ORNITHOLOGICAL LITERATURE

AVIAN BIOLOGY, Volume III. Edited by Donald S. Farner and James R. King. Academic Press, New York, 1973: xx + 573 pp., drawings, charts, photomicrographs, photographs. $40.00.—This third volume of *Avian Biology* lives up to the reputation established by the first 2 volumes. The first chapter is a masterly review of avian reproduction by B. Lofts and R. K. Murton. It gives an overview of reproduction and sets the stage for the following chapters. The authors describe not only the gross anatomy but also the fine structure of the testicular interstitial cells and the Sertoli cells. They emphasize the correlation between structure and function, and indicate the manner in which the function of different reproductive organs has been evaluated. It is particularly important that data from numerous wild species and also from domestic species are used in an attempt to integrate and understand the physiologic mechanisms involved in the regulation of gonadal activity by pituitary and gonadal hormones. The electron micrographs are of very good quality, and the legends are clear, so that a non-expert reader should have no difficulties in interpreting the illustrations or the data presented, or in following the authors' salient arguments. My only regret is that the research of A. H. Meier and his co-workers (Meier, A. H. and R. MacGregor, III. Am. Zool. 12:257–271, 1972; Meier, A. H., D. D. Martin and R. MacGregor, III. Science 173:1240–1243, 1971; Meier, A. H., T. N. Trobec, M. M. Joseph and T. M. John. Proc. Soc. Exp. Biol. Med. 137:408–415, 1971) was not included. His experiments on the importance of the temporal relationships between prolactin and corticosterone for reproductive biology of the White-crowned Sparrow have contributed considerably to our understanding of the regulation of the reproductive cycle of this species.

The chapter on the adenohypophysis by A. Tixier-Vidal and B. K. Follett is a valuable contribution to an understanding of the correlation between the morphological features of the pituitary cells and the function and hormonal secretions of these cells. An extensive table listing the responses of different pituitary cells to various stains is especially welcome. This table plus a well produced color illustration and the excellent electron micrographs of the various cells provide details of the morphology. The authors then present the conclusions that may be drawn from the available evidence concerning the morphology and physiology of the pituitary cells, being extremely careful to point out the tentative nature of these conclusions. Comparative endocrinologists and many avian biologists will find this chapter a "must" especially because of the critical review and evaluation of assay methods that have been and are being used to measure hormone content of the pituitary.

The third chapter, "The Peripheral Endocrine Organs," by I. Assenmacher, presents a thorough and scholarly review of the function of the adrenal cortical tissue, adrenal medullary tissue, the thyroid, the endocrine pancreas, the parathyroids, the ultimobranchial bodies, the thymus, and the bursa of Fabricius. The sections on the adrenal and the thyroid bring together a great deal of information, including a wealth of important material from Assenmacher's own laboratory. I regret that the fascinating research by R. K. Cole and his co-workers (Cole, R. K., J. H. Kite, Jr., and E. Witebsky. Science 160:1357–1358, 1968; Cole, R. K., J. H. Kite, Jr., G. Wick, and E. Witebsky. Poult. Sci. 49:839–848, 1970) on hereditary auto-immune thyroiditis in chickens, and the role of the bursa of Fabricius in this syndrome is not mentioned. This work shows the importance of the bursa in forming the auto-immune antibodies to thyroidal tissue. This thyroiditis in chickens in many aspects resembles Hashimoto's disease in man.

H. Kobayashi and M. Wada wrote the chapter on neuroendocrinology, beginning with a review of the morphology of the neurosecretory system. The gross morphology, microscopic, and fine structures are illustrated with well selected drawings, photomicrographs, and electron micrographs. The authors then present the experimental evidence concerning the hypothalamic regions and the releasing factors involved in regulation of the secretion of the various pituitary hormones.

This reviewer lacks expertise to review critically the chapters on sensory reception, but it is evident that they are written clearly and in such a manner that the important features can be understood by non-experts.

In the chapter on vision, A. J. Sillman discusses the morphology of the avian fovea and its relationship to visual acuity. Apparently birds do not have a much greater visual acuity than monkeys and man, but they can perceive a sharp image of an object extrafoveally; this allows them to keep a moving object in sight more easily than humans do. The function of the oil droplets in the retina and the function of the pecten are treated dispassionately. Both seem to remain enigmatic.

B. M. Wenzel reviews chemoreception from anatomical, neurophysiological, and behavioral points of view. A great deal of research on this avian sensory function is yet needed.

J. Schwartzkopff's chapter on mechanoreception has numerous excellent diagrams and illustrations to help explain the morphology and the physiology of the mechanoreceptors, chiefly the auditory organ. The organ of equilibrium and skin sensory receptors and proprioreceptors are also reviewed.

The final chapter, on behavior, by R. A. Hinde covers a wide range of topics, including "learning," in a systematic fashion. Hinde first analyzes animal behavior by describing and classifying different types of behavior, and then illustrating several functional aspects of avian behavior.

My criticism of this volume does not pertain to its quality; on the contrary, it is my opinion that the chapters are all excellent and clearly written. I am impressed by the coverage of the world literature. The flaw is that the arrangement of the chapters in different volumes of the series makes them somewhat dissociated. I think that it would have been more desirable to have one volume which contained the following chapters (possibly in the order indicated): "Neuroendocrinology in Birds," "The Adenohypophysis," "The Peripheral Endocrine Glands," "Reproduction in Birds," "Ecological Aspects of Periodic Reproduction" (by K. Immelmann, published in Vol. 1), "Ecological Aspects of Reproduction" (by M. L. Cody, published in Vol. 1), "Behavior," and "Ecological Aspects of Behavior" (by G. Orians, published in Vol. 1).

Such an arrangement would benefit the readers and buyers of these rather expensive books, although it is a matter of opinion whether another reader would prefer the same grouping of chapters. The selection of chapters for each volume is probably dictated more by the extent to which authors meet deadlines and by the economics of the publishing business than by the judgements and best laid plans of the editors.—ARI VAN TIENHOVEN.

PRODUCTIVITY, POPULATION DYNAMICS AND SYSTEMATICS OF GRANIVOROUS BIRDS. Edited by S. C. Kendeigh and J. Pinowski. PWN—Polish Scientific Publishers, Warszawa, 1973: 410 pp., graphs, diagrams, paperbound. Price not given. (Available from Jan Pinowski, Institute of Ecology, Polish Academy of Sciences, Nowy Swiat 72, Warsaw, Poland).—Some 10 years ago Dr. J. Pinowski of the Polish Academy of Sciences, an

active worker on the breeding biology of *Passer domesticus* and *P. montanus*, began to investigate the possibility of setting up a cooperative international program of research into these 2 widely distributed species. Opportunity was taken to discuss this project at the 14th International Ornithological Congress in 1966 and a Working Group on Granivorous Birds was set up under the auspices of the International Biological Program. The primary aim was to obtain a measure of the importance of granivorous birds in the flow of energy through the agricultural ecosystem created by man. The genus *Passer* was selected as the most suitable group for these studies, both because of the close association of many of the species of this genus with man and also because of the wide dispersion of the genus throughout the world.

Largely through the enthusiasm of Dr. Pinowski the Working Group attracted the interest of over 100 individuals and it was possible to hold a special 3-day meeting in 1970 immediately following the 14th International Ornithological Congress. This book contains 25 papers presented at this meeting (2 in summary only) and 6 later submitted papers. Three papers are in French and the remainder in English.

The papers are grouped in 4 principal sections dealing with biometrics and bioenergetics, population dynamics, food, and systematics and evolution, with a miscellaneous section for papers that did not fit into the more specific themes. This is always a problem in a general conference, but one would have thought that with a meeting of this type a more rigorous selection procedure might have limited papers to the chosen theme. Twenty-four of the papers deal exclusively or principally with *Passer* and the publication would have been improved if it had been restricted to these papers and a more suitable title chosen. The one chosen is rather misleading because it gives an inaccurate impression of the scope of the papers included. The bulk of the publication deals with *Passer domesticus*, which, as Dr. Kendeigh remarks in his opening address, is well on its way to becoming for ornithologists what the laboratory mouse or white rat is to the physiologist and the fruit fly, *Drosophila*, is to the geneticist.

The first section presents a mass of quantitative data on body weight, covering both growth rates of nestling *P. domesticus* and *P. montanus* in Poland, and daily and seasonal variations in the weight of *P. domesticus* trapped in England. Of particular interest are data on daily weight in individuals of the migratory race *P. d. bactrianus* on spring and autumn passage in Tadjikistan. This paper is mainly concerned with variations in the body make up with respect to water, fat, and non-fat materials, and shows that adaptations similar to those in other small passerine migrants have evolved in this race of House Sparrow with premigratory weight increases of up to 6.5 g (ca. 25% of body weight), and the storing both of fat and water to provide energy and compensation for water loss when migrating over arid areas. It is a pity that more of the data in this interesting paper were not presented in tabular form to allow more ready comparison with data from non-migratory populations.

Three of the papers deal with energy requirements. Myrcha, Pinowski, and Tomek provide data on nestling *P. domesticus* and *P. montanus* in central Poland (52° N), while Weiner gives results on both cage and aviary studies of the former species in southern Poland (50° N). Latitude and longitude readings are transposed in the text.

Weiner's results basically confirm those of earlier workers. An interesting feature is that the energy consumption of aviary birds, which might be expected to exceed that of caged birds to finance the cost of free flying, in fact did so only at ambient temperatures above 5° C. Weiner accounts for this by suggesting that the aviary birds clustered together at night, employing "social thermoregulation" to save energy. It was reported

at the meeting that social roosting among wild sparrows was frequent in Poland, where winter temperatures of –20° C are common.

Kendeigh attempts to provide a complete annual energy budget for House Sparrows living in central Illinois (40° N). This is based on considerable experimental work on caged birds carried out over many years, largely by Kendeigh and his collaborators, supplemented with existence requirements data derived mainly from other species and converted weight-for-weight to House Sparrows. Kendeigh acknowledges the limitations of many of the assumptions that had to be made, but nevertheless this is an important paper giving a basis for studying the annual energy requirements of the species, and, by providing full derivations of the different components, suitable conversions can be made to suit localities in different climatic conditions. Factors are given to convert the energy requirements into food, though these are based on laboratory food rather than on foods actually taken in the wild. An important result is the monthly productive energy available over that which is normally used. Providing there is no limitation in food availability, this could determine the range of the species at high latitudes by increased heat requirement to maintain body temperature, and at low latitudes by the inability to realize this potential through heat stress.

The final paper in this section deals with the growth of 7 ground-nesting passerine birds in the Canadian prairie.

The second section is mainly concerned with population dynamics. Eight of the 10 papers deal with *Passer domesticus* and provide breeding data from New Zealand, India, Pakistan, Poland, and the U.S., with one paper from France giving preliminary data on the structure of a population based on the capture and recapture of banded birds. Thus these papers cover geographically, latitudinally, and climatically a representative selection of the House Sparrow's range. Another paper gives similar data for *P. melanurus*, a species indigenous to South Africa. Although *P. melanurus* is associated with man, it is not as closely dependent as *P. domesticus* and the data in this paper, although admittedly from rather atypical Cape Sparrows nesting gregariously in a wine growing area, nevertheless are valuable in providing information for comparison with the better studied *P. domesticus* and *P. montanus*. *P. domesticus* was introduced into South Africa at the end of the last century but only in the last decade or so has it spread over the area and come into significant contact with *P. melanurus*. It will be very interesting to have some information on the interplay between these species, such as already exists for *P. domesticus* and *P. montanus*.

The remaining paper in this section is concerned with census methods for determining the population density of *Agelaius phoeniceus* in the Lake Erie border of the U.S. and Canada. While somewhat off the main *Passer* theme of the conference, it does emphasize the one area that appears to have received somewhat less attention in the *Passer* studies, namely population density and its seasonal variation in different habitats and different parts of the world, though in several of the papers sufficient information is given for this to be extracted. This paper, by Dyer, Siniff, Curtis, and Webb, illustrates very nicely the preferred wetland habitat of this species and emphasizes the considerable variation in numbers that occurs in less favored habitats compared to preferred ones.

Perhaps the greatest value of this section is the full amount of tabular data. This does not make for exciting reading, but does provide in the case of *P. domesticus* a most useful source of data which in due course should allow a much more accurate picture of the species to be built up as well as show how one species can adapt to widely differing conditions.

The section on food contains 2 papers that deal directly with investigations on the food of *P. domesticus* and *P. montanus*. One, based on stomach analyses, gives data on the food taken by these species in the winter in Hesse, West Germany. The other gives preliminary results on seed preference by caged *P. montanus*, but is rather inconclusive. A further paper in this group deals with the food taken by 5 species of dove in Senegal and shows that although there is overlap in the food seed species taken when these are plentiful, the different birds tend to specialize in time of shortage.

Many *Passer* species are agricultural pests and thus are of economic importance. "Economic ornithology" is beset with emotional overtones, but except for the paper by Palmer on *Carpodacus mexicanus* and *Sturnus vulgaris* in California, the economic importance of the birds is not dealt with directly. This paper is really out of place in this publication.

A notable characteristic of the House Sparrow is its sedentary nature over most of its range. It is thus an excellent subject for the study of regional variation and to test adaptation to local conditions. Nordmeyer, Oelke, and Plagemann do this for 5 populations of *P. domesticus* from different parts of West Germany using external measurements. Johnston and Selander compare some 40 North American populations using principally skeletal characters. The latter supports the earlier results of these workers in showing that adaptive evolution has taken place in the 110–120 years since the species was introduced to North America. Significant variations are demonstrated for both areas and where the data are appropriate, appear to support the Allen and Bergmann "rules." A third paper in the "systematics" section by Rising examines House Sparrows taken from Kansas in the autumn and spring, and shows variations that can be explained by selection to the winter climate that are consistent with the variations for a sedentary species shown in the 2 previously discussed papers.

Johnston and Selander are prepared to regard *P. domesticus* and *P. hispaniolensis* and their intermediates as belonging to a conspecific complex (though the large area where the 2 are sympatric but do not interbreed presents considerable difficulty in accepting this view) and in this context the paper by Bortoli on sparrows in Tunisia would have been more appropriately located in this section than in the one on food. This is an area of much interest for those concerned with *Passer* systematics. Although the Tunisian birds can be allocated to *hispaniolensis*, Bortoli reports that hybrid *domesticus* × *hispaniolensis* types, as defined by male plumage characteristics, appear to be evolving ecologically as "*domesticus*" by associating closely with man and remaining sedentary in contrast to the seasonal movements of the typical *hispaniolensis* birds. This would seem to be based on a genetic penetration of *domesticus* from the west through interbreeding.

The "miscellaneous" section includes 3 papers on *Passer* species concerned with pathology and physiology. In separate papers Martin studies the influence of dietary protein on the low temperature tolerance of *P. domesticus* (and the American Tree Sparrow, *Spizella arborea*), and in collaboration with Votava the effect of low partial pressures of oxygen on the House Sparrow. If the oxygen pressure is translated into the equivalent altitude it would appear that the House Sparrow should be able to survive at 6000 m. Natural populations are in fact found up to 5000 m in the Himalayas. Bont and Franssen artificially infected caged specimens of *Passer griseus* with *Salmonella* after finding infected wild individuals and studied the effect on the blood plasma proteins. The results obtained were influenced by the birds becoming simultaneously infected by *Coccidium*.

This publication will be valuable to those interested in the genus *Passer* rather than for the wider field suggested by the title. It is mainly a collection of basic data. The synthesis is promised in a further volume now in preparation by the editors following

a second meeting of the Working Group in Warsaw in September 1973. The editors and publishers, printing in a foreign language, are to be congratulated on the almost complete absence of spelling and printing mistakes.—J. DENIS SUMMERS-SMITH.

FEATHERS IN THE WIND—THE MOUNTAIN AND THE MIGRATION. By James J. Brett and Alexander C. Nagy. Hawk Mountain Sanctuary Association, Kempton Pennsylvania, 1973: 72 pp., 13 photographs, 5 in color including cover, numerous drawings, diagrams and maps. Paper cover. $2.25.—The art of identifying flying hawks has advanced enormously since the early years at Hawk Mountain and this new publication by staff members of the Hawk Mountain Sanctuary should be an invaluable aid not only to the beginner but to most experienced hawkwatchers. The hawk-by-hawk descriptions contain much helpful information not found elsewhere, and gleaned personally by incomparably long hours on the mountain. Each species account is illustrated by a number of drawings showing various flight aspects and anatomical features . . . a long step forward from the usual single figure in a field guide.

Although the chapter on identification is perhaps the most useful feature, other chapters include a short history of the Sanctuary (just a reminder of Dr. Broun's classic of 25 years earlier), the topography of Hawk Mountain, the geography of this and other hawk migration observation points (but no indication of the patterns of the spectacular spring flights through parts of the Great Lakes system), some aerodynamic principles and weather patterns conditioning hawk flights, a reminder of hawk shooting, a bit about DDT, and ancillary material including a yearly summary from 1934 through 1972. If the statement: "As a result of the Sanctuary's educational endeavors, all species of hawks, eagles and owls are now protected by law" seems somewhat sweeping, no one will dispute the Sanctuary's place as probably the major influence in a generation's turn-about in its view of hawks. Fortunately this small volume will fit a coat pocket along with other field guides.—WALTER R. SPOFFORD.

THE DELL ENCYCLOPEDIA OF BIRDS. By Bertel Bruun. Dell Publishing Co., Inc., New York, 1974: 240 pp., 395 color illustrations. Paper cover. $2.45.—This is a handy collection of over 641 ornithological terms and biographical entries briefly defined and listed in alphabetical order. The more than 395 color paintings by Paul Singer are adequate but uninspired, and the anatomical drawings contain several minor errors. The text entries, on the other hand, are accurate and concise.—R. J. R.

INDEX ORNITHOLOGORUM. The Ring, vol. VI. By W. Rydzewski (ed.). Polish Zoological Society, 1972: iv + 112 pp. Paper cover. $3.00. Order from: Editor of The Ring, Sienkiewicza 21, 50-335 Wroclaw, Poland. Checks should be made out to "Polish Zoological Society."—Here is a very useful list of ornithologists of the world, and a great aid in finding persons in various countries sharing one's interests. In a Personal Index the names are listed alphabetically according to country, and for each the following information is provided: surname, other names, year of birth, title, occupation or situation, memberships in principal ornithological organizations, editorships, principal interests in ornithology, address. This is followed by a Subject Index in which the names are listed referring to the Personal Index.— R. J. R.