

died at Santa Barbara on January 23, 1918, after having reached the sixty-third year of his age. Mr. Hazard was well known as an enthusiastic oologist and as a man ever ready to advance the interests of others in this field.

PUBLICATIONS REVIEWED

A STUDY OF THE INCUBATION PERIODS OF BIRDS—WHAT DETERMINES THEIR LENGTHS?—By W. H. BERGTOLD, M. D., M. Sc. Member of the American Ornithologists' Union The Kendrick-Bellamy Co. Denver, Colorado | 1917 (our copy received June 20, 1917); 8vo, pp. 1-109.

The above title brings to the attention of bird observers a field of observation in which, as the author well states, there is "a lamentable dearth of information". Nevertheless the data finally gathered and here presented is really of astonishing quantity (though not always of acceptable degree of accuracy), and has proven sufficient for the establishment tentatively of several interesting conclusions. Among these are that length of incubation is not directly or closely correlated with either size of the bird, or size of the egg, or size of the yolk, or degree of precocity of the young, or age of the female, or longevity of the species. There is, however, a "true" incubation period (secured by allowing for all factors which serve to prolong the process abnormally) which is constant and characteristic of each species, and this is directly correlated with the body temperature—the higher the temperature the shorter the incubation period. Now, such data as are available seem to show that the lower or more generalized a bird in the phylogenetic scale, the lower its temperature; so that, again, the incubation period allies itself in degree of abbreviation directly with degree of phylogenetic advancement of the species concerned.

The above brief epitome is inadequate to give a fair idea of Bergtold's discussion of the many phases of the subject involved, and we can only recommend that interested readers take the first opportunity to fully apprise themselves of the contents of the book.

Referring again to lack of information, the following are the facts called for by Bergtold, if further enquiries along this and related lines are to be pursued fruitfully: Exact length of incubation period of birds and reptiles; exact length of incubation of birds in polar and tropical regions; the period of viability of birds' eggs; the weights of birds, preferably of the breeding female; the

weights of birds' eggs; the effects of super-heating on birds' and reptiles' eggs; the optimum incubation temperatures of birds' and reptiles' eggs; bird temperatures; temperatures under the incubating bird; reptile temperatures; minutiae of bird physiology.

Egg-collectors, skin-collectors, and nature students of the opera-glass contingent are here on common ground in that all are in positions to contribute importantly to the stock of facts needed.—J. GRINNELL.

THE DISTRIBUTION OF BIRD-LIFE IN COLOMBIA; A CONTRIBUTION TO A BIOLOGICAL SURVEY OF SOUTH AMERICA. By FRANK M. CHAPMAN. Bulletin of the American Museum of Natural History, vol. xxxvi, 1917, pp. i-x, 1-729, 41 plates (some colored), 21 text figs.

The ultimate object of the several years of zoological exploration which the American Museum of Natural History has been prosecuting in South America is, we are told, the discovery of the geographic origin of South American life. As a step toward the attainment of this end the publication here reviewed is devoted to a careful study of the birds of a relatively restricted part of the continent, in their racial variation and geographic distribution—of the "life zones" and "faunal areas", and the species and subspecies inhabiting them. As explanatory of the peculiar interest attached to the study of the birds of Colombia, the chapter devoted to "a review of Colombian ornithology" is briefly descriptive of the "Bogota" collections, productive of so many new species of birds in years gone by, pointing out the value of these collections in the early study of the birds of this region and their absolute uselessness in a present day investigation relative to the distribution of species. Californian ornithologists will be especially able to appreciate the points here made, as to the necessity for absolute accuracy in the labelling of specimens.

The life zones recognized by the author in Colombia are four in number, being, in ascending order, Tropical, Subtropical, Temperate, and Paramo, the last mentioned being a term "locally applied to any treeless region lying above 10,000 feet". Some important conclusions as regards the existing fauna of the region are as follows: That the birds of every zone above the tropics have been derived from a lower level; that the Temperate zone of the Colombian Andes reaches sea level farther south in South America and that its life is derived in part by zonal, in part by latitudinal extension and is