

The distinct streaks of the aberrant bird serve to point out that in normal birds the general light tone of the plumage renders the pattern nearly obsolete. This suggests that the ancestors of *Cariama* may have been darker in order for the pattern to be at all evident, and that the pale plumage of *cristata* may have evolved as an adaptation to the arid grassland it now occupies. It should be noted that the other species in the family, *Chunga burmeisteri*, is a forest bird that roosts high in trees (Sclater and Hudson 1889, Argentine Ornithology, vol. 2, London, R. H. Porter). Both species nest in low bushes.—STORRS L. OLSON, *Department of Vertebrate Zoology, Smithsonian Institution, Washington, D. C. 20560*. Accepted 3 Jan. 73.

Winter singing of the Purple Finch in Massachusetts.—Long before the advent of spring the Purple Finch (*Carpodacus purpureus*) can be heard singing in the northeastern United States. In 1962 I began keeping a record of the earliest dates on which I heard Purple Finch songs. Most of the songs were recorded in Boxford, Massachusetts, and all were from Essex County in the northeastern corner of Massachusetts.

Aretas A. Saunders (*in Bent* 1968, U. S. Natl. Mus. Bull. 237, part 1, pp. 272–274) describes two kinds of Purple Finch songs given early in the year: The warbling song heard chiefly from February to April and the uncommon “vireo song” usually heard in early March.

TABLE 1

EARLIEST DATES OF PURPLE FINCH SONGS IN BOXFORD, MASSACHUSETTS

Year	Date	Song type
1962	20 February	Whisper song
	25 February	Warbling song
1963	2 February	Whisper song
	10 February	Whisper song and warbling song (same bird)
1964	24 February	Warbling song
	5 February	Whisper song
1965	9 February	Warbling song
	6 February	Whisper song (author not in area after 14 February)
1966	12 February	Whisper song
	2 March	Whisper song and warbling song (same bird)
	6 March	Warbling song
1967	4 March	Warbling song
1968	8 March	Warbling song (Topsfield, Mass.)
1969	11 February	Whisper song
	27 February	Warbling song
1970	24 January	Whisper song
	14 March	Warbling song
1971	20 February	Whisper song
	24 February	Vireo song
	27 February	Vireo song and warbling song (same bird)
	1 March	Warbling song
1972	13 January	Whisper song
	17 February	Warbling song

In 9 of the 11 years during which I have kept records I have heard a third type of song, not described by Saunders, in January and February. The song was similar in pattern to the warbling song, but being much softer, it appeared to fit the category of secondary song called "whisper song" by Lister (1953, Brit. Birds 46: 139). The songs were first heard as early as 13 January and as late as 2 March although the majority were recorded in February (Table 1). Each song lasted from about 1 to 3 seconds and was usually repeated a number of times with variations for a total period of from 1½ to 3 minutes. The birds sang in both mornings and afternoons, at temperatures varying from -6° to 12°C, and in sunshine, rain, and light snow. Some of the singing birds were adult males, while others were brown and could have been either immature males or females.

My records bear out Saunders' statement that the vireo song of the Purple Finch is uncommon. I heard this song only twice, both times in February 1971. Both times the singer was an adult male. The song consisted of short vireolike phrases of a few notes each. In one of these two cases the bird began singing the vireo song and after a short period changed over to the warbling song.

The well-known warbling song was heard as early as 9 February but, more commonly, during the latter part of February or in early March (Table 1). Adult males and brown birds were heard frequently giving this song. On one date in February and one other in March, I heard a bird sing a mixture of a warbling song and a whisper song. The former singer was an adult male, the latter had brown plumage.

It appears from my records that Purple Finches in northeastern Massachusetts sing three types of songs during mid- and late winter. The whisper song is heard commonly and the vireo song rarely (two records only) in February. The common warbling song begins usually in late February or early March and continues into spring.—STEWART DUNCAN, *Department of Biology, Boston University, Boston, Massachusetts 02215*. Accepted 4 Jan. 73.

Volume of Forster's Tern eggs.¹—Few data on the volume of tern eggs have been published. The only ones I have been able to locate are those of Worth (1940) and Barth (1953) for the Common Tern (*Sterna hirundo*). This report presents egg volume data for Forster's Terns (*S. forsteri*) and evaluates present and past methods of estimating egg volumes.

The irregular shapes of birds' eggs prevent easy determination of egg volume from linear dimensions. Two formulae have been proposed by which egg volume (V) may be estimated from measurements of egg length (L) and greatest width or breadth (B). The earlier method (I), originally proposed by Bergtold (1929), Westerskov (1950) reduced to $V = 0.51 LB^2$. The second method (II), originally proposed by Worth (1940), Barth (1953) later reduced to $V = 0.445 LB^2$. As Barth pointed out, such formulae have the disadvantage of possible errors resulting from shape bias, and as the two formulae differ, it is not clear which one should be used for a given species. Shape bias can be avoided by using the methods of Preston (1968 and earlier) to determine egg shape and then calculating volume, but shape is frequently not determined. It may be useful, therefore, to compare the results of these formulae with those obtained from an additional

¹ Publication No. 20 of the University of Manitoba Field Station, Delta, Manitoba.