

ject are on a comparatively limited area. It is an oasis in the desert, for desert conditions still exist on all sides.

Since the opening of the region the number of bird species has risen from fifteen to one hundred and thirty. A few of the most interesting changes are tabulated below.

Boulder, Colorado, February 25, 1914.

THE RACES OF *BRANTA CANADENSIS*

Suggested by Swarth's "Study of a Collection of Geese"*

By ALLAN BROOKS

NO GROUP of North American birds so badly needed revision as the geese of the *canadensis* type, and Mr. Swarth has put not only all ornithologists, but also the discriminating sportsman, under a deep debt of gratitude for his excellent and carefully studied paper, which is practically in the nature of a monograph of the group.

American ornithologists have always been rather prone to carefully study all small birds, and let the larger species severely alone. No better instance of this is needed than the case of these geese. Sportsmen were unable to correctly identify the geese they shot by the aid of any of the available works, nor could their ornithological friends help them much, as all the given diagnoses were at fault.

Could anything be more impossible than the breeding range of *Branta c. occidentalis* as given in the latest A. O. U. *Check-List*? This sub-species is there quoted as breeding in northeastern California and on the coast of western Alaska—localities some fifteen hundred miles apart—though it was known that the whole intervening country was occupied by typical *canadensis*.

Many good ornithologists had worked the northern California and Oregon regions, but it was not until the last year or two that it was definitely ascertained that all records of *occidentalis* as a breeding bird were wrong, and that *canadensis* and only *canadensis* was the resident species. The wonder is that any credence could be given to the theory of an isolated breeding colony of *occidentalis*.

Mr. Swarth has been unable to find any reliable evidence of this sub-species in California, even as a migrant.

In his treatise he first of all proves the fallibility of all the distinctions as based on pattern and color, and indicates that the most reliable distinctions between *canadensis*, *hutchinsi*, and *minima* lie in the measurements of the culmen and in the comparative lengths of tarsus and middle toe. The very adequate and ingenious system of symbolical measurement charts given by Mr. Swarth are a distinct feature of his work. From these it would seem that most reliance can be placed on measurements of the culmen to separate the three subspecies, i. e., *canadensis*, *hutchinsi*, and *minima*. In his table the two former do not coalesce at all in this respect, and the slight overlapping of the last two might

*A Study of a Collection of Geese of the *Branta canadensis* Group from the San Joaquin Valley, California. By Harry S. Swarth. Univ. Calif. Publ. Zool., vol. 12, 1913, pp. 1-24, 2 pls., 8 text figs.

be accounted for by the fact that no distinction was made in the comparison of old and juvenile birds.

It is difficult to tell the young from adults when the birds are in skin form, but in the flesh the difference is usually fairly apparent. In the adults of all geese the feathering of the neck is fuller, the knob on the carpus is more prominent, and the whole plumage has a distinct gloss seldom seen in the young bird. Could the tests of the measurement of culmen, and the comparative measurements of tarsus and middle toe, be applied to a series of geese where only young could be compared with young, and adults with adults, it is the writer's belief, based on the handling of many geese in the flesh, that there would prove to be three distinct species—not subspecies—*canadensis*, *hutchinsi*, and *minima*, with *occidentalis* as a subspecies of *canadensis*.

If the four birds accepted as subspecies occupied distinct breeding ranges, impinging only on their boundaries, the theory of their specific identity might be a sound one, but in the case of *canadensis*, *hutchinsi*, and *minima* their breeding ranges overlap to such an extent that they cannot be treated as climatic subspecies. In the field *minima* seems to be a very distinct species; in flight the neck looks shorter and the wings longer in proportion than in any other goose, not even excepting the Brant. It also has an unique and peculiar cackling or chuckling cry, only rarely heard, in addition to the ordinary high pitched "honk". Was this known to Mr. Ridgway when he gave it its common name?

It is unfortunate that Mr. Swarth had to work on material, the bulk of which is from California. He has evidently not seen the breeding *canadensis* from the coast strip south of the breeding range of *occidentalis*.

This is largely a non-migratory bird, nearly as dark as *occidentalis*, the under parts being dark gray-brown, but the measurements fully up to the maximum of *B. canadensis canadensis*.

This bird the present writer long took to be *occidentalis* until specimens were carefully measured. The next problem was to identify *occidentalis* among the numbers of *hutchinsi* that he had a chance to examine. The conclusion he was forced to was that as far as southern British Columbia was concerned *occidentalis* was a myth, even though so eminent an authority as Mr. Brewster identified skins sent to him as of that subspecies. The whole problem is a very difficult one and much work remains to be done on the group, but Mr. Swarth's treatise should serve as a basis, a sort of causeway over a hitherto impassable morass.

Okanagan Landing, British Columbia, January 25, 1914.

THE BIRDS OF TETON AND NORTHERN LEWIS AND CLARK COUNTIES, MONTANA

By ARETAS A. SAUNDERS

WITH TEN PHOTOS BY THE AUTHOR

TETON COUNTY lies in the northern half of Montana and considerably west of the center of the state, its northern border formed by the Canadian boundary, and its western by the continental divide. Although in the western half of Montana, its bird-life is more nearly like that of the east-