THE ORIOLE

A Quarterly Journal of Georgia Ornithology; Official Organ of the Georgia Ornithological Society



THE ORIOLE

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No. 1

INTRODUCTION OF EXOTIC GAME BIRDS IN GEORGIA

By Robert A. Norris

In past years there have been attempts to introduce in Georgia several kinds of game birds, some from the Old World and some from Middle America (Mexico and Central America). For the most part these attempts proved to be failures, and they bore out Leopold's (1933) conviction that, with respect to the results of introductions and transplantations, "no other property of game species has been explored with as much persistence, and with as little guidance from either science or experience, as that of susceptibility to transplantation." There have been long-standing arguments for and against introductions, a pro stand having been taken, in general, by hunters and game enthusiasts, and a con by naturalists and nature lovers. The question as to the desirability of introductions has been elucidated not so much by sportsmen as by wildlife authorities like Leopold (ibid.) and naturalist-conservationists like Grinnell (1925), Storer (1931), and King (1942). After examining the relevant facts and reviewing the contributions of earlier writers, King (ibid.:310) reached several tentative conclusions relative to the wisdom of introducing foreign game birds. These conclusions, in part, are as follows: Introductions are highly expensive; they often prove nonbeneficial or injurious, with some species increasing to pest proportions; they create demands on food and cover, may spread new parasites and diseases, and do not necessarily result in reduced hunting pressure on diminished native species.

In a similar vein, Redington (fide King, 1942) says: "Experience has indicated the desirability, as a general rule, of restocking game ranges with the same species that formerly occurred there, as these are adapted to conditions prevailing and are most likely to thrive. To introduce species foreign to a region, at least without careful consideration of each case by experts with all available knowledge of the factors involved, is to risk results that may prove disastrous " The story of attempted introductions in Georgia, like those in other states and regions (for instance, in Hawaii, as discussed by Fisher, 1948), is one that tends to support these general conclusions. It is true that the attempts in Georgia were not disastrous, but this would seem as fortuitous as it is fortunate, for despite the fact that the U. S. Biological Survey lent a hand with certain introductions, we have no proof that the cases were considered by experts with specific knowledge of the problems involved. Action, it would seem,

was sicklied o'er with the pale cast of lack of thought. Let us briefly consider the cases of introduced species in Georgia.

OLD WORLD SPECIES

According to Phillips (1928), four potential game species of the Order Galliformes were introduced in Georgia after having been imported from Europe and, presumably, Africa. These were: the Hungarian Partridge (Perdix perdix), the Ring-necked Pheasant (Phasianus colchicus), the Migratory or Egyptian Quail (Coturnix coturnix), and the Guinea Fowl (Numida galeata). Some details of these trials are given herewith:

Hungarian Partridge.—The introduction of this species is alluded to by Phillips (*ibid.*:34). Manifestly, this partridge did not long survive in the state, for nowhere has it thrived in the eastern United States south of central Indiana and Ohio (Edminster, 1954:370; Aldrich and Duvall, 1955:14).

Ring-necked Pheasant.—Along with the other states, Georgia tried to establish pheasants before World War I (Edminster, 1954:2). This proved fruitless, not only in Georgia but throughout the southeast. As is well known among Georgia sportsmen, pheasant introductions have been made locally in recent years, but this is merely a matter of stocking for temporary hunting purposes.

Migratory Quail.—These strong-flying birds were imported from Sicily and Italy from 1875 to 1881, with some shipments in excess of 5000 birds. Although individuals were seen for three years in a Pennsylvania area and others bred for two successive years in certain New England states (McAtee, 1944), most of the quail migrated, apparently going southeastward, and it was thought that large numbers perished at sea (Phillips, 1928). Specific mention of Georgia introductions appeared in old issues of *Forest and Stream*, the exact references being provided by Phillips (*ibid.*).

Guinea Fowl.—About 1890, some 40 or 50 individuals were released on Jekyll Island. Presumably they represented feral stock from Africa. The introducer is not named and the trial was "apparently without permanent results" (*ibid.*).

(The Chukar Partridge has possibly been introduced in Georgia in recent years, but if so the effort has been of no avail. Indeed, according to Edminster (1954:358), "it is doubtful if this bird will ever achieve good populations in the country from the Dakotas to Texas and eastward.")

MIDDLE AMERICAN SPECIES

Phillips (1928) furnishes information on four species from Guatemala and Mexico. Introduced in coastal Georgia, this foursome includes a species of tinamou (*Tinamus robustus*) of the Order Tinamiformes, as well as the following species of Galliformes: the Central American Curassow (*Crax rubra*), the Ocellated Turkey (*Agriocharis ocellata*), and the

Chachalaca (Ortalis vetula). Some particulars on these transplantations, mostly derived from Phillips' paper, are set forth in the following accounts.

Tinamou.—In 1923, 15 birds obtained in Guatemala were introduced on Sapelo Island by H. E. Coffin. Their wings had been "cut," and they had to be kept under fence. Only one was left alive in January, 1926. Presumably no breeding took place.

Central American Curassow.—Again in 1923, the U. S. Biological Survey, in cooperation with H. E. Coffin, was responsible for transplanting nine curassows, from "Mexico," onto the same island. At first the birds "did fairly well," and they seemed able to withstand a rather cold winter. But only two remained in January, 1926, and these doubtless succumbed not long thereafter.

Ocellated Turkey.—In the fall of 1923, H. E. Coffin, in cooperation with the Biological Survey, had five turkeys, obtained in Guatemala, placed on Sapelo Island. All died within two weeks after arrival, evidently because of "bad weather conditions."

Chachalaca.—In the same year, 1923, H. E. Coffin, again cooperating with the Biological Survey, int oduced 42 Chachalacas on Sapelo Island, the birds having come from Tamaulipas, Mexico. This species nested on Sapelo in the spring of 1924. As reported by Phillips (*ibid.*), a letter from A. W. Jones (January, 1926) states that the birds had increased and were able to care for themselves and escape predators; they had, moreover, become scattered all over Sapelo and neighboring Blackbeard Island. In 1948, Jenkins (1949), in company with Drs. Eugene P. Odum and Donald C. Scott, noted several birds on Sapelo Island and heard at least six calling at one time. "Young birds have been observed on many occasions by several of the permanent residents of Sapelo" (*ibid.*:12). Although definitely a breeding bird on Sapelo, the Chachalaca seems not to have persisted on Blackbeard.

This species was placed on the Hypothetical List of *Birds of Georgia* (Greene, et al., 1945) because no specimen had been taken. For the same reason, no doubt, Aldrich and Duvall (1955:3) designate the Sapelo Island population of Chachalacas as "races unknown." If Phillips' information as to the place of origin (Tamaulipas) is correct, it would seem that the Sapelo birds represent the northern race, *Ortalis vetula mccalli* (Ridgway and Friedmann, 1946:32). Yet a shipment of 42 birds might have included individuals from a number of localities sent via Tamaulipas, so that Aldrich and Duvall seem properly justified in suspending judgment as to subspecies until specimens can be examined.

The Chachalacas of Sapelo Island inhabit relatively dense stands of live oak (*Quercus virginiana*), Jenkins (*loc. cit.*) having remarked on their noisy "strident cackling" and on their "typical habit in the area of walking slowly through the tops of the large live oaks." There can be little question that this species is an important and influent member of the forest community on Sapelo, and it certainly merits and invites further scientific study.

CLIMATE DIAGRAMS FOR MIDDLE AMERICAN SPECIES

As has been illustrated by various papers (as Steggerda, 1929; Twomey, 1936) and by general discussions of exotic species and their climatic limitations (as Graham, 1944:203 ff.; Odum, 1953:45 ff.), attempts to evaluate habitats or environments in connection with transplanting living animals or plants can be made with *climate diagrams*. In these diagrams, the mean monthly precipitation (or relative humidity) is plotted against the mean monthly temperature for every month in the year. The twelve points are then connected by a line, and each point is labeled according to month (January—1, February—2, etc.). The result is a twelve-sided polygon, or "climograph," which refers to a given locality or weather station. The construction of such diagrams facilitates graphic comparison of one climate with another.

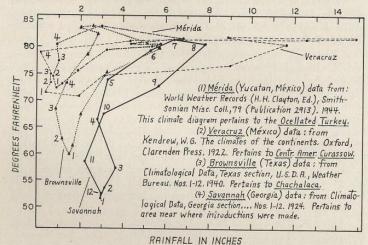


Fig. 1. Climate diagrams for the native regions inhabited by three potential game birds introduced on Sapelo Island, Georgia. Comparison is made with the climate of the Savannah area which approximates that of the coastal island.

In figure 1 are climate diagrams for four areas: (1) Merida, Yucatan, a representative locality for the Ocellated Turkey; (2) Veracruz, a composite diagram which is fairly representative of the locale of the Central American Curassow; (3) Brownsville, Texas, an area marking the northern boundary of the range of the Chachalaca; and (4) Savannah, Georgia, a station whose weather conditions approximate those of Sapelo Island. It is readily apparent that the first three diagrams show very little overlap with the one for the Savannah area. Had a comparable study of rainfall and temperatures been carried out before the introductions were made (and at that time a better evaluation than mine could have been made, for the area of origin of the birds probably would have been known with

fair exactitude), the turkey and curassow, which appear to require much warmer winters (60 degrees or above) might not have qualified for trials. The Chachalaca area, Brownsville, differs from Savannah in having decidedly less rainfall during most of the year. Still, the Brownsville area somewhat resembles that of Savannah, or Sapelo Island, insofar as its winters are colder than are those of Merida or Veracruz. The suggestion remains that the winter cold may have been the chief factor working against the establishment on Sapelo of the Ocelated Turkey and the Central American Curassow. Because of the roughly comparable winter climates shown for Brownsville and Savannah, one might have predicted that the Chachalaca, unlike the turkey and curassow, would have at least a fair chance of surviving and establishing a niche for itself on Sapelo Island. In the breeding season, however, conditions at Brownsville are considerably warmer and dryer.

As a rule climate diagrams are not intended to clarify hindsight (as they are in this paper and some others, such as Steggerda, 1929) as much as to clarify foresight—to indicate, with some degree of probability, "whether an untried plant or animal will succeed in a new environment" (Graham, 1944). As Odum (1953:47) has pointed out, near coincidence or positive correlation of two climate diagrams simply indicates that *two* factors, moisture and temperature, are not likely to be limiting for the organism in question. This does not mean that other factors, including plants and animals, may not have a limiting effect. Hence climate diagrams are of greatest usefulness in ruling out, or at least contra-indicating, such proposed introductions or transplantations as prove unreasonable on a strictly climatic basis.

COMMENT

Climate diagrams together with study of physiographic and vegetational maps as well as general bio-ecologic associations of organisms in question, serve as important guides to whether given species obtained from regions are likely to prosper if transported and released elsewhere. Should it ever seem needful or desirable to introduce another exotic game-bird species in Georgia, it is hoped that such guides, including "careful consideration . . . by experts with all available knowledge of the factors involved," will be brought to bear on the problem. Otherwise, we could but look for further action sicklied o'er with waste and futility.

SUMMARY

There have been attempts to introduce in Georgia no less than eight species of potential game birds. Old World species—the Hungarian Partridge, Ring-necked Pheasant, Migratory Quail, and Guinea Fowl—were all unsuccessful, as were three Middle American species—a tinamou, the Central American Curassow, and the Ocellated Turkey. The Chachalaca, like the last three species, was introduced on Sapelo Island, but this galliform bird, unlike the rest, found a niche for itself and became established on the island as a breeding bird. Climate diagrams offer partial

explanation for its success. The Chachalaca was transplanted from Tamaulipas, whose climate approaches more closely that of Sapelo than do the tropical climates characterizing the curassow and the turkey. If further introductions are to be made in Georgia, it is urged that before action is taken the prospective species be examined carefully, along with their climatic needs and biotic associations, to determine whether there is likelihood of success.

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GENERAL NOTES

THE BEWICK WREN BREEDING IN NORTH GEORGIA.—On May 27, 1944, six young Bewick Wrens (*Thryoman's bewickii*) left the nest which had been built in a basket of string on a high shelf in a summer house in my garden. Later the adult male was heard singing on overhead wires and in the next few years, but no other nest was found in my neighborhood. On May 18, 1952, while Mr. and Mrs. R. E. Hamilton and I were visiting a bird-bander who lives on the Tennessee-Georgia line, on a rural route out of Chattanooga, Tennessee, we found there a second brood for the season of the Bewick Wren. Perhaps their range has not become permanent in my immediate vicinity, some tewnty-five miles southwest of the ones near Chattanooga.—Blanche Gardner, 601 Kenilworth Court. Dalton, Georgia.

OBSERVATIONS FROM MACON AND VICINITY.—During the course of field work in the Macon area in the spring and summer of 1955, several significant observations have resulted. Most of these observations were made in the Ocmulgee River bottomland two miles southeast of Macon. This general region provides a diversity of ecological situations—heavy riparian woodland, open cultivated and abandoned fields, temporary and permanent ponds, and levee banks. One specific location, designated the "borrow pit," has proved to be attractive especially to water birds because of the open pools of water in an abandoned field. This ten-acre area was created as the result of the soil being "borrowed" to construct the river levees.

Mississippi Kite: *Ictinia misisippiensis*. On March 6 one bird was seen on the outskirts of Jeffersonville, Twiggs County, as it circled over a farm pond and an adjacent field. In the Macon area, kites were seen at or near the borrow pit on May 27, June 8, 11, 19 (T. P. Haines), and July 6 (2). On June 11 three birds were approached within 100 feet as they perched on the dead limbs of a sycamore.

Sandhill Crane: *Grus americana*. On March 20, Mr. and Mrs. Tom Cater, Jr., Mrs. J. W. Calhoun and the author were attracted to the unmistakable calls of this species as two flocks flew over in a northerly direction. The first flock was composed of six birds in a V-shaped formation at about 400 feet. About one hour later we saw and heard another flock of thirteen birds. As they passed overhead, the formation broke up as if the birds were changing leaders. It had been raining steadily up until the time of these observations in the late afternoon, so it is probable that they had been resting in a field nearby and were once again on their way north along a regular migratory pathway.

Evening Grosbeak: *Hesperiphona vespertina*. The most significant record for the Macon area during the spring was the observation of two birds of this species on the Mercer University campus on April 7. About noon I was attracted to an inconspicuous and unfamiliar *chur* note coming

from the upper foliage of sugarberry trees. Quoting from my field notes, "I looked up and saw two evening grosbeaks, not more than 25 ft. overhead. I didn't look at them a full minute, but rushed over to my car to get binoculars and gun. I came back in about 3 minutes, and was unable to locate the birds. In that brief moment that the birds were observed, they gave one or two brief pip-pip notes, but these were not recognizable to me as the notes I had heard in the West. A thorough search of the campus and (adjacent) park failed to turn up the birds again. I wonder if the birds were actually feeding in the sugarberries but were just passing through in an erratic fashion. Although I saw only two birds, there were probably one or two others." This is apparently the southernmost penetration of this erratic species.

A less definite but nevertheless important observation was the presence of two sandpipers at the borrow pit on June 11. These birds, about the size of Spotted Sandpipers, circled over the area several times as if preparing to land, but they flew off toward the river without landing or uttering any call notes. In view of the fact that the Spotted Sandpiper has been found breeding in Atlanta recently, it seems desirable to record this observation at this time.

The presence of three swifts on February 18 poses a further speculation. They were seen only briefly as they circled over the post office in downtown Macon. It is probable that they were Chimney Swifts (Chaetura pelagica). In recent years, however, wintering Vaux Swifts (C. vauxi) have been found in Louisiana; the two species are virtually indistinguishable afield. In any event we should be on the lookout for possible wintering Vaux or Chimney Swifts in Georgia.

Additional early or late records for the area include the following-Water-turkey (March 20), American Egret (April 4), Snowy Egret (May 30), Least Bittern (June 8), Wood Ibis (5 on June 11; Gregor Rohwer), Mallard (female coll. June 11), Baldpate (im. male coll. May 27), Blue-winged Teal (April 14), Ground Dove (May 30, June 8), Barn Swallow (May 27), Cape May Warbler (April 14, T. P. Haines), Bobolink (male coll. May 30), Pine Siskin (April 27-May 15), Grasshopper Sparrow (June 8, 11). David W. Johnston, Department of Biology, Mercer University, Macon, Georgia, July 11, 1955.

WINTERING BALTIMORE ORIOLE AT ROME, GEORGIA.-During most of the month of January, 1955, I observed a female Baltimore Oriole (Icterus galbula) on the campus of Darlington School at Rome, Georgia. It was first seen at my bird feeding station on January 8, and after that it came several times a day for about two weeks, always eating the peanut butter which I had put out for bird food. Toward the end of the month the bird came less frequently, making a final visit to the peanut butter on January 28. I saw the bird one more time, on January 30, in a thicker along a stream not far away. I looked for a possible companion, but the bird was always alone.—PHILIP M. HAM, Darlington School, Rome. Georgia.

A SURVEY OF BOAT-TAILED GRACKLE NESTS ON SAPELO ISLAND, GEORGIA.—On May 8, 1955, Boat-tailed Grackles (Cassidix mexicanus) were nesting in oleander shrubs which grow at about 30-foot intervals along both sides of the road embankment leading to Marsh Landing on Sapelo Island, Georgia. The salt marsh on each side of the embankment is largely composed of short, grazed marsh grass (Spartina) and islands of low glasswort (Salicornia). There is a narrow border of tall, ungrazed marsh grass along the Dublin River at the landing.

On the above date the ornithology class from the University of Georgia and a few other interested persons helped in a quick survey of the Grackle nests, examining each shrub and beginning at the east end of the road. Counts were made of the number of nests per shrub, empty nests per shrub, nests with eggs, nests with young, and eggs or young per clutch. In order to determine nest contents, we climbed the shrubs, stood on each other's shoulders or used a mirror on a pole.

On the south side of the road sixteen shrubs contained 23 nests, sometimes as many as three nests per shrub. Seventeen nests were empty (three were not examined), two nests held three eggs each, and one nest had three young. On the north side of the road fifteen shrubs contained 27 nests with as many as four nests per shrub. Ten nests were empty. Three nests held one egg each; two nests, two eggs; eight nests, three eggs; two nests, two young; and two nests had three young each.

Thus fifty nests were found in the 31 shrubs. Of the 47 nests which were examined, 27 were empty, 15 had from one to three eggs, and five had two to three young. No reason can be given for the presence of more occupied nests on the north side of the road. The nests were at heights of 7 to 12 feet, the oleander shrubs being about 8 to 15 feet high.—WILLIAM H. CROSS, Department of Zoology, University of Georgia, Athens, Georgia.

BIRD NOTES FROM CHATHAM COUNTY, GEORGIA.-A few notes covering birds not usually found along the Georgia Coast are submitted, these being based either on specimens or on species which cannot easily be mistaken in the field.

American Brant, Branta bernicla. A single Brant sat among the concentration of shorebirds, gulls, and terns on Tybee Island, December 24, 1953, and was easily the most conspicuous individual on the beach. Careful stalking was not enough, and it left flying east along the beach. A search of the front beach and the south end of the island failed to locate it again, and I could not find the bird upon my next visit two days later. I have not seen the species since 1928. There is at least one specimen from the state, taken by George W. Sciple in Glynn County, a few years

Greater Scaup Duck: Aythya marila. It has been presumed that the Greater Scaup occurs at times, but actual specimens are few, primarily because it is difficult to identify in the field. On March 21, 1954, a male

was found dead behind one of the steel jetties that protect the beach on Tybee Island, and by size and color of head, it appears to be of this species. There are numerous scaups that spend the winter just off the beach, or dredging in the sand at low water, and after finding this bird so definitely colored, I was able with a 25 X telescope in favorable light to find other Greater Scaups from then on until April 3, 1954. A single bird with a group of Lesser Scaups in a man-made lake on the same island on December 12, 1954, had a distinctly greenish head.

Surf Scoter: Melanitta perspicillata. Mr. William S. Roberts brought me a female of this species from the ocean side of Wassaw Island, Chatham County, on December 30, 1954. The stomach contained several Solens. Birds of Georgia (Greene, et al., 1945, p. 33) mentions several sight records, but does not list a specimen from the state.) Three specimens of this species were taken by Isaac F. Arnow in Camden County in 1903-1904, and are now located at the University of Georgia Museum.—Ed.)

Long-billed Dowitcher: Limnodromus scolopaceus. A single bird, a female and quite fat, was collected in a rain-water pool on Deptford Tract, three miles east of Savannah, on November 7, 1953. A couple of others were seen several times, but were not collected. These were similar in appearance, and thought to be of this species. The large size, long bill, and barring of the sides quite definitely identify this specimen as scolopaceus. It is significant that it was found wading in an impounded pool rather than on the beach where great flocks of dowitchers may be found at certain times as well as a few individuals at nearly any time of year. Pitelka, in his monograph on the dowitchers (Univ. Calif. Publ. Zool.. 50:1-108, 1950) has pointed out this important habitat difference (Longbilled Dowitchers in fresh-water situations and Short-billed Dowitchers in marine situations), and it is interesting to find evidence that this difference holds true on the Atlantic Coast as well as in California.

It becomes quite clear that sampling of the large migrating flocks is not enough to determine the status of any species. Neither migration times and routes, nor habitats, are necessarily equal in the varying populations that exist among bird groups appearing morphologically quite similar. Fresh- or salt-water impounded areas without dense vegetation are not too common in coastal Georgia, and quite lacking in dry seasons, which may be the reason why species using such habitat-White-rumped, Stilt, and Buff-breasted sandpipers, for example-are not well known since they pass by rapidly when suitable habitat is not found.

Parasitic Jaeger: Stercorarius parasiticus. On September 10, 1954, a male in dark plumage was collected on the north end of Tybee Island. The legs and part of the feet were blue, the rest of the feet dark. The irides were dark. The stomach contained two fish about four inches long. There was no sign of any illness which would cause the bird to land on the beach. In flight it resembled an immature Laughing Gull in size and general shape, though darker all over.

Cabot Tern: Thalasseus sandvicensis. It may be that my observations of earlier years have not been as well done as they might have been, but August 29, 1954 was the first day I have been able to identify definitely this species anywhere around the Savannah River entrance, although I have seen it farther south along the coast. On this day ten birds were seen in the midst of a mixed flock of at least a thousand birds, and one adult male was collected. It takes careful stalking, good shooting and a lot of good luck to pick out one bird from a milling flock of gulls, terns, and skimmers, but there are few specimens of this species from Georgia. From that date on until October 17, three to ten birds at a time were seen in the same location on various days. On that latter day, several members of the Georgia Ornithological Society also saw them. IVAN R. TOMKINS, 1231 East 50th St., Savannah, Georgia, January 23, 1955.

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OSPREY CATCHES A WOOD DUCK.-In the spring of 1955 J. R. Walker of Rome erected six nesting boxes for Wood Ducks (Aix sponsa) near a small private lake about four miles south of Rome, and was successful in seeing two of the boxes occupied. Both pairs hatched rather large broods. On the afternoon of September 28, 1955, Mr. Walker was watching one of the broods swimming in a line when an Osprey (Pandion haliaetus) swooped down and picked up one of the immature ducks from the center of the line. As the Osprey rose, Mr. Walker shot and killed it with the young duck still alive in its talons. This is one of the rare recorded observations of an Osprev taking a duck. W. A. DuPre, Rome, Georgia. October, 18, 1955.

FROM THE FIELD

Two Golden Plovers near Perry on October 30, 1955, by G. O. S. members. Four Anhingas at Sandersville from November 19-26, 1955, by Dean Holmes. An immature Blue Goose near Center from mid-October, 1955 until at least February 14, 1956, by Athens Bird Club members. Twenty-three Sandhill Cranes flying NNW over Osierfield on March 5, 1956, by Milton N. Hopkins, Jr. Twelve adult Ring-billed Gulls, three immature Herring Gulls, and one male Indigo Bunting near the dam of Lake Sinclair, on March 25, 1956, by Dean Holmes.

NEWS AND COMMENTS

SPRING MEETING, 1956.—The thirty-fourth semi-annual meeting of the Georgia Ornithological Society will be held in Rome on April 27, 28, and 29. Make plans now to attend this meeting which will feature scientific papers, field trips, kodachrome slides, and bird banding activities.

PREPARATION OF MANUSCRIPTS FOR PUBLICATION.—All members of the Georgia Ornithological Society are encouraged to submit articles for publication in The Oriole. Manuscripts to be considered for publication generally deal with any phase of birds found in Georgia, their distribution, migration, life history, taxonomy, or the like, and should be sent to the editor. Articles are of two general types: (1) major articles of some length, and (2) general notes of briefer extent. The style to be employed in writing such articles may be ascertained by examining recent issues of The Oriole.

Manuscripts should be typewritten and double-spaced on standard $8\frac{1}{2} \times 11$ paper. Pages should be numbered in the upper right-hand corner, and tables and illustrations should be given on separate pages. The author should strive to present his material in a concise, accurate fashion, making proper citations to any literature used. Galley proofs will be sent to authors of major articles, and reprint orders may be made when proof is returned.

The Editor

RECENT LITERATURE

THE HONEY-GUIDES.—By Herbert Friedmann, United States National Museum Bulletin 208, 1955; *vii*, 292 pp., 25 plates.

Dr. Friedmann, long considered an expert on birds of Africa, has told the story of this family, the Indicatoridae, the members of which are of interest to the student of animal behavior because of two habits which many of them have: (1) laying their eggs in other birds' nests and (2) guiding other animals to wild bees' nests. Many of the species lay their eggs in the nests of kingfishers, starlings, barbets, woodpeckers, and sparrows. Typical guiding behavior illustrates mutualism between the bird and its mammalian symbiont. It begins as the bird calls and ruffles its wings to attract the attention of an African native of honey badger. The bird then guides or leads the mammal to the vicinity of the bees' nest. After the nest has been pillaged by the mammal, the honey-guide feeds on bits of beeswax which are left. This behavior obviously benefits both parties involved. The honey-guides also eat insects, so are not entirely dependent on the guiding habit.

Following these orienting statements regarding brood parasitism and guiding, the author describes for each of the eleven species songs, food, distribution, courtship, and other interesting habits. D. W. J.