ORNITHOLOGICAL LITERATURE

A Comparative Study of the Behavior of Red-winged, Tricolored, and Yellow-headed Blackbirds. By Gordon H. Orians and Gene M. Christman. University of California Publications in Zoology, Vol. 84, 1968: 81 pp., 2 pls., 30 figs., 10 tables. $3.00.

The purpose of this study is to "analyze the influence of the striking differences in social organization upon the evolution of behavior" in three marsh-nesting icterids. Displays (other than vocalizations) of all three species are described in 19 pages, nine of which are comprised of excellent sketches by the junior author. Vocalizations are described in 25 pages in which appear 16 figures of sonographs. Comparison of all displays and vocalizations is achieved by a system of scoring "based upon the conspicuousness of the displaying bird." Points are added according to the degree of erection of plumage of different parts of the body, spreading of wings and tail, etc., and this information is presented in tabular form. This is an interesting way of giving emphasis to the importance of the display components and their possible combinations. Displays and vocalizations of all three species are related to specific stages of the breeding cycle in six figures.

Displays and vocalizations are considered to function primarily to communicate information. Based on a set of assumptions, namely, that information of environmental, social, identifying, and locating nature is being communicated, an analysis is made, but for the male Red-winged Blackbird only, of the amount of information transferred by each display and vocalization.

An "evolutionary analysis of blackbird behavior" is based on the "importance of five major factors on the evolution of similarities and differences both within species (especially sexual differences) and between species." These factors are: species recognition, social organization, habitat, plumage patterns, and motivational changes. This interesting discussion covers 13 pages.

In a concluding section the authors speculate briefly on the origins of blackbird displays. Landing movements, it is suggested, may have given rise to aspects of flight displays and displays accompanying basic song; vocalizations "probably all have been ultimately derived from breathing movements. . . ." Caution is advised (p. 75) in interpreting behavior in relation to causation: "Behaviorists attempting motivational interpretations are subject to errors comparable to those of a paleontologist uncritically assuming that a group of organisms necessarily evolved where most living members occur." A forewarning of this point of view is given in the introduction, the authors noting that they have largely omitted motivational analysis in the belief that descriptive field studies can yield only "crude speculation" in this respect. Evidently, something more than "single frame analysis of over 2,000 feet of motion pictures," a large series of recordings of vocalizations, and field observations during eight breeding seasons is necessary in order to obtain data that will yield information on motivation.

Perhaps the authors are simply more candid than most of us, their uncertainties in this behavioral study being freely admitted: "Some behaviors. . .are *exceedingly difficult* to understand" (p. 54); ". . .it is *exceedingly difficult* to measure information transfer between individuals. . ." (p. 57); ". . .the risks and the benefits of social behavior patterns are *exceedingly difficult* to measure. . ." (p. 62); ". . .since many of the displays are associated with a wide variety of vocalizations we have found it *exceedingly difficult* to

fit them into such a scheme. . ." (p. 74); ". . .song and other territorial vocalizations. . . and their associated displays should evolve primarily internal control and should be *exceedingly difficult* to analyze. . ." (p. 75). (Italics mine).

This work was evidently carefully proof-read for there are few typographical errors. Some of the graphs, e.g., Figs. 16, 19 and 24, are poorly set, and the illustrations of Wing Flipping (Fig. 4) have reversed captions. Figure 4d illustrates Wing Flipping in the female Redwing (as drawn from a photo in Nero, 1956:14).

The section on displays was of particular interest to me since, as the authors state, frequent references were made to reports by me on behavior of two of the species concerned, the Redwing and the Yellowhead (Wilson Bull., 68:5–37, 129–150, 1956; Wilson Bull., 75:376–413, 1963).

In view of the significance which the authors attach to the number of displays in each species and especially the number and kinds of components in what are called equivalent, comparable, or analogous displays, it is important to establish that such displays are comparable and disparate. Some questions may be raised in this respect. The male Yellowhead is said (p. 7) to have a flight display that is similar to the "Flight-song" of the male Redwing, though it differs in that it is always silent. It also differs from the Redwing in that it is given only over the territory though in the latter it is also given upon leaving and returning to the territory. Further, it is said to differ in that it often leads to an elevated wings display upon landing from which often a nest-site demonstration follows. This display, though differing from the "Flight-song" of the Redwing in three major respects, is treated as a corresponding display (Tables 2 and 3, pp. 50–53).

A second "territorial flight display" in the Redwing (p. 7) is called "Fluttering Flight. . . . After landing the male commonly continues the display while perched as the Defensive Flutter. . . ." The latter (p. 16), considered a "perched analog" of the former, "is most common during the early stages of territory establishment and when the females are arriving." This display appears identical to behavior that some observers have regarded as indicative of sexual excitement. And note that the "*Si-si-si*" call accompanying Defensive Flutter (p. 45–46) "may not be really distinct from the *Ti-ti-ti* [precopulatory] call" (p. 46). No reason is given for the reference to defensive behavior, a seemingly inappropriate term especially in a paper which attempts to avoid motivational aspects. In any case, the appearance of a display ("Flutter") both when perched and when in flight would not seem to warrant description and use as two separate displays.

Under "Precopulatory Display" of the male Redwing (p. 20) it is said that "In the full intensity display the male walks or jumps around as much as terrain and vegetation permit as he approaches the female. . . ." This is incorrect, the statement unfortunately implying some similarity to precopulatory display of the male Yellowhead. The male Redwing walks or runs toward the female and "jumps around" only as necessary to surmount obstacles in his path, thus on a level surface there is no jumping.

Although a "postcopulatory display" was described and illustrated for the Tricolor (p. 20) and was used as a basis for comparative study, the authors note that there was "insufficient evidence to determine whether this is a regular display which is widely used in this context. . . ." "Postcopulatory display" in the male Yellowhead (illustration based on a photo supplied by me) in which the male raises its tail is said (p. 20) to be of "regular" occurrence. This is misleading. Although tail raising occurs regularly in this species in agonistic situations it does not regularly follow copulation. The statement that "tail raising has not been noted. . .under any circumstances in the Redwing

(except rarely in the Crouch). . ." is also misleading for it is of common occurrence in feeding groups (see Nero, 1956: 13; 1963: 394). No mention is made of the extensive though perhaps inconclusive discussion of tail raising as an appeasement display (in Nero, 1963: 391–394), the authors concluding only (p. 20) that "its function is still obscure."

Considering that this study concentrates on relationships between plumage and communication the statement (p. 5) that the male Yellowhead "apparently has no plumage modifications other than the development of a yellow head and white areas on the wing" is surprising. The yellow cloacal patch (referred to elsewhere by the authors, pp. 20, 72) appears to function in display, and the black area surrounding the eye and the base of the bill may well be significant.

I am credited by the authors as having shown that "Bright colors on the throat and breast are the most common plumage aberrations of the Redwing" (p. 71). This is incorrect. Various albinistic features are far more common. When melanic pigmentation is inhibited in the throat and breast feathers, underlying carotenoid pigments become visible.

Redwings and Yellowheads are said (p. 73) to be "completely dominant to the females at all times"; but, as already pointed out, there are conditions under which male Yellowheads are repulsed by their mates (Nero, 1963: 404).

The statement that "Nero (1963). . .interprets the Asymmetrical Song Spread as a low intensity form of the Symmetrical Song Spread" (p. 16) is an error on the part of the authors (see Nero, 1963: 377).

A great deal of emphasis is given to "Bill-up Flight" of the Yellowhead (pp. 9, 19, 49, 52, for example) which is here regarded as a unique feature of this species. Unfortunately, no comment is made regarding the proposed relationship of "Bill-up Flight" as a homologue of "Bill-up" display (Nero, 1963: 382–386). On the contrary, "Bill-up" display is considered a counterpart of "Bill-down" posture (p. 49). It is even stated (p. 9) that Bill-up Flight may be given with the bill pointed down!

In the Summary (p. 77) a further comparison is drawn between Bill-up Flight of the Yellowhead and territorial flight display in the Redwing and Tricolor, though these are not related displays.

The statement that Yellowheads make "short Bill-up Flights during which the birds also present their backs to each other" (p. 19) is hard to reconcile with males approaching each other in territorial boundary disputes.

Bill-up display in the Redwing female is said (p. 19) to be given "only to other females," though I have already reported it as being given "occasionally to first-year males, and rarely to adult males" (Nero, 1956: 12).

The above are examples of material in this paper that I found erroneous, questionable, or misleading. Possibly an attempt to describe and compare the behavior of three species in 10 pages led to the oversimplification and generalization that in my opinion detract from the value of the section on displays. Moreover, and unfortunately, many of these same points are raised again in the concluding sections of the paper.

Doubtless the main points of the paper regarding the influence of social organization upon the evolution of behavior of these three blackbird species, as suggested to me by Professor Orians in recent correspondence, are valid in spite of my contention that some portions were hastily assembled. Thus the paper attains its major objectives.—ROBERT W. NERO.

A Bird-Bander's Guide to Determination of Age and Sex of Selected Species. By Merrill Wood. College of Agriculture, The Pennsylvania State University, University Park, 1969: 8½ × 11 in., spiral binding, leatherette covers, 181 pp., 2 figs. $3.00.

Bird-banders and other field researchers have long felt the need for a guide, summarizing in a single volume, much of what is known about age and sex determination in living birds; Wood's guide is intended as a step in this direction. As the title denotes, however, the book is limited to selected species (I count 160), and coverage is restricted to the northeastern United States. Included are most of the commonly banded Passeriformes (House Sparrow, Blue Grosbeak and House Finch are missing); woodpeckers, a few hawks, small owls, etc. No herons, waterfowl, shorebirds (excepting American Woodcock), gallinaceous birds, gulls, or terns are treated. Also missing are several western and northern species that occur fairly commonly within the northeastern U. S. (Western Meadowlark, Oregon Junco, Gray Jay, Boreal Chickadee, etc.)

The author's approach, based largely on the literature, is in the form of a key. A short introduction covers the "parts" (topography) of a bird. A crude diagram of a spread wing shows 10 secondaries and 10 primaries, with no mention of variation in these numbers, although correct numbering of primaries is essential to the use of wing formulas cited later in the book. Also in the introduction are discussions on the use of the incubation patch and cloacal protuberance in sex determination, and of the "skulling" technique. An index of species treated (pp. 15–16) would be more convenient at the end of the book.

Each bird is listed under its common name, followed by the recommended band size, A.O.U. number, and a statement regarding the reliability of the skulling method for that species. The main section of each key is based on whatever characteristics have been selected to aid in determination of age and sex, and the appropriate code for use in preparing the Federal banding schedules is also indicated. A short summary of molt sequence, usually adapted from Forbush (Birds of Massachusetts and Other New England States, 1925–1929) or Roberts (Manual for the Identification of the Birds of Minnesota and Neighboring States, 1955), ends each account.

As this work will undoubtedly become the standard guide for hundreds of eastern banders, it is unfortunate that a number of errors and confusions are included. For example, both sexes of the Blue-gray Gnatcatcher in first fall [basic] plumage lack the narrow black line bordering the front part of the crown, which is acquired by the male in a [prealternate I] molt in February. Adherence to Wood's key, however, would classify *any* autumn gnatcatcher lacking the black forehead as a female; in actual practice only the adult male is identifiable after mid-August. In quoting Blake (Bird-Banding, 27:185, 1956) on the relative length of the ninth primary of Connecticut and Mourning Warblers, an error is perpetuated that dates back to Ridgway (U. S. Natl. Mus. Bull., 50, part 2:622, 1902). The 9th primary of the Connecticut is longer (not shorter) than the 6th, and the 9th primary of the Mourning Warbler is usually shorter (not longer) than the 6th. For a full discussion, see Lanyon and Bull (Bird-Banding, 38: 187–194, 1967), a paper that should have been in Wood's bibliography. The key for the American Redstart does not allow for males in second year plumage, and after the description of the fully adult male, a correction is needed to allow for birds in this plumage to be designated as ASY (after second year) from January through May; then AHY (after hatching year) only during the autumn months.

Considerable confusion under the Scarlet Tanager is apparently based on a misunderstanding of the timing of the "prebreeding" [prealternate] molt as based on

Forbush (ibid.); the age of a spring male cannot be correctly determined as the key is constructed. (From April through June the body plumage of *all* males is scarlet. Birds with gray-brown primaries and secondaries contrasting with black secondary coverts can be classified as second year birds; black primaries and secondary coverts indicate after second year.) The key to the Common Redpoll is also misleading, as it fails to allow for the buffy breasted immature male which does not acquire the pink breast feathers until after the first "postbreeding" [prebasic II] molt. Young males, then, key out as females! Also the bander should regard the key to the Cedar Waxwing as it relates to the red tips of the wing feathers as descriptive only of a general tendency. In the banding of over 3,000 waxwings in southwestern Pennsylvania, I have found many exceptions to this key: Birds of the year occasionally *are* found with very well developed appendages; some older waxwings apparently never acquire them.

The instances listed above represent only a sample of the errors of omission and commission within the main text. Of less importance are editorial errors such as the failure to list a reference to Baird (1964) in the "Literature Used" section at the end of the book; Amadon, 1966 reads "1965" on page 3, and the reference to Roberts (p. 17) should read 1955, not 1967. A more critical editing might have eliminated such minor errors as well as some of the others mentioned above.

The key provides an idea as to the reliability and time limits of the skulling technique for each species, which is the most original contribution of the book. Wood is wisely conservative in his treatment of the subject. As he notes (p. 13), "The skulling method probably can be used safely on many species at dates later than those given in this Guide." The dates that are provided apparently reflect an approximate period after which it may be impossible to differentiate between adults and young because of completed pneumatization in some of the immature birds; that use of the obviously unossified skull after this point is not impaired is unfortunately not explained.

For over two dozen species, including Catbird, the orioles, all of the blackbirds, many northern finches, and the Song Sparrow, we are told: "Age by skulling unlikely." Since space was not a problem (almost all of the keys occupy less than half of the full page allotted), it would have been extremely helpful had a word or two of explanation been given in each case. Do the skulls of these species not pneumatize the first year? Is the skin of the crown too thick? Too dark? Does the skull of the immature pneumatize too early? As it is we can only speculate on Wood's reasoning. In my own experience (in skulling well over 20,000 birds) I find that in many species where the problem is simply seeing the skull because of a dark or thick skin, an experienced bander can safely classify at least some individuals as hatching year birds with the aid of a good artificial light and proper magnification.

There are several other species, listed by the author as safe to "age" by skulling, that my research has indicated (Leberman and Clench, MS. in preparation) often do not ossify until the second year or even later, and it might be appropriate to indicate them in this review. Included are the *Empidonax* flycatchers (use wing bar color as a double check), the White-breasted Nuthatch (the skulls of some individuals may never fully pneumatize), Barn Swallow, Swainson's Thrush, Red-eyed Vireo (use eye color as a double check), Northern and Louisiana Waterthrushes, Yellow-breasted Chat, Scarlet Tanager, and Indigo Bunting. For most of these, however, the area of unossified skull is usually quite small by the second autumn, and birds showing extensively unpneumatized skulls can be determined as hatching year with reasonable assurance.

Wood warns against using too much water in winter for wetting feathers while

skulling, suggesting that the birds be held until dry. At Powdermill Nature Reserve we avoid this problem by wetting the feathers with alcohol, which evaporates in a few seconds.

A surprising number of the keys provide tables for sex or species determination by use of wing or tail length. Nowhere in the guide, however, is the new bander warned that use of such measurements usually requires great caution and judgment. As anyone who has measured the wings of a large sample of birds in the field is aware, the potential of error and inconsistency in his own data, as well as the variability in the methods of others, is great. Positioning of the wing along the rule, the amount of pressure applied, and feather wear all combine to open such measurements to question. Tail measurements on a squirming chickadee are doubly difficult; data for separating such birds as the Carolina and Black-capped Chickadees should, I believe, probably be used only in combination with the slight plumage differences. The geographic variation within such plastic and migratory species as Robin, Slate-colored Junco, and Song Sparrow also adds to the possibility of error in determining sex by wing length; in the Slate-colored Junco, might a large female *J. h. carolinensis* not key out as a male *J. h. hyemalis*?

Caution would seem to be the key to the use of this book, which, despite some inadequacies, will prove useful to the prudent bird-bander. Perhaps its greatest contribution is to point to the gaps in our knowledge and hopefully prompt others to publish their findings. For as Wood notes in his Preface (p. 3), "For any particular species, somewhere there is certain to be a bander who has more information than is presented here. It is hoped that this knowledge will soon become available to others."—ROBERT C. LEBERMAN.

FROM LAUREL HILL TO SILER'S BOG. THE WALKING ADVENTURES OF A NATURALIST. By John K. Terres. Alfred A. Knopf, 1969. 8½ × 6¼, xix + 227 pp., 1 map, 32 illus. by Charles L. Ripper. $6.95.

Obviously John Terres belongs to the modest but select company of naturalists whose chief attributes in the research of natural history consist of time unlimited, spent within one limited area over a long period of years. The results of this kind of research are often astonishing. Reading directly from nature, the keen observer is able to follow installment after installment of events, which he can finally put together to form a factual and significant account. The enchantment and exhilaration of the discoverer is forever the reward of his painstaking work.

All this is contained in Terres' book and for this reason it is not just a tale of rambling roving explorations and haphazard walks in the woods. Ambition and definite aims dictated and directed the naturalist's observations. Concentration counts. The night was often turned into the most intensive work period and the ingeniously devised method and approach brought out meaningful information.

Within the light and poetic framework commenting on the four seasons, study after study disclose facts about rabbits, foxes, mice, flying squirrels, raccoons, birds. We learn how the Turkey Vulture (*Cathartes aura*) is guided to its prey, about the Red-tailed Hawk's (*Buteo jamaicensis*) courtship flights, the Barred Owl's (*Strix varia*) occasional excursions into shallow creeks, catching fish, and the courtship feeding of the Bobwhite (*Colinus virginianus*).

Especially interesting and noteworthy are the rather frequent accounts dealing with predation. The natural ending of a wild life is seldom witnessed, but the patient and

consistent watcher can sometimes follow the concluding episode or piece it together from signs written in the snow and on the ground. A Red-tailed Hawk attempts to strike a Turkey (*Meleagris gallopavo*) with a brood of young, but the ten-pound hen rises into the air and forces the three-pound hawk to turn tail. A rabbit cheats a pack of dogs of their prey, while death in the jaws of a weasel catches up with another.

In the last three chapters the author is at his best, not because the style of writing is outstanding, but because the naturalist is in his glory and his involvement is so complete that it is impossible for the reader not to be carried away with him. A book full of so many attractively presented facts belongs in any nature library worthy of the name. Ripper's sensitive and accurate drawings are a fine asset.—LOUISE DE KIRILINE LAWRENCE.

OWL. By William Service. Alfred A. Knopf, New York, 1969: 5 × 8 in., 93 pp., illus. with drawings by Walter Richards. $4.00.

This might be called "just one more story of a pet owl"—but it is better than most. At least it was more appealing to this critic, perhaps because the author recognizes anthropomorphism for what it is and is rarely guilty of it, perhaps because of a rather unique style of presentation of his story. Mr. Service speculates on many aspects of Owl's behavior. He performs simple experiments with this bird, described what the bird did, and rarely fell into the trap of attempted interpretation of this behavior. Whether you like owls or not, you will like this appealing little creature.

There is one serious omission. At no time does the author bring out the point that in many states it is illegal to have a Screech Owl in captivity. I find myself shuddering over the number that may be taken into homes now, in misguided attempts to raise a pet like Mr. Service's owl, without permit and without sufficient knowledge of how to do it.—SALLY H. SPOFFORD.

ANNOUNCEMENT

The North American Nest Record Card Program, Laboratory of Ornithology, Cornell University wishes to remind contributors that 1969 nest records are still welcome. In addition the Program desires to accumulate data on nests from the pre-mid-1940s (pre-pesticide era) for comparison. The Program still lacks Regional Centers in Idaho, New Hampshire, New Jersey, and Wyoming.