

RECENT LITERATURE

Birds of India.¹—The principal purpose of this booklet is to illustrate in color and describe all of the more common birds of the Indian Peninsula. It includes pictures of 181 species while of others only a description is given. The colored plates do not come up to the standards of American bird books, but they are sufficiently good to permit quick identification. The text and particularly the descriptions of the habits contain a considerable amount of original data. Interspersed with the systematic sequence of the birds are short chapters on "Nests and Nesting Behavior" (pp. 92–104), on "Bird Migration" (pp. 190–200), on the "Usefulness of Birds" (pp. 289–296), and on "Bird Watching" (pp. 390–394). A great deal of this is based on the author's own extensive experiences as a field student of Indian birds. The booklet is obviously meant for the amateur but it seems to contain much information of interest to the expert. There is no doubt that it will accomplish the purpose for which it was published by the Bombay Natural History Society, namely "to popularize nature study" and to create public opinion in favor of the conservation of the Indian fauna.—E. MAYR.

Bird behavior.²—Although the present work has as its major title, "Bird Display," the breadth of the subject is better expressed by the secondary title, "An Introduction to the Study of Bird Psychology," as a glance at the chapter headings will show. 'The Evolution of Nest Building,' 'Courtship Feeding,' 'Disablement Reactions,' 'The Expression of the Emotions,' 'The Evolution of Social Ceremonies,' 'The Social Hierarchy in Bird Life,' and 'Territory, Song, and Song-flight' are but some of the subjects there listed and there are still others discussed though not mentioned by title. Such a large share of a bird's activities are a part of its emotional life that many actions that might appear to be unrelated are, in reality, part of the same psychological picture. Great strides have been made in comparatively recent years in getting an insight into the nature of the world in which a bird lives, and a very different world it is from what was supposed even a generation ago.

So much has been done by workers in different places and their findings have been published in so many diverse journals and books, that it is undoubtedly difficult for many students to follow all of the current developments. Mr. Armstrong has made a useful contribution by collecting these scattered accounts and extracting the pertinent facts for comparison with each other. Thirty-one pages of bibliographic references attest to the amount of material that has gone into the present account.

The text is not, however, a compilation of quotations. It is a readable discussion of the vast complex of reactions to internal and external stimuli that make up so much of the bird's behavior pattern, noting the conflicting observational data and the theories that have been adduced therefrom with Mr. Armstrong's own interpretations added. Anthropomorphism has lost its early standing and finds no place here. The book thus serves not only as a mine of digested information but

¹Ali, Sálím. 'The Book of Indian Birds.' 16mo, xxxix + 395, incl. 192 pls. (171 col., depicting 181 species, 3 line, and 18 half-t.), 1 map, 1941. The Bombay Natural History Society, Bombay. Price, 14 rupees.

²Armstrong, E. A. 'Bird Display—An Introduction to the Study of Bird Psychology.' 8vo, xvi + 381, pls. 1–22, 1942. The University Press, Cambridge [England]. The Macmillan Company, New York. Price, \$5.50.

points out fields where further work needs to be done. The field for further research is still wide.

Vernacular names have been used for the birds in the general text but the scientific names are tabulated in systematic order in a special list. The bibliography has already been mentioned. There is a three-part index—one part for the animals discussed, one for the subject matter, and one for the authors whose observations have been used. The pages of the general text are free from lengthy documentation. Twenty-two plates contain forty well-chosen photographs from various sources illustrating different types of avian behavior.—J. T. ZIMMER.

Records of bird songs.¹—A number of years ago, the late Albert R. Brand commenced his activities in the recording of bird songs and, from time to time, offered to the public various phonograph records to which had been transferred the most outstanding results of his labors. Various articles also appeared in print describing the methods used as well as certain of the more technical data that had been obtained from the original recordings on films.

After Mr. Brand's untimely death in 1940, the work that he had begun was continued by the Foundation established for the purpose, under the supervision of Dr. Arthur A. Allen and Dr. Paul Kellogg. The present series of records embodies the latest selection from the extensive file of recordings that has been built up. Comparison with earlier records shows a marked improvement. Background noises have been reduced to a noticeable degree. There are still some differences in the degrees of accuracy with which the birds' voices are reproduced, much of which is probably due to the different pitch and quality exhibited by the birds in life, which register unevenly. Part of this irregularity can be overcome by varying the adjustment of the machine on which the records are played. Some of the records appear to sound better on an old-style phonograph without a loud-speaker and others are better on the more modern instrument. Some are improved by a little distance and others not.

In any case, the voices here demonstrated are more than just recognizable and many of them are excellent. There are six species represented on each side of the six records, making seventy-two in the complete set. They are classified as the birds of the northwoods, of northern gardens, of the fields and prairies, of southern woods and gardens, and of western North America, and North American game birds. Those persons wishing to identify unfamiliar bird notes will find these records of considerable service, and those who already know their bird songs will enjoy hearing them again through this medium. Single records are on sale at the price of one dollar each.—J. T. ZIMMER.

Animal portraiture.²—This album of photographic illustration of various mammals, birds, and reptiles to be found in the National Parks of the western part of the country is offered as a contribution for the enjoyment of camera enthusiasts and interested visitors to the areas in question. It is not a manual for the naturalist. Thirty-five species of mammals, fourteen birds, with the addition of a miscellaneous group of waterfowl, and two reptiles are shown in interesting attitudes. Mr. Dixon has supplied a short text for each species, describing some of its characteristics

¹Albert R. Brand Bird Song Foundation, Laboratory of Ornithology, Cornell University. 'American Bird Songs.' Album with six double, 10-inch records. Comstock Publishing Co., Inc., Ithaca, N. Y., 1942. Price, \$5.00.

²Dixon, Joseph S. 'Wildlife Portfolio of the Western National Parks.' Imperial 8vo, xii + 121, 121 figs., 1942. U. S. Dept. Interior, Washington. Price, \$1.25.

and giving pertinent anecdotes from his rich experience in the field. A list of the species is prefixed with the names of the principal western National Parks and National Monuments where each may be most readily found. Visitors to the parks should find the collection both useful and entertaining.—J. T. ZIMMER.

Biographies of ornithologists.¹—In a most interesting volume, Colonel Hume has brought together a surprising amount of biographical information about thirty-six one-time members of the United States Army Medical Corps (two are still living) who have left their impress on American ornithology. Some of these men, like Charles E. Bendire, Elliott Coues, E. A. Mearns, and R. W. Shufeldt, need no introduction since they left a quantity of writings published under their own names, but even about these men Colonel Hume has succeeded in assembling many unfamiliar facts that add to our acquaintance with their backgrounds. Some of the other members of the Corps are less well known to us although their names, perhaps, have appeared from time to time in articles by their contemporaries. Some of them were detailed on service in the western part of the country when that area was being opened to exploration and settlement, and their activities in the field added much to our knowledge of the birds of the regions they visited. Their collections and commentaries were invaluable to Spencer Baird and others in the preparation of their epochal reports on the bird life of the newly opened western territory.

Still others found opportunity in foreign countries or in the laboratory to make important contributions to various branches of ornithological science. The record of the Corps is one not only of preëminence in medical service but of collaboration in different branches of zoology, and ornithology has been among the favored fields. The present volume performs a service of importance in presenting interesting facts about the lives of the men who were responsible for this effective collaboration.—J. T. ZIMMER.

Mayr's 'Systematics and the Origin of Species.'²—This is another distinguished member of the group of outstanding books comprising the Columbia Biological Series. Although of broad zoological import, it is particularly of interest to ornithologists because of the wealth of illustrative material drawn from birds and the leading rôle that ornithologists have played in developing taxonomic methods. Its main purpose is to review the contribution that systematics of the most up-to-date stamp can make to the study of evolution and particularly to that critical phase, the origin of species. It is both a defense of systematics, if indeed that be needed, and a critique of its procedure and outlook, past and present. The nexus of genetics and systematics, so worthily developed in Dobzhansky's recent book ('Genetics and the Origin of Species,' 1937), is thoroughly reflected by Mayr, although the details of the genetic facies are, properly, not repeated.

The early part of the work, especially chapters 1 and 2, is a sound elementary exposition of taxonomic procedure which may well serve as a manual for beginners in the field. We have lacked such an item in English equivalent to Rensch's 'Kurze Anweisung für zoologisch-systematische Studien.' There follows a detailed, orderly treatment of phenomena of geographic variation—different types of characters involved, gradients, kinds of intergradation, and population structure, to

¹ Hume, Edgar Erskine. 'Ornithologists of the United States Army Medical Corps.' Super-royal, 8vo, xxv + 583, frontisp., figs. 1-109, 1942. Johns Hopkins Press, Baltimore. Price, \$5.00.

² Mayr, Ernst. 'Systematics and the Origin of Species, from the viewpoint of a zoologist.' 8vo., xiv + 534 pp., 29 figs., 1942 (copy received December 15). Columbia University Press, New York. Price, \$4.00.

mention a few. No attribute of animals seems to be immune to heritable geographic variation and consequently all characters of full species may be modified in this way.

Chapter 5 which deals with the "new species concept" is the most contentious section of the book. Perhaps too much stress is placed by Mayr on definitions. I can not wholly agree that "a concise definition of the species is, for . . . [the student of evolution], a necessity, because his interpretation of the speciation process depends largely on what he considers to be the final stage of this process, the species." If, as Mayr correctly insists, there is a continuity of evolutionary process up through the species to the generic level and if the student carries through to this level in his analysis, the setting of rigid limits of the species stage becomes rather academic. But, actually, I think Mayr's definition of a species is thoroughly good and it is more widely acceptable to ornithologists than one would gather from his discussion; indeed in its essentials it has been put in practice by them for several decades in this country. His statement in shortened version is: "Species are groups of actually or potentially interbreeding natural populations, which are reproductively isolated from other such groups."

Always there is the problem of dealing with instances of interrupted distribution and the question of how complete the reproductive isolation is to be before the species stage is reached; after all there are going to be borderline examples and interpretations whatever the definition. Mayr appreciates this and throughout he seems more tolerant of others' views and more sensitive to necessary qualifications of statement than in some of his earlier papers and reviews. Still, occasionally, particular examples are unduly warped to accord with his preconceptions. His treatment of the garter snakes is a case in point. Here, unless we are to deny the validity of Fitch's basic data, we have a most unusual situation in which three groups of races on the Pacific coast overlap each other geographically, yet between the groups in some areas there is normal intergradation. There really is a branching chain of races, considerable segments of which overlap spatially without interbreeding. Mayr boldly reinterprets this situation, explaining that the intergradation between the three groups consists of hybrid populations and implying that these junctions differ in character from the intergradation between member races of a group. I can find nothing in Fitch's account of the details of these intergradations which can justify Mayr's contention. The meeting of groups may involve secondary intergradation or hybridization, whereas that between members of a group may be primary intergradation, but in any event reproductive isolation of the groups is lacking. In dealing with other examples Mayr demands a high degree of reproductive isolation before recognizing groups as separate species. Perhaps this merely illustrates how difficult it is both for original worker and compiler to be completely consistent in applying a species concept.

A point that the author makes forcefully and appropriately is that reproductive isolation does not necessarily mean sterility. A host of factors is involved in the reproductive isolations of nature, and obviously it is only under natural conditions that speciation takes place. Ability to cross in captivity is not a decisive test.

One element of style in writing proves annoying. It is the excessive use of the word "modern." Indeed, through repeated reference to the "modern worker," he creates an illusion of a caste of modernists arrogantly assigning to themselves a favored position in their science. Mayr would of course regret such a spurious impression.

Thoroughly good is Mayr's system of terms for geographically variable species

(polytypic, as against monotypic) and for geographically complementary species (allopatric, as against sympatric) which may constitute **superspecies**. **Polytypic** species and superspecies may be substituted for Rensch's German terms, "Rassenkreis" and "Artenkreis." Some highly instructive discussion pictures the transition from a polytypic species to two or more allopatric species and finally to sympatric species that live together in the same region. Mayr is convinced that most species are formed by the geographic process, rarely if ever aided by ecologic isolation *per se* in the initial stages. Geographic isolation is essential to permit reproductive isolating mechanisms to arise. Little evidence is found for "instantaneous sympatric speciation" among animals.

In the final chapter on higher systematic categories, a distinctly practical approach is advocated and the differences between "lumpers" and "splitters" are nicely illustrated. "The genus is . . . based on a natural phenomenon." But, "the genus of the systematist in his own artificial creation, and not a natural unit." He concludes that "all the available evidence indicates that the origin of the higher categories is a process which is nothing but an extrapolation of speciation. All the processes and phenomena of macroevolution . . . can be traced back to intra-specific variation . . ."

The student of systematics and evolution, as indeed the general biologist, is certain to be stimulated by this excellent book. Mayr's presentation is lucid, rich in examples, and can not help but improve the concepts of even the most experienced workers in these fields whether or not they see eye to eye with him on all issues.—ALDEN H. MILLER.

The Roseate Spoonbill.¹—Mr. Allen spent sixteen months in the field and other time in library and museum, assembling a great variety of information regarding this beautiful species, particularly as concerns its life within the borders of the United States. A large share of the accumulated data came from his own careful work in the field and much that is presented here is not to be found elsewhere in print.

The Roseate Spoonbill once was more common as a nesting species in the southern portion of the United States than at present. Down to about 1830 it was little affected by man but shortly thereafter showed such unfavorable reaction to his presence that some time after 1850 it virtually disappeared from the North American scene although it still remained in areas outside our borders. The disappearance was due in part to deliberate shooting or destruction of eggs but, probably in largest part, because the birds are hypersensitive at nesting time and will desert their nests at slight provocation, even lacking direct contact or injury. Owing to a littoral habitat, drainage and cultivation have caused little damage. Predation by Great-tailed Grackles and raccoons is definitely a serious factor but parasites and disease are not particularly deleterious, at least over extended periods.

At any rate, after the spoonbill was gone from most of its former haunts in the United States, efforts were made to encourage its return and results were favorable in Texas but not in Florida where, even now, the species rarely breeds on the mainland. The exact explanation for this discrepancy has not been determined, but in his search for the clue, Mr. Allen has recorded a wealth of information concerning the life-history, behavior, and requirements of the species.

¹Allen, Robert Porter. 'The Roseate Spoonbill.' Research Report No. 2 of The National Audubon Society. Imper, 8vo., xviii + 142, frontisp. (col.), pls. 1-20, text-figs. 1-44. New York. Price, \$2.50.

The Roseate Spoonbill is classed as of the *cichlid-fish* type, with releasers in both sexes, display by both sexes, and no dominance order. However, it is at the bottom of a peck order in a mixed colony of various species. The female constructs the nest but the male is active in bringing material for it. The male, alone, defends the nesting area and the territory is reduced from its original limits at least until the eggs are laid. Both sexes incubate. Eggs are one to four, averaging 2.7, and are laid, probably, one every other day, beginning the sixth day after the first observed copulation of the parents. They require 23-24 days incubation. The sexes remain together until the brood is raised.

A study was made of various feeding areas to determine the spoonbills' niche, which appeared to have, as outstanding requirements, shallow water, fresh or saline, and a sufficiency of small animal life for food. Examination is made of the structure of the bill as related to feeding activities. An analysis of stomach contents, a study of the other animals of the community, and an examination of the food of the associated birds contribute to the data.

Plumage and molts are discussed in some detail. A total of 33-36 months is required to reach adult plumage in which, alone, the bird breeds. General distribution, migration, and post-seasonal wanderings are examined although the Central and South American data are not complete. Most of the present-day occurrences of spoonbills in Florida are found to be of young birds or other non-breeders.

As recommendations for future conservation measures, Mr. Allen suggests further study of the species in the tropics, protection throughout its range, and its inclusion among the species listed in migratory bird treaties. Complete protection in this country should include freedom from disturbance during the nesting season. These measures should encourage it to return in increasing numbers to its former haunts which appear to be still intrinsically favorable for colonization by this interesting bird.

A colored frontispiece by Roger T. Peterson and numerous fine photographs and line-cuts give adequate illustration to this important report.—J. T. ZIMMER.

Birds of Burma.¹—This volume was mailed to me on Feb. 18th, 1942, two days before the evacuation of Rangoon, but managed to reach me in some miraculous manner. It is a popular handbook giving concise information on all the birds (species and subspecies) that have so far been recorded from Burma. Stuart Baker's nomenclature and sequence of species is followed, on the whole, although Ticehurst's recent work is fully utilized. The field notes contain much of interest. The most important part of the book for the professional ornithologist is a checklist of the birds of Burma, with notes on their occurrence in the 13 principal geographical subdivisions of this country. The color plates, illustrating 290 species, are a pleasant surprise by uncovering a new bird artist, A. M. Hughes. Although the poses of some of the birds are a little stiff and the colors occasionally rather flat, these plates are very much better than those in any of the other popular books on Indian birds. They are the portraits of live birds! The entire unsold edition was apparently lost during the occupation of Rangoon, but I hope Mr. Smythies can go through with his plan of a second edition.—E. MAYR.

The Vertebrate eye.²—At first glance, one might think that here was another

¹ Smythies, B. E. 'Birds of Burma.' With 31 colored plates from paintings by Lieut. Commander A. M. Hughes. 589 pp., 1 map. American Baptist Mission Press. Rangoon, 1940.

² Walls, Gordon Lynn. 'The Vertebrate Eye and its Adaptive Radiation.' Cranbrook Institute of Science, Bull. No. 19; 8vo, xiv + 78g, frontisp., pl. 1, figs. 1-197; Aug., 1942. Price, \$6.50.

weighty book for students of anatomy and physiology, important and apparently exhaustive, but not a book to be read through, page by page. Such conclusions, except as regards importance and completeness, would be quite erroneous. Dr. Walls's knowledge of his subject and his happy faculty of clear expression have enabled him to produce a work that can be read from cover to cover. The reader who is at all interested in the subject matter will be likely to find that it is difficult to put the book down.

Beginning with a basic discussion of light and its perception, the structure of a typical Vertebrate eye and its appurtenances, its functional usage, and its evolution and development, the author then passes to the wealth of adaptive modifications to which the eye is subject in different animals and concludes with a synoptic treatment of this organ in the different classes of the Vertebrata. Whether the reader wishes to learn of the structure of the eye or its evolution, the mechanism of color perception, the reason for a cat's linear pupils, the purpose of the perfect decussation in the optic chiasma of mammals in contrast to the imperfect condition in other Vertebrates, the suggested explanations of the pecten in birds, or any other of the myriad details that may come to mind regarding the eye in these higher groups of animals, he will find something about it here. Not only are the current beliefs expounded, but the theories, as well, that have been advanced in the past and the reasons for their abandonment or modification if they are no longer tenable.

Dr. Walls has avoided the interruptions of bibliographic references in the text and has thus kept the thread of his discourse free, but there is an excellent bibliography at the close of the volume where these references may be found. He, furthermore, writes with an exceedingly light hand, considering the weight of his subject, and enlivens the text with frequent humorous allusions or turns of phrase that often serve to bring home the points he makes with added force. The profusion of diagrams and figures throughout the volume furnishes adequate illustration.

After first perusal, the reader will want to keep the book at hand for ready consultation, for which purpose a good index is supplied. One can wish only that a more serviceable color could have been used for the binding since the white covers are likely to suffer through the use to which the volume is sure to be subjected.—J. T. ZIMMER.

PERIODICAL LITERATURE

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locally resident birds, the gonads of the adults do not regress so far in the summer and begin a slow development again in the autumn, accelerating rapidly in the spring. The birds have a permanent attachment to their nesting sites, even roosting in them during the winter, and during the autumn and winter there is some exhibition of sexual behavior. The hormonal development in the autumn inhibits migration away from the nesting grounds.

The migrants from the Continent show no interest in any nesting holes, their gonads regress farther than those of the other group and do not start growth again until spring when they develop more slowly, and this growth impels return to the breeding areas on the Continent.

Owing to the difference in seasonal activities and physiological development of the two groups, the seasonal change of color in the birds' bills shows noticeable distinctions at any one time and there is also distinction in respect to the amount of wear shown by parts of the plumage in the birds that frequent nesting holes in winter and those that do not.

On the basis of these various characters, the author proposes to separate the British birds as a physiological subspecies to which he applies the name *Sturnus vulgaris britannicus*. The separation appears to be eminently justifiable, but the question arises in the mind of the reviewer as to whether the earlier name *guttatus*, applied to British birds by MacGillivray (Hist. British Birds, 1: 595, 1837) will not have to take precedence. Some restriction of type locality may be necessary to assure the application of '*guttatus*.'

The paper gives a mass of details regarding morphology, histology of the gonads, and behavior of the two groups of birds in the various seasons and ages and of both sexes. It is an important contribution to a branch of ornithology, physiological subspeciation, which has received far less attention heretofore than its morphological equivalent.

American ornithologists will be interested in the author's belief that both subspecies are probably represented in the American population. This conclusion is reached on the basis of differences in behavior occasionally reported here that coincide with the distinctions ascertained to exist in the two subspecies under discussion.

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