

nia". Each year's field-work serves to add materially to the store of facts upon which he can draw, and the manuscript has now reached considerable proportions. In his field work the past season Mr. Dawson has been assisted by Mr. C. I. Clay.

At the behest of Mr. E. O. McCormick, vice-president of the Southern Pacific Railroad, Mr. H. S. Swarth, of the staff of the California Museum of Vertebrate Zoology has recently been devoting his attention to the birds of the "Apache Trail", central Arizona. A trip was made through the region, and specimens were collected and notes gathered, to serve as a basis for a published account of the birds of that section. This will be non-technical in character, designed to stimulate interest in persons without special knowledge of the subject, as well as to draw the attention of the experienced bird student to the exceptionally interesting bird life of a unique corner of the United States.

Bird students in the San Francisco Bay region have recently interested themselves in the matter of the destruction of water birds by crude oil poured out of tank steamers plying to and from San Francisco. Reports of the destruction of large numbers of California Murres have been received from government employees stationed on the Farallon Islands, and other species are known to suffer in less degree from the same cause. The tank steamers come to the port with salt water as ballast in their oil tanks. As they approach the Golden Gate they pump out this water, and some residue oil is unavoidably carried with it. This oil floats back and forth on the surface of the water, and, getting on the feathers of the birds which alight to feed there, directly or indirectly causes their death. Committees from the Audubon Association of the Pacific and Cooper Ornithological Club are co-operating in an attempt to devise some means of securing alleviation of this menace to our coastal bird life.

In connection with the Enabling Act now pending in Congress, to give effect to the migratory bird treaty between the United States and Great Britain, we learn that at a meeting of the Executive Committee of the National Association of Game and Fish Commissioners, held at Washington, D. C., June 13, 1917, resolutions were passed recommending that this bill, as relating to the conservation of natural resources, be considered an important war measure, and urging its immediate passage. We are further informed that while there is good prospect of the passage of this bill, still there are difficulties to be met, especially in the House of Representatives, and it is urged that everyone use his influence with his Congressional representatives, to get un-

divided support for the measure.

Most of the bird migration along the Pacific coast lacks the impressive rush and wave-like movement that characterizes the migration in the eastern states, but that is no reason why the subject should be neglected here. Indeed, this is a good reason for paying particular attention to the arrival and departure of our migrant species in the spring and fall. The problems of migration are even more complex here than in the East and we therefore have need of much more data in attempting to explain our part of this ever-baffling mystery. All of our bird students, including both collectors and sight observers, should keep notebooks and record the first and bulk arrivals of all the species which occur in their localities, and also, what is much more difficult, the dates of their departure. It is only by combining many such sets of notes, gathered over a term of years, that we will be able to make any serious attempt toward the successful solution of the problem.

PUBLICATIONS REVIEWED

BIRDS OF THE ISLANDS OFF THE COAST OF SOUTHERN CALIFORNIA. By ALFRED BRAZIER HOWELL. —Pacific Coast Avifauna Number 12. Published by the Cooper Ornithological Club, June 30, 1917; pp. 1-127, 1 map.

A valuable addition to the Pacific Coast Avifauna series has appeared in Number 12, which will prove of interest and great utility to the student of insular bird life, as well as of much importance as a book of reference to general ornithologists. In this publication Mr. Howell shows not only that he is familiar with island conditions and characteristics, but that he has worked most persistently and diligently to gather together all available data and information concerning the avian population of these islands. The bibliography is as complete as would seem possible, and yet there is a full synonymy accompanying the account of each species. In fact the latter appears to be more complete than necessary, in connection with such a bibliography; but, as the author has been willing to perform such a laborious task, the student of the book will have good cause to congratulate himself upon being saved a lot of trouble.

Mr. Howell seems to have left no stone unturned within his reach that might have some fact or record hidden beneath it. There are probably other stones that have escaped his careful search, whose existence is known to none but the owners thereof, and which may cover valuable information. It will be a service to all students of insular

conditions if his work induces their possessors to turn them to the light. The author has also taken much trouble to run down to their sources several questionable records, the correcting of which should be a cause for rejoicing, as for instance the record of the breeding on Santa Barbara Island of *Puffinus opisthomelas* Coues, so often published as authentic, which turns out to be valueless.

Except where modified by the Supplement since published, the American Ornithologists' Union *Check-List* has been followed instead of adopting the later rulings of some of our well known investigators; but it is distinctly stated in the introduction that it was deemed the most convenient course, for the public, to do this and to give the newest findings in the text only, without deviating from the *Check-List* in the headings of the species. This is probably to overcome the objections some readers may have to what may seem to them an old-fashioned method of procedure. A few errors and omissions appear in the text, such as are practically impossible to keep out, and the author of this review is happily in a position to correct one or two, the occurrence of one at least being indirectly his own fault.

The paper is divided into several chapters, among the titles of which are Introduction, Descriptions of the Islands, Problems Presented by the Island Avifauna, and General Accounts of the Birds, followed by a Tabulation of the Species and Subspecies by Islands and by Manner of Occurrence, with a bibliography and index. The tabulations have been prepared with great care and will be found most useful. They are given as only approximately correct and subject to changes as our knowledge of the subject increases. While good judgement has been shown in the classifications under the head of Manner of Occurrence, the author naturally expects many corrections to be made when more light has been shed upon the matters in question.

Under the head of Problems Presented by the Island Avifauna, Mr. Howell touches upon some of the conditions which exist, and upon the probable reason for such conditions as regards the formation of the islands, separation from the mainland, differences in flora, etc. He presents some of the problems that have arisen and suggests some theories for their solution, but does not apply them to individual races, and admits that there has not as yet been suffi-

cient observational work done upon the islands to allow us to draw definite conclusions concerning such problems as the effect of the changing geologic and climatic factors upon the bird life, migration, etc.

It would take too long to go into much detail in this review, but a few remarks upon some of the features under the heading General Accounts of the Birds may not come amiss. Naturally a great deal of space could not be devoted to every species enumerated, partly because of the size of the paper this would entail, and mostly for the reason that but little data is available concerning many of the birds. The notes upon the Xantus Murrelet, and upon several of the petrels are given at some length and are of especial interest and value, as but few, if any, ornithologists have had access to all the material and notes that Mr. Howell has unearthed. He gives the occurrence of the Greater Yellow-legs with some hesitation, although in the second citation (Osburn, CONDOR, XI, 1909, p. 137) one specimen is recorded as shot by Beck on the South Coronado Island. There is also extant a specimen, shot by J. Mailliard on Santa Cruz Island, May 1, 1898 (no. 3284, coll. J. & J. W. Mailliard), that was not mentioned in the list of birds found on Santa Cruz Island (Bull. Cooper Orn. Club, I, 1899, p. 44) for the reason that only land birds were included in that list, and the value of a record of such a widely distributed species was not then recognized. At the time the above cited list was made out there were some quail (*Lophortyx californica vallicola?*) upon the island, but as they had been liberated there, and locality of their origin was unknown, they were omitted from the text.

On page 54 of Mr. Howell's contribution, *Accipiter cooperi* is given in the text as listed by Mailliard in 1908, when it evidently should have been in 1898, a typographical error. On page 72 the statement that the only state record for the Rusty Blackbird, *Euphagus carolinus* (Müller), is that of a bird shot by Linton on San Clemente Island, November 20, 1908, is incorrect, as his citation (3) will show, there being one in the Mailliard collection (no. Ex2185), taken by H. B. Kaeding in Amador County, December 15, 1895. The observations upon *Carpodacus mexicanus clementis*, comparing the insular with the mainland forms, are of especial interest, and the conclusion reached that there are not sufficient grounds for recognition of the subspecific form *clementis*

from Santa Cruz Island agrees with that of several ornithologists who have made a study of the insular races.

On the whole group of islands 195 species and subspecies are tabulated as authentically recorded, or noted, together with 16 doubtful ones. The greatest number reported from one island—Santa Cruz—is 141 authentic, with 2 doubtful. This is partly accounted for by the apparently more attractive conditions on this island and partly because more observers have visited it. San Clemente comes next, principally on the latter account as it does not appear to be an especially attractive resort for land birds, with 114 authentic and 2 doubtful.

Mr. Howell is to be congratulated upon his work, and his paper will undoubtedly meet with a warm reception by all members of the Cooper Ornithological Club, as well as American ornithologists in general.—JOSEPH MAILLIARD.

THE FUNDUS OCULI OF BIRDS ESPECIALLY AS VIEWED BY THE OPHTHALMOSCOPE. A STUDY IN COMPARATIVE ANATOMY AND PHYSIOLOGY. By CASEY ALBERT WOOD. The Lakeside Press, Chicago, 180 pp., 61 colored plates, 145 figs. in text.

A revelation awaits everyone fortunate enough to have access to Dr. Casey A. Wood's monograph on the fundus oculi of birds. The professional bird student will be surprised at the wonderful colors and patterns to be found in the eyegrounds of birds; while the amateur bird student will be at least no less impressed. The well-known shining eye of a cat or of an owl in the dark gives no intimation that the ophthalmoscope can bring out such beautiful eyegrounds.

In the introduction Dr. Wood points out that although the fundus oculi of many of the mammals have been thoroughly described, little attention has been given birds, vertebrates that exhibit the highest and most varied types of vision. Ophthalmoscopic examination of the fundus oculi of living birds comprised a large part of the investigations reported upon.

In addition to macroscopic examinations of prepared specimens, the tissues were microscopically examined by Dr. J. R. Sloanaker of Leland Stanford University in collaboration with Dr. Wood. In one chapter a review of the anatomy and physiology of the organs and tissues in the fundus oculi plained; the appearance of the eyegrounds of the bird is given; in another, ophthalmoscopy and the instruments used are explained in the various orders of birds and a classi-

fication of them forms another chapter; whereas, the concluding chapter points out the relations of reptilian to avian fundi.

The differences noted between day birds and nocturnal birds are described as follows: "The average eyeground or fundus oculi of most Day Birds resembles, as much as anything, the texture of the so-called 'scotch mixtures' in smooth finished cloth—usually light brown, gray, gray-blue, blue mixed with striate rays, or fine concentric marking of lighter gray or white. Scattered over this background are numerous yellowish, yellow-white, brown or gray points of pigment. . . ."

"Nocturnal Birds have, almost invariably, yellow-red, orange, orange-red or reddish brown fundi, with the choroidal vessels plainly visible through the semi-transparent retina. Some of the Owls present almost a scarlet vermilion eyeground, and this intensity of colors appears to be peculiar to Strigiformes. . . ."

Although attempts at photographing the fundus have failed, there is a wealth of illustration in the monograph. One hundred and forty-five drawings illustrating the macroscopic findings of preserved specimens are to be found in the text, most of them by Mr. C. H. Kennedy, now of Cornell University. A series of sixty-one paintings executed by Arthur W. Head, of London, showing minute details and shades of color of the fundus oculi of many different species of birds and of several species of reptiles, show the varied and beautiful coloration and the complex tissue formations revealed by the ophthalmoscope. These attractive plates cannot fail to catch the eye of everyone who opens the pages of the book, and they will doubtless aid in stimulating others to examine the eyegrounds of birds that come under their observation, something which the author has stated in the introduction is the main purpose of the study.

The monograph is the more appreciated when it is known that Dr. Wood brought it to completion by utilizing spare moments during a busy professional life. Students of comparative anatomy and physiology owe a great deal to the energy and enthusiasm of Dr. Wood, and specialists on the eyes of birds will long have to refer to the fundamental work of this author. Nor is the work so technical that it will be utilized only by the scientist. The book will be found entertaining and understandable by all.—H. C. BRYANT.

A DISTRIBUTIONAL LIST OF THE LAND BIRDS