of collectors in the taking of full data (and their responsibility to do so) and in educating the general public in the potential scientific value of the dead bird found outside the picture window and of bird specimens in general. There are also situations in which a general collection can (and often should) be made, in which the bird populations will not be affected by the collecting per se. For instance, if a woodland is slated to be turned into a shopping center, the future of its bird populations will hardly be affected by judicious sampling, which among other things will provide future documentation for populations locally extirpated by habitat destruction. Such situations are especially common in the tropics where forest destruction is rampant. Here, it is particularly vital that each specimen be accompanied by full data, for entire populations are often wiped out by chainsaw and fire from one year to the next—only the specimens (if any) remain. More museum curators must become so in fact as well as in name and must take a more active part in the museum's collecting efforts than simply collecting specimens for the revision of genus X or family Y. By actively accumulating not only more but better (in terms of data) specimens, museums could broaden their scientific clientele and provide an important service to a far wider variety of scientists than is now the case. Only museums are in a position to make such a contribution; they should be given every encouragement to do so. *Received 18 January 1982, accepted 5 July 1982.*

Do Darwin's Finches Lay Small Eggs?

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We have just finished reading Grant's (1982) thought-provoking paper on egg weights of Darwin's finches. Unfortunately, his calculations contain two serious errors that profoundly affect his interpretation of the data and his speculative conclusions. The first error is the statement that a fringillid, scaled to a 30-g bird, lays an egg weighing 20% of body weight. The second error involves the y-intercept of the regression of egg weight on body weight in Darwin's finches.

Grant's statement that a 30-g fringillid lays a 6-g egg perpetuates an error presented by Rahn et al. (1975). They used data summarized by Amadon (1943), believing that Amadon's regression equation related egg weight to body weight. It did not; it related an egg volume index, called "egg value" (LB^2 where L and B are the length and breadth of an egg), to body weight. Amadon stated (p. 224):

> "For the purposes of the present study the volume or weight of eggs is not of interest *per se*. The value of the expression LB^2, which is based directly on the egg measurements, has been used without alteration."

and on p. 225:

> "For the eggs, the average value of the expression LB^2 (called "egg value" in this paper) is given."

We have done some calculations to see how this error affects Grant's conclusion that Darwin's finches have proportionately smaller eggs than those of other fringillids. We used Amadon's LB^2 values to calculate egg weights for the 13 species and subspecies of fringillids (all emberizines) for which Amadon analyzed data. We used Schoenwetter's equation, as modified by Amadon (1943):

$$W = 0.5128LB^2,$$

where W is egg weight in grams. The egg-weight data were used to calculate the power function equation:

$$W = a \cdot B^b,$$

where W is egg weight in grams, a is a constant (the

Table 1. Body weights and proportional egg weights for several finch species.

Species	Body weight (g)	Proportional egg weight (%)
Darwin's finches (Grant 1982)		
Certhidea olivacea	~9	17.4
Geospiza difficilis	~12	17.1
G. conirostris	~25	10.7
G. magnirostris	~35	8.9
Other fringillids (Amadon 1943)		
Spizella passerina	~12	12.8
S. pusilla	~13	12.5
Zonotrichia albicollis	~25	11.0
Pipilo erythrophthalmus	~41	9.5

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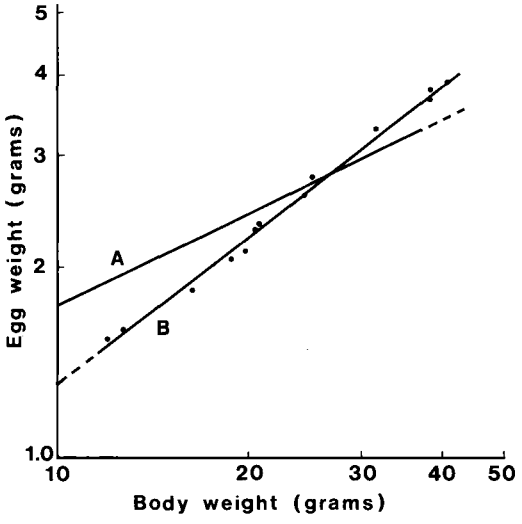

Fig. 1. The relation between average egg weight and average body weight (log-log scale) for 10 species of Darwin's finches (line A) and for 13 species and subspecies (dots) of North American Emberizinae (line B). Lines A and B are extended (broken lines) beyond the recorded weights to facilitate comparison. Regression equations are given in the text. The scatter of Darwin's finches around their line is shown in Grant (1982).

y-intercept on a log-log plot), B is body weight in grams, and b, the exponent of B, is the slope of the regression line on a log-log plot. The resulting equation is:

$$W = 0.212B^{0.786}; \quad r^2 = 0.99, P < 0.001.$$

The slope, of course, is identical to that calculated by Amadon (1943) for the LB^2 values, but the y-intercept is lower [the intercept is equal to 0.413 (Amadon's) × 0.5128 (from Schoenwetter's equation)].

Grant (1982: Fig. 1) stated that the equation for the Darwin's finch data is:

$$\log Y = 0.48 \log X - \log 0.24,$$

where Y = egg weight = W, and X = body weight = B. Inspection shows that this equation is incorrect (as is that given in the caption for Fig. 2) and should read:

$$\log Y = 0.48 \log X - 0.24$$

or

$$\log Y = 0.48 \log X + \log 0.575,$$

which in the form of a power function is:

$$Y = 0.575X^{0.48}.$$

The slope (0.48 ± 0.04, the 95% confidence limits from Grant 1982) is significantly lower than the slope of 0.786 ± 0.041 for Amadon's finches. The y-intercept of 0.575 is much greater than the corresponding value of 0.212 for Amadon's finches. This means that small Darwin's finches (i.e. those weighing about 12 g) lay much larger eggs than do North American emberizines of similar weight. Of the 10 species of Darwin's finches shown in Grant's Fig. 1, the eight that are less than 26 g lay relatively larger eggs, but the two heavier species (about 35 g) lay relatively slightly smaller eggs (Fig. 1). This is easily seen by comparing selected species from each group (Table 1) [the body weight of *C. olivacea* is about 9 g (Grant, pers. comm.), not 7 g as stated by Grant (1982: 19)]. The smallest Darwin's finches also lay relatively much larger eggs than do some small finches other than emberizines, such as the cardueline *Spinus tristis* (Amadon 1943) and the tiny African finches of the Estrildidae (Payne 1977). Thus, the interesting question becomes, "Why do small Darwin's finches lay such proportionately large eggs?"

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