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A nest of the Pale-billed Antpitta (*Grallaria carrikeri*) with comparative remarks on antpitta nests.—The antpittas (Grallariinae: Formicariidae) are a widespread group in tropical America, yet their breeding biology is poorly known because of their secretive habits. Few antpitta nests have been found, and only Skutch (Life Histories of Central American Birds, III, Cooper Society, Berkeley, California, 1969) has observed the behavior of adult birds at the nest for any appreciable amount of time, and then only during incubation. I here report observations at a nest with young of the newly-described Pale-billed Antpitta (*Grallaria carrikeri*) (Schulenberg and Williams, *Wilson Bull.* 94:105–113, 1982).

Nest description.—I found the *G. carrikeri* nest in cloud forest at 2875 m, above Cumpang, along the trail to Ongón (8°12'S, 77°10'W), in the Dept. La Libertad, Perú, on 14 October 1979, when I saw an adult carry food to it. The nest was only about 5 m from a trail along which perhaps 30 people with burros pass daily. The nest, on the sloping trunk of a partially fallen tree (0.5 m in diameter), was 3 m vertically above the steeply sloping ground. The nest (LSUMZ nest collection), concealed among living mosses, ferns, and dead leaves on the trunk, comprised a few small sticks and a mass of wet, decaying leaves of the same type found on the trunk. The nest merged almost imperceptibly with detritus on the trunk, so that if the rootlets lining the cup had not been seen, the nest would have been difficult to distinguish. Approximate outer measurements were 20 × 19 cm, and the inner dimensions of the cup were 14 × 12 cm, by 5 cm deep. No eggshell fragments were found in or around the nest.

Behavior at the nest.—M. B. Robbins and I took notes on the behavior of the adult antpittas at the nest for a combined total of about 11 h on 14 and 15 October 1979. Both adults participated in feeding and brooding the nestlings. Several times I saw both adults at the nest simultaneously, when one adult replaced the other in brooding. Skutch (1969) noted that in the Streak-chested Antpitta (*Hylopezus perspicillatus*) both adults also participate in incubating the eggs. Both *G. carrikeri* nestlings were fed each time that an adult returned to the nest, on the average about every 30 min. Frequently, however, a period of 1 h or more passed without a visit to the nest, followed by two feeding visits in a few minutes. After feeding the young birds, the adults often reached down into the nest and appeared to be eating something that I never could see. Since no removal of feces was observed, and since the nest was very clean when I collected it, I assumed the adults were eating the nestlings' fecal sacs.

Invariably after feeding the young, the adults began brooding them. Neither adult brooded more than 41 min at one time (\bar{x} = 27 min, N = 14). The nest was covered by an adult 6.6 h of our 11 h of observation (60%). The weather during this period was cool and cloudy, but no rain fell, and temperature extremes were a daytime high of 23°C, and a nighttime low of 10°C on the 14th and 11°C on the 15th.

Although food items brought to the nest were difficult to identify, earthworms (Annelida) seemed to be an important part (7 of 19 feedings) of the nestling diet. However, earthworms seemed to be an uncommon food for the adults themselves. Although one male (LSUMZ 92460), which was eventually collected when it brought food to the nest, was found to have a portion of an earthworm (3 cm long) in its stomach, no other individuals collected in this area had earthworm parts in their stomachs.

Unlike the Streak-chested Antpitta observed by Skutch (1969), the Pale-billed Antpitta never called from the vicinity of the nest, although its distinctive call (see Schulenberg and Williams 1982) was heard frequently in mid-mornings elsewhere in the forest.

Nestlings.—The nestlings were estimated to have been about 7 days old when collected (LSUMZ 91513 and 91514). They weighed 27 and 26 g, respectively. Their eyes were not yet

open and down was sparse. An egg tooth was still present. The bill and mouth lining were bright orange.

Nesting in the Grallariinae.—Nests have been reported for only 11 of 41 species in the subfamily Grallariinae (following the taxonomy of Lowery and O'Neill, Auk 86:1–12, 1969), but those reported show many similarities. The clutch-size found in all nests reported so far (23 of 25) is two, except for one clutch of three collected by S. B. Gabaldon (American Museum of Natural History 13865, J. Bull, pers. comm.) from a Chestnut-crowned Antpitta (*Grallaria ruficapilla*) nest, and one nest of Scaled Antpitta (*G. guatemalensis*) with only one egg (Edwards and Lea, Condor 57:31–54, 1955).

Although antpittas seem to be largely terrestrial, their nests are generally placed above ground, but usually not more than 3 m above the forest floor. Edwards and Lea (1955) and Rowley (Proc. Western Foundation of Vertebrate Zool. 1(3):1–204, 1966) reported *G. guatemalensis* nests found close to the ground placed on top of fallen trunks. Belcher and Smooker (Ibis 6:792–813, 1936), however, found a *G. guatemalensis* nest 2.4 m above the ground. The Pale-billed Antpitta nest described above was about 3 m vertically above the ground, but only about 1.5 m from the base of the steeply sloping trunk upon which it was placed.

A common nest-site for antpittas is on top of fallen or partially fallen trunks, as the nests described above. A few nests have been found in low, understory bushes or vines. Miller (Univ. Calif. Publ. Zool. 66:1–78, 1963) reported a *G. guatemalensis* nest among the branches of a fallen shrub, and Skutch (1969) described a *H. perspicillatus* nest suspended in the branches of a low bush. *Hyopezeus perspicillatus* has also been recorded building in vine tangles (Willis and Eisenmann, Smithsonian. Contrib. Zool. 291, 1979). Schwartz (Boletín Sociedad Venezolana de Ciencias Naturales 88:42–62, 1957) found four nests of the Rusty-breasted Antpitta (*Grallaricula ferrugineipectus*), all in low bushes or vine tangles. A pair of Rufous-faced Antpittas (*Grallaria erythrotis*) built a nest in tropical foliage at the New York Zoological Park (Bell and Bruning, Avicul. Mag. 82:119–122, 1976), but the normal, preferred nest-site may not have been available to those birds.

Antpittas also build nests among the rosettes of leaves formed by palms and aroid plants. Wetmore (Birds of the Republic of Panamá, Pt. 3, Smithsonian Institution Press, Washington, D.C., 1972) found a Black-crowned Antpitta (*Pittasoma michleri*) nest in the crown of a low palm. The nest of *G. guatemalensis* found by Belcher and Smooker (1936) was placed at the heart of an aroid growing on a tree trunk. A. Williams found two nests of *H. perspicillatus* (Western Foundation of Vertebrate Zoology 58259, 58404; L. Kiff, pers. comm.) in the centers of rosettes of unidentified plants.

The nests reported have varying dimensions, but all are described as roughly circular, shallow cups, usually 6 cm deep or less, usually lined with fine rootlets or vegetable fibers. The main body of the nest is generally composed of a loosely constructed, thick mass of leaves, often wet and decaying, that can hardly be distinguished from surrounding leaf litter or debris.

Eggs of *Grallaria* spp. are pale blue or blue-green (Schönwetter, Handbuch der Oölogie, Vol. 2, Pt. 14, Akademie-Verlag, Berlin, Germany, 1967), except for the set from *G. ruficapilla*, which has buffy eggs with rufous blotches (J. Bull, pers. comm.). When the eggs of other species in the same subgenus (*Hypsibemon*) as *G. ruficapilla* are known, it will be interesting to see if egg coloration is a subgeneric character.

Known eggs of small antpittas in the genus *Grallaricula* are light coffee-brown with darker brown blotches (Slate-crowned Antpitta [*G. nana*] and Hooded Antpitta [*G. cucullata*]) (Schönwetter 1967), although the ground color of *G. ferrugineipectus* is light green (Schwartz 1967). *Pittasoma michleri* also has brown-blotched eggs, but with a "pinkish-buff" background (Wetmore 1972). Eggs of *H. perspicillatus* have a more varied background color (light gray [Skutch 1969], pale olive-buff [Wetmore 1972], or yellowish-brown [Schönwetter 1967]), but they too have dark brown blotches.

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Interspecific nest use by aridland birds.—Nest holes drilled by woodpeckers (Picidae) are frequently used by secondary cavity-nesting species, but interspecific use of open and domed nests is less well known. Nests constructed by many southwestern desert birds last longer than one year (pers. obs.) and are consequently reused by the same pair (e.g., Abert's Towhees [*Pipilo aberti*], pers. obs.) or by other birds as suitable nests. I observed several instances of interspecific nest use in honey mesquite (*Prosopis glandulosa*) habitat of the lower Colorado River valley, on the Colorado River Indian Reservation about 10 km north of Ehrenberg, Yuma Co., Arizona.

On 25 March 1980, I discovered a Mourning Dove (*Zenaida macroura*) incubating two eggs in a Crissal Thrasher (*Toxostoma dorsale*) nest built at a height of 130 cm against the main trunk of a 4.6 m honey mesquite. The nest tree was on the border of a thick mesquite woods adjacent to a large opening of bare ground. I had observed a pair of Crissal Thrashers incubating four eggs in this same nest during the summer of 1979. On 5 April 1980, the nest contained one dove egg that had been abandoned. Secondary use by Mourning Doves of nests of other bird species has been reported to be as frequent as 27% in Tennessee (Monk, *Migrant* 20:1–9, 1949) and is common throughout North America (e.g., McClure, *Trans. N. Am. Wildl. Conf.* 15:335–343, 1950; Cowan, *Calif. Fish and Game* 38:505–521, 1952; Nickell, *Wilson Bull.* 66:137, 1954; Hanson and Kossack, *Illinois Dept. Conserv. Tech. Bull.* 2, 1963). Documented use of secondary nests by doves in the southwest is limited. One Mourning Dove nest with two eggs, found by J. C. Barlow (pers. comm.), was built on top of an abandoned Cactus Wren (*Campylorhynchus brunneicapillus*) nest in a cholla (*Opuntia* sp.).

On 16 June 1980, I found a female Abert's Towhee incubating two eggs in the Crissal Thrasher nest mentioned above. I had color banded this towhee in the spring of 1980 and observed four of her previous attempts to nest. Two earlier nests were built in mistletoe (*Phoradendron californicum*) (a parasite of mesquite) and the other two nests were built directly on honey mesquite branches. The nest heights ranged from 0.92–2.3 m. On 10 June 1980, the fourth of these nests, which contained one egg recently laid by the towhee and one egg of a Brown-headed Cowbird (*Molothrus ater obscurus*), fell to the ground. The female towhee laid a fifth clutch of two eggs in the thrasher nest about 90 m south of her fourth nest tree.

During the spring and summer of 1980, I found three additional clutches of Abert's Towhees in old Crissal Thrasher nests. I had observed construction and use of these nests by three pairs of Crissal Thrashers in the spring of 1980. One pair of thrashers fledged three young, but the nests of the other two pairs were depredated, possibly by snakes or Roadrunners (*Geococcyx californianus*) (e.g., Finch, *Condor* 83:389, 1981) without damage to the nests.