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EDITORIAL

We Are Happy to Present in this issue a paper by Dr. Frank R. Lillie, the distinguished embryologist of the University of Chicago, and author of one of the best books on avian embryology, "The Development of the Chick". This article penetrates into the problem of the physiological causes of the color pattern of the feather. While the color pattern of the individual feather may be determined by hormones, as Dr. Lillie and his colleagues have shown, one may wonder if these internal factors are sufficient to account for plumage pattern, or whether the latter is due in part to the operation of natural selection, also. It may still be possible that, after the color pattern of the feather has been determined by internal processes, natural selection may play a part in the elimination or survival of the organism possessing it. What external factors may lie behind the variation in quantities of hormones in nature, to bring about the varying color pattern? Or, is there less fluctuation in color pattern than has been supposed, and more orthogenetic evolution, depending directly upon internal factors? Many of our readers are *field* students of birds, but we believe that they will be interested in this glimpse at the experimental aspect of the biology of birds.

The most promising field for research in biology today is in the direction of animal activity, physiology, behavior, etc. Anatomy and classification have had their day—these subjects are not being emphasized in modern biological research. Only here and there are morphological problems of importance found. There may still be some discoveries concerning the relationships of the larger groups; but most of the systematists of today are driven to the work of making subspecies, the biological significance of which is doubtful. And all of these taxonomic problems can be taken care of by a relatively few specially trained men. This is a narrow field for the average man with an interest in ornithology. The young man who looks forward to a professional career in ornithology would do well to consider the field of experimental laboratory work in development; or the field of economic ornithology and game management; or the field of animal be-

havior and psychology, including territory problems. In preparation for these pursuits the student will need all the biological training he can get, including psychology, physiology, ecology, systematic botany, entomology, etc., and chemistry.

Modern studies in animal behavior should be carried out first under natural environment in the field, as far as possible; then results and conclusions should be checked in the laboratory, as far as possible. Field study and laboratory study must go hand in hand in the solution of many modern biological problems; and this will be true in ornithology, as well as in the study of most other special groups. As an example of the way these two methods may be applied we call attention to the study of the Great Horned Owl, by Dr. Paul L. Errington, in this issue. The opportunity for research in the physiology and behavior of birds, as indicated by the papers of Dr. Lillie and Dr. Errington, is unlimited.

Since the preceding lines were written we have received the paper by Baldwin and Kendeigh on "Physiology of Temperature of Birds", reviewed in the pages of this issue of the BULLETIN. Here is another outstanding field of study for the biological ornithologist. The work which is being done at Mr. Baldwin's research station is indicative of a new horizon and a new opportunity. The remedy for the subspecies fad will be found in these new fields of endeavor. Nothing is likely to give better scientific results than a combination of field study with laboratory checks and experiments.

AN EFFORT is being made to locate and list all existing sets of the old *Iowa Ornithologist*, published between 1894 and 1898. Those who possess sets of this early publication will confer a favor by informing Mr. Fred J. Pierce, Editor of *Iowa Bird Life*, Winthrop, Iowa.