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Peculiar behavior of a subadult female Tree Swallow.—I observed peculiar behaviors displayed by a dull-brown subadult (SY; Hussell 1983) female member of a trio of nesting Tree Swallows (*Tachycineta bicolor*) at the Creston Valley Wildlife Management Area, southeastern B.C. (49°05′N, 116°35′W), during May–June 1991. The range of behaviors exhibited by the SY female included typical parental breeding behavior, apparent "helping" behavior when the SY female tended only the offspring of the other female, and non-breeding (i.e., nest attendant) behavior when the SY female repeatedly took food from both the male and other female (cf Lombardo 1986, 1987a, b). The observations suggest that mistaken "helping" behavior may occur frequently in Tree Swallow trios (cf Quinney 1983) and that behavior in adult Tree Swallows during the breeding season has evolved considerable plasticity, perhaps in response to the unpredictable availability of nest-sites.

The trio of birds included an unbanded male, an after-second-year (ASY) female, and the SY female. The ASY and SY females were captured, banded, and painted on 30 May and 7 June, respectively, but the marked differences in plumage color enabled me to distinguish each bird prior to banding. The ASY female completed a clutch of five eggs on 23 May. The SY female was observed circling the box on 26 May while the ASY female was incubating, and she was also present when I banded the ASY female. On 2 June, I discovered eight eggs in the nest cup. Evidently, the SY female began laying on 31 May and she completed her clutch on 4 June when there were ten eggs in the nest cup. I marked the new eggs with a non-toxic permanent marker beginning 2 June. On 5 June one of the eggs of the ASY female began pipping, and by 7 June there were five nestlings belonging to the ASY female and five eggs belonging to the SY female.

Three 1-h watches were conducted (08:00–11:30 MST) at the nest on 7, 10, and 14 June, corresponding to nestling-days (ND) 2, 5, and 9. Watches were conducted from 45 m using 7 × 50 binoculars and a 15× spotting scope. After the first watch I captured the SY female while she lay on the ASY female, which was brooding the nestlings. The SY female was

found to have a large, non-vascular brood patch. When I recaptured her seven days later, she was lying on the nestlings, and her brood patch was vascular. It is likely that the SY female never directly incubated her eggs because they were covered by the ASY female's nestlings, particularly as the nestlings grew.

The parental and "helping" behavior exhibited by the SY female was considerable. She removed more fecal sacs (N = 6), defended the nest site from conspecific intruders more often (N = 5 chases), and spent more time on the territory (98/180 min = 54%) than either of the parents (fecal sacs, parents combined, N = 5; intruder chases, parents combined, N = 3; % time on territory, ASY female = 38%, male = 44%). She apparently brooded the young as indicated by her vascular brood patch, the fact that she was captured lying on the young, and her prolonged visits inside the box. The SY female spent 50% (30/60 min) of last watch inside the box compared to only 5% (3/60 min) by the ASY female. Evidence suggests that the SY female was feeding the young. I once saw the SY female enter with a large bolus of food. Also, the SY female entered the box (23 times in 180 min) at a rate comparable to that of the ASY female (24 in 180 min), and more often than the male (15 in 180 min). Lombardo (1987a) found that nearly 100% of parental visits to nests resulted in nestling feeding after ND 3. Finally, the SY female exhibited feeding behavior similar to that of the two parents.

All three adults were seen at the box until the young fledged on 27 June. The young were of comparable size and mass to other broods in the study area. After the young fledged, the eggs belonging to the SY female remained intact in the nest cup. They did not hatch, and they were not inspected for embryos.

During nest watches the SY female exhibited nest attendant behaviors on five occasions when she took whole or partial food boluses from the parents. In each instance the SY female was perched inside looking out of the hole where she met the incoming parent. This happened three times to the ASY female and twice to the male. Once the SY female took the bolus from the ASY female and swallowed it in plain view, but on the other four occasions she either went inside the box or flew off. The parents flew away on four of the five occasions, as if they had fed one of the young, and once the ASY female entered the box. Lombardo (1986, 1987a) found that attendants at Tree Swallow nests often beg for, or attempt to steal food from parents. Tolerance of such actions of nest attendants by parents may be due to the fact that attendants typically do not harm nestlings or significantly impede parents (cf Lombardo 1985, 1987b).

The "helping" behavior exhibited by the SY female arose due to reproductive error which likely resulted from the summation of various stimuli received from the nestlings, the feeding behavior exhibited by the parents and her motivation to care for young after completing her own clutch (Williams 1966). Examples of misplaced parental care have been reported in other species (e.g., Power 1975, Bollinger et al. 1986), and there are many accounts of interspecific feeding by birds (Skutch 1961, Shy 1982, Butler and Campbell 1987, Yoerg and O'Halloran 1991). Power (1975) noted that misplaced parental care is an inevitable result of strong selection on birds to care for their own young, so the behavior of the SY female is not surprising given the unique sequence of events that occurred in the nest. It is probable that the females at seven trios described by Quinney (1983) also misplaced parental care due to the close hatch dates at his nests, mixing of broods, and an assumed inability of parents to recognize their own young. Females from these trios also had lower reproductive success due to the disappearance of young and eggs from trio nests. Nesting-trios in Tree Swallows apparently occur under conditions of extreme nest-site limitation and good habitat quality, but because of the drawbacks of trio-nesting, it is not surprising that female Tree Swallows aggressively defend nest-sites from floating females (e.g., Stutchbury and Robertson 1987, Dunn and Hannon 1991), and that trios of Tree Swallows are uncommon in both nest-box and natural populations.

The SY female repeatedly oscillated between mature adult reproductive behavior (i.e., caring for young) and the behavior of a nest attendant (i.e., stealing food), indicating that Tree Swallows can quickly switch between the typical roles of a breeder and non-breeder during the nesting season. Lombardo (1986, 1987a, b) showed that many attendants at Tree Swallow nests were mature, non-breeding birds that were exploring potential nest-sites for future breeding attempts. These attempts may occur within a season, or in subsequent seasons. Ultimately, all mature Tree Swallows are driven to breed each year, but under some conditions the benefits from doing so may be relatively low, such as those associated with nesting in polygynous trios. Maintenance of control over breeding drive based on proximate environmental cues (e.g., nest-site availability), and an associated flexibility in behavioral roles, might be favored by selection in nest-site limited species such as Tree Swallows (Holroyd 1975, Rendell and Robertson 1989) because it would allow individuals to abstain from nesting under poor environmental conditions, but swiftly occupy any good nesting opportunities that arise.

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A nest and egg of the Rufous Antpitta in Ecuador.—The nesting habits of *Grallaria* antpittas are poorly known owing to the dense understory vegetation frequented by most of the species and the generally secretive nature of the birds. This note provides the first description of the nest and egg of one of the common species, the Rufous Antpitta (*Grallaria rufula*). On 25 March 1990 I found a nest of a Rufous Antpitta at about 2700 m in the valley of the Rio Chalpi Grande approximately 9 km by road east of (below) the town of Papallacta (0°22′S, 78°08′W; Paynter and Traylor, Ornithological gazeteer of Ecuador; Cambridge, Massachusetts, Harvard Univ. Press; 1977) on the east slope of the Andes in Napo province, Ecuador. The river valley and surrounding region is heavily forested although some large patches of forest have been cleared along the road and on nearby mountain slopes. The nest was situated in lightly disturbed forest (many of the largest trees had been removed) with a dense, woody understory dominated in places by *Chusquea* sp. bamboo (although bamboo was not dense at the nest site). Walking along a trail contouring a steep slope about 30 vertical m above the rushing river, I first noticed the motion of a bird sneaking away downslope through the undergrowth. On inspection, I found a Rufous Antpitta sitting quietly on a thin horizontal branch about 1 m above the ground. The bird sat motionless for more than 2 min only about 6 m from me, and I suspected that it had a nest nearby. After some searching, I located the nest in the side of a large, moss-covered stump about 1.5 m tall, well hidden from outside view by dense surrounding vegetation. The nest appeared to be sunken into a shallow hollow in the side of the stump, about 0.75 m above the ground. A part of the stump formed an overhang above the nest, and small herbaceous plants about 15 cm tall growing out of or immediately beside the rim of the nest, one on either side, concealed the nest even at close range.

I did not have a ruler with me at the time, but from marks made on a piece of paper and later measured, the nest was about 9 cm wide from rim to rim across the cup, and the cup was steep-sided and about 5 cm deep in the middle. The rim of the nest consisted entirely of thin, yellowish grass stems and the cup was lined with what appeared to be 30–40 yellowish mammal hairs, each about 4 cm long. The bottom of the cup was visible through the lining, and seemed to be made of dark, damp leaves. The nest held one egg. It was an even, turquoise color, close to the color of a typical egg of the American Robin (*Turdus migratorius*), but slightly duller, thus similar to the color of the few known eggs of other species of *Grallaria* described to date, with the notable exception of *G. ruficapilla,* which has buffy eggs with rufous blotches (Wiedenfeld, Wilson Bull. 94:580–582, 1982). I did not measure