

The climatic and physiographic conditions are said to be quite uniform throughout the area under consideration, and, with the exception of the grouse, "the avian fauna is everywhere much alike." In the case of the mammals, however, "it is interesting to note that with one or two possible exceptions there is no species of mammal that ranges unchanged throughout the whole of the region."—J. A. A.

**Tracy's 'Significance of White Markings in Birds of the Order Passeriformes.'**—The subject<sup>1</sup> is considered under the following captions: Intrinsic factors in the evolution of color; white markings as visual clues; the problem discussed for birds in the open; the problem discussed for arboreal species; special study of the Mniotiltidae; sexual selection as affecting white patterns; directive markings outside the order Passeriformes; conclusions. The author has here assembled an interesting array of facts, and has discussed them in a liberal spirit. The Passeriform birds of North America are listed in groups with regard to whether they are birds of the open-ground or are arboreal, and are further subdivided with regard to their having or not having concealed white, or white wing and tail markings, etc. In birds of the open, nearly all those with white markings are "to be classed as flocking birds," while those without white marking do not flock, with a few exceptions, for which special explanations are offered.

"Coloration in birds," says the author, "whatever its cause or the mechanism of its production, is conceded to be adaptive; it responds to their needs, forms a part of their life adjustments. Concealment from its enemies is not the only need in a bird's life, not the only adjustment that affects color-patterns. The bird also needs to be made known to other individuals of its kind, and to other species associated with it; and this need has certainly been met. . . . The number and variety of perils that daily surround our smaller land-birds, and the extent to which these may be diminished by the birds' keeping in touch with one another, point to the need of something more than concealing coloration, and admit of special adaptations that shall act in harmony with it and yet serve to reveal the bird to its kind. . . ."

"Starting out with a presumption in favor of some form of revealing clues among the higher land-birds, and eliminating a terminology [banner-marks, etc.] which has been misleading, it remains for us to determine, if possible, what these clues are, and whether color features form a part of them; if so, how this harmonizes with the function of the same or similar color features as concealing. . . . But *general* coloration is seen to be normally protective, for birds that need protection; and as for special patterns, even a satisfactory demonstration of their 'obliterative' effect does not

<sup>1</sup> Significance of White Markings in Birds of the Order Passeriformes. By Henry Chester Tracy. University of California Publ., Zool., VI, No. 13, pp. 285-312. Dec. 28, 1910.

warrant the conclusion that such is solely or mainly their effect in all cases."

In the discussion of white markings that follows these general remarks, the conspicuousness and directive function of white markings that are concealed except in flight is insisted upon. The revealing function of white wing and tail markings "during flight is entirely in harmony with their concealing function when at rest." In Thayer's discussion of the "disruptive effects of color patterns," the author states that the "evidence here offered of their value as *revealing characters*, must not be regarded as contradicting anything but the application of the 'concealing' principle to birds in flight."

The following may be taken as the author's general summing of the evidence regarding coloration and environment: "With a preference for close, leafy coverts and secluded forest ways go the somberer tones, the monochrome coloration, shy, furtive habits. With a preference for open woods and roving ways, greater distances and separations to be adjusted, have come the greatest variety of top-patterns among birds, many of them showing excellent devices for a revealing flight from the opening wing." As a whole the paper is a welcome contribution of fact and discussion to a very interesting subject.—J. A. A.

**Grinnell's 'American Game-Bird Shooting.'** — Grinnell's 'American Game-Bird Shooting'<sup>1</sup> comprises three parts, treating respectively of 'American Game Birds,' in which the species and their habits are described (pp. 1-301); 'Upland Shooting' (pp. 303-507); and 'The Shooting of the Future' (pp. 511-558). The first part is ornithological, treating at length and in a very comprehensive manner of the habits and distribution of the Woodcock and Snipe, and the various species of Quail and Grouse of North America. For the purposes of the present book the author has "considered as game birds only the species that are commonly hunted with dogs," and it thus includes only those above indicated. The second part relates to the various methods employed in taking the birds, and such aids to shooting as dogs, guns, and ammunition. The third part comprises 'A Look Backward,' in which is historically set forth the great decline in the original abundance of game birds in this country and the causes that have produced it, and an account of the introduction of exotic game birds to replenish the havoc wrought through excessive destruction of native game birds. There is also an account of the efforts that have been made to restock exhausted covers and a plea for greater self-control on the part of gunners as an aid in promoting good shooting in the future.

Dr. Grinnell writes with the authority of one thoroughly master of his subject, and his 'American Game-Bird Shooting' may well interest a

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<sup>1</sup> American Game-Bird Shooting. By George Bird Grinnell. With colored plates of Ruffed Grouse and Bobwhite, 48 full-page portraits of Game Birds and Shooting Scenes, and many text cuts. New York: Forest and Stream Publishing Company. [Copyright, 1910.] 8vo, pp. xviii + 558. \$2.50 net; postage, 25 cents.