Although in Redwinged Blackbirds evaporation (panting) is an effective means of heat loss, it requires energy, and at the same time increases the gradient from surface to body (lower body temperature), thus enhancing heat gain in birds receiving solar radiation. Evaporation as a means of heat loss is used mainly when ambient temperature exceeds body temperature or the bird is active. An efficient way of minimizing heat gain from solar radiation would be to withstand a slight hyperthermia. At air temperatures of 30° C and above, the birds, when receiving radiation, had a higher body temperature (fig. 1 and table 1). Of course the most efficient means of regulating body temperature at high air temperature below body temperature would be behavioral regulation, that is simply to get out of the sun into the shade, and one can see from figure 1 that when the insolation source is turned off, simulating moving to the shade, the body temperature drops. This reversed thermal gradient explains why on warm sunny days most birds tend to be active in early morning and late afternoon when solar radiation is less intense. This does not mean that a blackbird cannot operate in open sunlight on a hot day, since increased convective heat loss might increase the temperature at which the thermal gradient is reversed, and evaporative cooling can maintain the body temperature below the lethal temperature. It should also be pointed out that only blackbirds were used in this study, and, as shown previously (Lustick 1969), a white bird (albino Zebra Finch) reflects approximately 90 per cent of the solar radiation impinging on its surface, compared to 5 per cent for a blackbird. One can conclude that, below their lower critical temperature, blackbirds receiving insolation are strict endotherms and show a decreased heat loss due to a decreased thermal gradient from surface of skin to surface of feather, whereas in blackbirds receiving insolation above their lower critical temperature (but below body temperature), the thermal gradient is reversed and the bird is no longer strictly an endotherm since it gains heat from insolation. The next step will be to repeat this experiment, varying the air flow (convective heat loss) through the chamber and thus determine the effects of convection on heat gain from insolation.

SUMMARY

Ten Redwinged Blackbirds (*Agelaius phoeniceus*) were used to determine if the net heat flow could be reversed at air temperatures below body temperature while receiving insolation.

It was found that at air temperature below the lower critical temperature (30° C), the bird was still an endotherm, the net heat flow being out of the bird, although the outward thermal gradient was decreased in birds receiving insolation. At air temperatures above the lower critical temperature, the thermal gradient was reversed, the net heat flow being into the bird. Thus, a blackbird sitting in the sun at air temperatures above its lower critical temperature shifts from strict endothermy to a combination of endothermy and heliothermy.

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MARBLED GODWIT AND YELLOW-THROATED WARBLER IN COLOMBIA, SOUTH AMERICA

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On 24 December 1969 at 14:15 we observed two Marbled Godwits (*Limosa fedoa*) with nine other species of shorebirds on a mudflat on the Caribbean coast at Puerto Colombia, Atlantico, Colombia. The birds were studied at leisure for 40 min with 8 × 40 binoculars and a 20× scope. They were also flushed so that wing and tail pattern could be observed. R. M. de Schauensee (The birds of Colombia. Acad. Nat. Sci. Philadelphia, Livingston Publ. Co., Narberth, Penn., 1964) does not list this species. However, the occurrence of *L. fedoa* in Colombia is not surprising since Eisenmann (Trans. Linnaean Soc. New York, 7:29, 1955) lists this species as wintering in Middle America and southward along the Pacific Coast to northern Chile. R. M. de Schauensee (The species of birds of South America. Acad. Nat. Sci. Philadelphia, 1966) states that some *L. fedoa* take a more easterly course through Barbados and have been recorded from Trinidad and Tobago. Probably this species has been previously overlooked in Colombia. On 23 December 1969 at 07:00 we observed a Yellow-throated Warbler (*Dendroica dominica*) near Hotel El Prado, Barranquilla, Atlantico, Colombia. The bird was studied for 15 min as it crept about on the trunks and branches of trees (palms, etc.). During winter in the Everglades at Flamingo, Florida, we have observed similar feeding habitat and behavior for this species. R. M. de Schauensee (1966 op. cit.) does not mention this species from anywhere in South America. Eisenmann (op. cit., p. 90) records the eastern race *dominica* as wintering in Florida and the West Indies and *albilora* as wintering in Middle America to Costa Rica. Airline distance from Costa Rica to Barranquilla, Colombia, is about 570 mi.

Although no specimens or photographs were secured of either species, their identity was unmistakable. Both of us are very familiar with these species in the United States. This note should alert future ornithologists in Colombia as to the possible occurrence of these birds. Appreciation is extended to R. Meyer de Schauensee for correspondence concerning these records.

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