

(Ricklefs 1973). The Black Vultures' growth rates (0.079 and 0.068) are 20–30% lower than Ricklefs' (1973) expected value for altricial and semi-altricial land birds of comparable adult weight.

The slow growth of Black Vultures may be related to precocity of development compared to faster growing raptorial birds (see Ricklefs 1973); the nestlings' dense down may indicate early development of homeothermy. Alternatively, slow growth may be related to the nutrient content of their food, i.e. the extent to which fruits or other plant material comprise their (presumably) mostly carrion diet. In addition, there may be energy limitations imposed by their dependence on carrion for food. Carrion may be an unpredictable resource in time and space, due to both the variability of its occurrence and to conditions limiting foraging activity. Hatch (1970) observed Turkey Vultures remaining on their roosts for 2 days in rainy weather, while Stewart (1974) observed that Black Vulture young that were normally fed several times daily were not fed on a rainy day. The reduced growth rates of Black Vulture young may be adaptive in ameliorating the "feast or famine" nature of scavenging.

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Song and Territory Defense in the Red-winged Blackbird

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Song is presumed to function as a long-range territorial advertisement in many species of birds, but surprisingly few studies have attempted to test this presumption (Krebs 1977). Experimental studies of territory defense in the Red-winged Blackbird (*Agelaius phoeniceus*) by Peek (1972) and Smith (1979) have shown that surgically devocalized males incur higher rates of trespass by conspecifics and are more likely to lose their territories than normal singers or sham-operated control males. These studies indicate that Red-winged Blackbird song plays an important role in territory defense, but they do not directly test the effect of song alone, as visual displays are also important advertisement signals (Peek 1972, Smith 1972). In addition, Smith (1976) has shown that surgically devocalized male Red-winged Blackbirds can successfully maintain their territories even though they are unable to produce species-typical songs. I attempted a more direct test of the hypothesis that Red-winged Blackbird song functions in territory defense by conducting speaker-occupation experiments (Krebs 1977).

Experiments were conducted from 21 March to 29 May 1979 at the Cary Arboretum of the New York Botanical Garden in Dutchess County, New York. Male Red-winged Blackbirds in the study population defended relatively large territories (ca. 4,000 m²) in upland habitats. I captured 38 male Red-winged

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TABLE 1. Means and standard deviations for three estimates of trespassing by male Red-winged Blackbirds during control and playback periods of speaker-occupation experiments.^a

	Single song type (<i>n</i> = 16)			Repertoire (<i>n</i> = 16)		
	Control	Playback	<i>P</i>	Control	Playback	<i>P</i>
Fly-through rate	11.9 ± 6.2	9.8 ± 6.1	*	14.5 ± 14.5	11.4 ± 12.8	**
Nonneighbor trespass rate	1.4 ± 1.2	1.4 ± 1.4	ns	2.6 ± 2.4	1.1 ± 1.4	**
Neighbor trespass rate	4.2 ± 4.0	4.5 ± 3.8	ns	4.1 ± 4.1	4.6 ± 4.0	ns

^a Rates are number/h. *P* values are based on Wilcoxon matched-pairs signed-ranks tests. An asterisk indicates statistical significance at the 0.05 level; two asterisks indicate significance at the 0.01 level (two-tailed).

Blackbirds using a decoy trap (Smith 1972). Although all experiments were begun within the first hour after sunrise, in six cases the captured male was replaced by a previously nonterritorial male Red-winged Blackbird before I could begin the playback period (see below). On each of the remaining 32 territories, I replaced the captured male with two Nagra DH speaker-amplifiers mounted on 1.5-m poles. The speakers were placed approximately 50 m apart, producing a "speaker territory" with an area of approximately 2,000 m². Each speaker territory was considerably smaller than the territory defended by the captured male.

In each experiment I noted all flights through the speaker territory and trespasses (perching within the speaker territory) by neighboring and nonneighboring conspecific males during a 1-h control period (no playback) and a 1-h playback period. The order of these two periods was randomly determined.

Previous observations of Red-winged Blackbird singing behavior have shown that males possess up to eight distinct song types, that males tend to synchronize their changes of perch with changes of song type, and that males sing many renditions of a single song type before switching to another (Smith and Reid 1979, Yasukawa in press). I attempted to simulate this singing behavior in all playbacks by alternating 5-min segments of 30 songs between the two speakers. Songs used in playbacks were recorded approximately 50 km away from the Cary Arboretum using a Uher 4000 Report-L tape recorder and a Uher 516 microphone mounted in a 61-cm parabolic reflector. I broadcast a total of 360 renditions during each 1-h playback period, using a Uher 4000 Report-L tape recorder. In half the experiments, a single song type was played. In the remaining half, I played a repertoire of eight different song types. In repertoire playbacks, a single song type was played during each 5-min segment. These playback procedures were designed to simulate a territorial male Red-winged Blackbird alternating between two perches at 5-min intervals. In addition, repertoire playbacks simulated a male that changed song type with each change of perch. The playback tape (8-song repertoire or 1 of 8 different single song types) was determined randomly.

Differences in rate (number/h) of fly-through, neighbor trespass, and nonneighbor trespass between control and playback periods were tested using Wilcoxon matched-pairs signed-ranks tests. Statistical significance was accepted at the 0.05 level (two-tailed).

Results of the playback experiments are shown in Table 1. Broadcasting a single song type significantly reduced rate of fly-through, when compared with control-period rate, but did not affect rate of trespass by neighbors or nonneighbors. Playback of a repertoire of eight song types significantly reduced rates of fly-through and trespass by nonneighbors, when compared with control-period rates, but did not affect rate of trespass by neighbors.

These results are consistent with the hypothesis that Red-winged Blackbird song functions in territory defense. They also suggest that a repertoire of song types is more effective than a single song type in deterring trespassing by nonneighboring males (Yasukawa in press). Song alone, however, was not sufficient to discourage trespassing by neighboring males. In fact, some neighbors responded to the playbacks as though the speakers had been placed within their territories. One explanation of this result is that the speaker-occupation experiments, which used song types that were unfamiliar to the neighboring males, simulated an attempted territory establishment by a nonterritorial male Red-winged Blackbird. Neighboring males may have been attempting to re-establish boundaries or to expand their territories at the expense of the new, replacement males.

Male Red-winged Blackbirds are extremely faithful to the territories they held in previous breeding seasons, and re-establishment by returning males occurs with little difficulty (Nero 1956). In contrast, initial territory establishment is more difficult and appears to depend in part on previous experience (Nero 1956, Yasukawa 1979). Results of the speaker-occupation experiments suggest that inexperienced males have difficulty establishing territories because they are unable to discourage intrusions by already established territory owners.

Results of the present study are the strongest evidence to date that Red-winged Blackbird song functions in territory defense. However, differences in effectiveness, which appear to depend on the identity of the singer and receiver, raise interesting new questions about the functions of song in this species.

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Discovery of the Nest and Eggs of the Cinereous Finch (*Piezorhina cinerea*), a Peruvian Endemic

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The Cinereous Finch (*Piezorhina cinerea*), the only member of its genus, is endemic to the coast of Peru from the Department of Tumbes south to the Department of La Libertad (Paynter, 1970, *Checklist of birds of the World*, vol. 13, Cambridge, Mus. Comp. Zool.). Within its restricted range, it is a fairly common bird in proper habitat. I have seen as many as 10 individuals during a morning walk. In 1978, six nests of this species were found about 4 km north of Ñaupe (5°34'20"S, 79°54'35"W; elev. 150 m) in the Department of Lambayeque, Peru. Because I have found no published information on any aspect of the biology of this species, I present the data on these nests below.

The habitat around Ñaupe is characterized by low dunes and sandy plains sparsely covered with short shrubs and occasional small trees (Fig. 1A). These dunes are on the eastern edge of the barren Desierto de Sechura where it abuts the western edge of the Andean foothills (visible in Fig. 1A). The dominant plants in this community are listed in the "Mapa Ecologico del Peru: Guía Explicativa" (1976, Lima, Oficina Nacional de Evaluacion de Recursos Naturales).

I assigned a single field number to a nest and all of its contents. All nests and eggs are now in the collection of the Louisiana State University Museum of Zoology.

NEST #1 (Fig. 1B).—On 31 May at 0730, I found an adult *Piezorhina* near a nest containing five eggs located 2.7 m up in a small unidentified tree (possibly *Capparis ovalifolia*). At 1700 I flushed a