

the Hawaiian Thrush (*Phaeornis obscura*). The nesting site presumably had been used by the same bird on four different nesting occasions. Each new nest was superimposed directly on top of the last, and an accumulated height of 5¾ inches had been reached.

One unhatched egg in the nest had a whitish background with tan markings scattered irregularly over the surface. Reddish-brown markings formed a dense ring around the larger end. The egg measured 19.4 × 14.1 mm. There was a powerful musky scent noticeable about the nest, which Henshaw (op. cit.) considers as perfectly distinctive of the family Drepanididae. Neither the nest nor the egg fit the description Berger (Living Bird, 8:243-250, 1969) gives for that of the Hawaiian Thrush.

I was curious whether this was a local specialization or was a common practice for birds in other areas. I examined lava tubes on Mt. Hualalai, a dormant volcano, and, on 9 August 1971, found six deserted nests in five different lava tubes. I began to make periodic trips to this study area in January 1972. On 12 February, as I approached a lava tube, I saw an Apapane fly from the entrance. I entered it and found a nest directly above the opening (Fig. 1).

The nest was seven feet five inches from the ground, supported by a lava ledge overhanging the entrance to the tube. The back of the nest, built against the wall, was flat while the front sloped downward to the base. The nest measured 2 inches from top to bottom on the backside and 5.8 inches on the inclined front side. This declivity was due to an accumulation of three separate nests placed one on top of the other with each consecutive nest situated closer to the wall.

The width across the top of the most recent nest varied from 3.5-4.8 inches; the rim of the nest, from 0.6-1.3 inches; the inside diameters of the nest cup were 1.5 inches on the narrow side and 2.8 inches from front to back. The nest cup had a depth of 1.5 inches.

Both the body and lining of this nest were primarily composed of grasses. There were a few large ohia twigs around the base. Interwoven throughout the main part of the nest were fine dark rootlets, one strip of ohia bark, and a few pieces of moss. The bottom nest had a base composed of mosses.

When I found the nest, it contained two eggs and contour feathers with crimson tips. I climbed out of the lava tube and moved off a short distance. Forty-five minutes later the Apapane returned to the nest to incubate the eggs.

I returned to the study area on 19 February, and the Apapane was still incubating the eggs. On two subsequent visits there was no adult at the nest. On 28 February I found both eggs broken and the nest deserted.—CHARLES VAN RIPER III, *Department of Zoology, University of Hawaii, Honolulu, Hawaii 96822, 8 August 1972.*

**New host records for the Bronzed Cowbird.**—While recently engaged in field studies in Costa Rica, I found nests of three species, Black-billed Nightingale-Thrush (*Catharus gracilirostris*), Yellow-billed Caticue (*Amblycercus holosericeus*), and Scarlet-rumped Tanager (*Ramphocelus passerinii*), which contained one or more eggs of the Bronzed Cowbird (*Molothrus aeneus*). In his summaries of cowbird host records, Friedmann (U.S. Natl. Mus. Bull., 233, 1963; Smiths. Misc. Coll., 149, no. 11, 1966; Auk, 88:239-255, 1971) does not list any of these species as hosts of the Bronzed Cowbird.

All of the records discussed here refer to the nominate race of the cowbird. Identification of the parasite was made on the basis of the color, texture, and dimensions of eggs which I collected. Upon comparison, my specimens appear to be virtually identical in these regards to a series of 107 *Molothrus aeneus* eggs in the collection of the Western

Foundation of Vertebrate Zoology. All egg measurements in this report are given in millimeters.

*Catharus gracilirostris*.—A nest containing two eggs of this species and one of the Bronzed Cowbird was found near the summit of Volcan Poas, Alajuela Province on 3 May 1972. An incubating nightingale-thrush was flushed from the nest, and all three eggs were found to contain small embryos. The cowbird egg measured  $22.9 \times 17.4$ .

This record is of particular interest because of the unusually high altitude, ca. 2,400 meters, at which it occurred. No Bronzed Cowbirds were found in the immediate vicinity of the *Catharus* nest, although a male was seen on the same day at an elevation of 2,100 meters on Volcan Poas. Because of the scarcity of cowbirds in the high montane habitat of *Catharus gracilirostris* in Costa Rica and western Panama, this nightingale-thrush is probably an infrequent victim of *Molothrus aeneus*.

*Amblycercus holosericeus*.—During April–May, 1970 near Sierpe, a village 13 km. SW of Palmar Sur, Puntarenas Province, I found five nests of this species which contained Bronzed Cowbird eggs. At least one cacique was in attendance at each nest, either incubating, or, in two instances, scolding me vigorously only an arm's length away as I checked the nest contents.

The nest dates and their contents were as follows: 16 April (1 cacique egg and 3 cowbird eggs); 17 April (3 cowbird eggs); 2 May (2 cacique eggs and 3 cowbird eggs); 7 May (2 cacique eggs and 5 cowbird eggs); 12 May (2 cacique eggs and 3 cowbird eggs).

Average measurements of the 16 cowbird eggs (with extreme measurements in parentheses) were  $23.0 (22.0-25.0) \times 18.6 (17.1-19.5)$ .

Friedmann (U.S. Natl. Mus. Bull., 233:173–174, 1963) noted the tendency of *Molothrus aeneus* to utilize icterid hosts, particularly species of the genus *Icterus*, and J. S. Rowley found that the colonial Yellow-winged Cacique (*Cassiculus melanicterus*) is heavily parasitized by the Bronzed Cowbird in southern Mexico (Friedmann, Auk, 88:252–253, 1971). It is apparent that the Yellow-billed Cacique, a non-colonial icterid, is a frequent victim of the Bronzed Cowbird at the Sierpe locality, since all nests of the species which I found there contained at least three cowbird eggs. The paucity of *Amblycercus holosericeus* nest records from other portions of its extensive range, however, makes it impossible to evaluate this cacique's importance as a host of *Molothrus aeneus*.

The disparity in size between the cowbird eggs found in each cacique nest suggested that they were laid by more than one female. Single *Molothrus* eggs in each of the nests discovered on 16 and 17 April were punctured when found, possibly the result of having been pecked by a cowbird, a behavioral trait which has been suggested, but not documented for this species (Friedmann, The Cowbirds, C. C. Thomas, Springfield, Ill., p. 327, 1929).

I found Bronzed Cowbirds to be very common in the Sierpe area even though Slud (Bull. Amer. Mus. Nat. Hist., 128:339, 1964) reported that the species was unknown from the southwestern portion of Costa Rica. Flocks of up to 200 individuals were seen in communal roosts along the major tributary in the area, the Rio Sierpe, even during the breeding season, and I saw smaller foraging flocks several times daily during my stay at Sierpe.

*Ramphocelus passerinii*.—I found a nest of this species which contained two *Molothrus aeneus* eggs and no eggs of the tanager on 21 April 1970, also near the village of Sierpe. The cowbird eggs hatched on 25 April, and on 1 May I observed the female tanager feeding the nestlings. When I checked the nest on 2 May, however, it was empty, presumably the work of an unknown predator. Another Scarlet-rumped Tanager nest

discovered on 20 May 1970 at the same locality apparently suffered the same fate. It also contained only two cowbird eggs when found, but was empty when I visited it on the following day. Of 35 nests of the Scarlet-rumped Tanager which I found in the Sierpe area between 15 March to 31 May 1970, these were the only observed instances of cowbird parasitism.

My field work in Costa Rica was supported by the Western Foundation of Vertebrate Zoology, and all specimens mentioned here are deposited in the collection of that organization.—LLOYD F. KIFF, *Western Foundation of Vertebrate Zoology, 1100 Glendon Ave., Los Angeles, California 90024, 20 July 1972.*

**Extreme overlap between first and second nestings in the Rose-breasted Grosbeak.**—The adaptive value of raising more than one brood per year is obvious and one might expect broods to be closely spaced or even to overlap so as to maximize reproductive output. But countering this is the fact that it may be impossible to meet successfully the demands of two broods at the same time. In most multiple-brooded birds these conflicting selection pressures result in little overlap between nestings although in some species such as the Cactus Wren (*Campylorhynchus brunneicapillus*) (Anderson and Anderson, *Condor*, 62:351-369, 1960) and the Cedar Waxwing (*Bombycilla cedrorum*) (Putnam, *Wilson Bull.*, 61:141-182, 1949) some females lay the first egg of their second clutch on about the day the young from the first clutch fledge. Although the Rose-breasted Grosbeak (*Phœnicurus ludovicianus*) is generally thought to be single brooded (Forbush in Bent, *Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies*, Part one, New York, Dover Publications, 1968:39), I have noted one instance in which two nestings overlapped to a greater extent than is apparently known for any other North American passerine.

The first nest was found at 15:45 on 2 July 1969 in a thicket of tall alders (*Alnus* sp.) in Emmet County, Michigan. An adult female was on the nest and a well-grown nestling fledged when I attempted to place a mirror over the nest. Additional nestlings may have been present but I was not able to inspect the contents of the nest at this time. At about 16:00 nest 2 was found about 12 meters away in the same thicket. When inspected an hour later nest 2 contained three eggs and a male grosbeak was incubating. On 3 July at 08:50 another observer and I were able to inspect both nests by using a ladder (the nests were each at least four meters up in the alders). Nest 1 was empty but a fledged grosbeak was on a branch about two meters from the nest. A female was now incubating the three eggs in nest 2. I replaced one of the eggs in nest 2 with an artificial cowbird egg (see Rothstein, *An experimental investigation of the defenses of the hosts of the Brown-headed Cowbird (*Molothrus ater*)*, unpubl. thesis, Yale University, 1970). The grosbeak egg contained a four to five-day-old embryo. During the 10 minutes we visited these nests on 3 July, we searched intensely for adult grosbeaks but, as on 2 July, only one female and one male were seen. The scolding of these two grosbeaks on 3 July was sufficiently intense to induce two Catbirds (*Dumetella carolinensis*) and a female American Redstart (*Setophaga ruticilla*) to join in the scolding, so if additional grosbeaks were participating at the two nests they would almost certainly have also been seen. Therefore, there is little doubt that both nests were being maintained by one pair.

Clutch initiation at nest 2 occurred six or seven days before the nest was found or when the young in nest 1 were only two to six days old (this is calculated using the nine to 12 day nestling period cited by Bent [op. cit.:40]). The male and female did not tend exclusively to one nest since on 2 July at nest 2 the male was incubating while the