Marking with thread has been consistently the best method in several years of nest study in the tropics and elsewhere. Thread should be replaced as the nestling leg grows. It can ultimately be replaced by a color band as used for adults. A square or double knot was needed to tie the thread securely, and the ends had to be cut short enough to not attract adult attention. Regular sewing thread (no. 40) was best, since thicker thread was difficult to tie and was more conspicuous. Dull-colored thread (such as gray, black, light yellow) was best; red attracted the adult's attention. Such birds as Slaty Antshrikes (*Thamnophilus punctatus*), which peer carefully in the nest after feeding or before and during brooding, sometimes saw the thread and pecked at or tried to pull it out (Oniki 1975, Anais Acad. Brasil. Ciencias 47:477–515), but young were never thrown out of the nest. In birds that do not peer much in the nest, such as Rufous Gnateaters (*Conopophaga lineata*) in São Paulo (pers. obs.), the thread remains unnoticed.

I appreciate comments of anonymous referees.—YOSHIKA ONIKI, *Department of Biology, University of Miami, P. O. Box 249118, Coral Gables, FL 33124.* Received 4 Aug. 1980; accepted 28 Nov. 1980.

Reproductive Success of Purple Martins in Aluminum Versus Wooden Birdhouses.—In the mid-1960's, the Trio Manufacturing Company of Griggsville, Illinois, began commercially manufacturing aluminum Purple Martin (*Progne subis*) houses. The president of that company published a book (Wade, What You Should Know About the Purple Martin, Trio Manufacturing Co., Griggsville, Ill., 1966) describing the development of the martin house industry. In that book and other brochures and advertisements, Wade has suggested that Purple Martins breed more successfully in aluminum houses than in wooden houses or gourds. He claimed (Wade 1966) that aluminum houses are cooler than wooden houses and fewer young birds are lost in aluminum houses (principally because the young remain in the nest longer and thus do not fledge prematurely). Wade indicated that this is a primary reason that people should erect aluminum Purple Martin houses.

However, certain aspects of the Trio birdhouse promotion have been shown to be misleading, e.g., implying that Purple Martins eat mosquitoes (see Kale, Auk 85:654–661, 1968) and that Starlings (*Sturnus vulgaris*) do not nest in Trio houses (see Brown, Bull. Texas Ornithol. Soc. 10:31–35, 1977). I think it thus appropriate to examine comparatively the reproductive success of Purple Martins in aluminum and wooden martin houses.

My studies were conducted in Sherman, Grayson County, Texas, from 1972–1978 as part of an investigation of martin breeding biology (Brown, Southwest. Nat. 23:597–604, 1978a), although initially I had not planned to compare reproductive success in different types of birdhouses. Colonies, methods, and data were those used earlier (Brown 1978a), except additional data were gathered at 5 martin colonies in 1977 and 1978. Data on nestling periods were obtained at a large, intensively-studied colony that contained both wooden and aluminum houses. Nestling period was defined as the number of days from hatching of the first egg until fledging of the first young. Aluminum martin houses in Sherman were 6-, 12-, and 24-room ones of the Trio line, or modified versions of the Trio houses that were distributed by Sears, Roebuck, and Company. Wooden houses were homemade ones which largely followed the Trio specifications, including porches with railing and 15 × 15 × 15 cm compartment sizes.

Table 1 presents values for nestling periods of Purple Martins in wooden and aluminum martin houses; there is no statistically significant (*t*-test) difference for these data. Young martins did not remain for significantly longer periods in aluminum houses. Percent original clutch fledged also was similar for aluminum-nesting and wooden-nesting Purple Martins (Table 1). (The overall fledging percent for Purple Martins in Grayson County, Texas, was 84.3% of the original clutch (Brown 1978a).) The objective of this study was not to determine nest site preferences of martins; Jackson and Tate (Wilson Bull. 86:435–449, 1974) found no statistically significant difference between martin occupancy of wooden and aluminum martin houses.

My data do not support Wade's (1966) contention that Purple Martins are more successful in aluminum birdhouses than in suitable wooden houses. When researchers and birders install a martin house, an aluminum house should not be chosen solely because

TABLE 1. Nestling period and percent original clutch fledged for Purple Martins in aluminum and wooden birdhouses.

	Birdhouses	
	Aluminum	Wooden
Nestling period in days*	28.20 ± 0.46	27.92 ± 0.39
sample size (no. of pairs)	82	67
Percent original clutch fledged	82.25	85.67
sample size (no. of pairs)	275	116

*$\bar{x}$ ± SD.

martins are assumed to nest more successfully there. If wooden houses, built properly (Brown, Bird-Banding 49:321–325, 1978b), are managed to discourage House Sparrows (*Passer domesticus*) and Starlings and are repaired and cared for regularly, Purple Martins should breed as successfully in them as in Trio houses.

Yet from a management perspective, I recommend aluminum houses. Aluminum houses are lightweight, encouraging people to lower them for nest cleanouts. Hinged doors (which few wooden houses have) further facilitate cleaning and maintenance. Aluminum houses do not require as much repair and repainting as do wooden houses. For these reasons, aluminum houses enjoy longer life than most wooden houses and ultimately produce more Purple Martins, while Starlings and House Sparrows take over neglected and aged wooden birdhouses.—CHARLES R. BROWN, *2601 Turtle Creek, Sherman, TX 75090.* (Present address: *Dept. of Biology, Princeton University, Princeton, NJ 08544.*) Received 4 Aug. 1980; accepted 21 Mar. 1981.

Incubating Female Gadwall Dies Upon Flushing From Nest.—While studying the breeding ecology of the Gadwall (*Anas strepera*) in southern Manitoba, I observed the death of a female that had flushed from her nest. This Gadwall, marked with a nasal saddle (cf. Doty and Greenwood 1974) in 1972, had been observed on 13 June 1974 with an incomplete clutch of 7 eggs. The nest initiation date was calculated as 7 June. After I attempted to capture the hen on the nest with an automatic nest trap on 24 June, she abandoned a completed clutch of 11 eggs after 8 days of incubation.

The female was relocated on 25 July, at 1100 by a dog that was used in locating waterfowl nests. As I approached, she flushed from the nest and flew 10 m to open water. I walked immediately to the edge of the water and found the hen dead a short distance offshore. The hen's second nest contained 9 eggs, and an embryo was aged at 18 days of development. Back-dating of the clutch (Sowls 1955) indicated a nest initiation date of 30 June, 6 days after the abandonment of the first nest in the same area. The female was at least 4 years old since it was originally banded as an adult (2 years old or older) in 1972 (Blohm 1977).

The carcass was necropsied at the Veterinary Pathology Laboratory in Winnipeg, Manitoba. There was no food in the gastrointestinal tract and no signs of internal trauma or parasite loads. An analysis to determine the lipid portion of the carcass as an index of body condition and energy stores was conducted at Raltech Scientific Services, Madison, Wisconsin. The ether extract procedure, following methods outlined by Peterson (1976), indicated a fat content of 2.3% of the overall carcass weight which was slightly higher than the overall mean lipid portion of 1.7% for other adult females collected on the area at the same stage of incubation.

Kabat et al. (1956) stated that captive hen Ring-necked Pheasants (*Phasianus colchicus*) with high energy stores were more stress resistant than birds with lower reserves; the lowest level of physical condition in these birds was during the post-laying period. Breitenbach and