

with a resulting high mortality that certainly must work to the disadvantage of the species. Fear, anger and sex reactions in the adults are treated with especial fullness.

In his discussion of the conclusions to be reached as to the gull's mental processes, the author is wisely restrained, and refrains from answering many of the questions he propounds. He concludes, however, that even though the bird's mental limitations often turn out to its disadvantage, it may nevertheless attain its goal by other means than through planning. Part of its failures seem due to a lack of perception of the relation between parts of a whole so that if the usual stereotyped forms of reaction fail, the bird has no further resource. One is impressed by the value of attitude and aspect as a means of communicating mental states.

The author has endeavored with much success to present an account of these matters that shall be untechnical and interesting to the general reader; he has even gathered on a separate page the Latin names of birds mentioned in the book, curiously omitting that of the Black-headed Gull itself! A useful bibliography of relevant literature on bird behavior is added, which perhaps justifies the somewhat inclusive major title of the book, and there is a good index. In the author's own words, "At the end of the account we are not much more advanced than at the beginning towards the answer to the main question why the birds acted as they did"; nevertheless he has presented much new matter of intrinsic value.—G. M. A.

Butler's 'Birds around the year.'—Characteristic of the changing seasons in our eastern States are the varying aspects of bird life, which form the theme of this readable little volume.¹ Beginning appropriately with the spring and the coming of the Bluebirds, the author carries her readers through the rush of the migration season, the busy period of nesting, the heyday of summer, the mellowness of autumn and the waning of the year with the advent of winter. For each of these periods a brief sketch of bird activities is presented. The author writes from the standpoint of the middle Atlantic States with occasional digressions farther afield and evidently draws from a considerable field experience as well as from some knowledge of ornithological literature. The book is of the 'popular' type, designed to arouse and enliven a general interest in birds and in its easy conversational style should readily accomplish its purpose. Such writing, however, too easily lends itself to slight inexactnesses of expression while the sympathetic attitude tends to bestow our own emotions and reactions upon birds to an unwarranted extent. One would disagree with the author that migration had its inception with the Ice Age; that the Golden Plover makes its long over-seas flight from "a pure spirit of adventure"; that the Gannet feeds its young by placing food in its bill; or that feathers have developed from reptilian scales. The wings of the Great Auk and the Penguin are specialized rather than "rudimentary"; and it is no longer true that "there is no record of a bird banded in Europe being recovered in America." The division of paragraphs is often faulty and interrupts the flow of the thought. But these are trivial defects and the book is in general an attractive picture of the outward aspects of bird life from season to season. Eight full-page illustrations, selected from artistic sketches by various well-known illustrators to whom due acknowledgment is made, convey the spirit of the book better perhaps than photographs could have done. What a thrill one gets from Brandreth's sketch of a great eagle launching in flight from its lookout in the dead top of a lofty pine! It seems a pity that the colored figure of Redstarts on the jacket of the book could not have been included among the plates.—G. M. A.

Pearson's 'Adventures in Bird Protection.'—This is the record of a great

¹ Butler, Lorine Letcher. *Birds around the year*. Small 8vo, xi + 242 pp., 8 pls., 1937, D. Appleton-Century Co., New York and London.

achievement,—the awakening and development within this nation and in other nations of a new and sympathetic viewpoint with regard to wild life. To this great task the author has devoted his energy and talents for a generation so that his own life has become inextricably bound up with the history of bird protection. The book¹ therefore very properly opens with an intimate account of his boyhood days in Florida where his innate love of natural history, especially his interest in birds, found fertile soil for development. Here at the little town of Archer, with its four general stores, a drug shop, three saloons, a smithy and a butcher shop, the Quaker community which his parents had joined, offered the lad little opportunity for schooling: every year in the one-room schoolhouse the scholars started in with their studies about where they had begun the year before and went over the same ground. But the growing youth was determined to have an education and eventually won his way to Guilford College, North Carolina. Here he laid the foundation for future usefulness, became an accomplished debater, developed a small museum, and after graduation came back to teach biology with fresh impetus at Guilford. In 1901 he was appointed to the chair of biology and geology at the State Normal and Industrial College at Greensboro, North Carolina. But his main efforts from now on, were to be more and more directed to the work of bird protection. He lectured and wrote and spread this gospel throughout the State. In those days most Americans were wont to regard the natural resources of their country as theirs to do with as they pleased, with little regard for the future or for their fellows. Game birds were killed in season or out, small birds were wantonly slaughtered, plumage and eggs were gathered as a natural crop just as much as apples and blueberries; Nature had provided abundantly and it was man's right to avail himself of her bounty.

But already the problem of bird protection had been attacked by a committee of the American Ornithologists' Union and William Dutcher was a potent force as its chairman. Late in 1901, Pearson attracted the attention of Dutcher through his activities in bird protection in North Carolina and through his writings, and he was asked to organize an Audubon Society in that State. This he did with great success and soon was deep in the work of extending his mission to other southern States. Thus began his real life work.

The main body of the book traces briefly the progress of the educational campaign to win a recognition for the esthetic and practical value of birds and other forms of wild life. In this the State Audubon Societies, and beginning in 1905 the National Association of these societies, became an increasingly significant factor. The struggle for the passage of the Audubon 'model law' in State after State, the development of a warden system, the regulation of shooting, the stopping of the feather trade, the prohibition of market gunning and the sale of game, the setting aside of reservations for birds and other life, the arousing of popular concern at its depletion and finally the extension of these efforts in cooperation with other nations for wider and more effective measures,—in all of this Dr. Pearson has for long years borne a leading part so that his simply told narrative becomes in effect a history of the fight for bird protection.

The book is well printed in clear type and the few illustrations appropriately include portraits of William Dutcher, Dr. T. S. Palmer and the author. Misprints are few indeed,—we may note, however, the loss of a terminal 'e' in the middle name of

¹ *Adventures in bird protection | an autobiography by | Thomas Gilbert Pearson | President Emeritus of the National Association of Audubon Societies | with an introduction by | Frank M. Chapman | Curator of Ornithology, American Museum of Natural History.* 8vo. xiv + 459 pp., illustr. D. Appleton-Century Co., New York and London. \$3.50.

Olive Thorne Miller, and of an 's' in the last name of Harriet E. Richards. While the narrative loses somewhat in continuity through frequently going back in time in order to trace the earlier stages in various of the "adventures," this is perhaps unavoidable in the presentation of the many-sided problems involved. This work is unquestionably a valuable document of human history.—G. M. A.

Hudson on Muscles of the Hind Limb in Birds.—This¹ is an important contribution to the study of comparative myology in birds, a subject too much neglected in recent decades. The author has made a detailed analysis of the hind-leg muscles in representatives of sixteen of the twenty orders of birds included in the A. O. U. Check-list, using special methods of preservation and fixation. From his brief review of important literature, it is apparent how little has been done since Gadow's great work in Bronn's 'Tier-reichs', while of American birds, the myology of less than half a dozen species has been carefully worked out. The author takes the common Crow as a type for detailed study, and by means of unusually clear and well-conceived line drawings, illustrates the various muscles of the leg, their origin and insertion, and relations. A unique feature is a series of cross-sections taken at different levels, and worked out with great care to show the arrangement of the muscle masses and tendons. A brief historical review of important works on avian musculature precedes a systematic account of all "muscles known to occur in the pelvic limb of birds," but one misses any reference to the work of Fürbringer, Beddard, or the more recent account by Stolpe. For each muscle is given the accepted name of the Basle 'Nomina Anatomica,' 1895, and as synonyms the names (often coined) used by Shufeldt in his 'Myology of the Raven,' together with the corresponding nomenclature of Gadow. Then follow: description, action of the muscle, its homology, and brief comparisons with those of other groups of birds. It might have been better, however, to have formally adopted the names suggested by Gadow, which are well considered and based on avian musculature, whereas those of the Basle list are based on human anatomy; for as Romer has shown in his study of the development of muscles in the embryo Domestic Fowl, it is not always certain that the portion of an embryonic muscle mass which finally develops into the adult muscle is homologous with the part that develops into a similar muscle in a mammal. Nevertheless the author is justified in following a standard set of names and he has given the equivalents as synonyms. The author shows that the ambiens muscle, the presence or absence of which Garrod regarded as of great significance in avian classification, is less important than generally supposed. Instead of the familiar formula including this and four other thigh muscles, designated as A, B, X, Y, as proposed by Garrod, the author extends this to include two other muscles of the thigh, the ilio-trochantericus medius and gluteus medius et minimus, and a vinculum connecting two of the digital tendons, or not. In this way, by using eight letter-symbols, it is possible to indicate for each taxonomic group of birds its particular and characteristic musculature. Thus one may see at a glance the specialization that has taken place through loss or parallel development in different groups. Fowls are generalized in having the full formula, while owls are specialized in having but two and swifts but one of the elements. Among other points brought out, the near similarity in the formulae of woodpeckers and Passeriformes is striking, while the dissimilarity between owls and goatsuckers, once thought to be closely related, is equally obvious. Again, in *Gavia* six of the seven thigh muscles are present, but in *Colymbus* there are but three.

¹ Hudson, George Elford. Studies on the muscles of the pelvic appendage in birds. Amer. Midland Naturalist, vol. 18, no. 1, 108 pp. including 26 pls., Jan. 1937, Notre Dame, Indiana. \$0.50.