

GEOGRAPHICAL VARIATION IN THE BLACK-
THROATED LOONS.

BY A. C. BENT.

DR. JONATHAN DWIGHT'S interesting paper in 'The Auk' for April, 1918, describing a new species of Loon from northeastern Siberia, has opened up a subject to which I have given considerable study without having been able to come to any satisfactory conclusion. After examining directly or indirectly some seventy specimens of Black-throated Loons, including the entire series in several of the largest collections in this country, I came to the conclusion that the necessary material was still lacking to settle satisfactorily the true status of this group.

I have long recognized the existence of a large, Green-throated Loon in the Bering Sea region; but I have postponed publishing anything on it until I could obtain enough breeding birds from somewhere in that region, to establish a more or less definite breeding range in which a more or less constant form is to be found. Now that Dr. Dwight has seen fit to open up the subject, I feel called upon to publish what incomplete data I have on the whole group.

It seems to me that there are only two alternative theories into which the known facts may be made to fit. The first and most likely theory is that there is but one circumpolar species, divided into three, or possibly four, subspecies, as hereinafter designated. To support this theory we need more material from Siberia and eastern Europe to show complete intergradation between the two intermediate subspecies, *arctica* and *suschkini*, though what material we have seems to indicate that such intergradation exists. An argument against this theory is the fact that the two extreme subspecies, *viridigularis* and *pacifica*, apparently breed side by side in northeastern Siberia and northwestern Alaska.

The second theory is that there are two species, *arctica* in Europe, with *viridigularis* as a Siberian subspecies occupying a subarctic area, and *pacifica* in North America, with *suschkini* as a Siberian subspecies occupying the Arctic coast. This theory would explain

the breeding of the two extreme forms in the same or in contiguous areas; but it would be upset by the discovery of more complete intergradation, unless such intergrades could be regarded as hybrids. A final choice between these two theories cannot be made until more material is available showing the distribution and relationships of the forms to be found in Siberia, a vast and little known region.

I will now attempt to state, roughly and in general terms, the main known facts in this complicated case and let the reader judge for himself how they fit in with the above theories. There are apparently three or four fairly well marked subspecies of Black-throated Loons, as follows:—

1. *Gavia arctica pacifica* (Lawrence), the smallest of all, in which the hind neck or nape is much lighter gray than the crown or forehead, nearly white in some cases, the black throat patch terminates below in a straight line and the metallic reflections of this patch almost always appear purplish in any light. This form occupies a breeding area which includes the whole of northern North America (which need not be more definitely outlined here), the Arctic Islands west of Greenland and the Arctic coast of Siberia for our unknown distance westward.

2. *Gavia arctica suschkini* (Sarudny), intermediate in size between *arctica* and *pacifica*, but nearer the latter, in which the colors are nearly as in *pacifica*, but with a slight tendency towards *arctica*. This form probably has a breeding range somewhere on the northern coast of Asia, but is known only from specimens taken in winter or on migrations in the Ural and Turkestan regions.

3. *Gavia arctica arctica* (Linnæus), intermediate in size, but nearer *viridigularis* than *pacifica*, in which the crown and nape are uniform dark gray, the black throat patch terminates below in a point and the reflections of this patch appear either purplish when held away from the light and greenish when held towards it, or wholly purplish in any light, with considerable individual variation. This form inhabits northern Europe, and northern Asia for an unknown distance eastward and southward in Siberia.

4. *Gavia arctica viridigularis* (Dwight), the largest of all, but intergrading perfectly with *arctica*, in which the crown and nape are colored as in *arctica*, the black throat patch terminates below

in a point and the reflections of the throat are usually more greenish than in the others. I have yet to see a specimen in which more or less purple reflections could not be found. Even Dr. Dwight's type shows "slight purplish tints." This form, if it is a good subspecies, has no well defined habitat; but what specimens I have seen would seem to indicate a breeding range on both sides of Bering Sea, which may extend for a considerable distance westward into the interior of Siberia.

The above arrangement may appear satisfactory to the casual observer, but the trouble with it is that all of the above characters, particularly those on which Dr. Dwight bases his new species, are decidedly variable and inconstant. Size is the most satisfactory character but even this shows intergradation or overlapping and greater individual variation in each group than the differences in averages between the groups. The measurements, in inches, of the four forms, which I have taken or had sent to me, are as follows:—

Gavia arctica pacifica (Lawrence).

- 12 males from North America, east of the Mackenzie River,
 average, bill 2.14 wing 11.65
 largest, " 2.32 " 12.42
 smallest, " 1.93 " 10.80
- 13 males from North America, west of the Mackenzie River,
 average, bill 2.06 wing 11.66
 largest, " 2.20 " 12.50
 smallest, " 1.87 " 10.50

Gavia arctica suschkini (Sarudny)

- 5 males from Turkestan,
 average, bill 2.35 wing 12.40
 largest, " 2.60 " 13.35
 smallest, " 2.20 " 11.80

Gavia arctica arctica (Linnæus)

- 6 males from Europe,
 average, bill 2.44 wing 12.24
 largest, " 2.62 " 12.75
 smallest, " 2.30 " 12.

Gavia arctica viridigularis (Dwight)

4 males from Bering Sea region,
average, bill 2.63 wing 12.69
largest, " 2.87 " 13.
smallest, " 2.50 " 12.

The other characters are equally confusing. The nape is lightest and almost constantly so in North American *pacifica*; it is darkest in *viridigularis* and more or less intermediate in many specimens of the other two forms.

The black throat patch terminates below in a straight line almost invariably in North American *pacifica*; I have seen but one exception to this rule; but in Siberian *pacifica* this character is less constant. In *viridigularis* this patch terminates below in a decided point, in all specimens that I have seen. In European *arctica* about half of the specimens I have seen have the patch decidedly pointed below and the others have it nearly straight or only slightly pointed.

The colored reflections of the black throat-patch are the most variable and inconstant of all the characters. In *viridigularis* three of the specimens examined show mainly greenish colors but even these show some signs of purple; and in one, a bird in my own collection, the colors are about equally divided. In European *arctica* about half of the specimens show mainly purplish reflections, while fully half show both purplish and greenish. In North American *pacifica* the purplish reflections predominate, but five specimens out of twenty-two show more or less greenish in certain lights. Mr. Waldron DeWitt Miller, in sending me descriptions of Pacific Loons in the American Museum, used the following terms in designating the colors of the throats; greenish-blue, bluish-green, dark greenish-blue, violaceous and dark violet. It can be easily seen from the above that the colors are very variable.

Dr. Dwight says, in his diagnosis of *viridigularis*:—"The green coloration of the throat is the essential character that sets this species apart from *arctica* and its races, which all have purple throats." In the light of the facts stated above this "essential character" disappears and his new species must be reduced to the

rank of a subspecies at least. Even a subspecies must prove to be fairly constant in a more or less definite range. The range of *viridigularis* is very imperfectly known; the four specimens, referable to this form, that I have seen were taken at Nijni Kolymsk, Siberia, St. George Island, Bering Sea, Nome and Saint Michael, Alaska; Dr. Dwight's specimens all came from northeastern Siberia. The Nijni Kolymsk bird, referred to above, is somewhat intermediate between *viridigularis* and *arctica*; if it had been taken in Europe it would probably be referred to the latter. I also have a perfectly typical *pacifica* from the Kolyma River, Siberia.

I have seen birds from Victoria, B. C., from Finland and from Norway which closely approach this new form, *viridigularis*, in size and color characters. If we had a larger series of *arctica* from Europe and Asia available for comparison, we could perhaps match these birds exactly and we could certainly show, if I have not already demonstrated it, that *viridigularis* is merely a subspecies of *arctica*. To use Dr. Dwight's own terms, the green throat seems to be a quantitative rather than a qualitative character.

REASONS FOR DISCARDING A PROPOSED RACE OF THE GLAUCOUS GULL (*LARUS HYPERBOREUS*).

BY JONATHAN DWIGHT, M. D.

IN discussing the moults and plumages of the Glaucous Gull, a dozen years ago I took occasion to bury "*Larus barrovianus*" among the synonyms of *Larus hyperboreus* (then known as *glaucus*) because the alleged characters seemed to me to afford insufficient grounds for recognizing even a subspecies (Auk, XXIII, 1906, p. 29). Later, in the 1910 edition of the A. O. U. 'Check-List,' the Committee on Nomenclature and Classification adopted my view of the case and discarded "*barrovianus*"; but recently Dr. H. C. Oberholser has seen fit to dig it up and it is revived, somewhat impressively, as a subspecies of *hyperboreus* (Auk, XXXV, 1918, p. 472).