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SOME TEMPERATURES OF PANAMANIAN BIRDS

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McNab (1966), summarizing records of body temperatures of birds, notes that large birds have lower body temperatures than do medium-sized ones (20–50 g), but their temperatures are above those of mammals of the same weights. Small birds have low body temperatures, like those of the relatively few mammals of the same weights. He, King and Farner (1961), and Wetmore (1921) list temperatures mainly of nontropical birds. Temperatures of a few tropical hummingbirds (Lasiewski 1964; Morrison 1962) and oceanic birds (Howell and Bartholomew 1961) have been measured in special metabolic studies. The present paper reports temperatures of other tropical birds and discusses possible reasons for differing temperatures of tropical and nontropical birds.

The birds were captured in mist nets set at three localities in Panamá: Barro Colorado Island (9° 09′ N, 79° 51′ W), Panama Canal Zone, July–September 1970 and December 1970–January 1971; Limbo Hunt Camp (9° 9′ 35″ N, 79° 44′ 36″ W), Navy Pipeline Area, Panama Canal Zone, on 16 January 1971; and the Florida Audubon Society cabin (8° 50′ 33″ N, 82° 35′ 33″ W) below Cerro Punta, Chiriquí, Panamá, 27–29 January 1971. The Canal Zone localities were near sea level, the Chiriquí locality was at about 1650 m (5400 ft).

Temperatures in degrees Celsius were taken with a Schultheis quick-recording thermometer inserted into the cloaca. To be certain that the mercury reached cloacal temperatures, the reading was taken only after the thermometer had stabilized, after 30–60 sec in the cloaca. The bird was then weighed and molt condition recorded. Birds released from nets after rain were sometimes wet and chilled, so that their temperatures were often very low. They are not recorded in the list given here. Nomenclature and order of arrangement of birds followed here are those of Meyer de Schauensee (1966) or those of Eisenmann (1955) for birds not in Meyer de Schauensee's list.

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BARRO COLORADO ISLAND, PANAMA CANAL ZONE

In table 1, 38 species of birds from Barro Colorado Island are represented. Most birds were netted at the laboratory clearing or in the forest undergrowth. The Yellow-rumped Cacique (*Cacicus cela*), a tame fledgling, and the Clay-colored Thrushes (*Turdus grayi*), hyperactive caged birds, were kindly provided by Eugene S. Morton; the tame Orange-chinned Parakeet (*Brotogeris jugularis*) was provided by Robin Foster. The Great Tinamou (*Tinamus major*) and Chestnut-winged Chachalaca (*Ortalis garrula cinereiceps*) were captive birds. Temperatures range from 38.2° in the Orange-chinned Parakeet to 43.2° in an Ocellated Antbird (*Phaenostictus mcleannani*), Wood Thrushes (*Hylocichla mustelina*), and a Plain-colored Tanager (*Tangara inornata*).

Martins (1858:19), Simpson and Galbraith (1905: 237), and Wetmore (1921:10) found that, in birds, temperatures of females are often slightly higher than those of males. In Spotted Antbirds (*Hylophylax naeviodies*), both sexes incubate and brood during the nesting period. Sixteen males with an average weight of 18.0 g (range, 16.8–19.3) had an average cloacal temperature of 41.8°C (range, 38.6–43.8), while 17 females with an average weight of 17.5 g (range, 15.8–20.0) had an average cloacal temperature of 42.1°C (range, 40.8–43.1).

On Barro Colorado Island, I captured 124 birds in mist nets, or 0.22 birds/12-m net/hr.

LIMBO HUNT CAMP, NAVY PIPELINE AREA, PANAMA CANAL ZONE

Table 2 shows average cloacal temperatures of 11 species of birds from one day's capture in forest, forest-edge, and second-growth vegetation. All birds were brought to the clearing for measurement of body and ambient temperatures and of weight. The only unusual temperature was a low one for one Long-tailed Hermit (*Phaethornis superciliosus*).

McNab (in litt.) found a body temperature of 41.0° C for a male Black-throated Trogon (55.0 g) at Pedra do Gavião, Amazonas, Brazil. This temperature is similar to the one I record.

At the Limbo Hunt Camp, I captured 20 birds in mist nets, or 0.17 birds/12-m net/hr.

TABLE 1. Bird temperatures on Barro Colorado Island.

Species		Average ambient temp. (°C)	Average cloacal temp. (°C) (range)	No. birds	Weight (g)
Tinamidae					
Great Tinamou	*Tinamus major*	28.6	40.2	1	982.8
Cracidae					
Chestnut-winged Chachalaca	*Ortalis garrula*	28.6	42.2	1	661.0
Psittacidae					
Orange-chinned Parakeet	*Brotogeris jugularis*	24.8	38.2	1	51.1
Trochilidae					
Long-tailed Hermit	*Phaethornis superciliosus*	26.7	41.4 (40.4–42.8)	6	6.3 (6.0–6.6)
Fork-tailed Woodnymph	*Thalurania furcata*	25.4	40.4 (36.0–42.5)	4	4.0 (3.7–4.2)
Violet-bellied Hummingbird	*Damophila julie*	26.3	40.8 (39.0–41.8)	3	3.6 (3.1–4.6)
Momotidae					
Rufous Motmot	*Baryphthengus ruficapillus*	26.8	39.6 (38.1–40.5)	6	159.0 (134–184)
Bucconidae					
Black-breasted Puffbird	*Notharcus pectoralis*	24.6	41.0	1	—
White-whiskered Puffbird	*Malacoptila panamensis*	25.2	39.8	1	(43.9)
Ramphastidae					
Collared Aracari	*Pteroglossus torquatus*	26.1	40.6 (40.2–41.4)	3	198.3 (188.8–213.2)
Dendrocolaptidae					
Plain-brown Woodcreeper	*Dendrocincla fuliginosa*	26.6	43.0 (42.5–43.4)	4	(40.4) (35.0–44.4)
Wedge-billed Woodcreeper	*Glyphorhynchus spirurus*	25.3	41.3 (40.0–43.4)	8	15.3 (14.0–16.7)
Buff-throated Woodcreeper	*Xiphorhynchus guttatus*	25.9	40.5	1	44.0
Black-striped Woodcreeper	*Xiphorhynchus lachrymosus*	25.7	41.0	1	50.7
Furnariidae					
Plain Xenops	*Xenops minutus*	—	41.0	1	(11.4)
Scaly-throated Leafscraper	*Sclerurus guatemalensis*	26.4	40.4	1	41.6
Formicariidae					
Slaty Antshrike	*Thamnophilus punctatus*	26.4	42.0 (40.8–42.9)	11	23.6 (20.7–26.8)
Checker-throated Antwren	*Myrmotherula fulviventris*	26.6	40.4 (39.6–41.2)	5	10.9 (10.2–11.3)

TABLE 1. *Continued.*

Species		Average ambient temp. (°C)	Average cloacal temp. (°C) (range)	No. birds	Weight (g)
Formicariidae (continued)					
White-flanked Antwren	*Myrmotherula axillaris*	26.5	40.6 (39.8–42.2)	5	9.3 (8.7–9.7)
Chestnut-backed Antbird	*Myrmeciza exsul*	25.6	41.9 (41.5–42.3)	3	27.4 (26.1–30.0)
Bicolored Antbird	*Gymnopithys bicolor*	26.7	42.1 (40.2–43.7)	6	33.2 (31.0–37.0)
Spotted Antbird	*Hylophylax naevioides*	25.8	42.0 (38.6–43.8)	34	17.8 (15.8–20.0)
Ocellated Antbird	*Phaenostictus mcleannani*	—	43.2	1	53.6
Pipridae					
Red-capped Manakin	*Pipra mentalis*	25.8	41.2 (37.8–43.8)	24	15.0 (12.5–17.2)
Golden-collared Manakin	*Manacus vitellinus*	25.1	42.3 (41.0–42.1)	3	17.4 (16.4–18.7)
Tyrannidae					
Streaked Flycatcher	*Myiodynastes maculatus*	26.3	42.1	1	48.4
Ruddy-tailed Flycatcher	*Terenotriccus erythrurus*	25.6	40.8 (37.8–42.7)	7	8.0 (7.6–8.3)
Golden-crowned Spadebill	*Platyrinchus coronatus*	24.9	39.8 (39.0–40.3)	3	9.0 (8.3–9.5)
Southern Bentbill	*Oncostoma olivaceum*	26.4	39.3 (36.6–42.0)	2	(6.5) (5.8–6.9)
Ochre-bellied Flycatcher	*Pipromorpha oleaginea*	25.8	39.2	1	9.1
Turdidae					
Wood Thrush	*Hylocichla mustelina**	24.6	43.2 (42.5–44.3)	3	46.1 (44.2–48.0)
Clay-colored Thrush	*Turdus grayi*	26.4	43.1 (41.4–44.8)	3	(73.6) (75.1–79.8)
Icteridae					
Yellow-rumped Cacique	*Cacicus cela*	26.4	40.5 (40.2–40.8)	2	81.8 (80.1–83.6)
Parulidae					
Tennessee Warbler	*Vermivora peregrina**	27.2	41.5	1	9.1
Northern Waterthrush	*Seiurus noveboracensis**	25.2	42.1 (41.3–42.9)	2	17.4 (17.3–17.6)
Thraupidae					
Fulvous-vented Euphonia	*Euphonia fulvicrissa*	25.6	39.8	1	11.8
Plain-colored Tanager	*Tangara inornata*	26.8	43.2	1	16.4
Gray-headed Tanager	*Eucometis penicillata*	26.2	43.1 (42.4–43.5)	6	31.8 (30.0–33.0)

Average ambient temperatures and cloacal temperatures are given whenever more than one bird was used. Weights are averages for the birds captured except for weights in parentheses, which are average weights obtained by James R. Karr at the Limbo Hunt Camp. Asterisks mark species that are migrants from North America.

TABLE 2. Bird temperatures from the Limbo Hunt Camp, Navy Pipeline Area.

Species		Average ambient temp. (°C)	Average cloacal temp. (°C) (range)	No. birds	Weight (g)
Trochilidae					
Long-tailed Hermit	*Phaethornis superciliosus*	26.2	38.6	1	5.6
Trogonidae					
Black-throated Trogon	*Trogon rufus*	29.6	41.6	1	46.0
Dendrocolaptidae					
Plain-brown Woodcreeper	*Dendrocincla fuliginosa*	29.6	40.6	1	40.0
Wedge-billed Woodcreeper	*Glyphorhynchus spirurus*	26.2	42.2	1	15.2
Formicariidae					
Checker-throated Antwren	*Myrmotherula fulviventris*	26.2	40.9	1	10.3
Spotted Antbird	*Hylophylax naevioides*	27.4	40.7 (40.0–41.4)	2	16.0 (15.7–16.2)
Pipridae					
Red-caped Manakin	*Pipra mentalis*	26.4	41.0 (40.0–42.4)	6	15.1 (13.2–15.5)
Blue-crowned Manakin	*Pipra coronata*	27.2	41.7 (40.8–42.5)	2	10.7 (10.2–11.2)
Golden-collared Manakin	*Manacus vitellinus*	26.2	42.8	1	17.1
Tyrannidae					
Brownish Flycatcher	*Cnipodectes subbrunneus*	26.2	40.0	1	20.2
Ochre-bellied Flycatcher	*Pipromorpha oleaginea*	26.8	40.6 (39.8–41.4)	2	9.8 (9.6–10.1)

See footnote, table 1.

TABLE 3. Bird temperatures from highlands of Chiriquí.

Species		Average ambient temp. (°C)	Average cloacal temp. (°C) (range)	No. birds	Weight (g)
Cuculidae					
Squirrel Cuckoo	*Piaya cayana*	18.8	42.3	1	117.0
Trochilidae					
Green Hermit	*Phaethornis guy*	13.4	38.2	1	5.3
Long-tailed Hermit	*Phaethornis superciliosus*	10.8	39.4	1	5.8
Snowy-breasted Hummingbird	*Amazilia edward*	16.8	39.0 (36.7–40.4)	3	4.2 (3.9–4.5)
Stripe-tailed Hummingbird	*Eupherusa eximia*	17.4	38.0	1	5.3
Magnificent Hummingbird	*Eugenes fulgens*	15.8	39.6	1	9.8
Dendrocolaptidae					
Spot-crowned Woodcreeper	*Lepidocolaptes affinis*	18.8	42.4 (42.1–42.8)	2	33.8 (33.3–34.2)
Furnariidae					
Red-faced Spinetail	*Cranioleuca erythrops*	18.8	41.8	1	15.6
Tyrannidae					
Yellowish Flycatcher	*Empidonax flavescens*	16.1	39.3 (37.4–41.1)	2	11.8 (11.8)
Paltry Tyrannulet	*Tyranniscus vilissimus*	15.4	39.4 (36.4–41.5)	4	9.8 (8.8–10.8)
Olive-striped Flycatcher	*Mionectes olivaceus*	15.4	41.1	1	15.9
Ochre-bellied Flycatcher	*Pipromorpha oleaginea*	18.8	41.2	1	13.0
Turdidae					
Mountain Robin	*Turdus plebejus*	16.6	42.0 (41.1–43.2)	5	73.1 (67.8–77.7)
Black-faced Solitaire	*Myadestes ralloides*	13.4	42.1	1	34.0
Vireonidae					
Philadelphia Vireo	*Vireo philadelphicus**	17.8	41.6 (40.6–42.4)	11	11.4 (10.7–13.2)
Brown-capped Vireo	*Vireo leucophrys*	18.5	40.4 (38.4–42.4)	4	11.8 (10.9–12.5)
Parulidae					
Ovenbird	*Seiurus aurocapillus**	18.8	39.4	1	19.6
Collared Redstart	*Myioborus torquatus*	17.4	41.4	1	10.9
Thraupidae					
Silver-throated Tanager	*Tangara icterocephala*	17.7	41.6 (40.1–42.8)	22	21.3 (17.3–23.8)
Blue-gray Tanager	*Thraupis episcopus*	18.8	40.6	1	27.0
Common Bush-Tanager	*Chlorospingus ophthalmicus*	17.5	40.1 (39.9–40.3)	2	18.3 (18.3–18.3)
Fringillidae					
Buff-throated Saltator	*Saltator maximus*	17.4	43.8	1	51.2
Rose-breasted Grosbeak	*Pheucticus ludovicianus**	15.8	38.4	1	47.5
Yellow-thighed Finch	*Pselliophorus tibialis*	18.8	39.2	1	31.8
Chestnut-capped Brush-Finch	*Atlapetes brunneinucha*	16.0	42.1	1	40.9

See footnote, table 1.

CABIN BELOW CERRO PUNTA, CHIRIQUÍ, PANAMÁ

Table 3 shows average cloacal temperatures of 25 species of birds captured in a small overgrown coffee grove near a narrow forest area at the Florida Audubon Society cabin in the Chiriquí highlands.

Although ambient temperatures were quite low compared to the ambient temperatures at the lowland localities of Barro Colorado Island and the Navy Pipeline Area, body temperatures of birds were similar.

At the cabin, I captured 71 birds in mist nets, or 0.88 birds/12-m net/hr.

DISCUSSION

As found by Wetmore (1921:31), thrushes (Turdidae) showed high temperatures while hummingbirds (Trochilidae) showed low temperatures. Some of the tanagers (Thraupidae) showed high temperatures in agreement with Wetmore's (1921:31) data, but other species had medium temperatures. In contrast with his North American findings, most tyrant flycatchers (Tyrannidae) in Panamá did not show high temperatures.

McNab (1969:260) suggests that insectivorous bats have low metabolic rates and therefore low body temperatures so they can use low or fluctuating food supplies. Tropical insectivorous birds of lowland and highland forests should also show low temperatures. Some of our insectivorous or partly insectivorous birds do show low body temperatures, but some show high body temperatures. Among the tanagers (Thraupidae), the Plain-colored Tanager (*Tangara inornata*) and the Grey-headed Tanager (*Eucometis penicillata*), and among the flycatchers (Tyrannidae), the Streaked Flycatcher (*Myiodynastes maculatus*), show high body temperatures. Possibly migrants and fast-moving species have high temperatures so they can move rapidly to new areas to obtain food when food supplies are low in the places where they are. The Gray-headed Tanager is certainly a fast-moving species. Other species, such as some of our small forest flycatchers and McNab's insectivorous bats, perhaps wait out periods of low food supplies by having low metabolic rates and low body temperatures. There may be at least two solutions for scarcity of food supplies: high temperatures and fast movement, or low body temperatures and relatively sedentary habits. Since size also affects the rate of heat loss by birds, the small size of our forest flycatchers may explain their low temperatures. There are rather few forest-interior flycatchers, and most of them are small. The reason may be that flycatchers in general do not do well in closed habitats. If the species that do occur have low food supplies, they should be small and have low temperatures so as to require less food or use the more common small prey. The small North American flycatchers, which have high temperatures, are migrants.

For three of the North American migrants (Wood Thrush, Philadelphia Vireo, and Northern Waterthrush) in Panamá, I found temperatures similar to those recorded by Wetmore. Single records for the other three North American migrants (Tennessee Warbler, Ovenbird, and Rose-breasted Grosbeak) were somewhat lower than those recorded by Wetmore. Most of his temperatures were from shot birds rather live ones, and most were from deep in the body, so it is difficult to compare temperatures.

In hummingbirds captured in mist nets, temperatures decrease the longer they stay in the net. But activity or excitement when held in the hand sometimes sends their temperatures up a degree or more. I do not know whether other species, especially small ones, show these effects. I attempted to get birds from nets soon after they were captured, but some low temperatures may have been caused by the declines in temperatures of birds forced to be inactive in the nets.

The rate of capture of birds was four times as fast in the abandoned coffee groves of the highlands of Chiriquí as in the lowland forest areas. Possibly because the canopy is low and irregular at the Audubon Society cabin and below a forested hillside, many birds fly low and are caught in nets but in a more level forest usually only birds of the undergrowth fly low. One thus captures a larger sample of the available species and individuals with low mist nets in a broken environment on a hillside locality such as the Chiriquí cabin. Moreover, mistletoe fruits were abundant in the abandoned coffee grove and many small fruit-eating birds were congregating near the cabin.

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A NORTHERLY WINTERING RECORD OF THE ELF OWL (*MICRATHENE WHITNEYI*)

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Ligon (Misc. Publ., Mus. Zool., Univ. Michigan, No. 136, 1968) investigated the winter range of the Elf Owl in México, chiefly by playing sound recordings of their calls at various point of suitable habitat from Arizona to Guerrero. Wintering Elf Owls were recorded at localities from the Sierra del Sur in central Guerro, east to northern Oaxaca, west to southwestern Michoacan, and north to the edge of the Mexican Plateau near Cuernavaca, Morelos. Negative results were obtained at one locality on Nayarit and two coastal localities in Sinaloa.

On the night of 10–11 January 1971, Ely collected an adult male Elf Owl (NOF 3007) 11 mi. N of México Highway 15 on the Consala Road in central Sinaloa. This locality (about 65 mi. SE of Culiacan) is more than 500 mi. NW of the nearest reported wintering locality.

The bird was mist-netted in second-growth thorn forest near a harvested corn field. It was retained alive and taken to Tucson, Arizona. It appeared to be in good health and fed freely on insects given it on the nights of 12–13 and 13–14 January, but suddenly fell dead from its perch late on the night of 13–14 January. Upon skinning the specimen, Crossin noted a circular area about 10 mm in diameter on the lower stomach. The area was a dark bluish-green in color and resembled dermal tissue which has received a severe bruise. The cause of the affliction was not determined, but may possibly have resulted from the intake of some chemical poisoning during feeding. The owl might have been afflicted before its capture, which could account for its wintering far north of the recorded winter range.

Insects and other arthropods appeared to be abundant at this locality and Ridgway's Whip-poor-will (*Caprimulgus ridgwayi*), also a nocturnal insect feeder, was collected here. Although not a requisite for winter roosts (Ligon, op. cit.), large cacti (*Lemaireocereus*) with woodpecker holes were present nearby. Future investigation of the coastal Sinaloa locality is needed to determine if the specimen collected represents an isolated, aberrant individual or whether the area serves as a regular wintering site for the Elf Owl.

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DIE-OFF OF COMMON MURRES ON THE ALASKA PENINSULA AND UNIMAK ISLAND

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This paper reports on massive mortality in a pelagic population of Common Murres (*Uria aalge*) in Bristol Bay during April 1970. The first evidence of mortality appeared on 23 April when local residents found three weakened Common Murres and brought them to the Aleutian Islands and Izembek Refuge headquarters at Cold Bay, located near the tip of the Alaska Peninsula (fig. 1). Other murres soon were found on land, and it became apparent that the previous day's storm had blown many birds inland from the Bering Sea. The next day Ken Manthey, an Alaska Department of Fish and Game biologist conducting stream surveys from a helicopter, reported hundreds of dead and dying birds along the Bering Sea beach in the vicinity of the Black Hills, 50 miles north of Cold Bay. Later reports from the helicopter crew related an oil slick, dead sea otters with oil on their fur, and a herd of 450 lethargic hair seals. Believing that a major oil spill had occurred, an aircraft was chartered the following morning at Cold Bay to investigate. About 60 miles of coastline north of Cold Bay were inspected. Dead Common Murres were strewn along the beaches, and weak or ill birds were staggering about on the sand and floundering in offshore waters. Trails in the sand showed that after washing ashore many waddled short distances and collapsed. A curious, discontinuous black sheen was noted along the high tide line in some areas. The recent storms obviously had churned up a tremendous surf, for debris was piled high up on the beach and was deposited 1000 ft up some streams. No oil or aberrant sea mammals were seen. Subsequent efforts were directed toward determining the extent and causes of the observed mortality.

AERIAL COUNTS

Aerial surveys were conducted by Alaska Fish and Game biologists enroute to Cold Bay from Kodiak Island on 25 April. They crossed the Alaska Peninsula near Port Heiden and encountered increasing numbers of dead murres from Ilnik Lake southward. Aerial counts were taken randomly for 1-min intervals, representing 2-mile samples of beach, as the plane's speed was approximately 120 mph. Total counts of dead birds from one geographical location to another were computed from averages at different locales. Between Ilnik Lake and Izembek Bay the number of dead and dying murres on 20 counts ranged from 2 to 415 per mile of beach and averaged 91 (table 1). Dead murres declined significantly south of Moffet Point, the beginning of the Izembek National Wildlife Range.