FURTHER OBSERVATIONS ON VARIATION IN CANYON WRENS

By ALDEN H. MILLER

The Canyon Wrens (*Catherpes mexicanus*) of the western United States have proved to be a most troublesome group with respect to racial taxonomy. Great amplitude of individual variation in any one population coupled with small series of available specimens are the sources of difficulty. The two most careful considerations of this problem of variation in recent years appear to have been those of Grinnell and Behle (Condor, 37, 1935:247-251) and Behle (Bull. Univ. Utah, 34, 1943:56-67) in which, however, opposing nomenclatural representations of geographic variation were advocated.

The later paper of Behle, based on some new material, particularly from Utah, portrays a pattern of variation which my current review of the group largely confirms. In brief, the wrens from California west of the Sierra Nevada are usually rich, dark brown dorsally. In the Great Basin and in the southern deserts coloration is exceedingly variable, with many paler, tawny- or gray-backed birds appearing. Apparently, as Behle has reported, in eastern Nevada and Utah pale and tawny, rather than rich brown, coloration predominates; I am not prepared to say from personal observation that this type of coloration is uniform there. In Colorado and Arizona, richly brown birds again appear, many of them like those of coastal California.

Behle has stated that along the eastern escarpment of the Sierra Nevada the separation of the dark and pale birds is rather abrupt. This I think is something of an exaggeration. Recently I have taken samples from the Inyo district east of the Sierra and from the western Sierran slopes and western California, including some new material from San Luis Obispo County, and have mixed seasonally comparable material to test the feasibility of separating geographic groups on the basis of color. I find that only about three-fifths of the total of 60 specimens can be correctly separated by this means; there seem to be no other useful characters available.

Behle (1943) advocated use of names for the extremes of color differentiation, namely the rich brown type in western California and the pale type in Utah, recognizing that there is a zone of intergrades or of mixed-type birds of great magnitude between them which occupies much more ground than do the extreme populations. This would be a reasonable proposal were it not for other complications. But mixed groups occur across the northern Great Basin (see beyond), not in a line of intergradation between California and Utah, and similarly to the southward in the deserts of California and in Arizona, and again to the east of Utah. Moreover we are not yet in a position to define the geographic limits of the uniform pale population in Utah and we certainly are not able to define an area where the rich-brown bird predominates on the west coast; such a color type is not uniformly present there.

Some further nomenclatural difficulties arise in the application of existing names. *Punctulatus* (Ridgway, Proc. U. S. Nat. Mus., 5, 1882:343) would be available, as in the past, for the birds of coastal California, but *conspersus* (Ridgway, Amer. Nat., 7, 1873:603) is dubiously applicable to the pale tawny birds of Utah. The type of *conspersus* according to Behle, who has examined it, is a pale tawny bird like those of Utah. Yet this name should probably not be used for the Utah extreme as Behle has done in disregard for the population of western Nevada, of which the type was a part, and which is a mixed sort of population, representing a mid-segment of the color gradation between California and Utah. As shown by the trial sorting already reported, birds east (*conspersus*) and west (*punctulatus*) of the Sierran crest are not separable in large enough degree to make nomenclatural distinction of them useful. Problems similar to

those presented by *conspersus* and *punctulatus* arise in the use of the names *polioptilus* (Oberholser, Auk, 20, 1903:197) and *meliphonus* (Oberholser, Sci. Publ. Cleveland Mus. Nat. Hist., 1, 1930:95), as indicated by comments of Hellmayr (Cat. Birds Amer., part 7, 1934:277-278) and van Rossem (Occ. Papers Mus. Zool., Louisiana State Univ., no. 21, 1945:191).

Aldrich (Proc. Biol. Soc. Wash., 59, 1946:129-136) recently has given the name *griseus* to the Canyon Wrens of eastern Washington and eastern Oregon, contrasting them with *conspersus,* as "more grayish, less rufescent." They are stated to be "paler and more grayish" than *punctulatus*. Behle (1943) characterized material he examined from the desert region of [eastern] Oregon in the Jewett Collection as "a variable lot of intergrades linking *punctulatus* with *conspersus*." I have not seen many specimens from this northern interior area, where *griseus* is supposed to differentiate, but those I have examined point to the correctness of Behle's characterization of them. For example, two birds in the collection of the Museum of Vertebrate Zoology from the adjoining Modoc region of California are to be matched among specimens from western Nevada and the Inyo district as is one from Twin Falls County, southwestern Idaho. Three birds from the Brooks Collection taken almost at the Washington border in the Okanagan Valley of British Columbia are generally dark. One in fresh plumage is indistinguishable from birds of the western slopes of the Sierra. Two in worn plumage are dark and gray and scarcely conform to Aldrich's characterization of *griseus*. One of these at least can be matched by dark gray variants from western California. Thus the impression is gained that *griseus* is no more, and probably less, satisfactorily separable as a race than is *punctulatus*.

There now remains another, and again incomplete or erratic, differentiation to report in this species. Canyon Wrens were found in the pine hills area of Powder River County, Montana, in late June of 1947, where to my knowledge the species has not heretofore been collected. It has been seen near Billings, Montana (Welch, Auk, 53, 1936:231) and has been taken in northeastern Wyoming and in the Black Hills of South Dakota (Brodkorb and Hinshaw, Auk, 55, 1938:554-555). Four adults and five juveniles were taken by our party from the Museum of Vertebrate Zoology two miles west of Fort Howes Ranger Station in Powder River County. These with the two adults and two immatures taken by Brodkorb, and kindly loaned by Josselyn Van Tyne of the Museum of Zoology of the University of Michigan, give a fair basis for judging the characters of the Canyon Wrens of the northeastern limits of the range of the species in the Great Plains. Four of the six adults are strikingly pale ashy on the anterior upper parts and are grayer and much lighter dorsally in general than are examples from the Great Basin. Two, however, one from Fort Howes and the other from 3 miles east of Newcastle, Wyoming, can be matched by the paler third of the series from the Inyo and Mohave desert areas. The juveniles are less strikingly different, yet most are paler or ashier than comparable examples from the Great Basin. One fresh-plumaged adult from Eagle Mountain, eastern Riverside County, California, is pale ashy gray and probably would match the palest type of bird from Montana when in worn spring condition.

In summary, the Canyon Wrens of the United States north and west of Texas present a mozaic of individual and local variation in which there are several restricted areas where one color type reaches a fairly high frequency of occurrence. Dark, rich brown color predominates in places on the Pacific coast, pale tawny predominates in sections of Utah, and ashy gray in the northern high plains. I am less sure that there is a distinctive gray type in eastern Washington and Oregon; such a type is certainly not the extremely light ashy variant of the plains. Between these weak foci of differentiation are great areas occupied by individuals of several color types in variable proportion.

There are no clear cut clines. It would be a mistake to conclude from what has been said that average color grades regularly from dark in coastal California through progressively paler values in Utah to an extreme in South Dakota. Rather the fluctuations in color are spotty or local; reversals of trends, as in the Rocky Mountains of Colorado, seem to occur.

The pattern of variation does not lend itself to nomenclatural designation. To apply racial names such as *punctulatus, conspersus, griseus* and *polioptilus* to the differentiations of low consistency and uncertain geographic limits which prevail calls for a high number of arbitrary and unreal decisions—rather more than the racial taxonomist normally must rationalize. The better course in the Canyon Wrens is to use one name, *C. m. conspersus,* the oldest, for this variable complex. This name was based on a population of mixed color type and appropriately it may remain applied to such on a broad scale. There is general agreement with the factual picture presented by Behle (1943), supplemented by knowledge of a further local trend in variation in the high plains. Only, then, in the nomenclatural treatment of this peculiarly variable group, do I hold a counter opinion; in short, I advocate the nomenclatural solution of Grinnell and Behle of 1935 which seems the most sensible and useful.

Perhaps in danger of being obscured by the effort to devise a racial taxonomy for Canyon Wrens are at least two points of general biologic significance. First, the variability of the color of the darker parts of this species in any one region points to a low rate of natural selection for these colors. Second, pairs of these wrens usually are widely spaced because suitable habitat is scattered; accordingly some of the young must disperse extensively to find breeding territories and mates. This dispersal, which I think is greater than has generally been realized, operates, doubtless in connection with weak selection, to maintain high variability and offset tendencies completely to fix one color type in a particular area.

Museum of Vertebrate Zoology, Berkeley, California, January 23, 1948.