

birds. Several times when automobiles passed some of the birds flew briefly but then landed and immediately resumed huddling.

Such behavior was very likely occasioned by the unusually cold weather and its resulting food shortage. During periods of environmental stress it is more advantageous for the swallows to abandon their normal "individual distance" in favor of body contact and thereby conserve their energy reserves. It appears that swallows, in addition to utilizing intraspecific huddling, will also huddle interspecifically if the opportunity arises.—W. ROGER MESERVEY and GEORGE F. KRAUS, *Zoology Department, Rutgers University, New Brunswick, New Jersey 08903*. Accepted 17 Dec. 74.

Migrant Golden-winged Warbler with a bivalent repertoire.—In Ithaca, New York on 8 May 1974 I heard a migrating male Golden-winged Warbler (*Vermivora chrysoptera*) sing the primary songs of both Blue-winged (*V. pinus*) and Golden-winged Warblers. The bird was feeding in a patch of maples and oaks within 5 feet of the ground. It first started singing the typical "bee-buzz" song of the Blue-winged Warbler. This would be song type IA (Lanyon and Gill 1964, Gill and Murray 1972). This song was not only in the form of Blue-wing type IA song but had the typical raspiness and timbre. The bird continued singing in this way for about 8 min. It then stopped abruptly and began singing the four-part song that is typical of the Golden-winged Warbler. Renditions of this song "zee-beee-beee-bee" were sung more rapidly than the Blue-wing song. Each "zee" was slightly higher in frequency than the succeeding "beee's." The Golden-wing song continued for about 1 min whereupon the Blue-wing song was resumed.

I am certain that this Golden-winged Warbler sang the type I songs of both the Blue-winged and Golden-winged Warblers, and that it did not sing either the type II or the AAA songs described by Gill and Murray (1972). This Golden-winged Warbler was seen actually singing every rendition of both songs. No other *Vermivora* was seen during the entire period of singing. The Golden-winged Warbler, carefully studied at 25 feet through 7 × 35 binoculars, was in bright spring plumage. No trace of yellow was apparent on the breast or belly below the black throat patch. I could detect no trace of green on the completely gray back. The wingbars were bright yellow and formed a patch. No signs of introgression were thus apparent.

There are only a few reports of warblers in the Blue-wing/Golden-wing complex with bivalent repertoires (Bilderssee 1904, Carter 1944, Short 1963). Males of these species usually have only one pattern of song type I in their repertoire (Gill and Lanyon 1964, Gill and Murray 1972). Gill and Murray (1972) conclude that a bivalent repertoire in the Blue-wing/Golden-wing complex must be "a rare phenomenon indeed" and stress the possibility of errors in such observations.

This observation confirms that occasional individuals do have an expanded repertoire. The singing behavior and territorial interactions of such individuals on the breeding grounds would be of interest.

I am grateful to B. Murray and especially to F. Gill for reading preliminary drafts of this paper and providing instructive comments.

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Growth and fledging age of Sooty Tern chicks.—The Sooty Tern, *Sterna fuscata*, is a pantropical species. Watson (1908) described qualitatively the development of Sooty Tern chicks. Ashmole (1963) measured growth of Sooty Tern chicks on Ascension Island during two consecutive breeding seasons. All of 27 chicks he weighed during the second season died, presumably of starvation. Ashmole (1963) on Ascension, Ridley and Percy (1958) on the Seychelles, Dinsmore (1972) on the Dry Tortugas, and Burckhalter (1969) on Manana estimated that Sooty Tern chicks fledged at about 8 weeks of age.

The information presented in this paper was obtained in 1972 on Manana or Rabbit Island, Oahu, Hawaii. I established a 12 × 12 foot plot within a densely occupied but accessible portion of the Sooty Tern colony. The quadrat was just above the beach on the southwestern side of Manana. I entered the plot briefly, usually just after sunrise, every day from before the first egg was laid until after the last chick was fledged. I enclosed the quadrat with a 9-in high, 1-in mesh fence of poultry netting when the first chick hatched. Whenever I found a newly hatched chick, I banded it and weighed it in a plastic sack using a 0.5 × 50 g Pesola scale, then measured its culmen to the nearest millimeter with vernier calipers. In addition to these daily activities, every third day I weighed each chick in the plot and measured its culmen. Older chicks from 50 g to 100 g were weighed with a 1 × 100 g Pesola scale, and chicks exceeding 100 g were weighed with a 3 × 300 g Pesola scale.

I also recorded when each chick fledged or could fly "moderately well" (Lack 1968). I used two criteria for this: A chick was counted as fledged if it could rise from the ground and fly about 10 feet or more or if it could sustain level or ascending flight over a similar distance when tossed into the air.

Refer to Figs. 1 and 2 for plots of weight and culmen length against age. Measurements at about 0.5 days of age are available for each chick. Some chicks were also weighed and measured at 1.5 days, some at 2.5 days, and a final portion at 3.5 days of age. These were combined into a 2.5 day age class. Likewise, a 5.5 day age class represents chicks 4.5, 5.5, and 6.5 days of age, etc.

Of the 28 chicks hatched in the plot, the culmen of one was not measured because it was deformed. I found another chick with a broken wing and measured only the initial weight and culmen length. Three other chicks eventually died, apparently of starvation, and were found in the plot. Two other chicks became emaciated and were missing from the plot before they possibly could have fledged. These chicks were probably taken by Black-crowned Night-Herons, *Nycticorax nycticorax*, on the island (Brown 1973). The measurements of these five chicks were taken until the