to the lake on 17 February 1974 I again sighted the mergansers, two males and four females, and the imprinted gull. The gull paid no attention to other gulls that fed nearby. On one occasion the gull swam following his "family" through a large heterospecific collection of ducks, mergansers, and gulls, apparently ignoring other gulls and birds, to remain with the mergansers. The gull now flew to keep up a great deal, rather than swimming. It did not swim about in a confused manner when they dove, but calmly allowed them to drift some distance ahead and then flew to join them. On one occasion it flew on ahead and landed in front of their line of travel and remained feeding in that location until after they had passed some distance before again flying to join them, landing in the middle of the flock. Occasionally the gull would circle about the flock before landing, in a brief hint of soaring flight. On these flights it was never observed higher than about 6 to 10 m above the water and the only departure from direct-line flapping flight was restricted to the brief spiral on landing.

This heterospecific "family" fed in the area daily in this manner until on 29 March 1974 they flew south toward the river, with the mergansers in a tight low formation about 2 m above the water. The gull flapped along at the same level about 3 m behind. This was the last sighting of these birds. The causes and outcome of this relationship can, of course, only be conjectured. Ring-billed Gull and Common Merganser nesting requirements are quite different, with the gulls nesting in colonies on the ground, usually on somewhat barren islands (Bent 1921), and the mergansers nesting in cavities in trees or other well-protected sites (Bent 1923, Palmer 1975). In this area, however, they do nest adjacent to the same bodies of water.

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Regulation of Metabolism During Torpor in "Temperate" Zone Hummingbirds

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The ability of hummingbirds to control their body temperatures and metabolic rates precisely while torpid has been noted for several species from tropical latitudes (*Eulampis jugularis*, Hainsworth and Wolf 1970; *Eugenes fulgens* and *Panterpe insignis*, Wolf and Hainsworth 1972; *Oreotrochilus estella*, Carpenter 1974), and regulation in torpor has been indirectly inferred from measurements of nest temperatures for one species from temperate latitudes (*Selasphorus platycercus*, Calder and Booser 1973). Lasiewski (1963, 1964; Lasiewski and Lasiewski 1967) did not report this phenomenon in his classic studies of the metabolism of hummingbirds from the United States.

Because of the lack of observation of the phenomenon there has been some question about the occurrence of regulation during torpor for hummingbirds from temperate areas (Dawson and Hudson 1970, Calder and King 1974). We present evidence that regulation of metabolic rate during torpor occurs for two species from temperate areas (*Archilochus alexandri* and the *Eugenes fulgens* race from Arizona), and we offer a possible explanation for the lack of observation of this in the earlier work of Lasiewski.

The methods were identical to those described previously (Hainsworth and Wolf 1970) with the exception that all measurements were made during the dark phase of the photoperiod on which the birds were maintained (either 14L:10D or 9L:15D). Data were collected from four female *Archilochus alexandri* and four male *Eugenes fulgens*.

Oxygen consumption for homeothermic birds (Fig. 1, closed circles) was similar to measurements previously reported for these species (Lasiewski 1963, Lasiewski and Lasiewski 1967) as well as for the more tropical race of *Eugenes fulgens* (Fig. 1; Wolf and Hainsworth 1972). When these hummingbirds

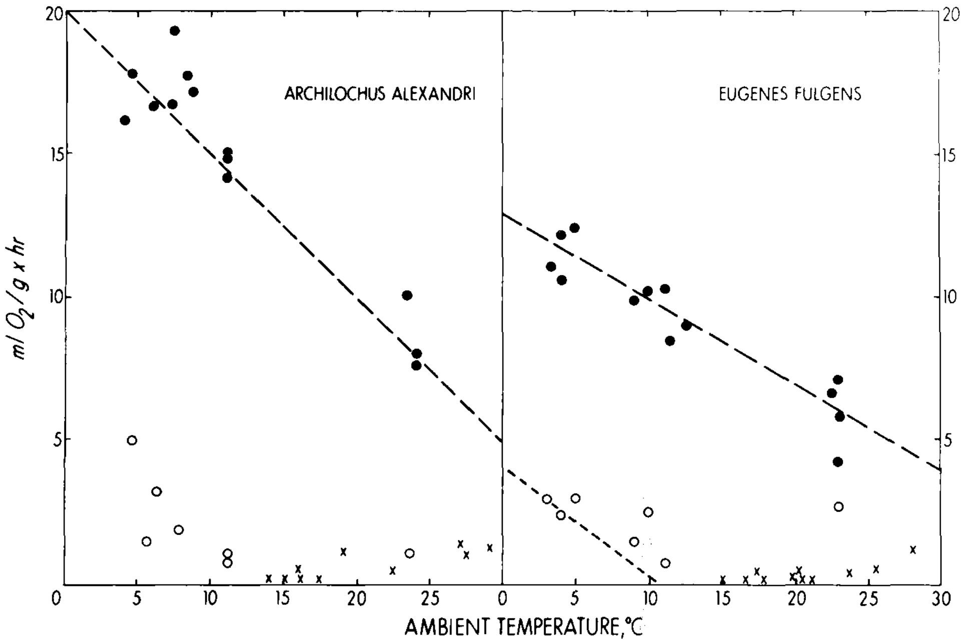

Fig. 1. Oxygen consumption as a function of ambient temperature. Solid points represent individual values for homeothermic birds; open points represent our measurements for torpid birds; x's represent torpor values from Lasiewski (1963) for *Archilochus alexandri* and Lasiewski and Lasiewski (1967) for *Eugenes fulgens*. Dashed line for *Archilochus alexandri* is from Lasiewski (1963); dashed lines for *Eugenes fulgens* are from Wolf and Hainsworth (1972).

were torpid they showed an increase in oxygen consumption below an ambient temperature of about 14°C (Fig. 1, open circles). In this respect they are similar to the species from high elevations of Costa Rica (Wolf and Hainsworth 1972) that regulate their metabolism below 12°C. *Eulampis jugularis* from lowland areas regulates below an ambient temperature of 18°C (Hainsworth and Wolf 1970), while *Oreotrochilus estella* from the high Andes of Peru regulates below an ambient temperature of 5°C (Carpenter 1974).

Why metabolism is regulated during torpor remains somewhat of an enigma. Clearly it has evolved with respect to a variety of temperatures, and the temperatures at which regulation is seen have been related to the minimum environmental temperatures in the habitats of the species (Wolf and Hainsworth 1972). Still, if *Oreotrochilus estella* regulates at a low temperature why is this not seen in other species? Any energy savings involved in entry or arousal or that might result from earlier feeding after arousal from regulated torpor would probably be offset by the considerable savings in expenditure that would occur at lower metabolic rates.

Lasiewski's (1963; Lasiewski and Lasiewski 1967) failure to observe regulation in torpor may be related to methods he employed to monitor body temperatures of torpid hummingbirds (Lasiewski 1964). He restrained the birds, and this could have modified their heat production abilities. This may explain the inability of the birds he studied to survive exposure to ambient temperatures below 12°C where heat production increases may be necessary for temperature regulation in torpor. It also suggests that regulation in torpor by hummingbirds is necessary for survival at those ambient temperatures where regulation occurs.

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The duration of parental care in the Common Tody Flycatcher.—The nesting habits of the Common Tody Flycatcher (*Todirostrum cinereum*) are now well known. Skutch (1930, Auk 47: 313–322; 1960, Pacific Coast Avifauna 34: 475–489) published two detailed life histories of the race *finitimum* in Panama and Costa Rica, and I (Haverschmidt 1968, Birds of Surinam, Edinburgh, Oliver and Boyd, p. 326) gave a summary of the nesting habits of the nominate race in Surinam. My observations agree in all aspects with those of Skutch except as to clutch size, *finitimum* laying 3, less often 2 eggs, while in Surinam all 21 nests I examined contained 2 eggs. The two stages of parental care as defined by Skutch (1976, Parent birds and their young, Austin, Univ. Texas Press, p. 341) he could not determine as all his nests were robbed.

In 1960 a single pair housed in my garden near Paramaribo, and I was able to study them through the whole breeding cycle till the young were independent. The pertinent data are: Nest still in progress of building on 26 July. On 9 August 1 egg, 10 August at 1730 still 1 egg, 11 August at 1730 2 eggs. On 28 August at 0700 still 2 eggs, which both hatched at 1230 after an incubation period of 18 days. The female slept in the nest (head in the doorway) till 9 September (age of nestlings 10 days). At sundown on 15 September both nestlings still in the nest, but had left the morning of 16 September after a nestling period of 18 days. The nestlings remained in company of their parents in the immediate neighborhood of the nest tree and could be easily located by their begging call, a long-drawn "psee," quite different from the ordinary note, a measured "tick, tick" of the old birds. On 13 October, 27 days after having left the nest, I saw one of the young birds feeding itself for the first time in the usual way by jumping to a leaf, but when one of the old birds arrived with food it uttered its begging call and was fed. Then followed a period in which the young birds not only searched for food for themselves, but were still fed by their parents. This I saw for the last time on 28 October. In this particular pair the duration of parental care after the young had left the nest lasted 43 days.—F. HAVERSCHMIDT, *16 Wolfskuilstraat, Ommen, Holland.* Accepted 19 Oct. 76.