmann et al. (1977) and Friedmann and Kiff (1985) report no instances of Loggerhead Shrikes (*Lanius ludovicianus*) rearing Brown-headed Cowbird (*Molothrus ater*) young. Furthermore, we can find no literature accounts of cowbird parasitism of North American members of the family Laniidae. The following observations therefore represent the first documented records of cowbird parasitism of Loggerhead Shrikes, as well as the first account of shrikes rearing cowbird young from eggs deposited by cowbirds. Two previous accounts of shrikes rearing blackbirds (*Agelaius* spp.) and Brown-headed Cowbirds have been reported, but in each case the foreign eggs were deposited by a researcher (Potter 1939, Rothstein 1982).

We monitored 261 Loggerhead Shrike nests initiated by 110 pairs in 1987–1989 in southwestern Iowa as part of a study of productivity and habitat preferences of shrikes nesting along roadsides. Most nests (N = 251) were located in roadside ditches; the other 10 nests were situated in fencerows and pastures away from roads. Shrikes initiated nests from 6 April through 11 June, with peak nesting in the second and third week of April.

During the study, we encountered three shrike nests parasitized by Brown-headed Cowbirds. On 2 May 1988, we found the broken shell of a cowbird egg in a shrike nest along a road in a mulberry tree (*Morus alba*). The nest had contained a clutch of six shrike eggs five days earlier. On 26 May, we found a clutch of five shrike eggs, which we estimate to have been completed two days earlier, in the same nest. The clutch hatched 14 days later and fledged without any further observed parasitism. Others have observed that cowbirds sometimes place eggs in empty nests (Friedmann 1929; Best, pers. obs.), and we suggest that when the first shrike clutch was lost to predation, the cowbird placed the egg in the temporarily deserted nest.

The second incidence of parasitism was discovered on 4 June 1988, at a roadside nest in a small boxelder (*Acer negundo*) shrub. The nest contained four, one-day-old shrike chicks and a single 7- or 8-day-old cowbird nestling (age estimates were based on body size and feather development; Friedmann 1929, Lohrer 1974). The age gap between the nestlings corresponded to the difference between the incubation periods of the two species (16–17 days for shrikes and 11–12 days for cowbirds; Bent 1950, Nice 1953), indicating that the cowbird had laid the egg before the onset of incubation. This nesting attempt was the third for the shrike pair that season, following two previous attempts that ended in predation. On 7 June, we revisited the nest and found three shrike nestlings and no cowbird. We assume that the cowbird chick fledged during the interval between visits, as most cowbirds fledge at 10 days of age (Friedmann 1929).

The third incidence of parasitism occurred on 16 April 1989. We discovered a clutch of three shrike eggs and one cowbird egg in a nest along the road in a roadside plum (*Prunus americana*) thicket, and by backdating from the hatch date, we estimated that incubation had begun three days earlier. Two shrike eggs hatched on 1 May, and the other shrike egg disappeared, but the cowbird egg failed to hatch and disappeared between our visits on 6 and 9 May. One shrike eventually fledged on 19 May. The other nestling had disappeared between the 9 May and 13 May visits.

Further evidence for cowbird parasitism of shrikes was suggested by the behavior of shrikes when their nest sites were approached by cowbirds. On two occasions at separate sites, we saw shrikes chase cowbirds that had approached their nests which contained eggs. Both instances occurred during the last week of April. Most shrike nests are less concealed early in the season. Thus, it may be more difficult for a cowbird to approach the nest without being detected. Many passerine species recognize cowbirds as a threat, and the level of

aggression directed towards cowbirds is positively correlated with the rate of their parasitism (Robertson and Norman 1976).

Reasons for lack of observed parasitism in shrikes are uncertain. Friedmann (1929, 1963) speculated that the shrike's freedom from "molothrine annoyance" was due to its aggressive and predatory nature. Shrikes typically prey upon insects, small rodents, and sparrow-sized birds (Bent 1950, Craig 1978, Kridelbaugh 1982), although cowbird-sized birds are taken on occasion (Bent 1950, Ingold and Ingold 1987). In addition, Rothstein (1982) determined that shrikes were egg rejectors, although in two of 21 artificially parasitized nests, they accepted easily distinguishable blackbird eggs. The incidence of parasitism in a rejector species, therefore, would be detected only on the few occasions when a bird accepts the cowbird eggs (Rothstein 1971). Thus, cowbird parasitism could be more common than indicated by the available data. Nevertheless, several incidences of parasitism have been reported for other aggressive rejector species (e.g., Eastern Kingbirds [*Tyrannus tyrannus*] and American Robins [*Turdus migratorius*]; Friedmann 1963, Rothstein 1975). A lack of cowbirds does not explain the lower rate of parasitism of shrike nests in our study. Frawley (1989) reported that 49% of passerine nests with complete clutches in six alfalfa fields within our study area were parasitized by cowbirds.

The scarcity of parasitism in shrikes might also be attributed to the lack of overlap between their nesting season and those of the cowbird's other passerine hosts in the upper Midwest. Both Loggerhead Shrikes and Brown-headed Cowbirds arrive in Iowa in late March and early April (Dinsmore et al. 1984). Shrike egg laying peaks in mid-April, 3–4 weeks before the peak nesting-period of many acceptor species (Frawley 1989). Two of the three instances of parasitism discovered in this study occurred in renesting attempts initiated late in the shrike's nesting season, and the egg laid in mid-April failed to hatch.

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Nests and eggs of some Costa Rican birds.—Although Costa Rica has a relatively well-studied avifauna, much remains to be learned about the breeding biology of many species. New breeding information for several species was collected in Costa Rica during 1984–1986 in a field survey conducted by the Western Foundation of Vertebrate Zoology (WFVZ). In this paper, we include information on seven species for which the nest and/or eggs previously were undescribed, although a summary of this information appeared in Stiles and Skutch (1989). Nomenclature follows that of Stiles and Skutch (1989), and egg shapes are those given by Preston (in Palmer 1962).

Vermiculated Screech-Owl (*Otus guatemalae*). Two vague references have been made to the breeding of this species. On 11 April (1942 ?), Sutton and Pettingill (1942) collected a female with enlarged ovaries in southwestern Tamaulipas, Mexico, at the entrance to a nest. The cavity was 15 ft (4.5 m) from the ground, but the nest contents were not determined. Wetmore (1968) reported a female collected on 19 March 1949 near Utive, Panama, with a nearly shelled egg in the oviduct. On 3 April 1986, while working at Cerro Montezuma (700 m), Alajuela Prov., about 45 km NE of Las Cañas, we flushed and collected a female (WFVZ #36,871) from a nest. The nest site was located in disturbed forest and was situated in a cavity in a decaying stump about 5 m from the ground. The cavity was 5 cm deep, and the entrance measured 23 × 18 cm. The shallow depth of the cavity suggested that it was made by a trogon rather than by a woodpecker. The nest contained two eggs deposited directly on wood chips. The slightly incubated eggs (WFVZ #154,790) are unmarked white, slightly glossy, and spherical, and they measure 35.10 × 30.51 and 34.30 × 29.60 mm.

Andean Pygmy-Owl (*Glaucidium jardinii*). We discovered a nest of this species on 26 March 1986 at an elev. of about 2000 m on the western slopes of Volcán Barva at La Concordia, Heredia Prov., about 24 km NW of San José. The nest site was located on a ridge at the edge of disturbed forest and pasture land with scattered stumps and mature trees. Our attention was drawn to the vicinity of the nest site by two loudly vocalizing Emerald Toucanets (*Aulacorhynchus prasinus*), which were being attacked by one of the