DIFFERENTIATION OF THE SCRUB JAY, APHELOCOMA COERULESCENS, IN THE GREAT BASIN AND ARIZONA

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From the time the Woodhouse Jay of the Rocky Mountain and Great Basin regions (*Aphelocoma californica woodhousei* of the A.O.U. Check-list, 1931) was first recognized as distinct from the Florida and California jays, it has been regarded as constant in character throughout its range. Study of a collection of 588 specimens representing most parts of the range of this form has revealed a hitherto unrecognized differentiation into eastern and western divisions which now merit taxonomic distinction.

Apart from the obvious difficulty of bringing together an adequate series of specimens to establish the presence or absence of such differentiation, there are at least three possible reasons why it has not been described earlier. First, an adequate amount of fresh-plumaged material has not been available to most systematists since the specimens in most collections are, in the majority, spring- or summer-taken, worn skins. Second, much discussion of the Woodhouse Jay and its relatives has been concerned with racial versus specific status of the more strongly marked differentiates of the widely distributed complex of forms now recognized as the *Aphelocoma coerulescens* rassenkreis (A.O.U. Check-list Committee, Auk, 61, 1944:453); to some extent this has hampered the study of particular portions of the group. Third, in previous systematic studies of *Aphelocoma coerulescens*, racial characters have been defined without segregation of adults and first-year birds. The two age classes differ in that first-year birds bear juvenal wing and tail feathers which are significantly shorter than those of adults; in series, first-year birds are also duller and usually more variable in color (Pitelka, MS). Thus, precise characterization of races rests on the separation of these age classes.

Recently expressed nomenclatural opinion (Hellmayr, Catalogue of Birds of the Americas, 1934:51; A.O.U. Check-list Committee, *loc. cit.*) has favored the combination of the series of closely allied, allopatric forms including the Florida, Woodhouse, California, and Santa Cruz Island jays, under the specific name *coerulescens*. Questions of relationships among these forms are the basis of a revisionary study now in progress. Whether they should or should not be regarded as conspecific may remain a matter of opinion that will not alter the facts brought forth by detailed analysis of inter- and intra-racial differences; my studies have led me to adopt the course proposed by Hellmayr and followed by the A.O.U. Check-list Committee. The basis for this decision cannot be developed or discussed here; the reader, however, can refer to a recent statement concerning use of trinomial names in polytypic species by Schmidt (Ecol., 25, 1944:255), whose general point of view I share.

Brief comment is also in order on the question of vernacular names. With almost every advance in our understanding of racial differentiation in *Aphelocoma coerulescens* and with almost every taxonomic change, the application of vernacular names to the various races has become increasingly confused. I propose in my own work to drop all subspecific vernaculars and to use only one name, that of "scrub jay," for the rassenkreis as a whole.

Within the range of the race *woodhouseii* as formerly understood, scrub jays of the Great Basin and Arizona are significantly lighter-colored than those of the Rocky Mountains and New Mexico. These lighter western birds may be separated under the name

Aphelocoma coerulescens nevadae, new subspecies

Type.—Adult male, no. 28080, Mus. Vert. Zool.; 3 miles east of Jackass Springs, 6200 feet, Panamint Mountains, Inyo County, California, September 30, 1917; collected by Joseph Grinnell, orig. no. 4509.

Racial characters.—Similar to *Aphelocoma coerulescens woodhouseii*, but blue coloration of head and neck lighter and duller (between Tyrian Blue and Deep Orient Blue, closer to the former, in Ridgway, Color Standards and Color Nomenclature, 1912), hence less purplish; back duller, suffused with more gray or blue-gray, hence less brownish; undertail coverts lighter (Pale Windsor Blue-Light Windsor Blue). Bill longer (8.9 per cent, calculated on the basis of average lengths in groups 1 and 4, table 1), more pointed and more tapering; similar to *A. c. woodhouseii* in other dimensions.

Geographic distribution.—Principally the Great Basin and Arizona (fig. 5); southeastern Oregon and southern Idaho south to the Providence Mountains, California, and southeastern Arizona, west to Mono Lake and the desert ranges along the California-Nevada line, and east to central Utah, northeastern Arizona, and New Mexico.

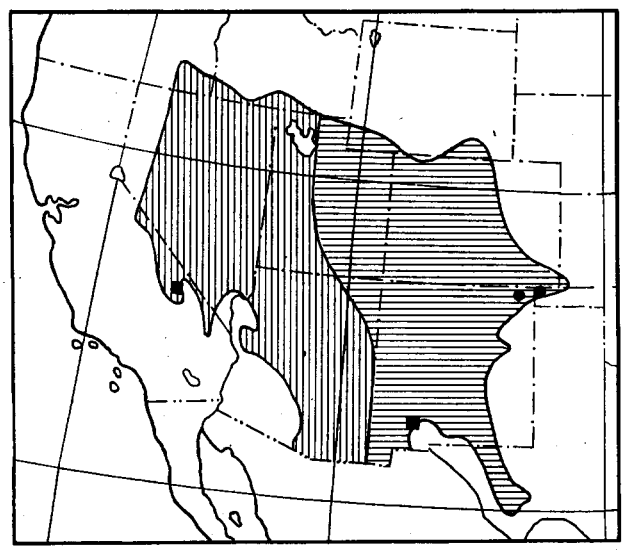

Fig. 5. Distribution of *Aphelocoma coerulescens nevadae* (vertical lines) and *A. c. woodhouseii* (horizontal lines) in the southwestern United States. Squares indicate type localities; circles indicate localities mentioned in the text from which representative specimens of *woodhouseii, sensu strictu,* have been examined.

Measurements.—Comparative data on size of adult males only are given in table 1 for five different geographic areas representing the total range of *A. c. woodhouseii* and *A. c. nevadae*. Statistical data on length of bill are compared graphically in figure 6. Measurements of the type are as follows: wing, 131.1 mm.; tail, 146.9; bill length, 21.8; bill depth, 8.5; bill width, 8.2; tarsus, 41.0; hind toe, 12.5; middle toe, 19.5.

Differences which separate the restricted race *woodhouseii* from *nevadae* are best seen in comparisons of unworn, *adult* specimens representing the eastern and western distributional margins of the two races, respectively. Gradual intergradation takes place over a more or less broad belt from western Colorado and central Utah south

through northeastern Arizona and western New Mexico. Because this intergradation is gradual and because specimens available from this north-to-south belt are limited in number, the geographic boundaries of the two races herein proposed are arbitrary and tentative.

Southwardly, in Arizona and central and southern New Mexico, differentiation of *nevadae* and *woodhouseii* is not so marked. Color differences, which are the chief basis for separation, are weaker; but in series, specimens of adults from Arizona are clearly assignable to *nevadae*, those from New Mexico to *woodhouseii*. With series of first-

Table 1

Measurements of adult males of *Aphelocoma coerulescens woodhouseii* and *A. c. nevadae*

	Number of specimens	Range	Mean and standard error	Standard deviation
A. c. woodhouseii				
(1) Western Texas and southern New Mexico				
Wing	18	124.1-132.2	128.67 ± 0.50	2.11
Tail	17	136.0-147.3	141.65 ± 0.74	3.07
Bill length	18	17.8- 21.6	19.73 ± 0.25	1.06
Bill depth	17	8.4- 9.0	8.66 ± 0.06	0.24
Bill width	18	7.3- 9.4	8.46 ± 0.12	0.49
Tarsus	18	37.9- 41.1	39.79 ± 0.20	0.87
(2) Colorado, eastern Utah, northern New Mexico				
Wing	50	125.0-136.8	130.92 ± 0.40	2.85
Tail	48	134.0-151.9	143.94 ± 0.55	4.17
Bill length	49	18.2- 22.9	19.93 ± 0.13	0.88
Bill depth	48	7.9- 9.5	8.57 ± 0.06	0.40
Bill width	48	7.5- 8.9	8.12 ± 0.05	0.33
Tarsus	49	37.0- 42.9	39.71 ± 0.16	1.10
A. c. nevadae				
(3) Arizona				
Wing	39	124.7-138.2	130.95 ± 0.49	3.05
Tail	38	137.2-153.1	142.68 ± 0.64	3.98
Bill length	39	17.7- 21.7	19.85 ± 0.15	0.95
Bill depth	38	8.1- 9.4	8.69 ± 0.05	0.34
Bill width	39	7.4- 9.2	8.27 ± 0.07	0.46
Tarsus	38	38.2- 41.7	39.70 ± 0.12	0.76
(4) Western Utah, Nevada				
Wing	17	128.1-133.3	131.29 ± 0.34	1.41
Tail	17	138.5-151.4	144.35 ± 0.87	3.58
Bill length	16	18.7- 22.8	21.48 ± 0.32	1.29
Bill depth	16	8.1- 9.4	8.70 ± 0.09	0.37
Bill width	16	7.3- 8.5	7.92 ± 0.09	0.38
Tarsus	16	38.0- 42.5	39.91 ± 0.28	1.10
(5) Mono, Inyo, and San Bernardino counties, California, and bordering parts of Nevada				
Wing	24	124.5-135.4	130.00 ± 0.54	2.66
Tail	20	134.6-147.3	142.10 ± 0.89	3.98
Bill length	26	19.4- 23.6	21.44 ± 0.23	1.15
Bill depth	26	7.8- 9.3	8.70 ± 0.07	0.38
Bill width	26	7.5- 8.9	8.13 ± 0.08	0.40
Tarsus	26	37.6- 42.7	40.31 ± 0.23	1.16

year birds, however, a separation of specimens adequate for systematic purposes cannot be made. Moreover, in size of bill, *nevadae* of Arizona does not differ from *woodhouseii* (fig. 6). A detailed discussion of the intergradation of *nevadae* and *woodhouseii* and of the relationships of these races to neighboring forms cannot be undertaken here.

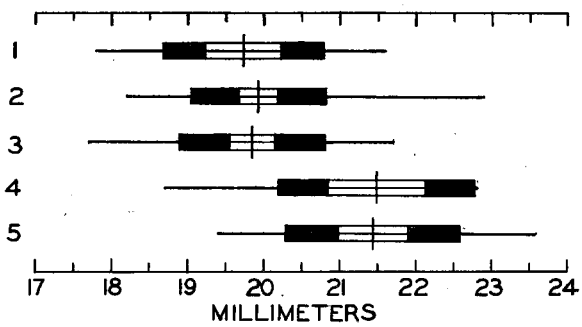

Fig. 6. Individual and geographic variation in length of bill of adult males of *Aphelocoma coerulescens* from five geographic areas (see table 1). Extreme limits of individual variation are shown by length of single line; the mean is shown by a short vertical line; the standard deviation is shown by a rectangle. The light portion of the rectangle represents twice the standard error. When these light portions overlap, as between groups 2 and 3, for example, the observed differences are not statistically significant (see Dice and Leraas, Contr. Lab. Vert. Gen., no. 3, 1936).

The type locality of the race *woodhouseii* is Fort Thorn, 10 miles west of Rincon, 4500 feet, Dona Ana County, New Mexico (Bailey, Birds of New Mexico, 1928:12, 48). This locality falls within the zone of intergradation between *woodhouseii* and *nevadae*. I have not examined the type nor any topotypes of the former, but a close study of specimens from southwestern New Mexico reveals that the majority are similar, or at least closer to the darker eastern form. On the basis of these comparisons, the name *woodhouseii* becomes applicable to the eastern differentiate, typical representatives of which have been examined by me from Kenton, Cimarron County, Oklahoma, and Folsom, Union County, New Mexico (fig. 5).

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