

REVIEWS

The Palatine Process of the Premaxilla in the Passeres. A Study of the Variation, Function, Evolution, and Taxonomic Value of a Single Character throughout an Avian Order.—Walter J. Bock. 1960. Bull. Mus. Comp. Zool., Vol. 122, No. 8, pp. 361–488, 29 figs.—In view of the considerable recent controversy over the relationships and arrangement of the passerine families, this study of a presumably useful taxonomic character—the palatine process—should be examined carefully. In studying the variation, function, and evolution of this structure, Bock concludes that it has “little value in showing relationships between families of passerine birds,” and he is particularly critical of Tordoff’s conclusions, which were based on the palatine process. There is much of value in this paper, but there are also some weaknesses and inaccuracies in the premises on which the conclusions are based.

Bock synonymizes the terms “palato-maxillary” of Parker, Tordoff, and others, and “secondary palatine process” of Shufeldt, with “palatine process of the premaxilla” (Parker), at least as applied to passerines. Embryological evidence, presented by Parker, Jollie, and Bock, although indeed scanty, supports this view. He suggests that the palatine process is present in all immature passerine birds, and that all of its manifestations (*i.e.*, free process, unfused process, bony splint, fused process, and lateral flange) in adult passerines represent homologous structures.

In an effort to determine the function of the palatine process in each of its forms, Bock studied the jaw musculature of various passerines. The discussion centers on the pterygoideus muscle, part of which originates from the palatine process in those species having a free process. Each of the four parts of the pterygoideus is described, and it is concluded that in general the lateral portions of the muscle serve mainly to raise the lower jaw and the medial portions to retract the palate, thereby lowering the upper jaw. Bock claims that “in the seed-eaters, the medial parts of this muscle are relatively small while the lateral parts are relatively large. In the insect-eaters, the medial parts are relatively large, although they are still smaller in mass than the lateral parts of the *M. pterygoideus*. . . .” He postulates that the attachment of a part of the pterygoideus to the free palatine process (as seen in Indigo Bunting, Cardinal, etc.) may be an adaptation for rapid raising of the lower jaw, an advantage in catching insects, but he found little or no connection between the palatine process in its other forms, and the pterygoideus.

Several criticisms of this section should be made: first, there is no mention of which species, or how many of each, Bock dissected; second, there is no explanation of his method for determining relative size or mass of muscles—a difficult task in small birds that vary in size; third, the function ascribed to the pterygoideus dorsalis medialis, that is, retraction of the palate, applies only to fibers attaching on the basitemporal plate—the bulk of this muscle affects primarily the lower jaw; fourth, functions are given individual muscles or parts of muscles without regard to synergistic actions of other muscles—a serious omission when dealing with jaw muscles.

According to Bock, the heavy-billed cardinalines and the heavy-billed carduelines exhibit basically different methods of seed cracking. The former use a “nut-cracker” technique, in which both jaws are freely movable. Seeds are broken by depression of the upper jaw and raising of the lower jaw; thus well-developed adductor and retractor muscles are required. The shocks associated with seed cracking “are borne by the jaws which form a system partially isolated from the brain-

case." By contrast, the carduelines use the "vise" method. "In the specialized carduelines, the upper jaw has lost its mobility; it is a nearly stationary block against which the mandible presses. Heavy bosses of bone (the lateral flanges) and the rhamphotheca distribute the shocks associated with the cracking of the seed evenly to all parts of the braincase. Only the adductor muscles are well developed. . . ." Bock states that the distinction between these feeding methods becomes "fuzzy" in the less-specialized members of both groups, but he assumes (while acknowledging the lack of evidence for it) that species in other groups with the lateral flange (modified palatine process) use the vise method (that is, estrildids, advanced ploceids, *Oryzoborus*, and *Psittirostra*).

There are several difficulties with the proposed "vise" method. With the exception of the hawfinch (*Coccothraustes*), no passerine bird has been shown to have a virtually immovable upper jaw. The upper jaw of the Evening Grosbeak (*Hesperiphona*) is fully as movable as that of a Cardinal (*Richmondena*); yet these are the two species used to exemplify the different feeding methods. Furthermore, it is not clear how the lateral flange could evenly distribute a shock wave, originating in the jaws, to the skull.

Bock presents a useful synopsis of passerine families, giving the form of the palatine process, and age and individual variation wherever possible, based on "some 3300 specimens representing 500 genera of all but a few passerine families. . . ." Semidiagrammatic drawings of 45 genera representing 25 families and subfamilies are included. These are followed by a discussion of various evolutionary principles and their application to the evolution of the palatine process. Based on his functional analyses, Bock assumes that selective forces "exert a fairly tight control on the palatine process." He believes that "the several controlling selection forces have arisen repeatedly and have reversed their direction numerous times during the evolution of the perching birds . . ." and that the palatine process, therefore, "has little or no value in showing relationships between families of passerine birds or in placing problem genera into the correct family." Consequently, he feels that Tordoff's conclusions should be dismissed pending further evidence. Bock discusses the evolution of the New World nine-primaried oscines at some length without positive results. He argues, finally, for the importance of comprehensive single-character studies such as the one under review, not because taxonomic conclusions can be drawn from any one study, but because "with several dozen such works, there would be a good chance of unraveling the entire evolutionary history of the recent Passeres." This view seems overly optimistic, especially in view of the inherent difficulties of the single character survey. Bock has demonstrated that the analysis of function of a single character soon involves one in a whole complex of characters. The subtleties of function require painstaking analysis of the entire character complex, an almost impossible task when dealing with the entire order Passeriformes. Anything less leads to errors and uncertainties such as are found in this functional analysis, and which, as Bock himself points out, correspondingly weaken the evolutionary and taxonomic conclusions. The immediate contribution of the single character study is likely to be the descriptive survey rather than the interpretation.

Several errors, which impair understanding of the text, should be mentioned: p. 393, line 31, for "mandible" read "maxilla"; p. 406, line 14, for "its" read "the"; p. 412, line 40, for "and" read "are"; p. 416, line 12, for "16B" read "16A."—
RICHARD L. ZUSI.

Atlas der Verbreitung palaearktischer Vögel.—Erwin Stresemann and L. A. Portenko. 1960. First installment (20 breeding ranges and 4 migration maps). Akademie Verlag, Berlin—We know the exact distribution of birds far better than that of any other kind of animals except a few of economic importance. Yet this information is exceedingly scattered, and very few species have ever been mapped with precision. To remedy this deficiency is the avowed objective of the new atlas, a product of harmonious international cooperation. The first installment of this work contains 20 maps, and nine further installments, each with 20 maps, will complete it. There are several notable innovations in this atlas. Most maps are about 8 x 11 inches, a different base map is being used in each case, to utilize a maximal amount of space for the range outline. The outermost range border is indicated by 30-80 numbered points, the number referring to literature citations in the text. Isolated breeding stations outside the continuous range are indicated by individual points. Dotted lines indicate uncertain range borders. A text with each map gives information on relationship of each species, ecology, geographic variation, and migration.

This atlas will be of the greatest value to ornithologists and indeed to all biogeographers. It will no doubt set a standard that other designers of distribution maps will want to emulate.—ERNST MAYR.

Atlas of European Birds.—K. H. Voous. 1960. Thomas Nelson and Sons, 19 East 47 St., New York. 284 pp., 419 maps, 355 photographs. \$15.—This attractive and useful volume is an English-language edition of the *Atlas van de Europese Vogels* (Elsevier, Amsterdam, 1960). For each of 419 European species there is a brief text (faunal type, distribution, habitat, food, nest, movement) and a map showing the entire known breeding range of the species. For most species there is also a photograph. As the author points out, the maps lack precision because of the scale used. The primary function of them is to give some zoogeographic insight into the distribution of the species concerned. From this aspect there are actually relatively few criticisms, although the strange arrangement of North American rivers does not instill confidence in their accuracy. The systematics are relatively conservative. The following pairs are treated as conspecific: *Tringa hypoleucos* and *Actitis* (= *Tringa*) *macularia*, *Lanius excubitor* and *Lanius ludovicianus*, *Regulus ignicapillus* and *Regulus satrapa*, and *Carduelis hornemanni* and *Carduelis flammea*. The *Atlas* contains much of interest to the American ornithologist, not only because of the Holarctic distribution of many American species, but also because the author invariably notes the Nearctic counterparts or replacements of European Palaearctic species when such exist. The arrangement and organization of the book are optimal. The quality of the photographs is good and contributes much to the attractiveness of the volume.—D. S. FARNER.

The Trumpeter Swan—Its History, Habits, and Population in the United States.—Winston E. Banko. 1960. U.S. Government Printing Office, Washington 25, D.C. North American Fauna No. 63, 214 pp. \$1.00.—A few decades ago there was genuine and justifiable concern that the Trumpeter Swan could soon become extinct. The decline in the population of this once fairly widespread species has ceased. Indeed, there has been some recovery to a continental population level of about 1,500 individuals. Of these, about 600 occur in the tri-state area of Montana, Idaho, and Wyoming, including Yellowstone National Park and Red Rocks Lake Refuge. This treatise is concerned basically with the population of this tri-state

area, with the bulk of the information from the investigations and observations at the Red Rocks Lake Refuge. It is inevitable that this should be the case, since the Refuge has been of such fundamental importance in the recovery and stabilization of the species in this area. The author is to be commended for a thorough inventory and analysis of the information concerning this species with emphasis on the population in the United States. There are extensive sections on distribution, habitat, life cycle, population, and management. But this is more than a monographic treatment of an interesting species. It is tangible evidence that there is a growing appreciation of our biotic national heritage, an appreciation that makes it possible to rescue and preserve an endangered species.—D. S. FARNER.

Birds of Campbell Island.—Kaj Westerskov. 1960. Wildlife Publication No. 61, New Zealand Department of Internal Affairs, Wellington. 83 pp., 21 photographs, 4 figs.—Much of this interesting little book is based on the author's observations and collections while a member of the Denver Museum of Natural History expedition, which was on Campbell Island from 7 January to 19 February 1958. In addition to this, however, he has carefully reviewed and included the important observations of 20 earlier expeditions and visits to the island, beginning with the discovery by Frederick Hazelburgh in 1810. The annotated list contains 57 species. The author estimates that there were 2,300 pairs of the Southern Royal Albatross, *Diomedea epomophora epomophora*, during 1957–1958, suggesting that the present breeding population is about 4,600 pairs, bearing in mind that the birds breed every other year. The author's investigations of this species are being reserved for a separate publication.—D. S. FARNER.

XII International Ornithological Congress, Helsinki 5–12. VI. 1958. Proceedings.—Edited by G. Bergman, K. O. Donner, and L. von Hartman. 1960. Vol. 1, pp. 1–436; Vol. 2, pp. 437–822.—In addition to the reports, list of members, list of delegates, and the presidential address by Professor J. Berlioz (pp. 1–49), the *Proceedings* contains 97 papers presented at the general sessions and at the symposia on *Adaptive Evolution in Birds*, *Avian Classification*, and *Nocturnal Migration*. This collection of papers demonstrates not only the increasing rate of ornithological research but also a greater diversity and an enhanced quality. The papers were contributed from 20 different countries.

Dr. Lars von Hartman, General Secretary of the Congress, has informed me that, at the time of mailing of the *Proceedings*, an explosion occurred at the printing plant and that most of the copies were destroyed by fire. A reprinting will be effected; however, there will be a delay of several months before many subscribers will receive their copies.—D. S. FARNER.

The Second Pan-Soviet Ornithological Congress, 18–25 August 1959. Summaries of Communications. [Vtoraya Vsesoyuznaya Ornitologicheskaya Konferentsiya, 18–25 Avgusta 1959, g.]—Izdatelstvo Moskovskovo Universiteta, Moscow. 1959.—Part 1, 94 pp; Part 2, 111 pp, Part 3, 128 pp. (No foreign-language summaries.)—This very interesting publication contains summaries of 266 communications. Crudely classified by the reviewer, these are distributed as follows: systematics and evolution, 12; distribution and zoogeography, 80; ecology and natural history, 71; physiology, 7; morphology and anatomy, 17; embryology and development, 8; behavior, 10; reproduction, 8; migration, 24; diseases and parasites, 15; bird protection, 2; miscellaneous, 12. Of interest are summaries (Part 3, pp. 17, 18, 20, 22) of

four papers dealing with Antarctic investigations. Also of very substantial interest is a paper by B. G. Novikov, O. P. Chepinoga, and M. A. Lyubarskaya of Kiev (Part I, pp. 60-61); this paper reports that it has been possible to modify the molecular weight of the deoxyribonucleic acid of duck Erythrocytes by the injection of preparations of deoxyribonucleic acid from a race in which the molecular weight is characteristically different. This report is of interest because of its possible bearing on the controversial experiments of J. Benoit, P. Leroy, C. Vendrely, and R. Vendrely (*Compt. Rend. Acad. Sci. Paris*, 244: 2320-2321; 245: 448-451), in which it was reported that injection of deoxyribonucleic acid preparations from one race into the ducklings of another race resulted in the development of some characteristics of the donor race and that some of these alterations occurred in the offspring of the treated birds.

Presumably the papers represent the spectrum of ornithological research in the USSR. This spectrum would appear to differ from that of American ornithology primarily in the lesser emphasis on research on behavior and migration.—D. S. FARNER.

Ecological Studies on Mammals, Birds, Reptiles and Amphibians in the Eastern Belgian Congo.—Part II (Report No. 1 of the Swedish Congo Expeditions 1951-1952 and 1958-1959). Kai Curry-Lindahl. 1960. *Annales du Musée Royal du Congo Belge*, Tervuren (Belgique), *Série in 8°*, *Sciences Zoologiques*, Volume 87. 170 pp., 39 photographs.—This volume consists largely of notes on 253 non-passerine species obtained by the Lund University Congo Expedition of 1951-1952 and the Swedish Congo Expedition of 1958-1959. The investigations were conducted mostly in the eastern Belgian Congo and in Ruanda-Urundi. The notes are rich in important biological observations on African species. Evidence is cited for an expansion of *Pelecanus rufescens* in Ruanda-Urundi and for increase in numbers of *Ardea cinerea* at some localities in eastern Belgian Congo. Territorial behavior on the wintering grounds was observed in both sexes of *Tringa hypoleucos*. The author cites cases in which it appeared that flocks of *Merops persicus* in migration induced migration in smaller groups of resting *Hirundo rustica*. It was observed that *Apus affinis* and *Apus caffer* may leave their breeding colonies for several days and then suddenly return. Although this superficially resembles similar movements by *Apus apus* during periods of bad weather, there are no data to suggest that a similar relationship exists for these African species. These are only a few of the many interesting contributions to the biology of African birds.—D. S. FARNER.

The Art and Practice of Hawking.—E. B. Mitchell. 1959. (Reprint Edition, first published in 1900.) Charles T. Branford Company, Boston. 291 pp. 10 pls. \$6.00.—This is essentially a practical handbook concerning the fundamentals of the art of falconry. For the beginner it covers detailed instructions for the capture, care, and training of a hawk or falcon from the time it is secured until it is flown at game. The seasoned falconer will find a most interesting record of hawking as practiced in England prior to the turn of the century, as well as much of value concerning the care and handling of his birds. The first chapter covers the antiquity of this ancient sport, its history and related literature on the subject. The next is a list of the birds of prey most commonly used in Europe and Asia for hawking, with descriptions and characteristics of the various species. There is also a discussion of the difference in character, temper, and disposition between the so-called "long-winged" species (*Falconidae*) and the "short-winged" species (*Accipitridae*). In view

of present-day recognition of a single species of gyrfalcon, it is interesting to note that the author describes four different species: *Falco candicans*, *Falco islandus*, *Falco gyrfalco*, *Falco labradorus*. However, in a footnote he states: "They are indeed little, if anything, more than climatic varieties of the same bird." Several different races of peregrine are also described as separate species. Other chapters include the fittings and appliances that should be used in falconry; methods of capture; care and training; methods of game-hawking for various quarry; recovery of lost hawks; and treatment for maladies and accidents. The chapters concerning Lark-Hawking, and Gull- and Heron-Hawking are little more than stories of the chase. Perhaps they could best be used as propaganda against falconry, but at least they convey a story of this fashionable sport in years gone by. For those interested in falconry, this volume will be a valuable addition to their library.—L. R. WOLFE.

Våra Fåglar i Norden. Vol. II (Rev. Ed.)—Kai Curry-Lindahl, Editor. 1960. Bokförlaget Natur och Kultur, Stockholm. 567–1002 pp., 262 black and white photographs, 11 figs., 56 color plates.—Volume II of this extensive treatise of Scandinavian birds includes the galliform (8), gruiform (5), and charadriiform (35) species. For most of the species there is a general account followed by detailed descriptions of plumages (adult and young), voice, general distribution, occurrence in Sweden, habitat, and migration.—D. S. FARNER.

The Wonders I See.—Second Edition. John K. Terres. 1960. J. B. Lippincott Company, Philadelphia and New York. 256 pp., with sketches. \$5.00—Over 80 selected encounters with squirrels, insects, spiders, birds, and other everyday animals, spanning a year of time, are presented in remarkably intimate detail in this book. The scope of material is based on more than eight years of note taking and ranges from a primitive beach to a Long Island lawn, from a deer floundering through deep New England snow to white ibises flying over Lake Okeechobee in Florida, with emphasis on animals that surround the average person's daily life.

John K. Terres learned to know individual insects and spiders, birds, and generations of squirrels by banding and by marking them with harmless dyes. His fascinating accounts are proof of his belief that the only way really to learn about animals is to study them as individuals, and that the small animals in his backyard—sparrows, woodpeckers, centipedes, and others—lead no less interesting lives than a black bear, an antelope, or an eagle. In the words of John Locke, "He that hawks at larks and sparrows has no less sport than he that flies at nobler game."

To me the most important message of his book relates to the philosophy of observation. Why do some bird lovers see Lincoln and Leconte sparrows that many observers have never recorded? Are these birds actually few in numbers, or do they occur only in very special places at restricted times? How does a naturalist develop a pattern of life for an animal he sees only occasionally or seasonally or merely making a few jottings in his field diary? These and hundreds of other questions relating to animals and plants are implicitly involved in Terres' philosophical statement in the Introduction: "What I saw today, you may see tomorrow. To see well and to develop the 'seeing eye' one needs to have interest, sympathy, and the understanding heart. To see *correctly*, one needs knowledge, because interpretation is a part of seeing truly." I am reminded of Carlyle who wrote: "With their great eyes men do stare withal, so few can see."—IRVEN O. BUSS.

Ducks, Geese, and Swans. A Sunset Junior Book.—Herbert Wong; illustrated by William D. Berry. 1960. J. B. Lippincott Company, East Washington Square, Philadelphia. 63 pp. \$2.95.—This carefully conceived little book has been prepared primarily for children of about eight to ten years of age. In addition to general discussions of waterfowl, there are descriptions and illustrations of the common species of ducks, geese, and swans of western North America. Also included are useful brief discussions of migration, bird-banding, dangers to waterfowl, and waterfowl protection. A wide circulation of this book would go far in creating an enhanced appreciation of waterfowl in a new generation.—D. S. FARNER.

Songs of Fringillidae of Eastern and Central North America. Sounds of Nature. Vol. 6. Finches.—Recorded by Donald J. Borror and William W. H. Gunn. 12" 33-1/3 rpm. \$5.95. Federation of Ontario Naturalists, Edwards Gardens, Don Mills, Ontario, Canada. (In United States: Curtiss and Weir, 54 Priscilla Place, Trumbull, Connecticut.)—This record reproduces the voices of 43 (possibly 44) species of North American finches. The quality is good. As in the earlier warbler record of the same authorship, vocalizations are grouped according to similarity, rather than taxonomic relationship. The jacket supplies a species index and also shows the number of songs (or song sequences) reproduced and the number of individuals of each species involved. For most species at least six songs are given; for the Cardinal, White-throated Sparrow, and Rufous-sided Towhee 15 or more. A three-page, mimeographed leaflet supplies such significant data as the locality and month of each reproduced vocalization, and which were uttered by the same individual, as well as other pertinent facts. All this enhances the scientific usefulness of the record, for it facilitates the study of geographic, seasonal, and individual variation in song and provides a basis for taxonomic comparison. The leaflet adds that a detailed analysis of the songs (illustrated by spectrographs) is being prepared, available on request for 25 cents. Considering the scientific value of records like these, technical (as well as English) names of the species should be included, either on the jacket or the enclosed leaflet. With its supporting data this recording is a real contribution to ornithology and a service to the bird watcher wishing to identify songs or interested in the esthetic aspects of avian voices.—E. EISENMANN.

A Treasury of New Zealand Bird Song.—An album of three 45 rpm extended-play disks boxed with a 40-page booklet describing, and portraying in black and white photographs, 30 species, including 11 introduced species. Recording and photography by Kenneth and Jean Bigwood. Text and commentary by Gordon R. Williams. Published by A. H. and A. W. Reed, Wellington. 45 s.—This is an album of exceptional quality, both technically and ornithologically. On the average, a little more than one minute is devoted to each species. This gives an unhurried quality to the presentation. Song description in the booklet is closely tied to the recording and is helpful. Most listeners would be willing to forego the pleasure of listening to House Sparrows and Starlings, but even these are well done.

Mr. Gordon Williams has done a nice job on the text and commentary. The latter, which appears to introduce each species on the disks, has been quoted from outstanding literature and often adds much to the enjoyment and understanding of the recording. To anyone familiar with or interested in New Zealand birds, this collection is recommended.

Technically, the recording is excellent. The signal-to-noise ratio, which is always a serious problem in natural history recording, is well above average in all but a few instances, such as the European Goldfinch. Water noise in the background of the Blue Duck seemed perfectly natural. In the few instances where other birds were heard in the background, they were mentioned in the text. Distortion in the recordings seemed reasonably low, although some was noticeable on high notes with steep wave fronts on the two separate reproducers on which I listened to the disks. This is usual in all bird recordings published today and emphasizes the need for more investigation into the very special problems of recording bird songs.—PETER PAUL KELLOGG.