

the least between roosts which reflected this bird's partiality to a particular roost. In 56% of the observations made, owl 2 was in the same cavity.

The owls became habituated to the observers and allowed them to approach within 2 m. Owls flushed from roosts only twice during the study and, if in the open, usually assumed a cryptic posture when approached.

All owls were recovered. Owl 3 was found dead in a mutilated condition on 2 Dec. 1980. Owls 1 and 2 were captured by hand from roosts on 15 Dec. 1980. Both owls appeared to be in good condition. Each had a small callus between the scapulae where the transmitter had rested, but no signs of excessive irritation were present.

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**Bill-shoving Feeding Behavior in Darwin's Finches.**—Both interspecific and intraspecific morphological radiations of Darwin's finches may be associated with ecological differences in food and foraging behavior (Lack 1947, Bowman 1961, Grant et al. 1976). The usual foraging techniques of the ground-feeding finches include hopping, scratching in the soil, picking up, tossing, turning, or flicking objects, and using their bill as a hoe (DeBenedictis 1966, P. R. Grant and R. I. Bowman pers. comm.). Use of the bill as a brace while scratching has been described in one species (DeBenedictis 1966) and subsequently seen in others (P. R. Grant and R. I. Bowman pers. comm.). Bill-brace feeding, in which a finch places its culmen against a rock and scratches and kicks gravel to expose seeds (DeBenedictis 1966), has been of interest because of its complexity, the environmental correlates of its use, and its possible value as a taxonomic character. Harrison (1967), Greenlaw (1976), and Clark (1971) have discussed behavioral, taxonomic, and ecological aspects of the use of feet and bill in other finches. In January 1979, I observed Darwin's finches using an unreported foraging behavior, which I called bill-shoving. Here I briefly describe this behavior as a contribution to the more complete documentation of the feeding methods of Darwin's finches and seasonal patterns in the use of such behaviors.

I studied the finches in the open park-like arid zone 1 km inland from James Bay on Isla Santiago, Galapagos, at the end of the cool-dry season. The ground between the trees and bushes was covered by a several centimeter-thick layer of litter of leaves, twigs, dry herbaceous material, and small rocks. Finches foraged near each other in loose groups including Small Ground Finches (*Geospiza fuliginosa*), Medium Ground Finches (*G. fortis*), Galapagos Doves (*Zenaida galapagoensis*), Yellow Warblers (*Dendroica petechia*), and Large-billed flycatchers (*Myiarchus magnirostris*).

The ground finches fed primarily by hopping and pecking and also by scratching. Some finches shoved the litter out of the way using their bills to uncover seeds on the ground below. In doing so, a finch placed its closed bill, tip downward, into the top of the material and, by pushing and lifting, moved a wad of material up and forward. Doing this several times, with or without removing and reinserting the bill, the finches uncovered areas 3–5 cm in diameter, where they then fed by pecking and scratching, but without bracing the bill. Other birds use their bill to expose food, one of the most widespread behaviors being bill sweeping, a lateral bill movement (Clark 1971), which may be used with scratching (Clark 1983).

The bill-shove feeding technique was used on Santiago primarily by Medium Ground Finches, including both smaller- and larger-billed individuals. Small Ground Finches used it less frequently, and less effectively, as was also noted by DeBenedictis (1966) for bill-bracing. The lighter- and smaller-billed Small Ground Finch is apparently less adept than the Medium Ground Finch at using a feeding behavior requiring bill and body strength (Abbott et al. 1977).

Excavating behaviors such as bill-shoving may be particularly useful in the dry season when most plants are dormant, the previous year's growth of herbaceous ground cover is dried out, and easily accessible seed sources are rare. These conditions on Santiago

during my study were similar to those on Espanola when bill-brace feeding was first described in the Large Cactus Finch (*G. conirostris*) (DeBenedictis 1966) in that seeds were covered by other material. Such dry conditions may require finches to excavate to reach the seed supply, although similar uses of the bill may also be of value at other times of year. Clark (1971) found that bill-sweeping in various species, and Greenlaw (1976) found that scratching in the Rufous-sided Towhee (*Pipilo erythrophthalmus*), occur under restricted conditions when food is not readily available except by moving litter. Clark (1983) found in thrushes that the extent and complexity of such behavior depended on the depth of the litter. On the Galapagos, foraging responses appear to differ in wet and cool-dry seasons, and it is this latter period when specific differences in foraging may be most apparent (Smith et al. 1978). Understanding alternative tactics used in the dry season such as group feeding and complex feeding techniques may provide insight into the evolution of foraging behaviors. The study of complex behaviors in captive finches may be useful in distinguishing genetic from learned components of their behavioral repertoire and in determining how behavioral choices relate to morphological constraints on feeding efficiency of the various species of Darwin's finches.

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**Burrowing Owl Occurrence on White-tailed Prairie Dog Colonies.**—The Burrowing Owl (*Athene cunicularia*) nests primarily in the underground burrow systems of various rodents (Zarn 1974). Owls have been studied on black-tailed prairie dog (*Cynomys ludovicianus*) colonies by several investigators (Butts 1973, Koford 1958, Olendorff 1973) but little is known about their occurrence on white-tailed prairie dog colonies (*C. leucurus*).

Burrowing Owls are known to nest in 20 of 28 Wyoming latilongs (Wyoming Game