

presence was being made known over a wide area. This might have a discouraging effect, leading the hawk to move well away before hunting again.

The idea that a barrage of sound, given in alarm, may act to deter or distract an attacking hawk has been discussed previously (Kilham, *Auk* 93:15, 1976) in regard to Chestnut-winged Chachalacas (*Ortalis garrula*) and Pileated Woodpeckers (*Dryocopus pileatus*) when feeding on fruit in exposed situations.

The hawk-eagle did attack the guan while it was screaming, when the guan flew from one tree to another close by. One might regard this as a "pursuit invitation" (Smythe, *Am. Nat.* 104:491, 1970) but the distance was, it seemed to me, too short. The guan flew, I believe, because the second tree offered more security. The guan had two escape advantages in this situation: one, that it could slip through outer branches more readily than the hawk-eagle and two, that it could run along inner branches with the agility of a squirrel. As soon as the hawk-eagle left, the guan switched to the entirely different "cawk, cawk,

cawk" vocalizations. These might have warned other guans that the predator had left.

Why should the alarm calls of Crested Guans combine two very different types of vocalizations, namely the screams and the "jaguar-like" growls? Could the latter serve to further confuse a hawk-eagle, making it think that it itself might be exposed to a predator? It is of interest here that Russell (*Am. Ornithol. Union Monogr.* No. 1, 1964) described a female Great Curassow (*Crax rubra*) with young as making a "threatening, mammal-like snarl, similar to that of an angry dog" in the course of a distraction display. The situation is a complex one in terms of evolution and would seem to merit further study of the family *Cracidae* (Delacour and Amadon, *Curassows and related birds*. *Am. Mus. Nat. Hist.*, New York, 1973) as a whole.

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## COWBIRD PARASITISM OF SAGE AND BREWER'S SPARROWS

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Friedmann et al. (*Smithson. Contrib. Zool.* No. 235, 1977) stressed the value of new records of parasitism by Brown-headed Cowbirds (*Molothrus ater*) where those records might be associated with changes in the environment. The following illustrates a situation where hosts probably have become newly available to cowbirds. Friedmann (*U.S. Natl. Mus. Bull.* No. 233, 1963) listed only one record for the Sage Sparrow (*Amphispiza belli*). Four instances of parasitized Brewer's Sparrows (*Spizella breweri*) have been reported, two in each of the works cited above. I add here two new records for each species. All four nests were found on a 10-ha study area of ungrazed sagebrush (*Artemisia tridentata*) in Bingham County, Idaho.

**Sage Sparrow:** Nest #1. This nest, the second of the pair, was found on 23 June 1976. It contained one unidentified young, one sparrow egg, and one cowbird egg. The nest was deserted on 24 June. Nest #2. This also was the second nest of a pair and was found on 5 July 1976. It contained one unidentified young and one cowbird egg which had been perforated. The nest was deserted on 7 July.

**Brewer's Sparrow:** Nest #1. On 21 June 1976 I found a nest with three sparrow eggs. On 3 July the nest contained one young sparrow, two sparrow eggs, and one cowbird egg. The nest was deserted on 4 July. Nest #2. When found on 5 July 1976, this nest contained three sparrow eggs. On 11 July it contained one sparrow egg and one cowbird egg. The nest was deserted by 13 July.

I considered the nests deserted when several subsequent visits revealed no change in their contents

and no parents in attendance. Two of four Sage Sparrow nests and two of 16 Brewer's Sparrow nests that I found were parasitized. None of 21 Sage Thrasher (*Oreoscoptes montanus*) nests contained cowbird eggs.

The Sage and Brewer's sparrows are regarded as "almost entirely dependent" on sagebrush for breeding habitat (Baker et al., *Wilson Bull.* 88:165-171, 1976). My own observations in Idaho indicate that the Sage Sparrow, in particular, may have specific requirements that preclude it from large tracts of sagebrush which otherwise appear suitable. Both species occur along the Snake River Plain in southern Idaho. This area has only recently undergone large-scale alteration for crop and grazing land. I found the nests on the edge of a large expanse of sagebrush that bordered a cattle ranch for about 15 km. Daily, I saw cowbirds flying into the sage from the direction of the pasture. Flight distance to the study area was about 3 km, but the cowbirds commonly flew farther.

This intrusion of grazing land into the sagebrush appears to provide a large contact zone where cowbirds have access to the breeding birds of the sage habitat. Cowbirds may be limited by the distance that they will fly in search of hosts, but it seems that the continued alteration of sagebrush habitat for grazing will provide further opportunities for the parasitism of species heretofore isolated from cowbirds.

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