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FURTHER NOTES ON CENTRAL AMERICAN BIRDS, WITH DESCRIPTIONS OF NEW FORMS

BY W. DEW. MILLER AND LUDLOW GRISCOM

This paper practically concludes the systematic study of our Nicaraguan collections. For the reason already given (Amer. Museum Novitates, No. 183), the new forms are all from the Subtropical Zone, in Nicaragua so difficult of access. Once again it is a pleasure to state our indebtedness to the authorities of the U. S. National Museum, the Bureau of Biological Survey, the Museum of Comparative Zoölogy, the Field Museum of Natural History, and to Dr. J. Dwight for the loan of important specimens for comparison, including great rarities and types.

It is hoped that all those having criticisms or corrections will communicate with the authors promptly, as the final report on the birds of Nicaragua will be ready for the printer early next year.

Cyanocompsa parellina dearborni, new subspecies

SUBSPECIFIC CHARACTERS.—Closely resembling *Cyanocompsa parellina beneplacita* Bangs of northeastern Mexico, but very slightly smaller, the bill decidedly larger, deeper, and wider; adult male not differing in color, but female a darker brown, particularly on the forehead, rump and tail; intermediate between *beneplacita* and typical *parellina* (Bonaparte) of Vera Cruz; adult male a much lighter and brighter blue than typical *parellina*.

TYPE.—No. 103,492, Amer. Mus. Nat. Hist.; ♂ ad.; San Rafael del Norte, Nicaragua; February 5, 1909; W. B. Richardson.

SPECIMENS EXAMINED

Cyanocompsa parellina beneplacita.—MEXICO: Tamaulipas, 5 ♂, 2 ♀; Nuevo Leon, 3 ♂.

Cyanocompsa parellina parellina.—MEXICO: Vera Cruz, 2 ♂, 1 ♀.

Cyanocompsa parellina dearborni.—NICARAGUA: San Rafael del Norte, 2 ♂, 1 ♀; Las Cañas, 1 ♂; Matagalpa, 1 ♂, 2 ♀.

We take pleasure in naming this new race in honor of Mr. Ned Dearborn, who was the first to call attention to the differences in southern specimens of this species and to record it from Nicaragua. He had only one female from the latter country. It is worthy of note that the variations in the bill do not seem to be correlated with differences in general size.

MEASUREMENTS OF ADULT MALES

Place	Wing	Tail	Bill from Nostril	Depth at Base	Width of Mandible at Base
Vera Cruz	65.4	49.4	9	8.8	8.5 mm.
" "	70	57.6	8.5	8.4	8.2
N. E. Mex.	67.7	51.6	7.8	8	7.3
"	70.1	56	8.5	7.5	7.4
"	70	58.5	8.2	7.5	7.4
"	70	56	8.5	8	7.3
"	70	57	8.1	7.3	7
"	69	55.5	7.8	8	7.1
"	70	56.5	8	8.1	7
"	68	54	8		[6.2]
Nicaragua	68.2	52.1	9	8.2	7.5
"	67.5	54.6	8.3	8	7.9
"	69.7	52	9	[8.3]	8.5
"	68.8	53.3	9	9.1	8.6

MEASUREMENTS OF ADULT FEMALES

Vera Cruz	8.5	7.9	8
N. E. Mex.	7.8	7.1	7.2
"	7.8		7.1
Nicaragua	9.2	8.9	8.5
"	9.1	8.5	7.8
"	9	9	8.8

***Aimophila botterii vulcanica*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Aimophila botterii sartorii* Ridgway of southern Mexico in being equally dark above, but rufescent edgings to feathers of back and wings even broader, conspicuous on wing-coverts and secondaries; even darker below, more intensely smoke-gray and brown, less buffy; much larger.

TYPE.—No. 144,624, Amer. Mus. Nat. Hist.; ♂ ad.; Volcan Viejo, 4500 ft., Chinandega, Nicaragua; June 2, 1917; W. DeW. Miller.

SPECIMENS EXAMINED

Aimophila botterii botterii.—TEXAS: 3 ♂. ARIZONA: 3 ♂. MEXICO: Tamaulipas, 7 ♂; Cuernavaca, 4 ♂; Orizaba, 1 ♂; Puebla, 1 ♂; Chiapas, 1 ♂.

Aimophila botterii sartorii.—MEXICO: Palenque, Chiapas, 1 ♂.

Aimophila botterii vulcanica.—NICARAGUA: Volcan Viejo, 11 ♂, 2 ♀.

Any treatment of this particular species of *Aimophila* must be regarded as tentative until an adequate series of *A. b. petenica* from northern Guatemala can be studied. Mr. Ridgway has examined the unique female and has had the opportunity of comparing it with the type of *sartorii*. We quote freely his comments and measurements, in the appended summary of the information available at this time.

1.—*Aimophila botterii botterii* (Slater). A relatively pale and dull-colored bird, the feathers of the upperparts and wing-coverts mainly rufous with a dark central shaft streak and gray edging; worn birds consequently appear more solidly rufous; underparts chiefly light buffy; size absolutely larger. Southern Arizona and Texas south to Chiapas (breeding) and Vera Cruz (breeding).

2.—*Aimophila botterii sartorii* Ridgway. Very much darker and much smaller; feathers of upperparts mainly sooty with gray edgings; rufous color when present reduced to a narrow edging on the terminal half of the feather; wing-coverts wholly or almost devoid of rufous edging; less buffy, more smoky gray below. Known only from Chiapas and Vera Cruz.

3.—*Aimophila botterii petenica* (Salvin). The single female is stated by Mr. Ridgway to be practically identical with *sartorii* in coloration but to be about a millimeter shorter in the wing than his smallest female *sartorii*. We note, however, that in this group the female always averages smaller. We judge, therefore, that his three females do not actually indicate the possible minimum for *sartorii*. We also note that his detailed description of *petenica* mentions the "almost chestnut" edging of the wing-coverts, a character clearly indicated in the plate in the 'Biologica Centrali Americana.' This character is not mentioned in any description of *sartorii* and, judging by our single specimen, could not occur.

4.—*Aimophila botterii* subspecies? A worn male from Antigua, base of Volcan de Agua, Guatemala, in the Dwight Collection, is at present indeterminable. In general coloration it is intermediate between *botterii* and *sartorii*, but very much nearer the latter in general darkness. Like *botterii*, however, the feathers are chiefly rufous above, the wing-coverts are conspicuously rufous, and the secondaries are prominently edged with rufous. The under tail-coverts are much buffier than any other part of the underparts. The size (wing, 63.8 mm.; tail, 65.2) greatly exceeds the known maximum for *sartorii*, and is about medium for *botterii*.

5.—*Aimophila botterii vulcanica* Miller and Griscom. As dark as *sartorii* in general color, even darker below; rufous edgings conspicuous as in *botterii* and the Guatemalan bird. Size similar to these also.

We are inclined to suspect that *sartorii* is specifically distinct from *botterii*, as it was originally described. Whether *petenica* is distinct from it as a subspecies, or whether it is a subspecies of *botterii* remains to be determined. In any event the Guatemalan specimen, discussed above, is a distinct subspecies of *botterii*. The Nicaraguan bird is obviously a distinct subspecies of *botterii*, no matter what *petenica* proves to be, or how the relationships of *botterii* and *sartorii* are regarded in the future.

	MEASUREMENTS			
	MALES		FEMALES	
	Wing	Tail	Wing	Tail
<i>botterii</i>	59.6-69.8	59.1-70.6	58.4-68	56.3-64.2 mm.
Subsp. ? Antigua,				
Guatemala	63.8	65.2		
<i>vulcanica</i>	60.4-64.8	62.5-68	58.5-60	60.6-64
<i>sartorii</i>	54.8-58.9	53-57.6	56.6-59.6	54.1-57.9
<i>petenica</i>	?	?	55.8	53.4

Melozone leucotis nigrior, new subspecies

SUBSPECIFIC CHARACTERS.—Closely resembling *Melozone leucotis leucotis* Cabanis from Costa Rica, but black chest patch much wider, usually embracing the sides of the breast; the black throat usually confluent with the black chest, the band of white separating them reduced to a few feathers only with white bases, rusty in the exact center of the throat, or entirely absent.

TYPE.—No. 144,638, Amer. Mus. Nat. Hist.; ♂ ad.; Matagalpa, 2300 ft., Nicaragua; April 27, 1917; Miller and Griscom.

SPECIMENS EXAMINED

Melozone leucotis leucotis.—COSTA RICA: 3 ♂, 4 ♀, 1 ?, 2 juv.

Melozone leucotis nigrior.—NICARAGUA: 8 ♂, 7 ♀, 3 ?, 1 juv.

The greater amount of black on the chest and throat in the proposed new form is readily apparent in a series. In the Costa Rican subspecies the chest patch is much more restricted and is separated from the gray sides of the breast by a white border coming up on each side from the white abdomen, and connecting with the white band separating the throat from the chest. This band extends entirely across the breast, is always conspicuous, and often expands into a distinct patch in the center, which is rusty in the middle. We find that the same relative difference exists in the juvenal specimens examined. There is a slight sex difference also, not previously recorded, as females in both series have smaller chest patches than males. *Melozone occipitalis* (Salvin) of Guatemala is closely related, but there is even less black on the chest than in typical *leucotis*. In addition to the characters given by Ridgway, it is also much browner on the upperparts, and the white supraorbital spot is continuous with the loreal spot.

Icterus sclateri alticola, new subspecies

SUBSPECIFIC CHARACTERS.—Similar to typical *Icterus sclateri sclateri* Cassin of the Pacific lowlands from northwest Costa Rica to Tehuantepec, but back with more black in all ages of both sexes, in adult males almost solid black, the yellow bases showing on the surface only as an occasional spot, very different from the yellow back of *sclateri* with black streaks; decidedly larger. Superficially almost indistinguishable in color from typical *gularis*, a much larger bird with relatively the shortest and deepest bill in the genus, with powerful feet, constituting a subgenus *Andriopsar* Cassin.

TYPE.—No. 58978, Dwight Coll.; ♂ ad.; Progreso, Guatemala; Anthony.

SPECIMENS EXAMINED

Icterus sclateri sclateri.—COSTA RICA: Bebedero, Guanacaste, 6 ♂, 2 ♀. NICARAGUA: Chinandega, 1 ♂, 2 ♀; Tipitapa, 1 ♀; Calabasas (1400 ft.) 1 ♀ (intermediate in both color and size); Leon, 1 ♀. MEXICO: Tehuantepec, 3 ♂, 1 ♀.

Icterus sclateri alticola.—GUATEMALA: no definite locality (von Patten); Progreso (40 miles east of Guatemala City), 3 ♂, 3 ♀, 1 ?; Volcan Zunil, 1 ♀. NICARAGUA: El Tanque (3000 ft.), 1 ♂.

This new subspecies is so distinct from typical *sclateri* that it requires no further comparison. Its close resemblance in color to *I. gularis* is of great interest, but the two species are easily distinguished by size and structural differences. Typical *sclateri* is the coastal or lowland form, and *alticola* replaces it in the highlands above 2000 ft. The Nicaraguan male has a few more yellow spots on the back than the Guatemala specimens, but is equally large and obviously belongs here. The Calabasas (alt. 1400 ft.) specimen is intermediate in both color and size, and even the Tipitapa specimen shows a distinct increase in the density of the black streaking. We append a table of measurements of our adult males.

	Wing	Tail	Culmen
Three males; highlands of Guatemala (<i>alticola</i>)	110-113.5	93.5-97.5	20.4-21 mm.
One male; highlands of Nicaragua (<i>alticola</i>)	115.5	97	20
Five males; Costa Rica (Guanacaste) (<i>sclateri</i>)	103-108	85.5-91.8	19 -20
Two males; Tehuantepec (<i>sclateri</i>)	105-106.5	88.5-92	19 -19.5

***Corvus corax richardsoni*, new subspecies**

SUBSPECIFIC CHARACTERS.—Resembling *Corvus corax sinuatus* Wagler of Mexico in size and proportions, but iridescent gloss everywhere dark steel-blue or bluish green, instead of rich violet. Measurements of type: wing, 435 mm.; tail, 224 mm.; culmen, 69 mm.; tarsus, 67.5 mm.

TYPE.—No. 144,788, Amer. Mus. Nat. Hist.; ♀ ad.; San Rafael del Norte (4100 ft.), Nicaragua; April 2, 1917; Miller, Griscom, and Richardson.

SPECIMENS EXAMINED

Corvus corax richardsoni.—NICARAGUA: the type.

Corvus corax sinuatus.—MEXICO: 13 ♂, 13 ♀. ARIZONA: 4 ♂, 1 ♀. TEXAS: 1 ♂. UTAH: 4 ♂, 4 ♀. MONTANA: 1 ♂. BRITISH COLUMBIA: 1 ♂, 2 ♀.

Corvus corax principalis.—ALASKA: 2 ♂, 5 ♀. NORTHWEST TERRITORY: 1 ♂. ALBERTA: 1 ♂. QUEEN CHARLOTTE ISLANDS: 1 ♂, 1 ♀. WASHINGTON: 1 ♀. OREGON: 1 ♀.

Corvus corax islandus.—GREENLAND: 5 ♂. ICELAND: 1 ♂. UNGAVA, 2 ♂, 1 ♀ (approaching *principalis*).

Our study of 105 ravens available from the New World has been greatly simplified by Dr. Oberholser's painstaking and elaborate revision (Ohio Journal of Science, XVIII, No. 6, pp. 213-225), and we endorse his conclusions in every particular. Both Hartert and he pointed out differences between Alaska and Greenland specimens. Our material confirms these and adds one or two other characters. The most important point is the color difference which seems to separate all western

from eastern specimens. Starting in Mexico with *sinuatus* we find a bird that has a rich violet gloss all over. Birds from Alaska and the northwest are not quite so brilliant, but on the whole they would be described as uniform-violet, except on the belly which is bluish. Specimens from eastern North America from Greenland south to South Carolina (*islandus* and *euophilus*) have the wing-coverts, secondaries and scapulars rich violet, but the back, crown, cheeks, throat and breast are blue or bluish green in marked contrast to the violet wings. At most there is a purplish tinge to the throat feathers. This character enables every specimen to be named at sight without comparison. In addition the heavy, powerful feet, and the different size proportions would, in our opinion, justify the separation of the Greenland bird, without the color characters. Ungava specimens approach *principalis* in the relatively longer tarsus. The race Dr. Oberholser named from Alabama and the eastern United States, *euophilus*, is a small southern extreme of the Greenland bird, thoroughly worthy of separation.

In 1906 Hantsch separated the Iceland raven as *islandus* (Orn. Monatsberichte, XIV, p. 130). He compared it with typical *Corvus corax* and the Faroe Island bird, and went by Ridgway's measurements in regarding it as slightly smaller than *principalis*. Hartert, in his supplement to Vol. I, 'Vögel der Palæarktischen Fauna,' p. 2019, comments on the fact that it is very similar to Greenland birds and not always separable. Hantsch's measurements of a large series agree with our measurements of Greenland specimens minutely, both in size and relative proportions, and a single Iceland specimen before us is quite inseparable from Greenland birds, but is separable from Alaska birds in exactly the same respects as the Greenland bird. We formally propose, therefore, the addition of *Corvus corax islandus* Hantsch to the 'North American Check-List' on the basis of its occurrence in Greenland.

MEASUREMENTS

	Wing	Culmen	Tarsus
Two males; Alaska	429-433	76.5-77.5	65 -71.5 mm.
Six males; Alaska (Oberholser)	426-457	67 -76	66 -71
Four males; Greenland	427-439	75 -80	64 -68
Two males; Ungava	431-440	76.5-78	69.5-72
Twelve males; Iceland (Hantsch)	410-452	66 -75	61 -69
One male; Iceland	430	77	66.5

The Nicaraguan race, *richardsoni*, is a southward extension of the range of the species. It is named in honor of Mr. W. B. Richardson, who has sent us a splendid collection of Nicaraguan birds over a period

of many years of active field work. It is markedly distinct from *sinuatus* in color, and differs from *euophilus* and *islandus* in the total absence of violet gloss even on the wings.

***Cyanocitta stelleri ridgwayi*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Cyanocitta stelleri coronata* (Swainson) of southeastern Mexico, but white spot on lower eyelid always present, averaging larger; light-colored feathers on forehead at base of crest light azure blue, never white; throat patch larger, whiter, less gray, less broken with sooty margins and tips to the feathers; upperparts a purer blue with less contrast between the back and the rump, appearing lighter in that the dusky tint to the feathers of the back is lacking.

TYPE.—No. 42,316, Amer. Mus. Nat. Hist.; ad. (♀ by measurements); Volcan de Fuego, Guatemala; September 18, 1859; Osbert Salvin.

***Cyanocitta stelleri suavis*, new subspecies**

SUBSPECIFIC CHARACTERS.—The brightest and bluest of all the races of the species; above very closely resembling *Cyanocitta stelleri ridgwayi nobis* of western Guatemala, but appreciably lighter and brighter blue; white on lower eyelid and color of forehead as in *ridgwayi*; throat patch different from that form, closer to *coronata*, but even more restricted, more broken with sooty tips to the feathers, the chin always sooty; underparts decidedly different from both races, the blue of the throat and breast without dusky tint, more sharply defined from the back on the side of the head, the belly distinctly lighter and glaucous azure blue; bill distinctly longer and deeper than either *ridgwayi* or *coronata*.

TYPE.—No. 144,795, Amer. Mus. Nat. Hist.; ♂ ad.; San Rafael del Norte (4000 ft.), Nicaragua; March 24, 1917; Miller and Griscom.

SPECIMENS EXAMINED

Cyanocitta stelleri coronata.—MEXICO: Orizaba, Vera Cruz, 1 ♂, 1 ?

Cyanocitta stelleri ridgwayi.—GUATEMALA: Volcan de Fuego, the type; Quetzaltenango, 3 ♂, 1 ♀.

Cyanocitta stelleri suavis.—NICARAGUA: San Rafael del Norte, 8 ♂, 3 ♀. HONDURAS, 1 ?

Our Guatemala specimens fully confirm the characters first mentioned by Mr. Ridgway ('Birds N. and Mid. America,' III, p. 363, footnote), and we consequently take pleasure in naming it after him. The Nicaraguan race is the purest blue and the handsomest of all the races. While *ridgwayi* is intermediate between *coronata* and *suavis* in general color, it is quite distinct from either in the throat patch. An old Honduras skin is intermediate between *ridgwayi* and *suavis*, but nearer the latter. In so variable a species far larger series must be available before the ranges of the various races from central Mexico southward can be determined. It is by no means certain, for instance, that specimens from central or northern Guatemala will prove referable to *ridgwayi*.

In Vera Cruz both *azteca* and *coronata* are recorded from the same localities (Mirador and Orizaba). Judging by Mr. Ridgway's remarks *ridgwayi* occurs in Chiapas.

MEASUREMENTS OF BILL

	Exposed Culmen	Depth of Bill at Nostril
Three males; <i>coronata</i> (Ridgway)	av. 25.5	av. 9.5 mm.
Three males; <i>ridgwayi</i>	24.5-26.5 (25.1)	8.8- 9.8
Seven males; <i>suavis</i>	24.5-27 (26.1)	9.8-10.5

Cissilopha melanocyanea chavezii, new subspecies

SUBSPECIFIC CHARACTERS.—Similar to typical *Cissilopha melanocyanea melanocyanea* (Hartlaub) of Guatemala, but black areas extending much farther down on back and breast, less sharply defined below; belly, sides, flanks and under tail-coverts deep dusky Prussian blue, instead of light grayish glaucous blue; upperparts, wings and tail slightly darker blue, more cobalt, less cerulean.

TYPE.—No. 101,402, Amer. Mus. Nat. Hist.; ♂ ad.; Matagalpa, Nicaragua; March 23, 1907; W. B. Richardson.

SPECIMENS EXAMINED

Cissilopha melanocyanea chavezii.—NICARAGUA: Rio Coco, 1 ♂; Ocotal, 1 ♂, 2 ♀; San Rafael del Norte, 1 ♀; Matagalpa, 2 ♂, 2 ♀. Honduras, 1 ?

Cissilopha melanocyanea melanocyanea.—GUATEMALA: Lake Amatitlan, 5 ♂, 1 ♀; Antigua, 4 ♂, 4 ♀; Progreso, 1 ♂.

The Nicaraguan race is named in honor of Don Diocletiano Chavez, a diligent student of Nicaraguan birds, and the founder of the natural history collections in the Managua Museum. He collected this species at San Rafael del Norte.

The new form is almost a distinct species, so obviously and so markedly does it differ from typical *melanocyanea* of Guatemala. We have not cited among the specimens listed an old skin from "Honduras," No. 42,292, from the Lawrence Collection. Mr. Ridgway in discussing this species comments on this specimen at length. As he says, it is a darker blue above with an almost purplish cast on the tail, and is dusky cobalt-blue on the belly. It is quite different from the Nicaraguan race in both respects, but is distinctly intermediate between *melanocyanea* and *chavezii* in the color of the underparts. Two other "Honduras" specimens examined by Mr. Ridgway were "quite like Guatemala specimens," but curiously enough our other "Honduras" skin is quite like *chavezii*. The peculiar Honduras specimen described above is probably an unnamed subspecies, connecting *melanocyanea* with *chavezii*, the formal characterization of which can well await the receipt of further specimens, showing a definite geographical range. Were it not for this evidence we would have regarded *chavezii* as specifically distinct.

A REVIEW OF *Turdus assimilis*¹ CABANIS

This thrush is probably one of the most remarkably variable birds of Central America. For some time it has been apparent that the species needed revision from the treatment accorded it by Mr. Ridgway (1907, 'Birds of North and Middle Amer.,' IV, pp. 108-112). In that treatment *cnephosa* Bangs was given as ranging from Oaxaca to western Panama on the Pacific slope, and *leucauchen* Selater from central Guatemala to central Costa Rica. Mr. Ridgway's material was of necessity relatively quite limited, and the ranges assigned to the various forms were often presumptive and could not be based on an examination of specimens. In certain respects material of this species has been greatly increased since 1907. Dearborn described a very ruddy form, *rubicundus*, from western Guatemala, and as no form of *assimilis* occurs in western Nicaragua, this left *cnephosa* with a very anomalous range. Similarly a remarkably black and white race turned up in the highlands of Nicaragua, apparently splitting the range of *leucauchen* into two isolated colonies.

In an effort to solve some of these apparent anomalies, we have assembled practically all the specimens in the great eastern collections, and are under the greatest obligations to the U. S. National Museum, the Bureau of Biological Survey, the Museum of Comparative Zoölogy, the Field Museum of Natural History, and Dr. J. Dwight, for the opportunity of studying much important material including such types as exist in this country.

It is a matter of some surprise that the 245 skins before us, while straightening out some of the difficulties alluded to above, raise others which are quite insoluble at the present time, and it is apparent that far more material from critical localities and careful field experience is needed before the puzzling variations of this species can be understood and a systematic treatment be devised which will reasonably express them. A further complication is the relation of *assimilis* to several species in South America. Nor can we entirely eliminate the strong appearance of convergence of characters exhibited by series widely separated geographically, with the intermediate area occupied by one or more subspecies strikingly distinct. This genus in the Neotropical

¹For change of specific name from *tristis* to *assimilis* cf. Oberholser, 1921, Proc. Biol. Soc. Wash., XXXIV, p. 106. While we accept this change, there seems to be a technical point involved in this case not covered by any of the examples given in the A. O. U. Code. The rule, "once a synonym always a synonym," is based on cases where the primary combinations are the same, regardless of whether the earlier one was applied to a bird now in a totally different family. If Swainson had described his new species as *Turdus tristis*, it would of course be invalidated by any other earlier *Turdus tristis*. But he described it as *Merula tristis*. We know of no definite ruling in the code which would invalidate the specific name *tristis*, for *Merula*, when *Merula* must become *Turdus*, because of an earlier *Turdus tristis* now in some other family.

Región has long been noted for the close resemblance of the species in several groups. It is very interesting, therefore, to find the races of *T. assimilis* varying in such divergent ways that the extremes appear far more distinct than are many of the species of the genus from each other.

We give below a tentative arrangement of the races of *assimilis*, with such comment on the facts as seems pertinent, in the hope that it will be of assistance to future workers.

1. *Turdus assimilis assimilis* Cabanis

Turdus assimilis CABANIS, 1850, Mus. Hein., I, p. 4 (Jalapa, Vera Cruz).

Merula tristis SWAINSON (Temascaltepec, Dept. of Mexico).

Turdus assimilis lygrus OBERHOLSER, 1921, Proc. Biol. Soc. Wash., XXXIV, p. 106 (new name for *Planesticus tristis tristis* of recent authors).

CHARACTERS.—Sexes similar in color; upperparts deep buffy olive or olive-brown; chest, sides, and flanks buffy Broccoli-brown, drab, or hair-brown; wing, in ♂, 121–125.

RANGE.—Departments of Mexico, Tamaulipas, Vera Cruz and northeastern Oaxaca.

SPECIMENS EXAMINED.—MEXICO: Oaxaca, 1 ♂; City of Mexico, 1 ?; Tamaulipas, 1 ♂, 1 ?; Vera Cruz, 11 ♂, 8 ♀, 8 ?

A specimen from the Valley of Mexico in the Field Museum proves to be identical with topotypes of *assimilis* Cabanis from Jalapa, Vera Cruz, so that *tristis* Swainson becomes a synonym of *assimilis*. The typical form is consequently the *Planesticus tristis assimilis* of Mr. Ridgway's treatment. As *Turdus assimilis lygrus* Oberholser is a new name for the old *Merula tristis* Swainson, which is the same as *assimilis* Cabanis, *lygrus* is also a synonym of *assimilis*, and the race of western Mexico needs a new name.

2. *Turdus assimilis renominatus*, new name

Planesticus tristis tristis of recent authors, not Swainson.

CHARACTERS.—Obviously distinguishable from typical *assimilis* in series by being larger and paler; upperparts clear grayish to plain olive-brown; chest, sides, and flanks light buffy grayish brown to light Isabella; wing, in ♂, 122.5–133.5; bill dusker, less yellow, especially on terminal half of maxilla.

RANGE.—Western Mexico, in States of Sinaloa, Durango, Jalisco and Tepic to northwestern Oaxaca.

SPECIMENS EXAMINED.—MEXICO: Sinaloa, 6 ♂, 4 ♀; Jalisco, 8 ♂, 6 ♀; Tepic, 5 ♂, 1 ♀; Colima, 1 ?; Guadalajara, 1 ?; "Mexico," 1 ?

This is the typical *Planesticus tristis* of Mr. Ridgway's treatment, which, as shown above, requires a new name. We designate Juan. Lisiarraga Mountain (alt. 5500 ft.), southern Sinaloa, as the type

locality, and No. 91949, A. M. N. H., as the type. It should be noted that very old specimens are much browner, even more so than typical *assimilis*.

3. *Turdus assimilis leucauchen* Selater

Turdus leucauchen SCLATER, 1858, P. Z. S., p. 447 (Guatemala).

CHARACTERS.—Very different from the Mexican races, appearing almost specifically distinct; upperparts varying from grayish olive to dark slaty olive with the faintest perceptible tinge of brown; chest, sides and flanks hair-brown or olive-gray; throat streaks blacker, the white patch on lower throat more contrasted.

RANGE.—Northern and Central Guatemala to eastern Guatemala on the Caribbean slope.

SPECIMENS EXAMINED.—GUATEMALA: no locality, 2 ♂, 5 ?; Choctum, Vera Paz, 2 ? (1 olive, 1 slate); Los Amates, Izabel, 2 ♂ (both olive).

Material from Guatemala is still entirely inadequate. Typical *leucauchen* is probably from the highlands of Vera Paz, and we have seen a specimen from Choctum, *ex* the Salvin and Godman Collection, marked "compared with the type." All but two of the available specimens are old trade skins and the majority are not sexed. We have seen no definitely determined female, so do not know whether the most slaty birds are adult males and the more olive ones females and immature males, as is definitely proved to be the case with the Costa Rican race, but we suspect that this will prove to be so. Otherwise there would be a most remarkable amount of individual variation, which cannot be correlated geographically. We have seen no specimens in any way connecting *assimilis* with *leucauchen*.

4. *Turdus assimilis rubicundus* (Dearborn)

Planesticus tristis rubicundus DEARBORN, 1907, Field Mus. Nat. Hist., Orn. Series, I, No. 3, p. 137 (Patulul, Solola, Guatemala).

CHARACTERS.—Differing from *T. a. assimilis* in darker coloration, the upperparts and flanks richer, more ferruginous brown. Upperparts bistre to rusty mummy-brown; chest, sides and flanks bright Broccoli-brown; wings and tail much darker than upperparts, as in *leucauchen*, but not as in *assimilis*; throat streaks very dark and white throat patch very contrasted. Conspicuously different from *T. a. leucauchen* and other gray races.

RANGE.—Recorded only from the type locality, which is on the Pacific slope of Guatemala, but Dr. Hellmayr informs us, *in litt.*, that he has seen a specimen from Salvador which closely approached the type, though slightly paler on the flanks and less rufescent above. Another specimen, however, from the same locality, was found to be barely separable from typical *assimilis*.

SPECIMEN EXAMINED.—GUATEMALA: Patulul, 1 ♀ (the type).

Further material is essential to confirm the status of this race but, judging from the type, it should prove a tenable form, ranging from western Guatemala to Salvador on the Pacific slope. Years ago Salvin and Godman commented on the brownness of specimens from the western parts of Guatemala, their material coming from Dueñas, which is east of Patulul, on the eastern slope of the western cordillera. One of these specimens is before us. It is exactly intermediate in color between *rubicundus* and the olive extremes of *leucauchen*, just as it is geographically intermediate. Curiously enough this intermediacy of color makes it quite indistinguishable from typical *assimilis*. The systematist can choose, therefore, whether he shall name his specimen purely on the basis of its characters, or whether he shall consider the physiographic impossibility of typical *assimilis* ranging continuously from Vera Cruz to west central Guatemala. The latter consideration weighs strongly with us and, considering the paucity of material, we do not feel justified in recording *assimilis* from Guatemala.

5. *Turdus assimilis atrotinctus*, new subspecies

SUBSPECIFIC CHARACTERS.—The dark extreme of the species; upperparts in adult males slaty black, changing to sooty black on wings, tail and pileum; no tinge of olive above; chest, sides and flanks deep mouse-gray, decidedly different from the hair-brown of *leucauchen*; adult females deep slaty olive above, darker on the pileum; below as in adult males, but chest, sides and flanks tinged with olive.

TYPE.—No. 102604, Amer. Mus. Nat. Hist.; ♂ ad.; Tuma, Matagalpa, Nicaragua; November 28, 1907; W. B. Richardson.

RANGE.—Breeding on the Caribbean or eastern slope of the highlands of Nicaragua in the lower half of the Subtropical Zone, and descending to lower levels at other seasons.

SPECIMENS EXAMINED.—NICARAGUA: Ocotal, 1 ♀; Rio Coco, 1 ♂; San Rafael del Norte, 1 ♂; Vizagua, 1 ♂; Tuma, 1 ♂; Matagalpa, 2 ♂, 1 ♀.

It is hard to believe that this black, white and gray robin with differently colored sexes is conspecific with the brown *assimilis* of Mexico with similarly colored sexes. Salvin (1872, Ibis, p. 314) years ago commented on the blackness of a specimen collected by Belt at Chontales, but supposed it was melanistic. Our series, however, establishes the constancy of this character and its racial value. The adult male of *atrotinctus* scarcely seems conspecific even with *leucauchen*, but females of the new form are but little darker than the slatiest specimens from Guatemala.

6. *Turdus assimilis oblitus*, new subspecies

SUBSPECIFIC CHARACTERS.—Intermediate between *leucauchen* and *atrotinctus*; sexes quite different; in fully adult males the upperparts are dull slate, much paler

than in *atrotinctus*, but without the olive tone always present in *leucauchen*; younger males and females not with certainty distinguishable above from the more olive extremes of *leucauchen*; chest, sides, and flanks of fully adult males light mouse-gray, paler and less brown than in *leucauchen*, much paler than in *atrotinctus*; the same parts in younger males and females much paler than in *leucauchen*, particularly on the chest, making the white throat patch appear less contrasted.

TYPE.—No. 21261, Coll. E. A. and O. Bangs (now in Museum of Comparative Zoölogy); Tenorio, Costa Rica; February 11, 1908; C. F. Underwood.

RANGE.—The whole of Costa Rica except the extreme southwest portion. Birds from the Dota Mountains approach *cnephosa*.

SPECIMENS EXAMINED.—COSTA RICA: numerous localities north central and eastern sections, 13 ♂, 6 ♀; Dota Mts., 21 ♂, 9 ♀.

Costa Rican birds have, heretofore, been referred to *leucauchen* of Guatemala. Separated as they are by a black race in Nicaragua, it is not surprising that they should prove subspecifically distinct when adequate series are compared. Our large series also enable us, we believe, to straighten out the relations of this form with *cnephosa*, which we discuss beyond. However we cannot account for four specimens (3 ♂, 1 ♀) from the lowlands of British Honduras. Geographically these birds are nearest *leucauchen*, but they are not satisfactorily distinguishable from *oblitus*, and show the same sex differences. Their measurements are all near the minimum for *oblitus*, however, and two out of four are slightly paler below. It is possible, therefore, that an adequate series will in future show them to be separable on these characters.

7. *Turdus assimilis cnephosa* (Bangs)

Merula leucauchen cnephosa BANGS, 1902, Proc. N. E. Zoöl. Club, III, p. 92 (Boquete, Chiriqui).

Planesticus tristis panamensis GRISCOM.

SUBSPECIFIC CHARACTERS.—Sexes similar in color; no trace of slate in plumage as in *leucauchen*, *atrotinctus*, and *oblitus*; upperparts a browner olive than in females of *oblitus*; chest, sides and flanks buffier than in *oblitus*, scarcely distinguishable from some variations of typical *assimilis*.

RANGE.—Mountains of western Panama in the Subtropical Zone from Veraguas to Chiriqui; non-typical specimens, approaching *oblitus*, occur in extreme southwestern Costa Rica and are best referred here.

SPECIMENS EXAMINED.—Very large series from Veraguas and Chiriqui, Panama, and Boruca, Costa Rica, including the type.

The discovery that the sexes differ in color in the Costa Rican *oblitus* and do not in *cnephosa* helps, we think, to untangle the relations between these races, which are really very distinct. It will be recalled that *cnephosa* was supposed to occur with *oblitus* (*leucauchen* of authors) in the Dota Mountains, but this interpretation seems to have resulted

from regarding all the more olive females and young males of *oblitus* as *cnephosa*. With the exception of the type series of *cnephosa* in the Museum of Comparative Zoölogy, practically all the specimens representing this subspecies in American museums come from Boruca in southwestern Costa Rica, and it has not been generally realized that these do not properly represent it. While the olive-brown *cnephosa* is very distinct from the slaty males of *oblitus*, the large series before us from intermediate points represent perfect stages of intergradation. Thus the Dota series might be described as one-third of the way to *cnephosa*. The sexes still differ slightly, the males are never so pure a slaty, the females a trifle browner in series. The Boruca series is another third of the way towards typical *cnephosa*. The sexes are not essentially different in color, only a minority of the males showing the faintest trace of slate or gray in the upperparts. The females are scarcely distinguishable from the two females in the type series from Boquete. As might be expected in such large series of intermediates, one or two specimens from each locality might be referred to either type of intermediate with equal propriety.

The same general misconception as to the proper characters of *cnephosa* mislead the junior author in describing *panamensis* from Cerro Flores, eastern Chiriqui (1924, Amer. Mus. Nov., No. 141, p. 7). This series and a larger one recently received from Santa Fé, Veraguas, are not quite typical of *cnephosa* either. As stated in the original description they are very slightly more olive, less brown, above, and more olivaceous, less buffy, below. While quite different from the Boruca and Dota Mountains specimens, labelled *cnephosa*, used in comparison, their separation from typical *cnephosa* is unnecessary, and it would serve no more useful purpose to maintain this subspecies than to describe the Dota Mountains and Boruca series.

If the relations between *cnephosa* and *oblitus* can be regarded as clear, the same cannot be said for the relations of *cnephosa* with more northern races, where the sexes are also similar in color. Dearborn, who collected two male specimens of *leucauchen* of the olive type of coloration at Los Amates, Guatemala, has commented on how closely they resemble *cnephosa*. While this does not prove to be the case, when they are compared with topotypes from Boquete, they are quite inseparable from certain specimens from Cerro Flores and Santa Fé, which, as we have shown above, while not typical, are best called *cnephosa*. It also transpires that the extension of the range of *cnephosa* northward to southeastern Oaxaca, to include the whole Pacific slope of Central America, was based on two breeding birds from Santo Domingo, Oaxaca, which are

now before us. These two specimens are a trifle grayer olive above and slightly paler, less buffy below than typical *cnephosa*, but on the basis of their characters would have just as strong a claim to be named *cnephosa* as the series from Boruca or Cerro Flores. The case is analogous to that of the peculiar British Honduras specimens discussed earlier. On geographical grounds it is scarcely satisfactory to call them *cnephosa*, when we consider that the species is almost certainly absent from western Nicaragua, and that the Pacific slope of Salvador and Guatemala is occupied by the very distinct *rubicundus*. Perhaps further specimens will confirm the constancy of these very slight differences, and Oaxaca birds will prove separable.

To sum up the preceding discussion of the seven races of *Turdus assimilis*, which it seems necessary to recognize, they fall very naturally into three groups. First, there is the olive-brown group with similarly colored sexes represented by typical *assimilis*, *renominatus* and *cnephosa*. Second, there is the slaty group, represented by *oblitus*, *atrotinctus* and *leucauchen*, in two of which, at least, the sexes are differently colored. Third, there is the rusty tinted *rubicundus*. The distribution of these three types of coloration is so mixed geographically, that no evidence of a point of origin or radiation is available. The slaty group of the *leucauchen* type has, however, a consistent and continuous geographical distribution. It would be possible to regard this group as specifically distinct from *assimilis* and to consider that it hybridized with *cnephosa* in southern Costa Rica and was becoming fused with some representative of the *assimilis* group in Guatemala. Hybridization is always hard to prove, and the available evidence does not tend to endorse this theory. Nor would it relieve the complications of the situation, as *cnephosa* could not be regarded as specifically distinct from *assimilis*. Not only would we have the same subspecific difficulties, but our species would have an inexplicably discontinuous distribution, a situation quite without precedent in Central America.

THE RELATIONS OF *Turdus assimilis* TO SOUTH AMERICAN SPECIES

In eastern Panama and western Colombia there is a closely related robin which in recent years has been called *Planesticus tristis daguæ*, though it was originally described as a full species by Berlepsch. In color characters it is about halfway between *assimilis* and *phæopygos* Cabanis from eastern South America, and if it is called a race of the former, the latter could not be maintained as a distinct species. There

is an additional point to be considered, in that, so far as we know, *daguæ* is geographically isolated from any member of either the *assimilis* or *phæopygos* groups. It is, also, primarily a Tropical Zone species, as is also *phæopygos*, whereas the *assimilis* group is primarily Subtropical to Temperate. We append a comparative summary of the differences.

a. *Turdus assimilis*.—Upperparts varying from olive-brown to bistre and slaty black; chest, sides and flanks varying from buffy grayish brown to smoke-gray and Broccoli-brown; larger birds with relatively longer tails: wing, ♂, 113–130; tail, 87–97; bill mostly yellow; axillars always contrasted with color of sides and under wing-coverts, brighter and buffier; upper tail-coverts essentially like back and rump in color.

b. *Turdus daguæ*.—Upperparts nearest those of *assimilis rubicundus* but slightly more rusty; chest, sides, flanks darker and browner than any race of *assimilis*; smaller bird with relatively shorter tail, wing, ♂, 102–108; tail, 74–83; bill blackish; axillars similar in color to sides and under wing-coverts; upper tail-coverts essentially like back and rump in color.

c. *Turdus phæopygos*.—Upperparts varying from bistre-olive to fox-brown; the race *phæopygoides* very close indeed to *daguæ*; chest, sides, and flanks even lighter and grayer than extremes of *assimilis oblitus*; size and proportions as in *daguæ*; bill blackish; axillars not differently colored; upper tail-coverts quite different from back and rump in color.

It is apparent that the relationships of *daguæ* to the *assimilis* and *phæopygos* groups can be expressed nomenclaturally in four ways. It can be treated as a distinct species, as a subspecies of either of the other two, or all three can be regarded as conspecific.

An argument for maintaining all three as distinct species is the close resemblance of *Turdus amaurochalinus* Cabanis of southeastern Brazil to *Turdus assimilis renominatus*. They differ only in that the former has a more heavily streaked chin and a smaller, white, lower throat patch, but extreme specimens are nearly, if not quite, indistinguishable. A systematic treatment which regards *assimilis* and *phæopygos* as conspecific could not logically maintain *amaurochalinus* as distinct. In our opinion it is much better kept a distinct species, not only as a matter of convenience but also because its resemblance to a far distant race of *assimilis* is probably an accident of parallelism rather than evidence of genetic relationship.