Digestive efficiency and premigratory obesity in the Dickcissel.—Studies on the bioenergetics of the Dickcissel (*Spiza americana*), held outdoors throughout the year on both the bird's summer and winter ranges (Zimmerman, *Physiol. Zool.*, in press), illustrated significant changes in the caloric value of the "guano" (Table 1). Since it is known that, as the level of food intake increases above a certain value, the ability to digest all of the nutrients tends to decrease (Maynard and Loosli, *Animal nutrition*, New York, McGraw-Hill Book Co., 1956; see p. 273), these differences were possibly due to the changes in the amount of food ingested. This phenomenon is related to the rate of passage of food through the gut. High rates of intake reduce the amount of time for digestion and subsequent absorption, and thus greater amounts of calories are lost in the feces than at low feeding rates.

Yet the lowest caloric values for the excreta occurred for these birds during periods of fat deposition, a time of hyperphagia. In 1961 the low October value determined for the guano of the Illinois birds was obtained while these birds were either ac-

TABLE 1

AVERAGE CALORIC VALUE OF GUANO (KCAL/GRAM DRY WT.)

Illinois outdoors

1960			*1961*		
N	*Date*	*Mean ± S.E.*	*N*	*Date*	*Mean ± S.E.*
6	29 June–11 July	3.604 ± 0.03	10	25 May–18 July	3.496 ± 0.02
6	29 Aug.–28 Sept.	3.516 ± 0.02	10	5–9 Sept.	3.421 ± 0.01
6	28 Oct.–10 Nov.	3.665 ± 0.01	10	26–30 Oct.	3.399 ± 0.02
6	27 Nov.–21 Dec.	3.681 ± 0.03	10	4 Dec.–11 Jan.	3.510 ± 0.01

Canal Zone

Outdoors			*Indoors (12 hours, 29° C)*		
N	*Date*	*Mean ± S.E.*	*N*	*Date*	*Mean ± S.E.*
12	31 Jan.–21 Feb.	3.567 ± 0.01	8	31 Jan.–28 Feb.	3.588 ± 0.05
12	20–29 Mar.	3.564 ± 0.01	8	20–30 Mar.	3.562 ± 0.01
12	19–29 Apr.	3.478 ± 0.03	8	13–29 Apr.	3.447 ± 0.02

cumulating depot fat or had reached maximum weight at a high visible fat class. This average was significantly different ($P < 0.05$) from both the May–July and December–January amounts, but not from the September level. During the period covered by the September average, 90 per cent of the birds were in molt, and this value may be related to the low gross energy intake that characterizes the early molting period. The October value, instead of abruptly increasing as one would expect with the marked hyperphagia of fat deposition, is still lower. With the Illinois birds held outdoors in 1960, the August–September average for the guano was significantly different from the June–July, October–November, and November–December values, and this sample was likewise collected while these birds were undergoing autumnal premigratory fattening. The birds held outdoors in the winter and spring of 1961 in the Canal Zone also showed a change in the caloric quantity of the guano, with the April amount being significantly different from the higher and similar values for January–February and March. April was the period of vernal premigratory fattening, and the guano samples were analyzed for most birds during this rapid weight gain and for the rest immediately after they had become fat. Canal Zone birds under a constant environment of 12 hours photoperiod and 29° C also accomplished vernal fattening at the same time,

and again the low April value is significantly different from the January–February and March values.

In order to determine whether there was a relationship between food intake and the caloric value of the excreta, the kilocalories per gram of dry guano of all outdoor birds, exclusive of the premigratory period, as well as others held in constant temperature cabinets and not manifesting premigratory fat deposition, were compared with the hourly rate of feeding (gross energy in kilocalories per bird times hour of photoperiod) for the days when the excreta were collected. A positive correlation coefficient was obtained ($r = 0.214$, $N = 278$), which is statistically significant ($P < 0.05$). Although the magnitude of the dependency between guano calories and feeding rate is not great, it does suggest that in birds not exhibiting premigratory fat deposition the expected relationship between feeding rate and energy loss in the feces does exist.

Utilizing similar pairs of values from birds undergoing premigratory fat deposition, no dependency between feeding rate and the caloric value of the guano could be illustrated ($r = -0.011$, $N = 53$). With the high food intake levels that are concurrent with premigratory fattening, there is no correlated increase in the caloric value of the excreta as with birds at other times of the year. It appears that during this period unknown physiological mechanisms operate to increase the efficiency of digestion or absorption of food, or both, in the gut, augmenting the energy available for storage.

Certainly the primary proximate cause of premigratory fat deposition in the Dickcissel and many other species is hyperphagia (King, *Physiol. Zool.*, 34: 145–157, 1961; King, *Condor*, 63: 128–142, 1961; King and Farner, *Proc. Soc. Exp. Biol. Med.*, 93: 354–359, 1956; Koch and DeBont, *Ann. Royal Zool. Soc. Belgique*, 82: 143–154, 1951; Odum and Major, *Condor*, 58: 222–228, 1956; Merkel, *Zeit. vergleich. Physiol.*, 41: 154–178, 1958), while the caloric gain attributed solely to the more complete withdrawal of energy by the Dickcissel from the food ingested averages only 0.242 kcal/bird × day. It would take almost a month to accumulate the energy equivalent of one gram of fat from the caloric bonus accruing at this rate. In the short period during which migratory fat is deposited, the gross effect of this saving is therefore small; yet, in Ben Franklin's appropriate words, "a penny saved, is a penny earned."

This report is based on part of a doctoral thesis in the Department of Zoology, University of Illinois, Urbana, under the direction of Dr. S. C. Kendeigh, and financed by Grant G 14261 from the National Science Foundation.—JOHN L. ZIMMERMAN, *Department of Zoology, Kansas State University, Manhattan, Kansas.*

***Dendroica pensylvanica* in Trinidad.**—On 26 March 1963 I watched for about 30 minutes a Chestnut-sided Warbler feeding in the tops of two tall trees in north-central Trinidad. The region was one of second growth forest along the southeastern side of Waller Field about two miles from the village of Cumuto. The bird was in adult male plumage and was seen clearly at reasonably close range in full sunlight through 10× binoculars; there was no possibility of misidentification. As this species is not listed by G. A. C. Herklots (*The birds of Trinidad and Tobago*, London, Collins, 1961), or by his principal sources, it is presumably new to the Trinidad list. It is perhaps worth mentioning also that, according to James Bond (letter to R. M. Mengel), there appear to be only three records of this warbler from northern South America, two from Colombia (R. M. de Schauensee, *Birds of Colombia*, Narberth, Pennsylvania, Livingston Publishing Co., 1964) and one from Venezuela (W. H. Phelps and W. H. Phelps, Jr., "Lista de las aves de Venezuela con su distribucion." Tomo 1, Parte 2. *Bol. Soc. Venez. Cien. Nat.*, 24: 1–479, 1963.).—W. JOHN SMITH, *The Biological Laboratories, Harvard University, Cambridge, Massachusetts.*