THE ORIOLE

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

Vol. XXII MARCH, 1957 No. 1

THE ORIOLE

EDITOR
David W. Johnston, Department of Biology, Mercer University, Macon, Georgia

EDITORIAL COMMITTEE
J. Fred Denton, William W. Griffin, Ivan R. Tomkins

THE ORIOLE is mailed to all members of the Georgia Ornithological Society not in arrears for dues. Classes of membership are as follows:

Student, Out-of-State, Library { $2.00; Regular, $3.00; Sustaining, Garden Club { $5.00; Life, $50.00; Patron, $100.00.

Inquiries concerning back issues of THE ORIOLE or OCCASIONAL PAPERS OF THE G. O. S. should be directed to the Business Manager. All dues should be remitted to the Treasurer of the Society:

Gordon L. Hight, Jr., P. O. Box 1626, Rome, Georgia

CONTENTS

THE ORIOLE

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

VOL. XXII MARCH, 1957 No. 1

OKEFINOKEE BIRDLIFE AFTER THE FIRES OF 1954 AND 1955

By Frederick V. Hebard

The ecological results of the three terrible Okefinokee fires of December, 1954 and March, 1955, have not yet been finally assessed. The ornithological results of mid-day trips, however, along the Canal by John W. Burch and his son, Rois, on May 12, 1956, and June 18, 1955, compared with my mid-day trips along the Canal on May 14, 1942 and May 28, 1949 give some measure of the results of the fires on birdlife there.

On May 14, 1942 a trip was made along the Canal with H. A. Carter to Coffee Bay, a distance of about 5 miles by boat, and then along the Bugaboo boardwalk, a distance of almost another mile, by foot. One hundred and sixty-six birds of 30 species were observed. On May 28, 1949 a trip was made along the Canal with J. B. McCall, Jr. to Chesser Island Inlet, a distance of about 2½ miles, and thence south through Chesser Island, the Gap-o'-Grand Prairie to Monkey Lake, a distance of perhaps another 4 miles. Six hundred and twenty-two birds of 36 species were observed. On June 18, 1955, Burch and his son went as far as the Big Bend of the Canal, a distance of about 4 miles. Further progress

	5-14, 1942	5-12, 1956	5-28, 1949	6-18, 1955
Anhinga	1	21	4	
American Egret		63	133	66
Green Heron	4	391	1	22
Wood Duck	9	6	12	
Red-shouldered Hawk	1	21	6	2
Pileated Woodpecker	3	21	7	4
Red-bellied Woodpecker	7	16	4	
Kingbird	6	15		"many"
Prothonotary Warbler	6	31	12	"many"
Parula Warbler	14		2	
Red-wing	13	185	8	"many"
Grackle	12	28	9	6
Cardinal		23	1	

was blocked by trees fallen across the Canal. Only one hundred and thirty-three birds of 13 species were observed. On May 12, 1956, Burch and his son were able to reach the entrance of Chase Prairie on the Canal, a

distance of about 11 miles from Camp Cornelia. The last half of this trip was formerly rather birdless, whereas the first half often abounded in birds. A total of 1041 birds of 29 species was observed.

The above table shows some of the changes which we have noted as possible effects of the fires on the birdlife. Although these results may not be entirely conclusive, it can be seen that some species apparently decreased in numbers whereas others increased in numbers after the fires.

1500 *Walnut Street Building*
Philadelphia 2, *Pa.*
December 28, 1956.

ON THE APPRAISAL OF FAT CONDITION IN BIRDS

By Robert A. Norris

In a symposium at the Buffalo meeting of the American Ornithologists' Union in 1949, Josselyn Van Tyne said: "It is no longer necessary to defend the practice of recording bird weights, but it was not always so in the A. O. U.! When Alfred Gross and I began systematically weighing our specimens in Panama in 1925, we were lampooned more than once in the pages of "The Auklet" for that ridiculous over-refinement of technique. Now many articles based on weight data have appeared and other, more interesting, ones await only additional data on certain species. Dozens of uses of weight data have become apparent, and an increasing number of field workers are systematically recording the weights of the specimens they collect" (Van Tyne 1952). Some of Van Tyne's statements about bird weights would seem now to apply, more or less, to weights of certain component parts of birds, and of these component parts *detachable fat* ought, in my opinion, to be weighed as routinely as possible in the course of specimen preparations. This practice, which would not be too onerous at least for small- and medium-sized birds, would yield valuable data as to fat condition in different individuals, series, populations, races, and species. Aside from throwing light on such matters as physiological state and seasonal status, information on extent of fatness would aid in the interpretation of whole-bird weights, or total weights, as well as of organ weights expressed as percentage of total weights. The aims of this paper are, then, to emphasize the potential usefulness of a simple, quantitative method of appraising fat condition in small- to medium-sized birds, and to relate the "grades of fatness," as recorded by this method, to those obtained by two other procedures, namely, that of McCabe (1943) and that of Odum and Perkinson (1951).

In estimating fat condition in collected birds, McCabe (*op. cit.*) states: "I have no precise measure of degree of fatness and can imagine none applicable to field work, but the following verbal scale, which I have applied to a few thousand specimens, is a long way better than nothing: 'no fat,' 'little fat,' 'mod. fat,' 'fat,' 'very fat,' 'excess. fat.' " McCabe's scale is *"No fat.*—Hardly more than a hint in the dorsal tract or about the pygostyle. *Little fat.*—A substantial depth, perhaps a millimeter in a sparrow, in the dorsal tract. Some fat in the furcula (interclavicular region). *Moderate fat.*—Quite heavy in the tracts, with small plates elsewhere on the skin. Crotch of the furcula fairly well filled. *Fat.*—Moderate sheets removable as such from many parts of the skin. *Very fat.*—Considerable amounts of solid fat inside the abdominal cavity, filling in between the intestinal folds, but the latter not hidden or embedded. *Excessively fat.*—Deep sheets of fat everywhere between skin and muscle, even over the back. Intestines solidly embedded and overlaid, hardly visible."

Some workers, as Pitelka (MS notes on jays) and Norris, Connell, and Johnston (in press), have used a similar scale with the numbers 0 (no fat), 1 (little fat), etc., through 5 (extremely or excessively fat) either replacing or supplementing the descriptive terms. A modified procedure for specimens on living birds is that of Wolfson (1945, 1954*a,b*), which involves four fat classes: "none," "little," "medium," and "heavy".

More precise determinations of degree of fatness in birds, including laboratory measurements of total body lipids ("lipids" and "fat" are here used synonymously) as well as of lipid content of various body parts, have been made by Odum and Perkinson (1951). This method of analysis embodies a degree of precision which is really biochemical work and does not lend itself to routines in the field. A further, serious disadvantage in the laboratory analysis of total lipids is that it requires that each specimen be ground up and reduced to a pulpy mass, so that it is not possible permanently to keep the skin or preserve other parts.

Since the fat classes devised by McCabe and by Wolfson must be considered qualitative or at best *semi*-quantitative categories, and since the quantitative method of Odum and Perkinson cannot readily be used by most field collectors, the need for a "compromise procedure" has asserted itself. One has already been outlined (Norris, 1952). This method involves the careful removal of all fat found beneath the skin (peeled or scraped from the skin itself and also from the body, notably the rump and interclavicular regions), the weighing of this pile of subcutaneous fat, and the reckoning of relative fatness of a given specimen by expressing subcutaneous fat weight as percentage of total body weight. In this work, a balance weighing to the nearest one-hundredth

or one-tenth gram is fully satisfactory. A small amount of absorbent (corn meal or hardwood sawdust) included in the weighed fat is surely compensated by bits of fat not readily separated from skin or body and/or by fat unavoidably lost. When weighing, it is convenient to place the fat on a piece of thin plastic material (pre-balanced). After a weighed mass of fat is discarded, the plastic can be cleaned off by rubbing with absorbent and is then ready to be used again.

Table 1 illustrates a fairly representative gamut of variation in the amount of subcutaneous fat relative to total weight for 33 specimens of 18 species of birds. Most of these were fall migrants, although some (the Lapland Longspur, Horned Lark, and Tree Sparrow) were taken in winter or early spring. Interspecific comparisons are generally unwarranted because of the small series available for each species. The object here is merely to demonstrate the extent of variation from the leanest specimen (Ovenbird) to the fattest one (Connecticut Warbler).

TABLE 1

Analysis of Amount of Subcutaneous Fat in Eighteen Species of Birds

Species and individuals	Dates	Subcutaneous fat: Amount (Gms.); mean with standard error	Subcutaneous fat: Per cent of total weight; mean with standard error	** Fat class (McCabe scale)
Ovenbird (1)	Aug. 29	0.15	0.8	1
Yellow-throated Warbler (2)	Aug 8	0.15+0.10	1.50+1.00	1
Golden-winged Warbler (1)	Sept. 3	0.15	1.6	2
Worm-eating Warbler (3)	Aug. 8	0.28+0.12	2.03+0.78	2
*Slate-colored Junco (1)	Nov. 6	0.53	2.5	2
*Savannah Sparrow (2)	Oct. 1	0.58+0.02	3.35+0.35	2
Chestnut-sided Warbler (1)	Aug. 29	0.40	3.9	2
Grasshopper Sparrow (1)	Nov. 15	0.97	5.5	3
*Horned Lark (5)	Feb. 6	2.58+0.40	5.54+0.66	3
Hooded Warbler (1)	Aug. 12	0.85	6.8	3
†Tree Sparrow (1)	Mar. 20	1.5	7.7	4
*Lapland Longspur (1)	Feb. 6	2.70	8.1	4
Kentucky Warbler (1)	Aug. 29	1.30	8.3	4
American Redstart (2)	Aug. 10; Sept. 14	0.98+0.28	9.30+2.30	4
Cerulean Warbler (7)	Aug. 8-Sept. 1	1.11+0.28	9.57+2.19	4
*Palm Warbler (1)	Oct. 2	1.26	9.9	4
Yellow-billed Cuckoo (1)	Sept. 1	9.20	10.2	5
*Connecticut Warbler (1)	Oct. 2	5.55	24.3	5

*These species were collected in New Jersey in 1954-55; most of the others were taken on the Georgia Coastal Plain in 1951.
†Data from Baumgartner (1938:610), with percentage value rounded off.
**See table 2.
N.B.: Standard-error values for samples of two are equivalent to one-half the range between extremes, or to difference between mean and either extreme; hence any two values on which a mean is based can easily be recomputed.

For all the fact that McCabe dismissed the possibility of obtaining a "precise measure of degree of fatness . . . applicable to field work," it is interesting that he actually weighed "easily detachable" subcutaneous fat from a few specimens (McCabe, 1943:556). In some examples, including migrant Savannah Sparrows, he found that the detachable masses amounted to as much as 20 per cent of the total weight, thus indicating that some of the more extreme examples in this "excessively fat" class were almost as heavily laden as the fattest example given in table 1. Of further interest is the fact that most of McCabe's skins (about 4700) "have complete information as to the amount of fat present and the condition of the gonads" (Dickinson, 1953:125). So far as I know, practically none of this information has been analyzed or incorporated in publications.

After plotting graphically and studying the distribution of the percentage values for the 33 individuals, I undertook to establish a scale based on these values and to link it with that of McCabe (table 2). Nearly all the species listed in table 1 fall in the "small-sized" category. The one exception (Yellow-billed Cuckoo) falls in the "medium-sized" category and thus pertains to a slightly different scale. The establishment of more refined and definitive scales, including ones for various non-passerine groups of birds, will necessarily await the gathering of much more data on subcutaneous fat in relation to total body weight.

TABLE 2

Preliminary Attempt to Relate Fat-Class Values of McCabe to Quantitative Estimates of Relative Amount of Subcutaneous Fat

McCabe scale	No fat (0)	Little fat (1)	Mod. fat (2)	Fat (3)	Very fat (4)	Excess. fat (5)
"small-sized birds" (3-50 gms.)	*0—0.3	0.4—1.5	1.6—4.0	4.1—7.5	7.6—12.0	12.1—25(+)
"medium-sized birds" (50-150 gms.)	0—0.2	0.3—1.0	1.1—3.0	3.1—5.5	5.6— 9.0	9.1—15(+)

*Subcutaneous fat expressed as percentage of total weight.

One could translate percentage values for subcutaneous fat to the Wolfson scale, too, but it seems to me that the wide range of variation in fat condition of such birds as fall warblers is better accommodated by five (or six if "0" be counted) rather than four fat-class categories. In the fringillids with which Wolfson has dealt, adiposity is never as great as that of the fattest birds recorded in table 1. Consequently,

four categories may be adequate for Wolfson's experimental studies, but not for a broader framework involving a larger array of passerine and allied birds.

The fat condition of specimens for which subcutaneous fat has been weighed should enable one to estimate total fat content, or total fat expressed as percentage of total (wet) weight, inasmuch as subcutaneous fat has "proved to be an accurate index of total lipids, (varying) directly with total lipids . . . " (Odum and Perkinson, 1951). These authors add (p. 230): "From the formula for the regression line, Y=0.47x—0.19, total lipids (X) may be computed from skin lipids (subcutaneous fat, Y) for either sex at any of the four seasons."

If we substitute for Y the subcutaneous-fat value (5.55 grams) of our fattest specimen (Connecticut Warbler) and then solve for X, we obtain an estimate of 12.2 grams of total lipids for this specimen. This amounts to 53.5 per cent of the total weight—an astonishingly heavy deposit. In a sample of 68 bird specimens (including two species of tanager, two vireos, and four warblers) killed at airports while migrating over Georgia in 1954, Odum and Connell (1956) found the mean value for total lipids expressed as percentage of total weight to range from 22.2 (Common Yellow-throat) to 37.2 (Summer Tanager). For the fattest individual (Summer Tanager) the value was 41.8 per cent. Among four premigrant Ruby-throated Hummingbirds the mean was 43.0 per cent, the extremes being 40.6 and 45.9 per cent (*ibid*). The excessively fat stop-over migrant Connecticut Warbler from New Jersey is noteworthy in that the relative weight of its subcutaneous deposits would appear to exceed that of the migrating warblers and tanagers over Georgia.

What are possible effects of fat condition on certain aspects of behavior? Is agility (as indicated, for instance, by rate and nature of twig-to-twig movements) or vagility (as indicated, say, by extent of foraging excursions) measurably reduced in extremely fat warblers or other passerine birds? Patient observation coupled with selective collecting might well throw light on this query. In larger birds heavy fat deposits may have a decided effect on locomotory movements. Thus, Richdale (1947:167), in his study of the Yellow-eyed Penguin notes that "it was obvious that the males, in particular, were extremely fat by August 24, the beginning of the pre-egg stage. Even their ability to walk was impaired." Another sort of field study with interesting physiological implications might be that of relationships among weather conditions, fatness, and incidence of "panting" in passerine birds (Norris, 1952:3).

According to formula computations, the fattest Cerulean Warbler (table 1), with subcutaneous fat in excess of 17 per cent (*ibid.*), has a

total lipid/total weight value of 40.7 per cent. This figure is higher than those for the migrating warblers; it is nearly as high as that of the fastest of the migrating tanagers. The fat condition of these visitants was decidedly more variable than that of the birds taken in migratory flight. Whereas Odum and Connell (1956) reported coefficients of variability ranging from 8.0 to 32.2 (average of five samples, 15.9), the coefficients of variability for total lipid/total weight values computed for the series of Cerulean Warblers is no less than 49.5. This is not unexpected, however, in view of the likelihood that some of the leaner Ceruleans had just arrived, perhaps only a matter of hours previous to the time of collection, whereas others, more heavily cloaked with fat, had been foraging near the collection sites for a longer period, perhaps for several days (cf. Wolfson, 1954*b*:429 ff.).

The warblers listed in table 1, even though few in number, are of particular interest, then, for they suggest that fat condition in stop-over birds may show greater variability than that of similar kinds of birds "taken out of the air" while actually migrating. Conversely, fat stores of birds in migrating or flight assemblages appear to be less variable than those of birds in stop-over assemblages, particularly where the latter are sampled over a period of days or weeks.

Among nine Ruby-throated Hummnigbirds collected in fall shortly before their departure (and of these, seven were taken in one place between September 16 and 23, 1955), the relative amount of total fat, as determined by Connell using the method of Odum and Perkinson (1951), varied from 16.3 to 45.9 per cent (Norris, Connell, and Johnston: in press). The coefficient of variability was 32.9. This high variability was due mainly to the relatively rapid, more or less simultaneous deposition of fat among individuals in this population of Rubythroats. Maximal fatness was reached just before the birds left in late September. The premigrant hummingbirds, together with those approaching premigrant condition, may have been stop-over birds, at least in part. They are comparable to *bona fide* stop-over transients, such as the Cerulean Warblers, with respect to their high maximal fat deposits and their variability relative to amount of deposition. The variability was, to be sure, of a more orderly nature in the hummingbirds, whose deposits simply increased markedly as the time for departure drew near. In the Cerulean Warblers it was less orderly, although, as mentioned elsewhere (Norris, 1952), the first arrivals (August 8 and 13) were leaner than were most of the birds taken on subsequent dates.

DISCUSSION AND CONCLUSIONS

The quantitative appraisal of fat condition in collected specimens is desirable for several reasons. As has been clarified by Wolfson (1945),

the relative amount of fat, as well as other evidences (total weight, reproductive condition, and banding record) furnishes a valuable guide to the recognition of premigrant or migrant individuals in species that are partially or completely migratory. Some migratory species in small- to medium-sized categories show high values or "peaks" in both weight and fatness in winter, and still higher values in spring just before migration (Odum, 1949; Odum and Perkinson, 1951). By contrast, permanent resident species, as pointed out by Wolfson (1945:117), "do not indicate any great variation in weight in the winter and the early spring months such as is indicated by the data for the winter residents." It has also been demonstrated that resident populations, in contrast to migratory populations (Oregon Junco, White-crowned Sparrow), are characterized by absence of fat cycles or of marked seasonal variations in weight. Data on fatness may be useful, then, in establishing the status of strictly permanent-resident individuals, groups, populations, or species, in addition to indicating the status of those approaching or involved in migratory movements. Aside from serving as an indicator of seasonal status, fat condition is an important concern to those in need of interpreting weight variations associated with other phenomena, such as altitudinal, latitudinal, age, sexual, racial, and specific differences. Obviously it would be inadmissible to conclude that species A has a mean, overall weight significantly greater than species B if the sample of A were composed of fat migrants and that of B composed of lean permanent residents! Contributions to the literature should begin to take into account, more fully than in the past, the important matter of fat condition. And just as information on weights has burgeoned in recent years, so may quantitative data on fatness of specimens find, in the not distant future, a larger place in the annals of ornithology.

REFERENCES

BAUMGARTNER, A. M.
1938. Seasonal variations in the tree sparrow. Auk, 55:603-613.

DICKINSON, J. C., JR.
1953. Report on the McCabe collection of British Columbian birds. Bull. Mus. Comp. Zool., 109:123-209.

MCCABE, T. T.
1943. An aspect of collectors' technique. Auk, 60:550-558.

NORRIS, R. A.
1952. Cerulean warblers in fall on the Upper Coastal Plain of Georgia. Oriole, 17:1-5.

NORRIS, R. A., CONNELL, C. E., and JOHNSTON, D. W.
——. Notes on fall plumage, weights, and fat condition in the ruby-throated hummingbird. In press.

ODUM, E. P.
1949. Weight variations in wintering white-throated sparrows in relation to temperature and migration. Wilson Bull., 61:3-14.

ODUM, E. P., and CONNELL, C. E.
1956. Lipid levels in migrating birds. Sci., 123:892-894.

ODUM, E. P., and PERKINSON, J. D., JR.
1951. Relation of lipid metabolism to migration in birds: seasonal variotion in body lipids of the migratory white-throated sparrow. Physiol. Zool., 24:216-230.

RICHDALE, L. E.
1947. Seasonal fluctuations in weights of penguins and petrels. Wilson Bull., 59:160-171.

VAN TYNE, J.
1952. Principles and practices in collecting and taxonomic work. Auk, 69:27:33.

WOLFSON, A.
1945. The role of the pituitary, fat deposition, and body weight in bird migration. Condor. 47:95-127.
1954*a*. Body weight and fat deposition in captive white-throated sparrows in relation to the mechanics of migration. Wilson Bull., 66:112-118.
1954*b*. Weight and fat deposition in relation to spring migration in transient white-throated sparrows. Auk, 71:413-434.

(University of Georgia Ecological Studies,
AEC Savannah River Plant area),
1918 *Hahn Avenue,*
Aiken, South Carolina

FROM THE FIELD

A possible late date for the Indigo Bunting was the record of a single bird observed by Fern Dorris on November 12, 1956, on Highway 80 between Macon and Roberta. Ivan R. Tomkins observed and photographed four Avocets on Oysterbed Island below Savannah on February 4, 1957. There was also an immature Blue Goose on Oysterbed that day. From Grace M. Whiteman comes the following records from Ida Cason Calloway Gardens (Chipley): Bufflehead on December 16, 1956; three immature Blue Geese with forty-two Canada Geese from November 17, 1956, until at least March 2, 1957. Ben Maulsby reports that two Whistling Swans were seen six miles from Rome on Paris Lake, February 24, 1957. The birds had been present for two weeks and left on March 2. Also, a bird identified as a Krider Hawk (a western subspecies of the Red-tailed Hawk) was seen near Aragon, Georgia, on March 1 and March 3, 1957.

GENERAL NOTES

MIDWINTER OBSERVATIONS FROM THE WARNER ROBINS AREA.—The Baltimore Oriole (*Icterus galbula*) has been recorded several times in winter a tMacon and Warner Robins. The most recent record was that of a female seen several times on January 2 and 4, 1957. It fed from twigs and leaves in close proximity to bluebirds, and drank from the bird bath. On January 1, 1957, Tom and I and Mrs. Grubbs noted two male Buffleheads (*Charitonetta albeola*) on a pond near Grovania in Houston County. On the same day a Horned Grebe (*Colymbus auritus*) was seen on a private pond on Limestone Creek south of Perry. Three days later when we went to the pond again, the bird was not there. Two catbirds (*Dumetella carolinensis*) were observed February 22, February 24, and March 10, 1957, about ten miles south of Warner Robins, and on February 23 at the same location we were surprised to find a Yellow-breasted Chat (*Icteria virens*). *At* Wilkinson's Lake on February 3, 1957, there were seventeen males and three females of the Ring-necked Duck (*Nyroca collaris*); five males were present on March 2. Our first winter record for the American Bittern (*Botaurus lentiginosus*) was that of a bird seen at the old race-track pond in Warner Robins on February 25, 1957.

Coming through Powersville in Peach County on January 12, 1957, we noted a bird perched in a thicket which we recognized immediately as a Cardinal (*Richmondena cardinalis*). However, the bird was pure white with the exception of the crest, the wings, and the tail which were not red, but a bright pink color. We obtained a closer view with binoculars before it flew into the dense thicket toward the ground.

The next day, January 13, 1957, along the railroad track between Bullard and the Ocmulgee River in Twiggs County, we saw a whitish sparrow. The head was all white with the exception of a short streak of dark color beginning at the bill and suggesting part of a dark crown stripe. There were heavy dark stripes though not well defined, and a suggestion of a dark spot on the otherwise pure white breast and underparts. The tail was white with some dark feathers in it. The tail seemed longer than that of a normal Song Sparrow. The back and wings were a mottling of dark brown with considerable rufous-brown coloration. The legs seemed pinkish or flesh colored. It flicked its tail almost continuously in the same fashion as Song Sparrows did when they were disturbed. In the same brush pile were Song Sparrows and White-throated Sparrows, and not far away, Swamp Sparrows, but we could not be certain of the specific identity of the partial albino.—HEDVIG S. CATER, 315 *Davis Drive N., Warner Robins, Georgia.*

GOS PERIODICALS IN THE UNIVERSITY OF GEORGIA LIBRARY

November 1, 1956

Atlantic Naturalist, 1950-1956. Incomplete
Audubon Field Notes. 1947-1953. Incomplete
Audubon Magazine, 1943-1956. Incomplete
Bird-Banding. 1941-1945. Incomplete
Bird Life. 1943. Complete
Bird Lore. 1933-1939. Incomplete
Call Notes. 1951-1955. Incomplee
Chat. 1937-1956. Complete except for parts of two volumes.
Chicago Naturalist. 1938-1947. Complete
Cleveland Bird Calendar. 1941-1945. Incomplete.
Condor. 1937-1956. Complete except for parts of four volumes.
Feathers. 1944-1955. Incomplete
Flicker. 1941-1955. Incomplete
Florida Naturalist. 1939-1955. Complete except for parts of three volumes.
Flower and Feather. 1946-1955. Complete except for parts of two volumes.
Georgia Society of Naturalists. Bulletin No. 3
Great Basin Naturalist. 1943-1953. Complete except for parts of three volumes.
Gull. 1941-1955. Incomplete.
Huntington Chat. 1950, No. 3.
Iowa Bird Life. 1931-1954. Complete except for two volumes.
Jack-pine Warbler. 1945-1956. Incomplete.
Kentucky Warbler. 1935-1955. Incomplete.
Bulletin of Maine Audubon Society. 1945-1950. Incomplete.
Bulletin of Massachusetts Audubon Society. 1940-1951. Incomplete.
Migrant. 1935-1956. Incomplete
Nebraska Bird Review. 1944-1956. Incomplete.
Oriole. Scattered issues for 1940, 1944, and 1949.
Passenger Pigeon. 1941-1955. Complete except for parts of four volumes.
Postilla. 1950, nos. 1-3.
Raven. 1944-1948. Incomplete.
Scissortail. 1952-1954. Complete.
South Dakota Bird Notes. 1949-1954. Complete.
Urner Field Observer. 1946-1948. Complete except for two issues.
Wildlife Review. 1952, nos. 67-69.
Wilson Bulletin. 1939-1954. Complete except for parts of four volumes.
Wood Thrush. 1946-1950. Incomplete.

MONOGRAPHS

The Natural History of the Magpies. Jean M. Linsdale.
Bibliography of California Ornithology. Joseph Grinnell.
The Distribution of the Birds of California. Joseph Grinnell and Alden H. Miller.

In addition to these publications, the library contains more than one hundred reprints and papers on a variety of subjects, such as food habits of birds, distribution, and geographic variation.

The above periodicals are unbound and uncatalogued, but are housed in the Library of the University of Georgia. Since they belong to the G.O.S., members may borrow these periodicals at any time. Inquiries should be addressed to: W. P. Kellam, Director of Libraries, University of Georgia, Athens, Georgia. Contributions of books or periodicals to the G.O.S. library will always be welcome.

RECENT LITERATURE

AMERICAN WATER AND GAME BIRDS.—by Austin L. Rand. E. P. Dutton & Co., Inc., New York. 239 pp. $9.95.

The most striking features of this large book are the remarkable color photographs which are mostly close-ups of single birds, some at nests or with young. Of the 168 photographs, most of them are in color and were taken by such prominent nature photographers as Cruickshank, Grimes, Porter, and others. Although one finds some repetition (for example, three different pictures of drake mallards), the photographs are excellent, and color reproduction seems to be accurate.

Less conspicuous but as interesting is the readable text. About 337 species, ranging phylogenetically from loons and grebes through herons, ducks, geese, rails, shore-birds and quail to doves, are taken into consideration. Accounts are primarily of North American species, and contain general descriptions or appearances of the birds, their distribution, foods, habitats, and nesting activities. In view of the excellent photographs and readable, scientific text, the price of the book should not be prohibitive.

D. W. J.