

base blue-gray, gape and eyelids gray, iris dark brown, legs gray with light brown soles.

**Stripe-headed Tanager** (*Spindalis zena nigricephala*). Maxilla black, mandible mostly bluish, gape and eyelids black, iris blackish brown, eyelids gray.

**Yellow-faced Grassquit** (*Tiaris o. olivacea*). Beak black, gape usually pink, eyelids black, iris deep brown, legs livid, major diameter of eye opening 3 mm. The gape is variable in color; a February male had a livid gape and another male in late April a swollen dull pink one. Compare the next species.

**Black-faced Grassquit** (*Tiaris bicolor marchii*). Beak black, sometimes partly yellow, iris dark brown, legs light flesh color. The gape color is variable. In late April nearly 40 birds were handled in the garden of Mr. and Mrs. Arthur Pomeroy at Content Gap. The color varied from whitish through buff, tan, and yellow to pink. The range was about the same in the two sexes and in adult and immature birds. However, the males seemed to favor pink and the females buffy. Some gapes were noted as swollen. A single female of *T. b. omissa* handled at Ponce, P. R. in March had a deep buff gape, a light brown iris, and pinkish legs.

**Yellow-backed Finch** (*Loxipasser anoxanthus*). Beak blackish, eyelids black, iris and legs dark brown.

**Greater Antillean Bullfinch** (*Loxigilla violacea ruficollis*). Beak, gape, and eyelids black, mouth pink, iris dark brown, legs gray black. major diameter of eye opening 4 mm. The immature differs in no evident respect from the adult.

**Saffron Finch** (*Sicalis f. flaveola*). Maxilla dark gray, mandible yellow, eyelids blackish, iris dark brown, legs light gray brown, major diameter of eye opening  $4\frac{1}{2}$  mm. Apparent females and immatures were quite the same as adult males.

**Grasshopper Sparrow** (*Ammodramus s. savannarum*). Beak gray, gape whitish, eyelids slate, iris brown, legs pink, major diameter of eye opening  $3\frac{1}{2}$  mm.

The foregoing notes may have raised more questions than they answer. If so, this only goes to show the amount of work which remains to be done on West Indian birds.

It is worth noting that the four birds whose irides would, on casual examination, be called white proved each to have a distinctive character on closer inspection.

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## OBSERVATIONS ON THE STREAMER-TAILED HUMMINGBIRD

By Charles H. Blake

The strikingly beautiful Streamer-tailed Hummingbird (*Trochilus polytmus*) is endemic to the island of Jamaica. It is abundant, wide-spread, and easily seen. The male has a glittering green body and black head. Each fourth (next to outer) rectrix in the adult male is greatly

prolonged, hence the name of the species. These streamers may attain more than 200 mm. The female is bronze-green above and whitish below with a normal tail whose outer feathers are white-tipped. This species is the only resident Jamaican bird which has diversified enough for the recognition of subspecies. Most of the island is occupied by the subspecies I have banded, *T. p. polytmus*, which is characterized by the more or less extensively bright red beak. The extreme eastern end of the island is the range of the black-billed form, *T. p. scitulus*. (See Bond 1956, pp. 94, 95.) The male is illustrated in Bond (1947, p. 127).

While engaged in banding in Jamaica during 1955-56 as a Fulbright Fellow I handled no less than 70 of these hummingbirds. They are quite easily taken with Japanese mist nets. It was possible to come to some conclusions as to the meaning of certain differences observed between males in the field. The starting point for these studies was the occurrence of males without streamers. These might have been molting birds or they might be immature males.

In accordance with my usual practice the wing lengths of practically all the individuals banded were recorded. At the same time the apparent sex was noted and males without streamers were tentatively put down as immature. Later still other items were noted, including the length of the streamers.

Table I summarizes the wing length data for the three classes of individuals. It is fair to conclude that the three classes differ significantly as to wing length. However, it is not certain that all individuals have been correctly assigned. "Males, no streamers" may include a very few birds which have molted both streamers simultaneously, and "males with streamers" may contain a few birds which have developed streamers in advance of the appropriate primary molt. These exceptions are certainly few enough not to obscure the general picture. A good guess would be that no more than four of the 37 males are wrongly assigned.

TABLE I. WING LENGTHS OF STREAMER-TAILED HUMMINGBIRDS

	No.	Mean	Standard Deviation	Range
		mm.	mm.	mm.
Females	33	57.4	1.9	53-61
Males, no streamers	22	62.6	1.7	60-66
Males with streamers	15	66.5	2.6	62-70

In several species of birds it is known that, at least, the males increase the wing length at the first molt of the primaries (Blake, 1954). This is normally the first postnuptial molt. A further increase may occur at later molts. The figures for the Streamer-tail are consistent with such an increase and the higher standard deviation in adult males hints at increases at later molts. On the other hand the data for females indicates no increase in wing length with age and also that females have, even in first plumage, shorter wings than males.

It may be objected that the supposed females include males in first plumage or first winter plumage. The reasonable equality of numbers in the two assumed sex classes in the banding data and as observed in the long run in the field argues against this objection.

The only direct evidence I know for the character of the first plumage comes from Gosse (1847) who raised a few of these birds from the nest. He says (p. 110): "The young male, when ready to leave the nest, has the throat and breast metallic-green as above, the belly-feathers blackish, with large tips of green; the tail black with green reflections, untipped." The phrase "as above" evidently means like the back and "untipped" refers to the lack of the white tips to the outer feathers possessed by the female. The passage from a juvenal plumage as described by Gosse to an essentially male body plumage would be easy at the postjuvenal molt. We can conclude that, in general, males without streamers are younger than males with streamers and that these immature birds fall within a single year of age. This year must be the first year of life.

There is a special subclass of males with streamers, namely males with one streamer. Such birds were fairly often seen in the late fall of 1955 but rather rarely thereafter. It is hardly likely that males would lose a single streamer accidentally in one season rather than another. Streamers of unequal length were also seen. It seems more reasonable to conclude that the streamers are molted successively instead of simultaneously. Such a departure from the usual symmetrical tail molt is known in some birds with ornamental tail plumes (e.g., tropic birds).

In one case it was possible to form some idea of the rate of growth of the streamers. An adult male taken at Hermitage Dam on 15 Feb. 1956 had a single streamer 155 mm. long. When retaken on 22 April the other streamer had reached a length of 95 mm. This is a growth rate of 1.4 mm. per day.

The average length of the streamers of ten males was 179 mm., with extremes of 155 and 203 mm. If the rate of growth just noted is roughly correct then it takes about 120 days to grow the average streamer. Even if the second streamer were shed before the first was fully regrown, it would probably take at least six months to replace the two streamers. This is not consonant with field observations. Two alternatives come to mind. First, the bird cited may have been producing its first set of streamers and the first plumage rectrix preceding the second streamer was not shed until long after 15 February. Second, it is conceivable that the streamers are not molted annually. I am strongly inclined to reject the second alternative since I saw no clear indications of a marked difference in age of the two streamers on any bird. If the streamers are replaced annually, it seems hardly possible to allow more than 40 to 60 days for the growth of one. This would concentrate the operation during or just after the general season of annual molt which is evidently late summer and fall when single or unequal streamers are most often seen. This would require a daily growth rate of three to  $4\frac{1}{2}$  mm. The inner vanes of the streamers appear to be scalloped but are actually only fluted or rippled. This effect seems to be caused by rather regularly recurring variations in the flexibility of the shaft. As far as I can judge from museum specimens this variation recurs about every seven mm. If this should be dependent on the daily rate of growth of the feather then the longest measured streamer could be produced in about 29 days.

The problem has been posed; further speculation might be self-deceptive. Banding should tell the true story.

It was later found that there is another difference between the birds considered immature and the evidently adult males. The crown feathers in most males show a very narrow iridescent margin. This margin is bronze green in the immature group and narrower and light blue in the adults.

Aside from the color of the soft parts which I have given elsewhere (Blake, 1956), an adult male weighed 4.3 gr., and a female with a wing length of 56 mm. had a wing expanse of about 135 mm. This would indicate a maximum wing expanse in males of about 170 mm. Gosse gives the equivalent of 162 mm. for the male and I calculate 161 mm. for adult males of average wing length.

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## GENERAL NOTES

**Removal of Banded Cowbird Nestling by Veery.**—In the course of a nesting study of the Veery (*Hylocichla fuscescens*) made at the University of Michigan Biological Station, at Douglas Lake, Cheboygan County, Michigan, in July, 1956, I banded a young Brown-headed Cowbird (*Molothrus ater*). At that time, the nest contained two Cowbirds, which had hatched July 4, and one Veery, which had hatched July 5, as well as one Veery egg. Cowbirds do not commonly parasitize Veery nests, and I was interested in how it would work out. I had heard that birds sometimes remove banded nestlings, so, on July 8, at 6:30 p.m., I banded just one of the two Cowbirds. I put a Fish & Wildlife Service band on the right leg, and a red plastic band on the left.

At this stage in the care of their young, the parent Veeries waited a few seconds after feeding the nestlings and then picked up and swallowed the fecal sac or sacs. One hour after the Cowbird was banded, the parent Veery remained on the rim of the nest after swallowing a fecal sac, and made ten vigorous efforts to pick something up from the floor of the nest, but was unsuccessful. Half an hour later, the parent again tried to pick up some object, and this time was persistent. I guessed what was happening, and kept count of the number of times the Veery reached into the nest. After about 15 tries, I could see that the bird was pulling on a leg. By the 39th try, the leg was pulled high enough so that I could see the aluminum band shining on it, looking white, like a fecal sac. At this time the young Cowbird began to make a noise. The Veery kept on pulling, until it had tried 50 times to lift the Cowbird out of the nest. Then it stopped, and sat still on the rim, cocking its head and peering into the nest. After about 15 seconds, it resumed its efforts and tugged with even more force, judging from the way its feet were braced.