

RECENT LITERATURE.

Bergtold on the Incubation Periods of Birds.¹— It is refreshing to find an ornithological writer who strikes boldly out upon an essentially new line of research as Dr. Bergtold has done in the volume before us. The problem to the solution of which he has applied himself is by no means an easy one. The personal collection of the necessary data being out of the question, the author has had to depend upon such as could be compiled from widely scattered literature, the inaccuracies of which as the author explains have often proved confusing. When we realize that Dr. Bergtold was removed from any of the large scientific libraries and that his investigations were "carried on in the spare moments of a fairly busy professional life," we are astonished at the completeness of his treatment of the subject.

To use his own words: "The problem in hand is to answer the question, 'Why does a house finch's egg take fourteen days to hatch, an ostrich's forty-two days, an emu's fifty-six days, or a hummingbird's fourteen days? . . . to analyze the published data, . . . to examine the explanations heretofore given . . . and to determine if there be a law which controls the length of incubation.'" The author considers in order the various possible factors which might affect the time of incubation, quoting previous writers and weighing the evidence for and against each theory, referring constantly to accompanying tables of length of incubation for various species, weight of birds, weights of eggs, and bird temperatures — all of them compiled from a wide range of publications and from some original data secured by the author and his friends.

Dr. Bergtold tentatively concludes on the one hand that the length of incubation is only loosely related to the size of the bird or the egg and not at all to the longevity of the species, the body-weight egg-weight index, age of the female or size of the egg yolk. On the other hand he considers that there *is* a true length of incubation which is a deep seated, persistent, specific character, that bird temperatures are closely related to taxonomic lowness or highness of the species and finally that "a bird's temperature determines or fixes the time of its incubation period," — the higher the temperature the shorter the period.

Dr. Bergtold further considers it likely that variation in the period of incubation and in temperature exists among the species of any family, from those taxonomically lowest to those taxonomically highest, so that a curve of variation from the lowest to the highest birds would show undulations within each family. In this connection he says: "The question of lowness or highness in birds, in the present discussion, is a question of

¹ 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. 8vo, pp. 1-109. \$1.50 postpaid.

how far a given species has journeyed away from its proto-avian stem, since it seems probable that the farther a bird is from its primitive ancestry, provided it does not later degenerate, the higher will be its temperature. I doubt very much that the present mainstays of taxonomy can alone measure this space between pro-bird and super-bird. I believe that future students of avian taxonomy will have to give more consideration, not only to embryology, but also to bird physiology, in order to correctly locate and plot the mileposts in a bird's journey."

In considering his data Dr. Bergtold calls attention to the real and apparent time of incubation, the latter being the actual time plus that due to errors of observation or to the fact that in some species early laid eggs are incubated to some extent during the laying of the subsequent ones — facts that should be considered in making use of published data. The lamentable scarcity of information on the weights and temperatures of birds is emphasized as well as the numerous opportunities for experimental investigation which the problems here discussed offer.

Dr. Bergtold's book is a valuable contribution to a neglected line of research and can be read with profit by all ornithologists. That it does not represent the last word on the subject the author is the first to admit but it is so suggestive throughout that it cannot help but attract others to this interesting field, and we trust that ere-long the accurate detailed data necessary for the final consideration may be forthcoming. And in this work our Australian friends can give valuable assistance by supplying the data on the temperature of the Megapodes which Dr. Bergtold has been unable to obtain.

Pending the accumulation of further data we may accept his conclusions as the most plausible solution of the problem yet presented, and even if, as the author suggests, they be not entirely original they are certainly more concisely and convincingly set forth than has been done by anyone else.

We regret that the book shows numerous evidences of hasty proof-reading resulting in some misleading errors, as "egg-white" for egg-weight, on page 44. We also notice on page 16 a reference to the relationship of "the finches of Australia . . . to their cousins of the North" but the so called "finches" of Australia are really Weavers and belong to a different family.— W. S.

Howell on the Birds of the California Coast Islands.¹— This admirable paper forms No. 12 of the 'Pacific Coast Avifauna' published by the Cooper Ornithological Club and maintains the same excellence in style and typography presented by recent numbers of the same series. Mr. Howell having formed a personal acquaintance with the birds of some of the islands, was impressed with the need of a comprehensive treatise on the avifauna

¹ Birds of the Islands off the Coast of Southern California. By Alfred Brazier Howell. Pacific Coast Avifauna No. 12. Cooper Ornithological Club. June 30, 1917. pp. 1-127. Price \$1.50.