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NEST AND YOUNG OF THE HIGHLAND TINAMOU IN SOUTHERN COLOMBIA

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The nest and young of the Highland Tinamou (*Nothocercus bonapartei*) are little known and published information is limited to the northern part of this polytypic species' range. Schäfer (J. Ornithol. 95:219–232, 1954) described several nests of the race *bonapartei* in northern Venezuela, and Wetmore (The birds of the Republic of Panama, Smithson. Misc. Collect. 150:15, 1965) gave the coloration of a recently hatched *N. b. frantzii* from Costa Rica. The nominate race occurs south through the Andes to southern Colombia (Blake, Manual of neotropical birds, Vol. 1, Univ. Chicago Press, Chicago, 1977), and is fairly common at subtropical altitudes in the Cave of the Oilbirds National Park (1°35′N, 76°00′W) on the western slope of the Eastern Andes in the Department of Huila, Colombia. I describe here a nest site and young of *N. b. bonapartei*, and present observations on the behavior of the adult at the nest.

On 8 March 1978, I flushed an adult from a nest containing two eggs in a forested section of the park at 2,000 m. The nest was in a crevice under a fallen log on a hillside of 40° slope. The crevice measured 42 cm from entrance to back × 65 cm wide × 50 cm high. A seldom-used foot trail created a narrow level area 1 m downhill from the crevice opening. The eggs were incubated on a roughly circular concentration of dead leaves (*Vismia* sp., Hipericaceae) 29 cm in diameter, drawn together from the leaf litter on the crevice floor. The weight of the adult and eggs had created a "nest bowl" 5 cm deep, and an entrance to the nest was indicated by a slightly depressed area at one side. A barely discernible path led several meters uphill from the side of the crevice nearer to the nest entrance. The front of the nest extended slightly beyond the crevice opening, affording the incubating bird a wide lateral view.

Typically, several females deposit eggs in a single nest to be incubated by the male (Schäfer 1954). This clutch of only two eggs suggested a young male who had attracted only one hen. The eggs were deep turquoise, but I was unable to measure them prior to hatching. Most of my observations of the male during incubation are consistent with those of Schäfer. Although he observed a male to leave the nest for 50–80 min each morning, the bird I watched was present during the mornings of 9 and 10 March but absent for most of both afternoons. At 08:45 on 11 March I began observations from a blind 7 m from the nest. The adult was motionless until 11:32 when two chicks appeared at the front of the nest, having hatched some time that morning. After gathering the young under its wings, the adult remained very alert, looking from side to side. At 13:15 I approached to 0.5 m of the nest before the adult suddenly flew off downhill giving a loud "quok quok quok quok." It did not first raise its hindparts in the "defense position" noted by Schäfer. The young scrambled through a small hole at the back of the crevice and hid in an adjoining cavity under the log until captured. After photographing and measuring the chicks, I returned them to their hiding place. At 14:17 the adult returned along the path above the crevice and went directly to the nest. The chicks, which had hitherto been silent, started peeping until the adult began calling a soft "bup bup" etc. with the bill closed (about one note per second). In response, the chicks returned to the nest and settled under the wings of the adult, who looked around and preened until I left the blind at 17:15. The birds had left the nest by 07:00 on 12 March.

The young were colored as follows: head and neck dark gray with small white spots on nape only; small whitish area on chin; back dark reddish brown, finely vermiculated with black; underparts pale rufous, paler on abdomen and under tail coverts; legs and nails slate gray; bill black with white egg tooth; and iris dull brown. Pale rufous primaries had emerged 2–3 mm from the sheaths. Weights were 86 g and 87 g, and respective measurements (mm) were: length (prone) 184, 188; wing from wrist 41, 43; tarsus 38, 39; middle toe with claw 35, 35; and culmen from base 18, 17.

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POSSIBLE COMPETITION BETWEEN SEASIDE CINCLODES (*CINCLODES NIGROFUMOSUS*) AND RUDDY TURNSTONES (*ARENARIA INTERPRES*)

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Studies of interspecific competition in vertebrates have usually focused on closely related species (e.g., Morse 1974, Holmes and Pitelka 1968). Recently, some observers have examined competitive relationships between taxonomically distant species and their importance in sharing resources: birds and bats (Shields and Bildstein 1979), birds and other mammals (Fisler 1977), ants and rodents (Brown and Davidson 1977).

This note reports the foraging behavior and feeding associations of two distantly related bird species, and considers whether overlap in habitat, behavior and diet may result in competition between *Cinclodes nigrofumosus* (Furnariidae) and *Arenaria interpres* (Scolopacidae).

The Seaside Cinclodes of coastal Peru forages in the littoral zone. Although a passerine, its behavior and diet resemble those of shorebirds (Koepcke and

TABLE 1. Microhabitat overlap between cinclodes and turnstones on cobble-sand beach. (All turnstones foraging within 15 m of cinclodes. An individual may be scored in more than one microhabitat.)

	N	Tidal wrack	Rocks	Water	Wet sand
Cinclodes	18	14	4	5	3
Turnstones	23	20	10	3	1

$\chi^2 = 4.2$ n.s.

Koepcke 1953). Indeed, the stomach contents of the few specimens collected contained mollusks, marine worms, and crustaceans (Short and Morony 1969, Paynter 1971).

In June 1978 I observed Seaside Cinclodes foraging on the Paracas Peninsula on the coast of southern Peru. My observations were made near the village of Lagunillas in two types of habitat—wave-washed rocky ledges and cobble-sand beaches. During observation periods varying from 20–80 min, I scored the microhabitats used and noted food taken for each cinclodes as well as for each shorebird approaching within 15 m of the individual I was watching. Any interactions between cinclodes and shorebirds were also noted.

On the cobble-sand beaches cinclodes often fed near smaller shorebirds, particularly Ruddy Turnstones. During a total of 350 min of observation, I saw shorebirds foraging within 15 m of a cinclodes the following number of times: Blackish Oystercatcher (*Haematopus ater*) 1, Snowy Plover (*Charadrius alexandrinus*) 6, Semipalmated Plover (*C. semipalmatus*) 6, Black-bellied Plover (*Pluvialis squatarola*) 5, Ruddy Turnstone 23, Greater Yellowlegs (*Tringa melanoleuca*) 1, Western Sandpiper (*Calidris mauri*) 1, and Sanderling (*C. alba*) 10. In this habitat, the foraging behavior of cinclodes strongly resembled that of the turnstones (Table 1), although cinclodes forages singly or in pairs, not in flocks as with most shorebirds. Both species frequently fed by flipping over debris and by pecking at small organisms in piles of tidal wrack.

My observations of the food taken in both habitats indicated dietary overlap between turnstones and cinclodes. Small fish, stranded in the wrack or caught at the water's edge, were an equally common food item for both species. During 29 observations of cinclodes, 12 fish were taken; 7 fish were taken during 25 observations of turnstones.

On the rocky ledges, cinclodes' behavior resembled that of the Surfbird (*Aphriza virgata*; Paynter 1971) and the Purple Sandpiper (*Calidris maritima*; Short and Morony 1969). Here it moved in and out of crevices and overhangs, pecking at seaweed- and mollusk-covered rocks which teemed with amphipods. I saw two cinclodes eating sea urchins (*Tetrapygus niger*). The birds occasionally fed in the company of shorebirds, especially large species such as Willets (*Catoptrophorus semipalmatus*) and Blackish Oystercatchers. Usually, however, cinclodes foraged alone in these rocky areas.

In both the rocky habitats and on the beaches, feeding shorebirds were present only in small numbers. However, Lagunillas Beach provides the foraging conditions that turnstones preferred at the other sites that I studied in the Paracas area—large amounts of debris, shells, rocks covered with algae and barnacles, and shallow water for fishing. Furthermore, these observations were made during the boreal summer when most Ruddy Turnstones are in the northern hemisphere breeding.

The similarity in diet and habitat between Seaside Cinclodes and Ruddy Turnstones suggests that these species may compete. Of the three conflicts I observed between cinclodes and shorebirds, all involved turnstones. In each instance a cinclodes, feeding in a pile of wrack, chased away a turnstone. A small, dead fish was involved in two of the interactions. Unless additional food is available in winter, any competitive relationship between the species probably intensifies with the increased number of over-wintering turnstones.

Many studies of resource sharing, particularly in avian ecology, have assumed that competition will be most severe between closely related forms. My observations and other recent studies (e.g. Donnelly 1974) suggest that competition resulting from similarity in feeding habits may be important at the ordinal level.

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