

each given only once (Fig. 1B). Most of the eight buntings that sang this song regularly paired each of these four different figures. Only one bunting, banded XSOW, sang the second from the last song figure without repetition (Fig. 1A). No buntings were recorded singing the last song figure singly as the warbler did. It appears that the Chestnut-sided Warbler copied XSOW, an adult bunting who has been at the study area for at least 3 years. The song may have been copied early in 1983 (XSOW was first seen in 1983 on 24 May) or in an earlier year. Although additional Chestnut-sided Warblers were observed on the study area regularly during the breeding seasons from 1978–1983, none were heard singing unusual songs.

The context of singing suggests that the copied song may have been used by the warbler as an "Accented Ending" song. Chestnut-sided Warblers have two main classes of song, Accented Ending and Unaccented Ending (Lein, *Can. J. Zool.* 56:1266–1283, 1978; Kroodsma 1981). Accented Ending songs tend to be sung more frequently early in the season and before the male is mated. No mate or nests were found for the warbler and the warbler was not seen or heard on this territory later in the season. The structure of the song differs from both the Accented Ending and Unaccented Ending songs in the details of the terminal notes that define the song classes. In certain features the form of the terminal song figure resembles the penultimate song figure in the Accented Ending type 2 of a warbler song neighborhood (Lein 1978: Fig. 2). The penultimate song figure resembles a warbler note recorded by Lein (1978: Fig. 4f, 6a, middle notes) in some Unaccented Ending songs.

The observation of interspecific song learning by a Chestnut-sided Warbler of a local song of an Indigo Bunting suggests that song development in this species is not tightly constrained by an innate predisposition to learn only species-same behaviors. The warbler's faster delivery of the bunting song-figures may, however, reflect a species-specific constraint in the same manner as Greenfinches (*Carduelis chloris*) copying Canaries (*Serinus canarius*) retain Greenfinch-specific interval timing (Güttinger, *Z. Tierpsychol.* 49:285–303, 1979). The closer match of the wild warbler's song with the apparent tutor's song than was observed in the experimental Chestnut-sided Warbler (Kroodsma et al. 1983) is consistent with the suggestion that song learning in birds may normally depend upon social interaction (Baptista and Morton 1981, Kroodsma 1981, Payne 1983). The circumstances in which the warbler copied the bunting song may have involved aggressive social interaction; the two species overlap in habitat and both nest in shrubs below 1 m. The bunting may also have caught the ear of the warbler at a critical period in its behavioral development. Whether song development in the warbler involved response to the similar acoustic features of songs of the two species, or to social interaction, or both, is unknown.

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An apparent hybrid Black-billed × Yellow-billed Cuckoo.—On 22 October 1974, R. Miller, Meridian, Butler Co., Pennsylvania, found a dead cuckoo and took it to the taxidermy laboratory of Carnegie Museum of Natural History, then located in Meridian. It was prepared as a study skin by O. M. Epping, and eventually delivered to the museum in Pittsburgh. Superficially similar to a Yellow-billed Cuckoo (*Coccyzus americanus*), it was catalogued (CM 149972) into the museum collection as a member of that species. It was sexed as a male; no notes were made by the preparator about fat or molt, but the specimen has obvious

pinfeathers on the forehead and throat. The bird was apparently just completing its first prebasic body molt.

While examining immature *Coccyzus* specimens recently, I was struck by several color anomalies in the Meridian specimen. Further study indicated that this specimen is probably a hybrid between the Yellow-billed Cuckoo and the Black-billed Cuckoo (*C. erythrophthalmus*).

First-year *Coccyzus* cuckoos are readily distinguishable from adults by the narrowness of their rectrices, and the Meridian specimen clearly belongs to this age class. It was compared with nine first-year specimens of each species. In young Yellow-billed Cuckoos the rectrices (except the central pair) are dull black or dark gray above, with well defined broad white or grayish white tips on the outer three pairs. The outer two pairs also have a sharply defined whitish margin on the outer web. Black-billed Cuckoos of the same age class have olive-brown rectrices with no more than a small dull white spot at the tips. The outer edge of the outer two pairs has a very narrow (<0.5 mm), inconspicuous pale margin. In the Meridian specimen the rectrices are dark gray as in the Yellow-billed Cuckoo, but duller and browner; the terminal spots are as large as in that species but are not clearly defined at the proximal edge, blending more gradually into the dark gray area. Similarly, white outer margins are present on the outer two pairs of rectrices, but these are not clearly defined as in the Yellow-billed Cuckoo.

Neither the Yellow-billed Cuckoo nor the Black-billed Cuckoo normally replaces rectrices at the time of the first prebasic body molt in the fall (Bent, U.S. Natl. Mus. Bull. 176, 1940). In the Meridian specimen, the left outermost rectrix is sheathed at the base and has grown to about $\frac{2}{3}$ of full length. This undoubtedly represents replacement of an accidentally lost rectrix. The new feather is of adult shape and color, although rectrices of this kind would not normally be grown until some months later. The color and pattern of the new feather in the Meridian specimen are essentially those of the Yellow-billed Cuckoo, except that in that species the white tip is sharply defined from the adjacent black of the rest of the feather, whereas in the Meridian specimen the pigmentation fades from black to white in a band about two mm wide along this border.

The anterior underparts of young Black-billed Cuckoos are buffy-gray; in Yellow-billed Cuckoos this area varies from pure white to a purer, less buffy gray than in the black-bill. In the Meridian specimen the anterior underparts are lightly washed with a buffy-gray similar to that of the Black-billed Cuckoo. In the Yellow-billed Cuckoo the flanks are white, lightly washed with buff or gray, and the under tail coverts are usually white, sometimes cream. In the Black-billed Cuckoo the flanks are buffy-gray like the breast, and the under tail coverts are distinctly buffy. These areas in the Meridian bird are like the Black-billed Cuckoo but somewhat paler.

One of the most conspicuous differences between these two species of cuckoo is the color of the wings in dorsal aspect. In the Yellow-billed Cuckoo the inner webs of the primaries are strongly rufous on the proximal half; there is a rufous tinge to the proximal portion of the outer webs of the primaries and outer secondaries, and all of the wing coverts have rufous margins. Young Black-billed Cuckoos lack the rufous on the inner webs of the remiges, which are white to pale buff. They tend to have some rufous on the outer webs of the inner primaries and outer secondaries (lacking in adults), duller than that of the Yellow-billed Cuckoo, and a highly variable amount of the same dull rufous edging on some of the wing coverts. In the Meridian bird the wings, in general, are like those of the Yellow-billed Cuckoo, but the greater coverts lack rufous edgings, contrasting abruptly with the reddish primary coverts.

The bill color from which the two species take their English names is also diagnostic. In the Yellow-billed Cuckoo the lower mandible is bright yellow on the proximal $\frac{3}{4}$, as is the

area of the upper mandible below the nostrils. This area remains yellow in museum specimens as much as a century old, clearly contrasting with the dull black of the remainder of the bill. In young Black-billed Cuckoos, the lower mandible varies from the black of the upper mandible to blue-gray in color. In those examples whose lower mandibles were blue-gray in life, the color fades to white in museum specimens. In the Meridian bird, the lower mandible is yellowish brown, contrasting much less with the upper mandible than in Yellow-billed Cuckoos, and darker than any museum specimen examined of the latter species. It is thus intermediate between the yellow lower mandible of Yellow-billed Cuckoos and the black (rather than blue-gray) extreme of lower mandible color in young Black-billed Cuckoos.

The measurements presented by Ridgway (U.S. Natl. Mus. Bull. 50, Pt. 7, 1916) indicate that adult Black-billed Cuckoos have, on the average, shorter wings and bills but longer tails than adult Yellow-billed Cuckoos. The sexes are alike in size. First-year specimens measured for this study (as mentioned, nine of each species) confirm all except the tail differences; there was no significant difference in tail lengths between the two series, and the Yellow-billed Cuckoo series included both the longest- and shortest-tailed specimens. The measurements (mm) were as follows: flattened wing—Black-billed Cuckoos 128.5–141 (134.5), Yellow-billed Cuckoos, 140–152.5 (145.0), hybrid 142; tail—Black-billed Cuckoos, 134–150 (142.8), Yellow-billed Cuckoos 132–161 (143.9), hybrid 136; bill from anterior end of nostril—Black-billed Cuckoo 15–19.5 (17.1), Yellow-billed Cuckoos 18–20 (18.7), hybrid 17.5. The hybrid thus has a wing length like that of a large Black-billed Cuckoo or small Yellow-billed Cuckoo, a tail length within the range of both species, and a bill length like an average Black-billed Cuckoo or a very small Yellow-billed Cuckoo. In all other characters (color, pattern), the Meridian specimen is essentially intermediate between the two species, although more like the Yellow-billed Cuckoo in tail, wing and bill color and more like the Black-billed Cuckoo in underparts color.

Hybridization is apparently rare in the family Cuculidae. None has been reported prior to my describing a hybrid Philippine Coucal (*Centropus viridis*) × Lesser Coucal (*C. bengalensis*) (Parkes, Living Bird 4:94–95, 1965). I know of no other record of hybridization between the Yellow-billed and Black-billed cuckoos, which are widely sympatric in North America. Each of these species of *Coccyzus* is known occasionally to lay eggs in the nest of the other (several references given by Bent 1940:56). It is tempting to speculate that one of the parents of the Meridian bird hatched from such a misplaced egg and was thus imprinted on the wrong species.—KENNETH C. PARKES, *Carnegie Museum of Natural History, Pittsburgh, Pennsylvania 15213. Accepted 15 Feb. 1984.*

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Clutch-size and nest placement in the Brown-headed Nuthatch.—Brown-headed Nuthatches (*Sitta pusilla*) occupy southeastern pine forests from eastern Texas to Florida, north to Arkansas and the southern tip of Delaware; an insular race occurs on Grand Bahama Island (A.O.U. Checklist 1983). Data on their nesting biology are scattered except for that collected by Norris (Univ. Calif. Publ. Zool. 56:119–300, 1958). Information on clutch-size, nest placement, and other aspects of nesting biology throughout the species' range is available on oology cards and in the literature. Collation and study of data from these sources has allowed me to quantitatively examine some facets of Brown-headed Nuthatch breeding biology.

Methods.—I requested oology data from various museums and used a total of 372 cards. In addition, I conducted a literature search for nesting records (N = 35), received Cornell Nest Record Card Program (NRCP) data (N = 22), and solicited information from indi-