

scientific collecting. The expedition is expected to return about August 1. Included in the party is Mr. Harry S. Swarth as Naturalist-in-Charge. Mr. Swarth is particularly interested in the land birds of the Galapagos Islands, inasmuch as he has recently published a critical study of the large collection of birds from the Galapagos, taken in 1905 and 1906, and since then contained in the Academy's museum. His technical report on this collection was published last fall (Occasional Paper No. 18, California Academy of Sciences). On the present expedition it is Mr. Swarth's aim primarily to study the habits, life histories and ecological relations of the various species of Galapagos land birds so as to be in position to contribute to a better understanding of those evolutionary processes which have resulted in the development of so many unique forms there. The classic group of Geospizids will claim his special attention.

California and other western states were visited during the month of May by Dr. Alexander Wetmore, Assistant Secretary of the Smithsonian Institution and in charge of the National Museum. His two-day visit in the San Francisco Bay region was most profitable and pleasurable to the museum people who happened not to be away in the field and were therefore able to welcome him and participate in the informal conferences held.

Dr. Edward W. Nelson, formerly Chief of the Biological Survey, is spending the summer with his nephew, Mr. R. Leiland Nelson, 5009 Proctor Avenue, Oakland, California. Dr. Nelson has recently completed, for *The Auk*, an extended biographical account of the late Henry W. Henshaw. He is now taking up again his studies on Mexican birds and mammals, based on the field work prosecuted by him and Mr. Edward A. Goldman for many years.

PUBLICATIONS REVIEWED

HARRISSON ON THE NORMAL FLIGHT SPEEDS OF BIRDS.*—The speed at which birds fly has been a matter of much speculation so that it is valuable to have definite observations on a subject where considerable has been assumed without proper

basis. In the present paper Mr. Harrison summarizes flight records for thirty-six species of birds taken by means of speedometer readings from automobile or motorcycle when the birds observed were flying parallel with the vehicle, the speed of which was regulated to coincide with that of the bird. Observations were made in England and Wales, mostly in open country as opportunity for such studies seldom are possible in wooded or hilly sections. Effort was made in all cases to ascertain the usual speed of flight and its variation under normal conditions, instances where there was evident acceleration or retardation due to winds being rejected. The species on which records were obtained range from Rooks, Starlings, Yellow Buntings and House Martins to Tawny Owls, Ring Doves and Herring Gulls. The majority relate to passeriform birds.

In analysis of his own observations, and those of others as obtained from published records, the author considers there is some reason to believe that under the urge of the migration impulse birds may travel at speeds somewhat more rapid than under ordinary circumstances, in which he differs from Meinertzhagen, who has said that migratory flight differs very little from speed under ordinary circumstances. To substantiate his argument Harrison compares Meinertzhagen's records for migrating Rooks which traveled 38 to 45 miles per hour with his own observations of the same species which under ordinary circumstances flew only 29 to 35 miles per hour. Similar comparisons with like average difference are made for the swallow and lapwing.

The speediest bird recorded by Harrison in his personal observations was a Stock Dove flying at 59 miles per hour and the slowest a Herring Gull traveling at 17. The speeds of 41 and 45 miles per hour recorded for the Tawny Owl are quite surprising.

The paper closes with a bibliography of titles relating to speed in flight that will be of importance to other students. The author states that he expects later to give a summary of all that has been published on the subject, which will be awaited with interest.

The reviewer some years ago made a number of observations on flight speed from automobiles and was convinced that useful information was to be obtained by this means. It is to be hoped that Mr.

*Harrison, T. H., On the Normal Flight Speeds of Birds. *British Birds*, vol. 25, no. 4, September, 1931, pp. 86-96.

Harrisson's studies in this interesting subject may continue as additional data will be valuable.—A. WETMORE.

MCATEE ON THE EFFECTIVENESS IN NATURE OF THE SO-CALLED PROTECTIVE ADAPTATIONS IN THE ANIMAL KINGDOM, CHIEFLY AS ILLUSTRATED BY THE FOOD HABITS OF NEARCTIC BIRDS.¹—In this important contribution to ornithology in particular and to zoology in general, Mr. McAtee has made available to zoologists the results of an amazing amount of data on the food habits of Nearctic birds—data which have been accumulating in the records of the United States Biological Survey for the past forty-five years. This report should be of value to all students of natural history whether interested in vertebrates or in invertebrates.

The data presented in this report are based on records of animals identified in the stomach contents of about 80,000 Nearctic birds. The stomachs were examined in the Biological Survey and the determinations of species were made by specialists there in the various fields represented. The 80,000 stomachs represent a wide range of species of all of the families of birds occurring in the region, the birds being collected at all seasons and in practically all parts of temperate America.

The total number of identifications of animals from the stomachs, counting those of whatever degree, once for each time identified irrespective of the number of individual specimens concerned, was 237,399. Ten phyla ranging from Protozoa to Chordata were represented. The phylum Arthropoda was represented by the largest number of identifications, with 210,752, and Porifera by the smallest number, with two identifications. In no other institution in the country has such a volume of data been collected on food habits of birds. It is therefore extremely valuable to students throughout the country to have this mass of data digested, summarized, and made available for use as Mr. McAtee has done.

In his discussion of the animals used as food by birds Mr. McAtee treats each phylum separately. He has followed a uniform system throughout with the following sub-headings under each group considered: Protective Adaptations, Bird Enemies, Other Enemies, Discussion. In the phyla

Protozoa, Porifera, Coelenterata, Nematelminthes, Trochelminthes, Molluscoidea, Echinodermata, which represent a relatively small per cent of the food of birds, he has treated each phylum as a unit, whereas in the phyla Arthropoda, Mollusca, and Chordata he has considered each order separately and in many cases has listed in tables the families of certain orders showing the number of identifications and the percentage of identifications among those of the entire order. He has not discriminated, however, between types of predators within each group, but has lumped them all together. His results might be somewhat different were he to consider each species of predator separately.

At the end is a useful bibliography of over 500 titles. Mr. McAtee states that these titles are chiefly those from which notes supplemental to his tabulations were gleaned. The bibliography is primarily one of predation, pertaining to literature on predatory animals and their foods, and so far as possible, entries are distributed according to the thing eaten and are arranged according to the phyla or orders to correspond with divisions of the text.

Throughout the text Mr. McAtee stresses the principle that predation is in proportion to population—that the ruling criterion in choice of food is availability, and that the so-called *protective adaptations* in animals are of little or no significance as far as the predators are concerned. Further he indicates that indiscriminate rather than discrimination in the attack upon animal food is the rule in bird predation. To quote from his summary on page 144:

"Considering bird predation alone this principle [predation in proportion to population] leads to a high degree of indiscriminancy in attack upon the whole kingdom of animal life. The combined attack of birds plus all other predators still more closely approaches complete indiscriminancy. In other words there is utilization of animals of practically every kind for food approximately in proportion to their numbers. This means that predation takes place much the same as if there were no such thing as protective adaptations. And this is only another way of saying that the phenomena classed by theorists as protective adaptations have little or no effectiveness.

"Natural Selection theories assume discrimination in the choice of prey. The

¹ Smithsonian Misc. Coll., 85, March 15, 1932, 201 pp.