

candida (p. 42); *Anser anser* instead of *Anser ferus* (p. 89); *Tadorna tadorna* instead of *Tadorna cornuta* (p. 171); *Casarca casarca* instead of *Casarca rutila* (p. 177); *Querquedula querquedula* instead of *Querquedula circia* (p. 293), and especially in this case where *Querquedula* is often considered as not generically separable from *Anas*; *Nyroca nyroca* instead of *Nyroca africana* (p. 345); *Clangula clangula* instead of *Clangula glaucion* (p. 376); *Merganser merganser* instead of *Merganser castor* (p. 472); *Casuaricus casuaricus* instead of *Casuaricus galeatus* (p. 592). Through some unexplained exception to the author's evident rule, in the case of *Rhea americanus*, Linné is taken at 1758 instead of 1766, which otherwise would give us also *Rhea rhea* (p. 578). Although Brisson's genera are in some instances taken, Brisson's *Anhima* is rejected for the later *Palamedea* of Linné (p. 2).

Count Salvadori has expended an enormous amount of labor on this thick volume of nearly 600 pages. The bibliographical references are exceedingly full; the references to the anatomy are separated from the others, as are also the references to hybrids, which among the Ducks are so numerous as to form a striking feature of the bibliography. While the part of the work relating to the Anseres will prove so immensely valuable to the general student, the author's revision of the Crypturi will be hailed as a special godsend by those brought into relation with this exceedingly troublesome and difficult group.—J. A. A.

Chapman on Changes of Plumage in the Dunlin and Sanderling.¹—There is no uncertain ring about the present paper. It boldly challenges certain statements of an eminent European authority, Herr Gätke, and proves them erroneous, not by any theoretical arguments advanced to nicely fit the case, but by a simple statement of facts which leave no room for doubt. An interesting chapter of Gätke's book 'Die Vogelwarte Helgoland' is devoted to the long mooted question of changes taking place in feathers without moult, and much stress is laid upon repigmentation and renewal of abraded contour as important factors in the process of passing from the winter to the summer plumage of many species. The Dunlin (*Tringa alpina*) and the Sanderling (*Calidris arenaria*) are two of the species in which the gradual change is described with great minuteness of detail. One can almost see the black color spreading over the gray feathers of the back and the worn tips blossoming, so to speak, into new feathers by a "restoration of the worn and blunted barbs to their previous entirety," but unfortunately for this theory Mr. Chapman has examined no less than fifty-seven specimens of the former species (including the subspecies *pacifica*) and ninety-seven of the latter which show conclusively that a complete moult takes place in both, except in the rectrices and remiges of the Dunlin. Twelve specimens of the Dunlin

¹The Changes of Plumage in the Dunlin and Sanderling. By Frank M. Chapman. Amer. Mus. Nat. Hist., VIII, art. I, pp. 1-8 (March 4, 1896).

taken between April 2 and May 22 show various stages of the moult. "Many of these new black or rufous and black feathers are half grown, while a few are fully grown and their unworn edges are in strong contrast to the ragged borders of the gray winter plumage." In one specimen, "one cannot raise the plumage of any part of the body without discovering numbers of growing new feathers wrapped in their dermal sheaths." Twenty specimens of the Sanderling likewise show a moult in progress during March, April and May. Mr. Chapman has also seen moulting spring specimens of the Golden Plover, Knot and others of the Limicolæ, in which group Gätke states that color changes without moult frequently occur. That no moulting birds should have fallen into this ornithologist's hands is most surprising, and yet on hardly any other assumption can we understand his reaffirmation of the old idea of a color change in worn feathers with restoration by a new growth of the ragged edges. Inasmuch as this theory, resting as it does, upon a most unphysiological basis, is upset in the case of two of the species cited by Gätke in its support, what grounds have we for believing it will apply to any of the others?

He asserts almost dogmatically that a number of species acquire their summer dress without spring moult and Mr. Chapman shows us specimens of two of these very species in the midst of a moult at the time when Gätke declares they are simply growing new barbs on the old feathers and providing in them a fresh influx of new pigment. Can there be any doubt as to who is in error? If fifty years' experience with the birds of Heligoland leads to such deductions as these we may well wonder on what sort of material they are based and hope for more light upon the other species which Gätke has deprived of the normal way of changing their plumage by a moult. To Mr. Chapman we are indebted for the valuable contribution he makes to a subject which has long vexed those who have been readier with strange theories to fit obvious facts than with material to substantiate their theories. — J. D., JR.

Chapman on the Plumage of the Snowflake.¹ — The gradual change from the brown tinged winter plumage of the Snowflake into its abraded black and white summer dress is clearly demonstrated to occur without the loss of a single feather. Diagrams show at a glance that the dorsal feathers of the male during the winter gradually lose their brownish margins and by June "in place of the rounded outline of the brown-tipped feather we have left only its pointed black base. The rest of the plumage undergoes a similar alteration which in some places is evidently assisted by fading." The knowledge of this change without moult is not new, although among our early writers Wilson and Audubon do not seem to have been aware of it. Richardson and Swainson in 'Fauna Boreali-

¹ On the Changes of Plumage in the Snowflake (*Plectrophenax nivalis*). By Frank M. Chapman. Bull. Amer. Mus. Nat. Hist., VIII, Art. II., pp. 9-12 (March 5, 1896).