

Kansas Ornithological Society

BULLETIN

PUBLISHED QUARTERLY

Vol. 15

December, 1964

No. 4

TERMINOLOGY IN AVIAN BIOACOUSTICS

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The terminology used in bioacoustics has been drawn from the fields of physical acoustics, phonetics, and music or a combination of these, depending on the background of the investigator, the nature of the sounds he is studying, and the aspect of the sounds that he wishes to emphasize. Bioacoustics is a behavioral science; hence, terminology emphasizing only physical aspects of sounds and their production would be inadequate. Much work of phoneticians is pertinent to study of animal sounds, but the terminology of phonetics has been developed to describe particular elements—human speech sounds—and thus is not entirely applicable to sounds of other animals.

Considerable controversy centers around the use of musical terminology in describing the songs and calls of birds. Those who oppose such use fear that it implicitly suggests that birds are exercising artistic creativity. This implication need not accompany use of the terms since musicians themselves recognize an approach to music other than artistic—the study of the elements of music as acoustic entities as practiced by musicologists. Drawing an analogy between music and bird vocalizations is by no means lacking in philosophic basis. Biologists (Craig, 1943; Hartshorne, 1958) and musicians (Herzog, 1941; Szoke, 1963) alike have recognized that all the essential elements of music can be found in bird vocalizations. The differences are of a quantitative nature, there being greater complexity and duration of musical units and more extensive use of polyphony in much music.

The artistic approach to music emphasizes the relationship of certain sound patterns to largely culturally determined psychic phenomena—intellectual and emotional—in man. Obviously, bird vocalizations did not evolve in relation to psychic phenomena in man, so in this way they cannot be considered artistic. Yet, man does consider certain sounds produced by birds as being esthetically significant.

Such consideration is evidence of a notable instance of biological parallelism between mammals (especially man) and birds, based on the physical properties of sound and the similar mechanisms by which the two groups have made use of sound. Specifically, the syrinx of birds and the larynx of mammals are biologic analogs in that tracheae and bronchii have been variously modified in the derivation of the organs. The oral cavities as resonating chambers are, of course, homologues; consequently, the sound-producing systems as wholes can be considered partly analogous and partly homologous.

Considering the sound-receiving organs, Pumphrey (1961) stated, "Although there is a certain similarity in the disposition of the homologous parts, the differences between the mammalian and avian ears are evidently substantial and deserve detailed consideration." Here, again, the organs are partly homologous and partly analogous. The physical differences are reflected in different functional capacities although not all the physical bases of functional differences are known.

Lorenz (1957), writing of the comparative studies of behavior of Whitman and Heinroth, stated, "Neither Whitman nor Heinroth ever use the term 'homology.' Yet both their studies are based on the assumption that this concept, so widely used in

morphology, applies to innate, genetically determined motor patterns as it does to organic characters." Marler and Isaac (1961) call attention to the similarity of the study of vocalizations to classical comparative anatomy. The concept of homologous characters can be used to describe the relationship of the use of sounds for communication in mammals and birds. While the physical means with which sound is employed are only partly homologous, the fact of use of the sounds may be thought of as an instance of functional homology. The sounds themselves may then be treated as homologous entities. From this point of view, there seems to be no reason to avoid the application of the same terms to comparable elements. Where a close correspondence between elements can be shown, the use of preexisting terms such as those used in musical notation or language study may well serve better to promote clarity of description and facilitate communication between investigators than would neologisms.

Although Thorpe (1961:1) preferred the term *vocalization* for scientific usage, he often used *song*, presumably because it is more concise. So entrenched in the language is the term *song* in reference to bird vocalizations that part of the first definition for the word given by the *Oxford Universal Dictionary* (1955) is, "b. The musical utterance of birds. . . ." As stated in the definition, the usage has tended to center on those vocalizations that are "musical" or "pleasant" to the ear. From this tendency grew the widespread habit of ornithologists of using the term to distinguish primary song and secondary song from call notes. It would be best to use *song* only in a general sense and attach qualifiers such as primary and secondary for other purposes.

When used in avian bioacoustics, *song* should mean only the product of the vocal apparatus as opposed to art forms such as poems or musical settings for poems and ballads, etc. These distinctions are clearly made in the definitions for *song* given in both the *Oxford Universal Dictionary* and *Webster's Collegiate Dictionary* (1948).

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Notes on Birds From Southwestern Kansas.—Most of the observations summarized below were made by the authors, working under the auspices of The University of Kansas Museum of Natural History, between 11 July and 19 July 1964; included also are a few notes made by students in The University of Kansas summer session field course on 17 and 18 July 1963. All specimens taken were deposited in The University of Kansas Museum of Natural History, and numbers used in connection with these specimens refer to the catalog numbers of that institution. Data presented here are primarily distributional, and while they do not, in all cases, extend present estimates of range, they emphasize or clarify distributional trends outlined in the *Directory to the Bird-life of Kansas* (Johnston, 1960) and *The Breeding Birds of Kansas* (Johnston, 1964).

ACCOUNTS OF SPECIES

Mississippi Kite: *Ictinia mississippiensis* (Wilson).—Johnston (1964) says that this species is a common summer resident, found west to Morton County, with specimens and breeding records coming from stations south of Grant, Barton, Harvey, and Douglas counties. Johnston (1963) mentions two pairs seen along the Cimarron River north of Elkhart, Morton County, on 17 and 18 July 1963. We found kites in low density in Barton County, and they were locally common in Pawnee, Edwards, Ford, Clark, Comanche, Meade, Gray, Finney, and Morton counties. We located an occupied nest 7.5 miles north, and 5 miles east of Elkhart, Morton County, on 13 July. The nest was 24 feet up in a small cottonwood (*Populus* sp.) in riparian brush along the Cimarron River, and contained one downy white chick (ca. 200 mm). A parent bird flushed from the nest, and soon at least seven adult kites gathered overhead, apparently in response to the parent's alarm notes. Several similar, but unoccupied nests were located there in cottonwoods, indicating a large local breeding population. This seems to be the first nesting record from Morton County. Jon C. Barlow shot an adult male Mississippi Kite (KU 45635) 9 miles north and 2 miles east of Elkhart, Morton County, on 7 June 1964, thus documenting occurrence of the species in that area with a specimen. The habitat used by these kites closely resembled that described by Fitch (1963:506–507) for Kansas birds; however, kites or kite nests could not be located in similar vegetation along the Arkansas River near Coolidge, Hamilton County. We wonder if the distribution of the Mississippi Kite, at the extremes of its range where otherwise suboptimal conditions might be expected to exist, might not be related to the distribution of a large, locally abundant cicada (*Tibicen dealbata*). Fitch (*loc. cit.*) mentions these insects (*Tibicen* sp.) to be a food item of kites, and we found kites to be common where the cicadas were common (for example, in Morton County), and to be absent where the cicadas were absent (in Hamilton County). In support of this theory, we observed a kite eating a cicada of this species (identified by calls), 17 miles east of Coldwater, Comanche County, on 18 July.

Scaled Quail: *Callipepla squamata* (Vigors).—A pair of Scaled Quail was shot 7.5 miles north of Elkhart, Morton County, on 13 July. Specimens (2): male, 45522, testis 14 × 6, moderate fat, 193.0 g; female, 45521, one ruptured follicle with a shelled egg in oviduct, four large follicles, and five others enlarged to more than 4 mm, moderate fat, 220.0 g. These specimens document breeding in Morton County. Another Scaled Quail was shot 2 miles south of Coolidge, Hamilton County, on 15 July. Specimen (1): male, 45523, testis 10 × 6, moderate fat, 215.0 g. These records fall within the distributional limits described by Johnston (1964). The specimens resemble *C. s. pallida* Brewster.

Mountain Plover: *Eupoda montana* (Townsend).—On 15 July 1964, we shot one of 13 birds found in short, xeric pastureland [with interspersed yucca (*Yucca* sp.) and prickly pear (*Opuntia* sp.)], 2 miles north of Coolidge, Hamilton County. Specimen (1): male, 45526, testis 5 × 3, light fat, 87.0 g. On 16 July, we located at least 60 birds (one flock of 34) 3 and 4 miles north of Coolidge. Some were in the habitat

described above, but the largest congregations were in a fallow field adjacent to an ephemeral pond. Specimens (3): female, 45528, ovary inactive, light fat, 92.0 g; female, 45527, ovary inactive, 101.0 g; female, 45529, ovary inactive, light fat, 96.5 g. These seem to be the first specimens of Mountain Plovers from Hamilton County, although Linsdale (1927) found a flock northeast of Coolidge on 27 July 1921. Johnston (1964) considers this species to be an uncommon, local summer resident in western Kansas.

Ash-throated Flycatcher: *Myiarchus cinerascens* (Lawrence).—A specimen (41627) was taken by R. D. Burkett 7 miles north and 2 miles east of Elkhart, Morton County, on 17 July 1963. This specimen was a male, testis 8 mm, light fat. We took another male (45566) 7.5 miles north of Elkhart, Morton County, on 12 July 1964. It was an adult, testis enlarged (11×5), weighed 26.0 g., and contained light fat. This bird was one of two (a pair?) and supports Johnston's (1960) speculation that the species breeds in Morton County. These appear to be the second and third specimens for the state (see Graber and Graber, 1951). The specimens resemble the nominate race.

White-necked Raven: *Corvus cryptoleucus* Couch.—Three, from a flock of about 10, were collected 10 miles south of Johnson, Stanton County, and one of two seen 11 miles south of Johnson, on 14 July 1964, was taken. Specimens (4): female, 45578, ovary inactive, light fat; male, 45575, testis 3×2 ; sex ?, 45577, skull not completely ossified, light fat; male, 45576, testis 6×4 . These appear to be the first specimens from Stanton County.

Common Crow: *Corvus brachyrhynchos* Brehm.—Johnston (1964) indicates that crows breed at least as far west as Cheyenne, Logan, and Meade counties. We found Common Crows in Morton County between 11 July and 14 July and in Hamilton County between 14 July and 16 July. Crows were also noted in Morton County in July of 1963. These may have been postbreeding birds that wandered into these areas; however, the possibility that crows do nest in Morton and Hamilton counties is real. In these areas their distribution seemed to be limited to riparian situations.

Indigo Bunting: *Passerina cyanea* (Linnaeus).—Johnston (1964) states that "specimens referable to the Indigo Bunting have been taken as far west as Finney County, but most specimens from that far west show evidence of interbreeding with Lazuli Bunting [*P. amoena*]." We took an Indigo Bunting 7.5 miles north and 5 miles east of Elkhart, Morton County, on 13 July 1964. Specimen (1): male, 45612, testis 10×6 , moderate fat, 14.5 g. Another Indigo Bunting was taken 1 mile south and 1 mile east of Coolidge, Hamilton County, on 15 July 1964. Specimen (1): male, 45613, testis 8×6 , moderate fat, 13.5 g. No nesting was detected; Thompson (1958) found Lazuli Buntings nesting along the Cimarron River north of Elkhart on 18 July 1958.

Lark Sparrow: *Chondestes grammacus* (Say).—Johnston (1964) notes that Lark Sparrows generally build their nests on the ground, mentioning one record of a nest placed 1.5 feet high in a small pine. We found two nests of this species 7.5 miles north of Elkhart, Morton County: one was 12.5 feet up in a cottonwood (*Populus* sp.) and contained three eggs both on 11 July and on 14 July; the other was 5.5 feet high in a cottonwood and contained two young and one egg on 14 July. On geographical grounds, these birds are referable to the race *C. g. strigatus* Swainson.

Cassin Sparrow: *Aimophila cassinii* (Woodhouse).—According to Johnston (1964), breeding records and specimens taken in the breeding season come from Wallace, Hamilton, Kearney, Finney, Morton, and Comanche counties. We found these birds to be common in Morton, Hamilton, and Meade counties, and be present in Comanche County. One was taken on 17 July 1964, 12 miles south and 8 miles west of Meade, Meade County, and documents the occurrence of Cassin Sparrow in that county. Specimen (1): male, 45632, testis 8×7 , moderate fat, 16.5 g.

ACKNOWLEDGMENTS

We thank Clifford Low of Coolidge, and Mr. and Mrs. Ralph Einsel of Wilmore for kindly letting us obtain specimens on their lands, and giving us helpful information concerning the local faunas. Ronald L. Beeley helped us locate certain species in Comanche County.

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A Second Record and Early Migration Date for the Short-billed Marsh Wren in Colorado.—The Short-billed Marsh Wren (*Cistothorus platensis*) is widely distributed over the eastern part of North America and occurs westward through southeast Saskatchewan, Manitoba, eastern South Dakota, eastern Nebraska, eastern Kansas, and Arkansas (A.O.U. Check-list). The only record of this bird for Colorado was that of Cary (1909), who shot a specimen in the San Luis Valley on 23 October 1907. Sclater (1912) and Bergtold (1928), in their lists of Colorado birds, mentioned Cary's specimen but added no others.

A second Colorado specimen of the Short-billed Marsh Wren was taken 17 April 1964, in a sedge (*Carex* sp.) marsh near the Arkansas River, 30 miles east of Pueblo, Pueblo County. The bird was killed in a Museum Special trap which had been baited with peanut butter and oats, and set for rodents on moist ground beneath dead vegetation. The only other avian species observed in the area at the time was the Red-winged Blackbird (*Agelaius phoeniceus*).

Early dates of spring arrival of the Short-billed Marsh Wren in North America are usually in late April and early May (Bent, 1948). Only two records of arrival dates were earlier than that for the specimen here reported: 14 April 1887, in Cheyenne, Wyoming, and 10 April in Athens, Georgia.

It is possible that the bird here reported encountered the trap while feeding on spiders and small insects which were observed on the ground in the trapping area. Although little is apparently known about its food habits, Walkinshaw (1935) reported the Short-billed Marsh Wren ate spiders and insects, and Howell (1932) reported that an examination "of 34 stomachs of this Wren from Florida showed its food to consist wholly of insects and spiders." This type of feeding behavior (beneath vegetation on the ground) may explain the infrequent observations of this species in Colorado.

In conclusion, this paper reports a second record of the Short-billed Marsh Wren

in Colorado, a marginal record of occurrence in its range, and an early date of spring arrival on migration (the only spring date for the species in Colorado). In addition, it is hypothesized that infrequent observations of this species in areas of low population density may be related, in part, to its secretive feeding habits.

The author wishes to thank Mr. Raymond Mohr, in whose trapline the specimen was captured, and Dr. Jack A. Seilheimer, who participated in the identification.

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Contribution No. 2, Department of Biology, Southern Colorado State College.

DONALD W. JANES, *Southern Colorado State College, Pueblo, Colorado, 23 April 1964.*

Prairie Warbler Nesting in Cherokee County, Kansas.—On 10 June 1964, while collecting in an area of short shrub oak woodland 1 mile north of Galena, Cherokee County, Kansas, I located three singing male Prairie Warblers (*Dendroica discolor*) along 0.5 mile of road. One of these was taken and deposited in The University of Kansas Museum of Natural History, and bears the catalog number 45225. A testis was 6×4 . The following day, 11 June, I returned to the area and located a nest, a neatly woven cup of plant fibers and small grasses, situated 6 feet high in a crotch of a horizontal branch of a small (10 feet tall) blackjack oak (*Quercus marilandica*). The tree was in a small clearing having an understory of rank, but short, oak, and other deciduous growth, and grasses. The female gave noisy vocalizations as I approached the nest. Two or three juvenile Prairie Warblers and a juvenile Brown-headed Cowbird (*Molothrus ater*) jumped from the nest when I was about 6 feet from it, and flew about 10 feet to the ground. Two of the warblers (45226, 45228) and the cowbird (45232) were taken. Both parent birds were shot, but I was unable to find the male (female, 45227, ovary apparently inactive). This is the first time the nest of this species has been located in Kansas, although Hedges (*Bull. Kansas Ornith. Soc.*, 1953, 4:30-31) saw female Prairie Warblers feeding juvenile birds in Johnson and Wyandotte counties.—JAMES D. RISING, *Museum of Natural History, The University of Kansas, Lawrence, Kansas, 25 September 1964.*

Probable Breeding of the Clay-colored Sparrow in Morton County, Kansas.—On 4 September 1964, while walking in sagebrush country three miles north and two miles west of Elkhart, Morton County, Kansas, I observed a family group of two adults and three young sparrows. The young perched on the tips of plants within 10 feet of me, and as the adults bent their heads to feed the young, I had a good

chance to see their crowns. The medial stripe through the crown was pronounced as were the darker streakings on each side of the head. The birds were attenuate as are Field Sparrows (*Spizella pusilla*), but lacked the solid crown and pink bill, and the tail was long and slightly forked. The brownish patch on the side of the head of the adults was pale, but was well bordered above and below with streaks, and the patch contrasted with the darker crown. These birds resembled Clay-colored Sparrows (*S. pallida*) that I have seen in Michigan, but were paler. The male did not sing. The birds were seen in xeric brush that was about four feet high, and were fully one-half mile from higher vegetation. The birds were not Brewer Sparrows (*S. breweri*), a species that would seem to be a more likely breeding bird in this area.—MILTON B. TRAUTMAN, *Ohio State University, Columbus, Ohio. 9 September 1964.* (Adapted by J. D. Rising from a letter to the editor.)

CONSERVATION NOTES

In order to speak effectively to the issues in the present controversy over the misuse of pesticides, conservation-minded citizens should be well informed. Some reports pertaining to water pollution by insecticides may be of interest to KOS members:

1. *Report on investigation of fish kills in lower Mississippi River, Atchafalaya River, and Gulf of Mexico*, available free from U. S. Public Health Service, Dept. of Health, Education and Welfare, Washington, D. C.
2. *Pollution-caused fish kills in 1963*. Public Health Service Publication No. 847, for sale by the Supt. of Documents, U. S. Govt. Printing Office, Washington, D. C. 20402, for 25c.
3. *Use of pesticides. A report of the President's Science Advisory Committee*, for sale by the Supt. of Documents for 15c.

The establishment of the National Wilderness Preservation System has been a great step forward for conservation. Conservation organizations have worked hard for many years to get this measure passed by Congress. The August issue of *Bio-science* lists some other bills then before Congress that members of KOS may want to support. These bills may not have been acted upon in the last Congress; any such will probably be reintroduced in the new Congress.

1. S2958 would establish a National Human Resources Conservation Council to "conserve the human and natural resources of the nation." It was referred to the Senate Committee on Labor and Public Welfare.
2. A concurrent resolution was introduced by Ralph W. Yarborough of Texas that would provide for convening an international conference by the Secretary of Interior and the Secretary of State to consider cooperative programs to further conservation of wild animals on a worldwide basis. This was referred to the Committee on Commerce.
3. S1251 would increase appropriations for research into the effects of pesticides on fish and wildlife. It passed the Senate and has gone to the House.

The Board of Governors of the Nature Conservancy adopted a resolution on 23 May approving the Sand Prairie Natural History Reservation project in Harvey County, Kansas and authorizing financial aid to the project. A statewide Kansas Sand Prairie Committee of the Nature Conservancy will be planning a financial campaign for this project in the fall. The Board of Governors of Nature Conservancy also authorized a significant new program to be known as *Project "Rachel Carson Seacoast."* This will be established in Maine.

Dwight Platt

Chmn., Conservation Committee

NOTES AND NEWS

A continent-wide nest-records scheme is being launched by the Laboratory of Ornithology at Cornell University on 1 January 1965. This cooperative venture will be much like the Kansas Breeding Bird Survey, sponsored for the past six years by K.O.S., but will be concerned with all the birds of North America. Members of K.O.S. are urged to cooperate with this new effort at gathering information about nesting birds; full details will be sent to all members with the *Newsletter* for January.

A new book, concerned with all aspects of the conservation of North American waterfowl is now available from the Supt. of Documents, Govt. Printing Office, Washington, D.C. 20402. It is entitled, "Waterfowl Tomorrow" and numbers no less than 103 authors from Canada and the U.S.A. There are almost 200 photographic illustrations and more than 80 pencil drawings of birds and habitats used by waterfowl. At 784 pages and the single-copy price of \$4.00 it is a bargain; however, purchased in lots of 100 the price is only \$3.00.

The Cooper Ornithological Society will meet in Vancouver, British Columbia, probably 14-16 June in 1965. The Wilson Ornithological Society will meet at Sylvan Lake in the Black Hills, South Dakota, on 17-20 June 1965.

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Published December 17, 1964