scapulars with a slight chalky cast, showing, however, only in certain lights; terminal borders of the tertials, secondaries and shorter primaries smoky brownish, and secondaries more brownish than the general surface; outer surface of wing showing no indication of bars, except exceedingly faint ones on the secondaries, discernible only on close inspection. Tail grayish-brown (the intermediæ more grayish), narrowly bordered at extreme tip with paler grayish, crossed with a well-defined subterminal band of black nearly one inch wide, and with about six narrow, irregular bands of the same, broken on the intermediæ into irregular spots; under surface of the tail light silvery-gray (appearing hoary-white in some lights) relieved by a distinct subterminal band of dusky, and, anterior to this, by another less distinct, narrower, and more grayish band, the others being concealed by the lower coverts. Under surface of the primaries with the broad portion of the quills chiefly white, but this more or less broken, chiefly on the inner quills, by a grayish clouding, tending to form regular broad bars when the quills are separated; lining of the wing and narrowed portion of the quills uniform black.

Wing, 13.10; tail, 7.50; culmen, .85; tarsus, 2.50 (the unfeathered portion in front 1.50, and with 10 large transverse scutæ); middle toe, 1.55.

The specimens of this species in the U. S. National Museum are from the following localities: Oyster Bay, Western Florida (Jan. 28, 1881; W. S. Crawford); Mirador, Mazatlan, and Tehuantepec, Mexico; La Palma, Costa Rica, and Brazil (Sr. Albuquerque).

ON *PODICEPS OCCIDENTALIS* AND *P. CLARKII.*

BY H. W. HENSHAW.

By at least one author* the specific distinctness of our two largest Grebes, *P. occidentalis et clarkii*, has been denied and *clarkii* formally reduced to varietal rank. Since, however, this view of the relationship of the two seems not to be fully accepted,† and inasmuch as recently I have examined an unusually

* Coues in Birds of the Northwest, p. 128.

† Mr. Ridgway in the recent "Check List of North American Birds" names them as full species.

instructive series of these birds, I propose here to briefly discuss the question with a view to definitely settling, if possible, the relationship of the two. The series alluded to consisted of eleven beautifully prepared specimens in the collection of Mr. D. S. Bryant of Oakland, California, to whose kindness I am indebted for the opportunity of studying the series, and were all shot the same spring in San Francisco Harbor by Walter Bryant.

The characters which served originally to distinguish the two birds are as follows :* —

Occidentalis† : Size large — wing 8¾ inches; bill 3 inches; tarsus 3 inches; bill straight, dusky or nearly black, except cutting edges near end where it is yellow; line from eye to base of upper mandible gray.

Clarkii: Size smaller — wing 7¼ inches; bill 2¼ inches, tarsus 2¾ inches; bill with both upper and lower mandibles slightly recurved; color yellow except the edge of upper mandible, which is black; line from eye to base of upper mandible white.

Assuming that the above characters are all that can be brought forward to distinguish the two birds — and I can find no others — the simple question is Do the two maintain their respective characters so as to be always distinguishable or do specimens occur having the supposed distinctive features variously intermingled and varying to a greater or less extent? In other words, can intergradation between the two birds be proven? I answer in the affirmative and for proof refer the reader to the annexed table.

A glance at the table will reveal the fact that the several characters assigned the two birds are variously interchanged, some of the larger individuals referable to *occidentalis* having in addition to certain of the characters of that form peculiarities belonging to *clarkii;* others possess the small size of *clarkii* but with the form and color of bill and loral space of *occidentalis.* Therefore no distinct line can be drawn between the two, and it occasionally becomes a matter of nice judgment to decide to which of the two forms a given specimen should be referred.

The color of the loral spaces varies from being indistinguishable from the color of the head (greenish-black) to a pure white;

* See Birds North America, 1858, p. 894, 895.

† It is noticeable that the series examined by the original describer contained one specimen which, though doubtfully referred to *occidentalis*, was remarked to possess certain of the characters distinguishing *clarkii.*

Comparative Measurements, etc., of Podiceps occidentalis and P. clarkii.

No. 1.	*Sex.*	*Length.*	*Wing.*	*Bill.*	*Tarsus.*	*Depth of bill just anterior to nostrils*	*Curvature.*	*Color of Upper Mandible.*	*Color of Lower Mandible.*	*Color of Lores.*	*Date.*
195	♂	25.50	8.00	2.45	3.25	.48	Straight.	Ridge bluish-black, tip and cutting edge yellow.	Yellow.	Dusky but distinct.	
174	♀	24.50	7.62	2.50	2.75	.40	Very much recurved.	Black; edges and tip yellow.	Black; edges and tip yellow.	Scarcely different from color of head.	Jan. 3, '81.
194	♂	25.50	7.56	2.50	3.00	.44	Recurved.	Ridge black; yellow at tip and along edge.	Bright yellow.	Pure white.	
238	♂	26.00	7.43	2.60	3.00	.48	Straight.	Ridge black; edge and tip yellow.	Bright yellow.	White.	Mar. 10, '81.
199	♀	26.25	7.43	2.50	3.00	.37	Straight.	Ridge black; edges and tip yellow.	Bright yellow.	White.	Feb. 19, '81.
197	♀	23.00	7.37	2.37	2.50	.37	Straight.	Ridge black; edges and tip yellow.	Bright yellow.	White.	Feb. 19, '81.
25	♀	——	7.29	2.50	2.10	.37	Straight.	Ridge black; edges and tip yellow.	Bright yellow.	White.	
248	♀	24.00	7.25	2.25	2.87	.37		Bluish-black.	Black; edges and tip yellow.	Dusky.	Mar. 10, '81.
249	♀	23.00	7.25	2.31	2.69	.32	Slightly recurved.	Ridge black; edges and tip yellow.	Bright yellow.	Brown.	Mar. 10, '81.
198	♀	24.00	7.19	2.56	2.50	.38	Very much recurved.	Bluish-black; cutting edges yellow.	Bluish black; edges and tip yellow	Dusky; scarcely lighter than head.	Feb. 19, '81.
200	♀	23.50	7.00	2.25	2.56	.37	Slightly recurved.	Ridge bluish-black; edges and tip yellow.	Bright yellow.	Pure white.	Feb. 19, '81.

when differently colored, two specimens rarely agree in the extent of the colored area. In some the white or gray extends in a broad area from the bill to behind the eye. In others it is limited to a narrow line reaching only to the eye.

Although in the table the bills of several specimens are given as straight, it is rare to find two birds with the bills alike, and it is evident that it needs only a large number of specimens to constitute a series leading from one extreme to the other.

None of the above specimens chance to equal the extreme size often attained by *occidentalis*, and, on the other hand, specimens of *clarkii* may be had somewhat smaller than here given, yet the larger and smaller individuals in the list are quite within the requirements of size of their respective forms.

As but eleven specimens are considered here, it is easy to understand to what an unlimited extent the characters of the two forms may be intermingled even when, as in the present instance, the birds are derived from the same locality and taken during the same season.

Regarding the distinctive distribution of the two forms, we have little to offer save conjecture. The original specimens of both forms came from the Pacific coast, where the two are found together, at least in winter and during the migrations. Dr. Coues says "both varieties occur together in the United States west of the Rocky Mountains." This was probably a slip of the pen, since Dr. Coues clearly could not have intended to imply the occupancy of the same region by forms the disparities of which are only to be accounted for on the ground of geographical variation, *i.e.*, variation dependent on difference of locality.

As a matter of fact, *clarkii* appears never to have been found in the interior except in fall or winter in Mexico, where, as is well known, birds may, in the dispersion attendant on migration, cross from the Pacific to the Atlantic side and yet be wholly wanting in the interior regions to the northward.

On the other hand, all the specimens I have seen from the interior, *i.e.*, between the Rocky Mountains and the Sierras, were typical examples of the large straight-billed form, *occidentalis*, and during the breeding season, typical *occidentalis* may be confined to the interior. Of the breeding range of *clarkii* nothing is positively known. The fact that the two forms are

found together on the coast up to the last of the migration would seem to imply that their breeding ranges cannot be far separated. It may be ascertained that typical *clarkii*, with its small size and weak bill, only occurs in summer well up on the North-west Coast, and that the coast districts of California, Oregon, and perhaps Washington Territory furnish the intermediate specimens.

ON THE RELATIONSHIP OF *HELMINTHOPHAGA LEUCOBRONCHIALIS*, BREWSTER, AND *HELMINTHOPHAGA LAWRENCEI*, HERRICK; WITH SOME CONJECTURES RESPECTING CERTAIN OTHER NORTH AMERICAN BIRDS.

BY WILLIAM BREWSTER.

Since my original description of the White-throated Warbler (*Helminthophaga leucobronchialis*) appeared, specimens have slowly multiplied until, including the two announced by Dr. Fisher in the present number of the Bulletin,* there are now no less than twelve known examples. Until recently there has been no apparent reason for doubting the validity of the species, which has been generally accepted, and even heartily endorsed by several prominent ornithologists. But not long since Dr. Edgar A. Mearns and Mr. Eugene P. Bicknell sent me some puzzling specimens which, at the time, I was obliged to consider aberrant individuals of *H. pinus* and *H. chrysoptera*, but which nevertheless raised certain suspicions affecting *H. leucobronchialis* and *H. lawrencei*. These suspicions are now confirmed by the examination of a fine series, belonging to Dr. A. K. Fisher, which throws a flood of light on the whole subject. I am indebted to Dr. Fisher's kindness for permission to make use of this material in the present investigation.

Before entering into the details of the evidence before me it may be well to emphasize some of the prominent characters which respectively distinguish *H. pinus*, *H. chrysoptera*, *H. leucobronchialis*, and *H. lawrencei*.

[* See beyond, under "General Notes."—EDD.]