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Female Tree Swallow lays three clutches during one breeding season.—The Tree Swallow (*Iridoprocne bicolor*) usually lays a second clutch only in response to the disturbance or failure of the first (Kuerzi, Proc. Linn. Soc. N.Y. 52–53:1–52, 1941; Bent, U.S. Natl. Mus. Bull. 179, 1942; Chapman, Bird Banding 26:45–70, 1955). Wedemeyer (Bird Lore 36:100–105, 1934), however, reported that Tree Swallows in his study area in Montana sometimes raised two broods. No instance of a female laying three clutches in one breeding season has been recorded previously.

For the past two years (1980, 1981) I have been conducting a study of the social behavior of the Tree Swallow in a salt marsh on the south shore of Long Island, New York (see Schaeffer, EBBA News 34:216–222, 1972, for a description of the area).

On 18 May 1981, I banded an adult Tree Swallow (U.S.F.W.S. aluminum band 960-27903) caught in Box 13 of my nest-box trail. At this time there were four eggs in the nest. I recaptured this bird in the same box on 19 May (five eggs) and on 21 May (six eggs). Behavioral observations indicated that this bird was a female although she was not seen incubating the eggs in Box 13 and no brood patch was apparent. After 21 May, this female and her probable mate were seen flying back and forth between Box 13 and Box 23 (40 m away), frequently perching on and entering Box 23. The female and her male abandoned Box 13 on 25 May. The next census of Box 13 on 13 July showed that the only remaining egg contained a partially developed embryo.

On 30 May, one egg was discovered in Box 23 even though the nest cup was not lined with feathers as is usual in Tree Swallows. On 31 May two eggs were in the nest and the box was defended by female 27903 and another bird. On 1 June there were two eggs (♀ 27903 was captured in the box) and on 2 June, three eggs were discovered. The female was never seen incubating and the three eggs were cold on 5 June. The disappearance of all three eggs prior to the next census on 13 July precluded the determination of their fertility.

On 10 June two eggs were discovered in Box 16, 125 m from Box 23. Box 16 contained a nest completed and lined with feathers then abandoned by a pair of swallows in the middle of May. Female 27903 was captured in Box 16 while incubating five eggs on 15 June. She successfully hatched all five eggs (26 June) and fledged all five nestlings (18 July). It is not known if female 27903 retained the same mate for each clutch. The Tree Swallow has been shown to have the ability to lay two and possibly three fertile clutches in one breeding season.

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Infanticide by a Purple Martin.—Purple Martins (*Progne subis*) have been known to remove the young of other species from cavities (Nicholson, Auk 65:600–601, 1948), and they are capable of inflicting serious injury on other adults in intraspecific fighting (Brown, Bird-Banding 48:273, 1977). This note reports an instance of the killing of a brood of young Purple Martins by another female, a behavior not previously reported for this species.

The colony is an aluminum house with 12 cavities located in Jacksonville, Florida. On 12 May 1981, all cavities were occupied by Purple Martins, and cavity S6 contained four eggs. On 13 May, three eggs had hatched. The young developed normally for the first five days,

but on 18 May we noted that the young in this cavity had not gained as much weight as those in other nests. We noticed that the parents spent more time than others sitting outside the cavity. Subsequent events have shown that they were probably spending more time guarding the nest and less time feeding the brood than other pairs.

Both members of this pair were older birds. The male had full blue-black plumage and the female had extensive dusky coloration on the undertail coverts (North American Bird Banding Techniques, U.S. Fish and Wildl. Serv., Vol. II, Pt. 6, Species #611, 1977).

On the next day, 19 May, as we approached the colony, we found one young martin with its head crushed, lying on the ground about 10 m from the house. As we puzzled about this, we saw a young female (clear white undertail) fly in and perch outside cavity S6. She immediately began to fight with other adults perched on the house. Then we saw her reach into the cavity and pull a dead, young martin out onto the balcony. The other adults drove the female away, and we lowered the house. The dead chick had obviously been pecked to death. The skull was completely crushed and the head and back were lacerated with small round bruises. A search revealed the third young bird from S6, also pecked to death, on the ground about 12 m from the house. The young were marked, so we know that all three came from the same nest.

The female that originally occupied S6 was banded, but the young female that killed the brood was not. The unbanded female took possession of the cavity the day after the killings and took over the mate of the displaced female. (That it was the banded female's mate was confirmed by checking his band.)

The new female began to lay her eggs in the cavity on 27 May. By 1 June, she had completed a clutch of six eggs. She incubated the eggs until 14 June when the nearly grown brood in cavity S4 began to leave their cavity and roam along the balcony intruding into other nests. By 17 June, all the eggs in S6 had disappeared or cracked. In houses with balconies, older broods invariably move from one cavity to another, sometimes trampling adjacent younger birds and eggs or depriving them of food (Bitterbaum and Brown, Nat. Hist. 90(5): 65-69, 1981). By 18 June, all birds of all age classes had left the house.

Among other swallows, infanticide has also been reported in the Tree Swallow (*Iridoprocne bicolor*). Shelley (Bird-Banding 5:134, 1934) observed a young female enter a colony in Massachusetts on 10 June 1934, and during the next 8 days kill over 19 nestlings from five broods. He saw another adult female kill three of what he presumed to be its own brood of five in the same colony. Kuerzi (Proc. Linn. Soc. N.Y. 52-53:1-52, 1940-41) found that young female Tree Swallows tended to be more aggressive than males or older females. He also noted that a late flight of young females and males passing through his Connecticut colony well after it was established each year caused much disturbance by fighting with the established pairs, but they were always driven away in the 3 years of his study. He did not observe any cases of infanticide.

Charles R. Brown (pers. comm.) tells us that in 13 years of intensive work with Purple Martins in Texas, he has found dead nestlings at times which seemed to have been pecked to death, but he does not know whether they were killed by House Sparrows (*Passer domesticus*), Common Starlings (*Sturnus vulgaris*) or other martins. At our colony, no species other than martins were seen near the house at any time.

For a late-returning bird, without a mate and with no place to nest, it seems that at least three reproductive options are available: (1) take over the cavity of another pair, try to find a mate, and rear a brood; (2) find another cavity that is not occupied, try to find a mate, and breed; (3) don't breed. As for the second possibility, there was an empty martin house available, about 1000 m from the occupied colony. This house is made of wood and is not preferred by martins. It has been there for several years, but has never been used. Purple Martins are strongly attracted to the social stimulus of the colony and may require it to breed

successfully (Brown, Auk 90:442, 1973). Whether or not unmated males were available is not known.

Our bird tried the first option. The failure of the new nest was due to the intrusion of older young, a situation made possible by the balconies on man-made martin houses. In the old woodpecker holes where martins originally nested, this would not have happened. It is important to remember that a tactic does not have to work every time to be advantageous. It is obvious that pushing into a colony is a better option than not trying to breed at all.

As Purple Martins do not recognize their own young (Bitterbaum and Brown 1981), this bird would probably not have recognized these nestlings as Purple Martins, but, of course, she would have recognized the parents. Therefore, it seems that there is no inhibition against infanticide in the social system of the Purple Martin.

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Overlap of two broods of Eastern Bluebirds in the same nest and brood reduction.—Unusual nestings among House Sparrows (*Passer domesticus*) in which eggs of the successive clutches were laid while young of the previous broods still occupied the nests have been reported (Lowther, *Bird-Banding* 50:160–162, 1979). I have made a similar observation for Eastern Bluebirds (*Sialia sialis*) wherein simultaneous use of a single nest box by two females suggests that nest-sites (boxes) are an important and limited resource for reproduction by Eastern Bluebirds. In association with this dual occupation of a single nest box I recorded brood reduction that encouraged speculation about infanticide.

Female R426 was caught and color-banded on 23 April 1979 at nesting territory 133 on a study site in Pendleton, Anderson Co., South Carolina. During that spring she and an unbanded male produced a five-egg clutch of which four eggs hatched and four young fledged on 16 and 17 May (Table 1). On 25 May a new, completed nest was found in the box and on 29 May female R426, again accompanied by an unbanded male, completed laying a four-egg clutch; all eggs hatched on 12 or 13 June. On June 16 I began to mark and weigh nestlings (Table 1). On 22 June I found one of the nestlings dead on the ground (Table 1). This was the only time I had seen a dead nestling so close to a nesting box containing live siblings. (I have found dead nestlings in the box with their live siblings and noted nestling disappearances attributed to parental removal. Dead nestlings found in the box were all more than 8 days old. Nestlings which have disappeared from a nest containing live siblings were all under 8 days old.) I did not see female R426 during my visit to the nest; she did not respond to a tape recording of bluebird song, although an unbanded male observed me from a perch about 10 m away. I did not see female R426 after 18 June. On 25 June I found color-banded nestling L573 dead just beneath the nesting box. The remaining nestlings, female L572 and male L574, appeared healthy and had normal weights on all days weighed.

In addition to the two nestlings remaining in the box, three eggs were also there on 25 June. Four eggs and two nestlings were in the box on 27 June. Female L229 was near the box with an unbanded male on 27 June and I frequently saw her on the territory during the remainder of the nesting attempt. (I caught and color banded female L229 on 26 May 1978 at a study site about 3 km from territory 133. During 1978, she and her mate, color-banded male R696, fledged nine young from two clutches.) The two remaining nestlings, the apparent offspring of female R426, fledged at a normal age between 28 June and 1 July. Only three