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### A NEW SPECIES OF WOOD-WREN FROM PERU

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DURING a survey of the avifauna of the Cordillera del Condor, an isolated mountain range in northern Peru, we encountered two closely related species of wood-wren (*Henicorhina*) co-inhabiting the dense cloud forest near the summit. One species, *H. leucophrys*, is widespread in middle and upper elevations throughout the forested central and northern Andes and in Central America. The second wood-wren is a distinctive species that appears to represent a new form, as described below:

#### ***Henicorhina leucoptera* sp. nov.**

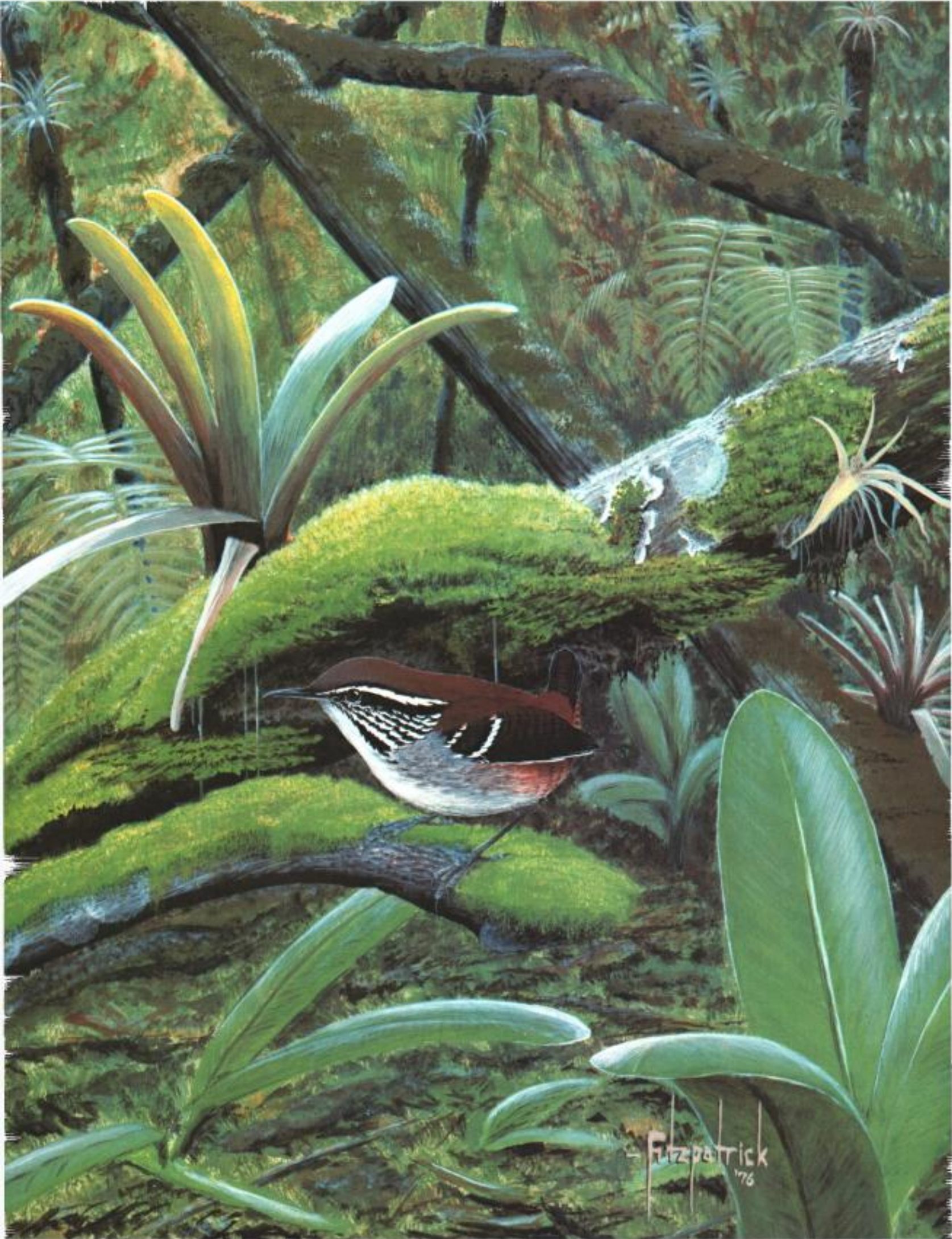
##### BAR-WINGED WOOD-WREN

**HOLOTYPE:** American Museum of Natural History, no. 812091; adult male from the Cordillera del Condor, above San José de Lourdes, dept. Cajamarca, Peru, 5°02'S, 78°51'W, elevation approximately 2,200 m; collected 18 June 1975 by John W. Fitzpatrick.

**DIAGNOSIS:** Recognizable as *Henicorhina* by short, partially graduated tail, long white superciliary stripe, and crisply striped black and white auriculars and malars; most similar to *H. leucophrys* but distinguished from it and from *H. leucosticta* by its nearly black wings with conspicuous white wing bars; outer three remiges narrowly edged white on outer web; rectrices black, faintly barred dusky brown; extent of white on underparts intermediate between *leucosticta* (pure white below) and *leucophrys* (white only on chin and throat); tail, tarsus, and bill lengths greater than in both congeners.

**DISTRIBUTION:** Known from two localities in northern Peru (see Fig. 1 in text): (1) at elevations from approximately 1,950 to 2,450 m on the southern extreme of the Cordillera del Condor, east of the Río Chinchipe valley; probably extends northward on this isolated ridge along the border between Peru and Ecuador; (2) at 1,900 m, east of the headwaters of the Río Nieva, dept. San Martín (Abra Patricia, 5°46'S, 77°42'W, LSMZ no. 82143).

**DESCRIPTION OF THE HOLOTYPE:** Mantle dark reddish brown, between Burnt Umber and dark Raw Umber (capitalized colors are from Smith 1975, Naturalist's Color Guide, New York, Amer. Mus. Nat. Hist.); warm reddish cast on lower back becoming Amber on rump and upper tail coverts; anterior mantle and hindcrown tinged dusky, crown becoming increasingly gray toward forecrown; center of crown light gray-brown, closest to light Fuscous but grayer; forecrown and narrow border over eyebrow Dark Neutral Gray; lores grizzled white, purest white at base of bill and continuous with broad white superciliary stripe extending from nostril to well behind eye, terminating at sides of mantle; conspicuous white eye-ring broken with black behind eye; broad postocular patch black, a few feathers faintly tinged Fuscous; cheek, suboculars, and malar region boldly streaked black and white: four white streaks discernible, extending to mantle and anterior sides; broad malar streak black, terminating in a few individual feathers with black flecks on side. Chin, throat, and upper breast nearly white, with Pale Neutral Gray showing through in places; white of upper breast fading through Light Neutral Gray to broad zone of Medium Neutral Gray on sides and anterior flanks; medial flank feathers tinged brown; lower breast white to Pale Neutral Gray, center of belly white; faint tinge of light Cinnamon on edges of some central breast and belly feathers, becoming a wash of pale Cinnamon on lower belly; posterior flanks, crissum, and undertail coverts cinnamon brown, closest to Tawny under tail, becoming Antique Brown on flanks; undertail coverts subterminally barred black; thighs grayish brown. Greater and median secondary coverts largely black, innermost with brownish tinge, all broadly tipped white forming two solid white wingbars; outermost



Bar-Winged Wood-Wren, *Henicorhina leucoptera*, a new species from Peru. Painting by John W. Fitzpatrick. (Reproduction costs partially supported by the St. Paul Audubon Society, St. Paul, Minnesota)

TABLE 1  
MEASUREMENTS OF THE THREE SPECIES OF *HENICORHINA* FROM NORTHERN PERU<sup>1</sup>

	<i>H. leucoptera</i> (6♂, 10♀)			<i>H. l. leucophrys</i> (5♂, 5♀)			<i>H. leucosticta hauxwelli</i> (5♂, 5♀)		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
<b>Males</b>									
Wing chord	56.0	1.4	54.4–58.2	56.3	1.4	54.5–58.0	54.0	1.8	51.5–56.0
External culmen	11.4	0.6	10.6–12.0	10.3	0.3	10.0–10.8	10.8	0.8	10.0–12.0
Culmen from base	18.8	0.5	18.2–19.0	16.9	0.4	16.5–17.5	17.0	1.0	16.0–18.0
Central rectrix	35.8	0.7	35.0–37.0	31.1	1.2	29.0–32.0	28.6	2.0	26.0–30.2
Tarsus	25.6	0.5	25.0–26.2	22.8	0.6	22.0–23.5	22.5	0.8	21.4–23.0
<b>Females</b>									
Wing chord	53.2	1.1	51.0–55.0	53.1	1.1	52.0–54.5	51.6	1.4	50.0–53.8
External culmen	11.0	0.5	10.5–11.8	9.6	0.4	9.3–10.4	10.8	0.3	10.5–11.0
Culmen from base	18.4	0.6	18.0–20.0	15.8	0.7	15.2–16.8	16.6	0.6	16.0–17.2
Central rectrix	33.7	0.8	32.2–34.8	28.6	1.3	27.0–30.5	26.4	0.9	26.0–28.0
Tarsus	25.5	0.5	24.8–26.0	21.9	0.5	21.5–22.5	21.5	0.5	21.0–22.0

<sup>1</sup> Measurements in mm; SD = standard deviation.

greater secondary covert white on entire outer web; primary coverts black, tipped white. Primaries almost wholly black, faintly barred Burnt Umber, outer three primaries edged white on outer web, forming a bold white border to remiges; secondaries largely black, narrowly barred dark reddish brown on outer webs; innermost secondaries entirely barred brown and black. Rectrices black, finely barred Fuscous on outer webs and across distal half of central pair. Tail partially graduated, outermost rectrices about 8 mm shorter than adjacent pair and 11 mm shorter than central pair. Soft part colors in life: iris dark reddish brown; maxilla black, mandible black on distal half, pale gray to whitish at base; tarsus dark gray.

MEASUREMENTS OF HOLOTYPE: Wing chord 57 mm; central rectrices 36.5 mm; tarsus 25.0 mm; culmen: from anterior end of nostril 10.5 mm, from base 19 mm.

*Specimens examined*.—6 males, 10 females from type locality (AMNH: 2♂, 2♀; LSMZ: 1♂, 4♀; MCZ uncatalogued: 3♂, 4♀); 1 female from Abra Patricia, dept. San Martín (LSMZ specimen).

#### REMARKS

*Variation in the type series*.—Fifteen of the 16 specimens from the type locality are in adult (first basic) plumage. The single juvenal example is described below. As in most wrens, sexes are identical in plumage, with females averaging slightly smaller than males (Table 1). Only slight variation exists in the series of adults. Several specimens show flecks of black on the sides and upper breast, associated with the termination of the malar streak. The reddish-brown cast of the mantle continues onto the crown in a few specimens, and in four such examples the crown becomes gray only above the forecrown and eye stripe. These slight variations have no relation to sex or skull ossification.

Five specimens show some reduction in the amount of white on the wing, especially on the greater secondary coverts. White tips are replaced by buffy brown edges and tips on varying numbers of coverts in these specimens. In two cases the extent and intensity of the white edges on the outer three primaries are also reduced. This variation is probably related to age. Four of these five specimens showed incompletely ossified skulls, and as described below, juvenile birds lack the white wing bar altogether. No molt is evident on any of the specimens we obtained.

*Juvenal plumage*.—One female specimen appears to be in juvenal plumage (LSMZ no. 82139, collected 19 July, 1976). Its skull was only partially ossified and its ovaries were poorly developed. Overall this specimen's plumage is brownish and lacks the crisp black and white features that characterize the adults. It shows a reduction in the clarity and extent of white on the lower breast and belly, with a few brown feathers scattered throughout this region. Its facial pattern is only rudimentary, with

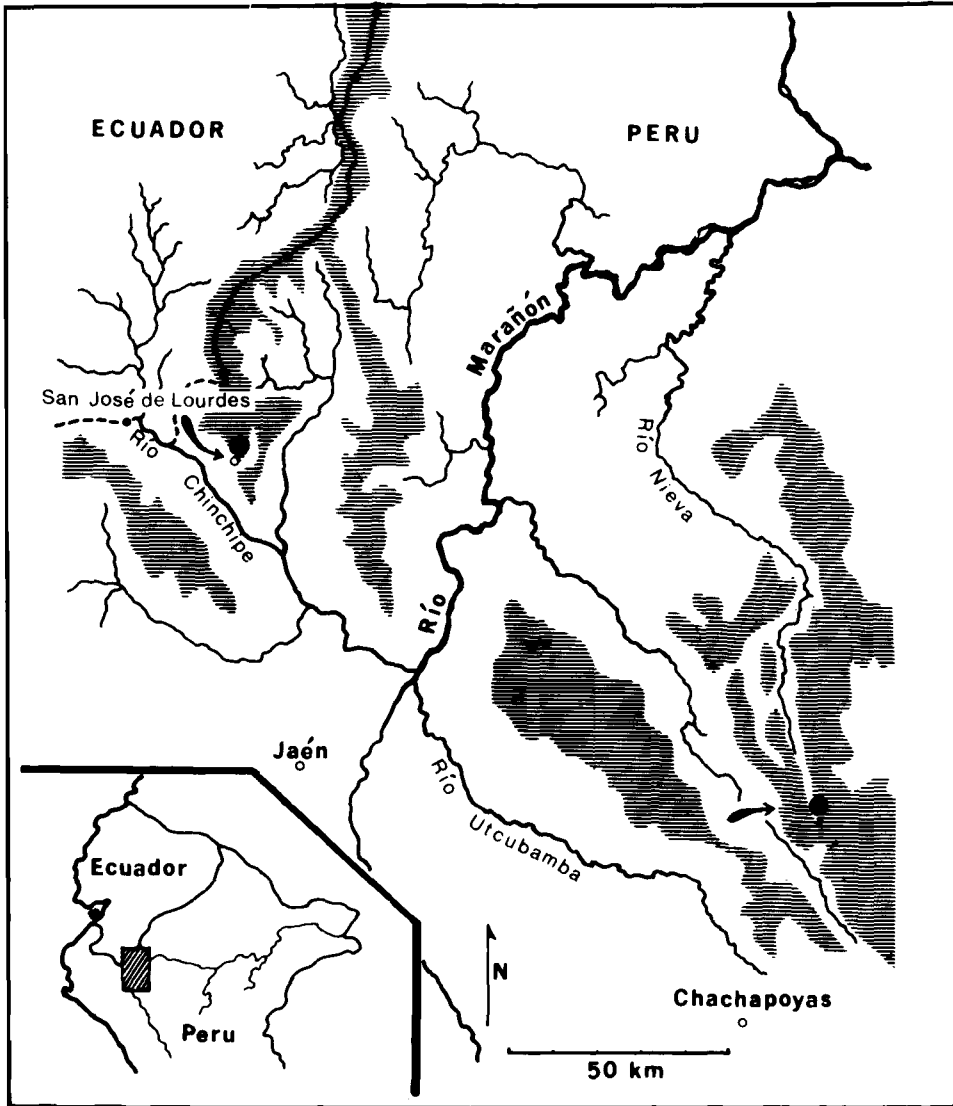


Fig. 1. A portion of the central Rio Marañón drainage, showing the two localities at which *Henicorhina leucoptera* has been collected (dark circles). The type locality (east of ridge above San José de Lourdes, dept. Cajamarca) lies 20 km from the northern border of Peru, on the southern end of the Cordillera del Condor. Note that the second locality (Abra Patricia, dept. San Martín) lies across the arid Marañón Valley, about 50 km NNE of Chachapoyas. Both localities are on mountain ridges that are separated by wide valleys from the main Andes. These isolated ridges are shaded within their 2000 m contours. Inset locates area detailed in the map.

the cheeks mottled brown and whitish in no distinct pattern. The eye stripe is present only behind the eye, where it lacks the black border above. The lores are dark gray, not white as in adults. On the wings, only the alula and a few primary coverts are tipped white. The remaining coverts are black, edged and tipped buffy brown. The outer three primaries are edged white as in the adults. Especially in the mottled facial pattern, this specimen is similar to the juvenals of the other two *Henicorhina* species.

*Habitat.*—The type locality of *H. leucoptera* has some singular features that we have not encountered elsewhere in the Andes. The parent rock of the southern Cordillera del Condor weathers to a pure white quartz sand, resulting in a leached and desiccation-prone substrate. Where similar soil conditions occur in temperate North America one finds pine barrens, or pocosins on poorly drained sites. While superficially the forest atop the Cordillera del Condor bears little resemblance to a pine barren, the analogy is supported by several convergent characteristics. The sparse canopy is composed of stunted trees of uneven height (6–9, rarely 12 m) and diameter (mostly 8–12 cm, not exceeding 20 cm). The more xeric facies of the ridgetop vegetation is dominated by a tree species that forms nearly monotypic stands. Ericaceous plants feature the heavy understory, which also contains a number of typical elements of the Andean flora: *Weinmania*, *Miconia*, *Ilex*, *Hedyosmum*, *Podocarpus*, etc. *Cyclanthaceae*, *Araceae*, orchids and terrestrial *Bromeliaceae* predominate in the lowest stratum, while the ground itself is carpeted with a thick layer of peat capped with mosses and pale billowy lichens. Tea-colored blackwater streams emerge from the lower slopes of the ridges to form extensive sphagnum bogs in the valleys.

The vegetation of the whole range from San José de Lourdes into the Chirinos Valley to the east gives the impression of being unproductive, as judged by the dwarfed trees, frequent bogs, and copious proliferation of lichens in every bare spot. The impoverishment of the region seems to extend to the birds as well, for the capture rates of our mist-net lines in 1975 were among the lowest we recorded at over 50 sites in Peru. Bird species diversity appears to be low as well. In 8 days of mist-netting and observation at two locations (1,950 and 2,200 m) in 1975 we found just over 40 species. We amplified the total number of forest species to about 70 during 3 weeks of intensive mist-netting and observation in 1976, but forests at this elevation in other parts of the Andes commonly harbor 80 to 100 species.

*Habits.*—Behavior of *H. leucoptera* strongly resembles that of its two well-known congeners. It forages solitarily or, more often, in pairs, usually concealed in the thick growth of the forest understory. It moves with frequent short flights, perching briefly on twigs, branches, and especially on thin vertical vines and leaf stems, which it appears to favor. It frequently hitches up these vertical perches, tail held upright, to probe and glean from adjacent leaves and bromeliads. Insects gleaned from twigs, stems, and leaf-litter probably comprise most of *leucoptera*'s food. During many glimpses of foraging individuals we saw them probe into the basal crevices between the leaves of bromeliads, which are abundant in its habitat. The conspicuously longer and thinner bill of *leucoptera* compared to that of *H. leucophrys* suggests that the new form may probe crevices for its food more habitually than *leucophrys* does.

During both visits to the type locality (18–25 June 1975 and 11–29 July 1976) we heard *leucoptera* singing regularly, especially in early morning and late afternoon.

*Voice.*—The song of *leucoptera*, similar to that of *leucophrys*, normally consists of a rich, warbled phrase (motif) repeated in rapid succession for up to 5 sec. Only one motif is used typically in an individual song, but occasional songs include a shift from one repeated phrase to a second one. A sample of the immense vocabulary of motifs sung by *leucoptera* is shown in Figure 2. Duetting by pairs of *leucoptera* was heard frequently, during which each bird repeated its own motif in syncopation with the other. This habit is well known in the other two *Henicorhina* species and in the related genus *Thryothorus*.

As the sonagrams indicate, *leucoptera* motifs separate into two categories (here

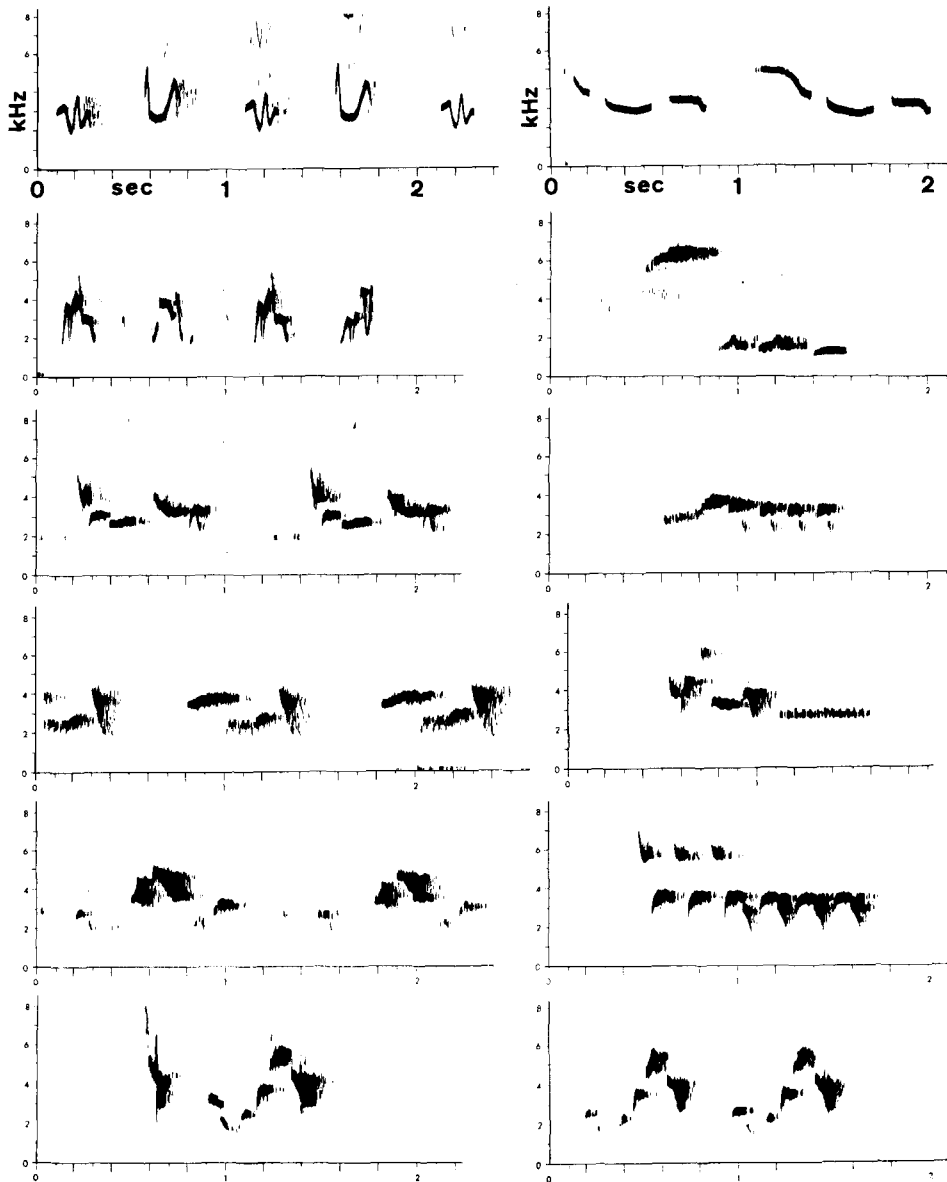


Fig. 2. Examples of the two song types of *Henicorhina leucoptera* (lower four in each column, type A on left, type B on right) compared with typical examples of its two congeners' songs. Type A motifs are repeated many times in succession as is the typical song of *H. leucophrys* (pair at upper left). Type B motifs are uttered singly or in pairs, in the fashion of *leucosticta* (pair at upper right). Lowermost sonagrams in each column show two variations on a single motif intermediate between types A and B. The sound laboratory of the Florida State Museum, Gainesville, Florida, has copies of the original sound recordings.

called types A and B), and the two song types appear to correspond to the different songs of *leucophrys* and *leucosticta*.<sup>1</sup> Type A motifs comprise the normal song of the

<sup>1</sup> The voices of all three species of wood-wrens are treated on a phonograph record entitled "The Wrens." 1977. 12-inch long-playing phono-disc album. ARA Records, published privately by J. W. and C. K. Hardy, Gainesville, Florida.

new form. They are repeated in rapid succession, and their warbled qualities resemble those of the normal *leucophrys* song. To the ear *leucoptera's* song is higher and faster with a more ringing quality and more frequent trills than the song of *leucophrys*. The new form may also exhibit a more varied repertoire of motifs than is known from *leucophrys*, and in this aspect its vocalizations seem more reminiscent of *leucosticta* (J. W. Hardy, pers. comm.). Type B motifs are uttered singly or in pairs, in the fashion of *leucosticta*. These are longer phrases than the type A motifs, beginning or terminating with a trill of varying rapidity. All type B motifs were uttered after a series of playbacks of the typical song brought an individual *leucoptera* very near the recorder. Phrases were sung at 10- to 30-sec intervals as the bird moved warily through the underbrush. This deliberate repetition of phrases, which is typical of the normal songs of *leucosticta*, may represent the types of song uttered by *leucoptera* when responding to a territorial intrusion. As in most wrens, *leucoptera* also utters a rapid, high-pitched chatter when alarmed.

*Systematic and ecological relationships.*—*H. leucoptera* is intermediate between its two congeners in the extent of white on its underparts, the boldness with which its black-and-white cheeks are delineated, and in the amount of gray on the crown (though this character is highly variable geographically in both *leucophrys* and *leucosticta*). Furthermore, as described above, the voice of *leucoptera* contains features of both congeners. Despite the presence of intermediate characters, however, *leucoptera* appears to be much more closely related to *leucophrys* both morphologically and behaviorally. The tail in all races of *leucophrys* averages 4 to 8 mm longer than that of *leucosticta*, and the tail of *leucoptera* is the longest of the three species (Table 1). The broad suffusion of gray on the breast and upper flanks of *leucoptera* resembles the plumage of *leucophrys* rather closely, while the underparts of both these species differ from the crisply defined broad white breast and belly of *leucosticta*. The primary song of the new form is nearly indistinguishable from that of *leucophrys*, and quite different from the deliberately repeated single phrases sung by *leucosticta*. Finally, both *leucoptera* and *leucophrys* occur at upper elevations in moist cloud forest habitats, while *leucosticta* is restricted to tropical lowlands.

*H. leucoptera* apparently represents a relict form whose distribution may have been restricted by ecological pressures from *leucophrys*, its closest relative. The presence of this and other unique forms on the Cordillera del Condor (unpublished records) may be related to the rather depauperate avifauna inhabiting this isolated range. The persistence of relict forest species under conditions of locally reduced competitive pressures has been documented on at least one other isolated mountain range in the Peruvian Andes (Terborgh and Weske 1975, Ecology 56: 562–576).

Ecologically *leucoptera* and *leucophrys* are very similar, but we have evidence for several factors that may be facilitating their coexistence on the Cordillera del Condor. As previously mentioned, the bill of *leucoptera* is substantially longer and thinner than that of *leucophrys*. In addition, the tarsi of *leucoptera* are exceptionally long in comparison with those of the Peruvian race of *leucophrys* (Table 1). Both these differences presumably reflect differences in their foraging methods, and support our observations that *leucoptera* spends more time on vertical perches and near the ground, probing for food among the leaf-litter and leaf bases, than does *leucophrys*.

Mist-netting results provide preliminary evidence for the altitudinal relationships of the two species. In a mist-net transect through the forest at 1,950 m we caught a total of 7 *leucophrys* and 6 *leucoptera* during our 2 visits to the area. However,

*leucoptera* was far more common than *leucophrys* in a transect of similar length at 2,200 m (23 *leucoptera* vs. 2 *leucophrys* over 2 years). On this transect, the new form proved to be the most common bird species in the nets. Finally at about 2,450 m atop the ridge where we worked in 1976, *leucophrys* was absent altogether, while *leucoptera* remained plentiful. Thus the new form appears to be most common at the top of the mountain ridge, replaced at lower elevations by *leucophrys* in a fashion typical of altitudinal relationships between close congeners elsewhere in the Andes (Terborgh 1971, Ecology 52: 23–40). Both species were absent at 850 m, where *Thryothorus maculipectus* was common.

Further information on the biogeographic status of *H. leucoptera* was obtained by John P. O'Neill and his co-workers in 1976. They collected one specimen of the new form, together with several *leucophrys*, at about 1,900 m near the top of a mountain ridge 150 km southeast of its type locality (see Fig. 1). Thus *leucoptera* is not restricted to mountains north of the arid Marañón Valley, as are many upper elevation forms in northern Peru. Furthermore, our topographic map (1973 Mapa Físico Político, Instituto Geográfico Militar del Perú; 1:1,000,000) shows this second locality to be on a ridge as isolated from the main Andes as is the Cordillera del Condor. This supports our hypothesis that *leucoptera* is a relict form, now probably restricted to isolated ridges in the central Andes.

Conspicuous wing bars are rare among wrens, and those of *leucoptera* are unique in the genus *Henicorhina* (though present in rudimentary form on a few individuals of *H. leucosticta prosthaleuca* of Central America). Bold white marking on the otherwise black wings of *leucoptera* probably evolved as a means of species recognition in the presence of its close relative, *leucophrys*. An analogous species pair may exist among the nightingale-wrens (*Microcerculus*), in which *M. bambla*, sympatric over much of its range with *M. marginatus*, has evolved a broad white bar across its otherwise brown wings and lower back. We are grateful to Eugene Eisenmann for bringing this interesting comparison to our attention.

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