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Edited by

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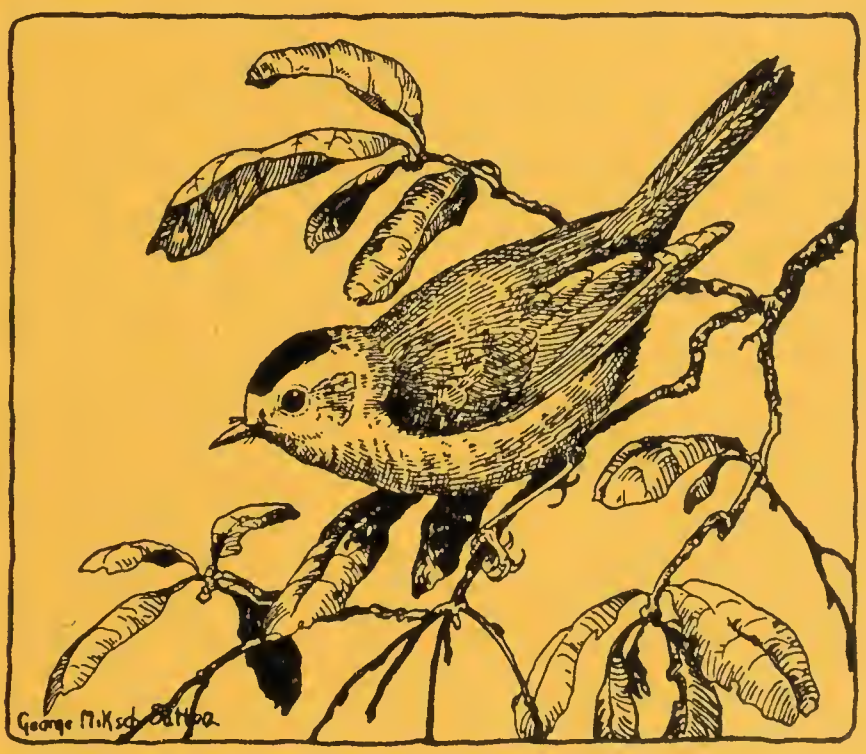

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THE MEANING OF BIRD CONTROL

BY W. L. McATEE

The reasons for bird control, the methods used, and the results obtained are subjects upon which most ornithologists are poorly informed. Any destruction of birds is anathema to some bird lovers, or so at first impulse, they will surely assert. How many of them, however, can honestly say that they never yearned to suppress some kind of bird? It may have been perhaps a gang of English Sparrows that were mobbing favorite Bluebirds, or possibly some of that other imported species, the Starling, because of its elbowing Flickers out of house and home.

Such are reasons for bird control which the most ardent bird lover may find himself driven to accept. In that position he should appreciate that other folks may have other reasons for keeping birds in check and perfectly valid ones at that. Even a very good bird protectionist may have his patience strained to the breaking point by Robins taking all of his early sweet cherries, or by Catbirds harvesting the whole crop of a highly prized patch of raspberries.

With many of us the production of such fruits is entirely a side issue, that does not affect our livelihood. In the case of many others, on the contrary, the production of small fruits or other crops, and protecting them from serious pilfering by depredators of all kinds are essentials upon which an important share or even the whole of income depends. In such cases it is only natural that demands for control should arise. Losses exist in every degree, from those of trifling consequence, which although of almost universal occurrence are equally widely condoned, to those that can be estimated only in very large sums, or are even so serious as to compel the abandonment of industries in areas that aside from the presence of crop pests may be particularly suited to them.

The writer has had Wood Thrushes, Catbirds, and Robins take all of the strawberries from a garden patch in Virginia and never even

said "shoo" to them. He liked the birds, the berry crop was not essential to him, so he could ignore the damage. But many cases can not be so lightly dismissed. Consider the case of Mr. and Mrs. Olaf Dahl, of Tulare County, California, an old couple dependent to a large degree on income from an eight-acre orchard of almond trees. California linnets, or house finches, picked off about all of the buds on these trees in the season of 1926-1927. In 1927-1928, by tramping up and down the rows and clapping shingles together all day long throughout the period from November to January inclusive, the owners were able to save the crop. In 1928-1929 they were both sick at the time of bird attack, so no patrolling could be done. In consequence the linnets stripped the orchard of buds to the extent that it produced less than 200 pounds of nuts; the loss was about $1,500, a staggering one under the circumstances.

Those engaged in commercial orcharding on a larger scale also suffer losses in proportion. We illustrate with an instance from the eastern states, one investigated in 1919 by L. L. Gardner, then an employe of the Biological Survey, now a captain surgeon in the U. S. Army. On the property of W. Ten Brock, Chairman of Supervisors of Columbia County, Hudson, New York, where sweet cherries were grown on a large scale, he observed Robins and Starlings in great numbers busily eating the fruit. The tops of practically all the trees were stripped and the ground under every tree in the large orchard was strewn with cherry pits. Cherries were bringing $1.50 per four-quart basket that year, and the estimate of loss on the entire crop was fifty per cent; on that basis the damage in this single orchard was not less than $4,000.

In 1918 the writer investigated damage by ricebirds, chiefly Bobolinks, in South Atlantic states. The rice industry, long in a decline, was then experiencing a degree of revival due to war-time conditions, and the depredations of the ricebirds were keenly felt. To cite only one instance of several observed: On the Marrington Plantation, near Charleston, S. C., September 21 to 23, immense numbers of ricebirds were present, at least from twenty to twenty-five thousand. The birds had come unprecedentedly early—August—and had been destroying rice ever since. The crop on about twenty-five acres was so badly damaged that it was not harvested and the loss for the whole plantation was about sixty per cent of the normal yield. Sixty-one Bobolinks and one Red-winged Blackbird were collected here and all had been feeding on rice. Quoting from my field report I note that "To the planter, the number of ricebirds present on this plantation must seem myriads and

the hope for his crop almost nothing. I observed the immense flocks of ricebirds and went over all the fields seeing the damage done. It is very serious and no bird doing such work should be protected."

There is no doubt that the depredations of ricebirds have been one of a number of causes leading to the abandonment of the rice industry on the South Atlantic Coast. In comparatively recent years, business men of Wilmington, N. C., besought the Biological Survey for an effective and economical method of minimizing ricebird damage. They desired to restore to rice-growing the large acreage in their region formerly devoted to the purpose, but recognized that control of ricebirds was essential to success.

The region which first gave competition to the southeastern rice growers was the central rice-growing district, and here again birds, chiefly blackbirds, proved pests of first rank. W. E. Lea, former manager of the Cameron Farms Company, Orange, Texas, in a letter of May 18, 1928, remarks that the average loss due to them in that region was ten per cent of the yield and adds, "When there was no rice other than that grown on my farm for a radius of say six miles, the loss would run between twenty-five and fifty per cent. This statement can be substantiated by many reputable rice farmers, some of whom actually went out of business because of losses from ricebirds." Corroborative testimony from O. J. Wintermann, Eagle Lake, Texas (May 5, 1928), is as follows: "We have two tracts of land in this locality which are no longer farmed because the birds destroy almost the entire crop each fall when rice is grown thereon. These tracts are near the water, which attracts the birds and they seem each year to ruin the crop."

As a further instance of birds causing the abandonment of agricultural endeavor in certain areas, we quote from a report (November, 1930) relating to Horned Larks in California by S. E. Piper, one of the most experienced field men of the Biological Survey: "Wherever in the state," he says, "commercial production of vegetables and of beans touches upon habitats of the Horned Lark, attack by this bird on the young plants is swiftly devastating. I have observed cases in which the birds in large numbers have completely destroyed plantings of beans, carrots, lettuce, and peas on areas of from twenty to fifty acres within the short period in which the plants are subject to attack. Most damage is sustained by bean-growers on the non-irrigated slopes and mesas of the Coastal Strip from Monterey and San Benito Counties to the Mexican boundary. This damage is decidedly localized, and recurs year after year in the same situations, with the effect that

bean-growing on certain areas, adapted almost solely to this purpose, has been abandoned."

Thus we see that bird damage runs the gamut from the insignificant to the unendurable. In his relations with destructive birds, man's position may be one in which the attacks are of no consequence, or on the contrary it may be one wherein, despite all efforts, he is defeated and driven out of certain areas.

While accounts of destruction by birds could be continued at great length, it does not seem necessary to give more than the preceding illustrative examples to convince even the most steadfast bird lover that mankind often is confronted with the necessity of bird control.

That necessity admitted, the question of methods of accomplishing control comes to the fore. All of us prefer measures of the preventive type that do not involve death to the birds and while sometimes such methods are feasible, at others they are not. As a rule frightening devices (scarecrows and their ilk) are effective only when novel, and familiarity with them soon breeds contempt. Such methods as tarring seed grain, planting it too deeply to be readily dug out by birds, covering a few trees or small berry patches with bird-excluding netting, choosing early or late maturing varieties with relation to their susceptibility to bird damage, harvesting early, or otherwise varying farm practice to minimize depredations, are examples of preventive methods.

Often none of these devices will avail, and aggressive measures are in demand. "Bird-minding", or the patrolling of areas and shooting at the birds or otherwise frightening them, usually with only a slight amount of actual killing, is a method long in use, but one that is expensive and often not very effective. Shooting at birds destroying small fruits involves perhaps the next greater degree of killing; some species, as Robins, are unwary and must be practically shot out, while others, as Starlings, are wary and soon avoid the dangerous area. Shooting is expensive both in labor and materials. Trapping has been little employed except against birds of prey and English Sparrows, and its possibilities are hardly known in the case of destructive birds in general. It is clear, however, that the methods so far mentioned are impracticable or prohibitively expensive for use where large areas are involved. This means that they will not be used on any extensive scale. Poisoning is the next resort and this method has the advantages of relative cheapness and of greater possibilities of economical application to large areas.

Often control measures are uneconomic, hence are not attempted. There may be other reasons also which render bird control impracticable. In illustration we may record that only recently (November, 1931) investigations of Crow depredations in Oklahoma (by E. R. Kalmbach and S. E. Aldous, of the Biological Survey) while confirming reports of vast numbers of Crows and of serious damage by them, revealed so great an abundance of food in unharvested crops, shocked cereals, and pastured grain fields, that all concerned agreed that an effective control campaign was impossible and that recourse must be had to alterations in farm practice.

This brings us back to the fact that in his competition with birds man is not always the victor. The Oklahoma grain growers must raise enough for the Crows as well as for themselves, as it is simply impracticable to cure the situation. In other cases, as previously noted, man can not do even that well; he must surrender to the birds. Such instances are parallel to the warfare with insects of which we read so much, for in many cases without a doubt there is a struggle for existence between birds and man, a favorable outcome of which from man's point of view is by no means assured.

The fears entertained by some, therefore, that efforts at control are endangering our bird population certainly in many respects are unfounded. Concluding that all bird killing tends toward extermination also is not justifiable. The thing that does seriously threaten local avifaunas is man's increasingly intensified occupation of the land. This is an inevitable accompaniment of population increase, and bird control operations along the way if a factor at all in the final result, are only incidental.

Bird control we must conclude is a self-limited activity. On a small scale it is unnecessary, on a large one it is impossible. In the intermediate categories, economics in the long run will rule, and in a high proportion of cases, so far as we can now foresee, control will be prohibitively expensive.

Ordinarily, furthermore, bird control does not affect the species that are favorites with bird lovers. There is no control of wrens or bluebirds, chickadees or warblers, swallows or phoebes. Most of the familiar species that the ornithophile has in mind when he thinks birds are never involved in control operations. The only notable exception to this statement is the Robin, and its universal abundance shows that it has not been injured by control operations.

In its entire history the Biological Survey has found it desirable to publish instructions for control of only certain hawks and owls,

crows, magpies, pinyon jays, starlings, blackbirds, and English Sparrows, and the whole list of birds involved in control operations anywhere in the United States is scarcely as long again.

For the interest it may have to readers, the policy of the Biological Survey in relation to bird control is here succinctly stated. The general policy of the Bureau is to hold bird control work to a minimum. In each case study of the situation in the field, development preferably of preventive methods, or, if necessary and possible, of control measures, with subsequent dissemination of information on the results obtained, are held to fulfill the Bureau's obligations. Large-scale control campaigns and far-reaching extension projects are not contemplated. The underlying principle recognized is that economic problems involving wild life are characteristically local and that means of adjusting them must vary with, and should be confined to, the localities where needed. In making adjustments of wild-life relationships for economic reasons, we should do whatever is required but no more than is necessary.

The charges of wholesale destruction of birds in control campaigns in most cases are entirely unfounded, and as for indiscriminate slaughter of birds of all kinds, there are practically no instances of it.

A little reflection should reveal that there is small cause for unease as to the results of bird-control operations in general. This is true not only because of the various limiting factors already discussed here, but further because bird control in the last analysis almost always is strictly local action against abundant and usually also widespread species. It is the very factor of overabundance of birds that brings on damage and the ensuing efforts at control. The insignificant effect of these efforts upon the bird population is evident on every hand.

These remarks apply to the general run of control activities against highly vegetarian species, the repression of which is undertaken for economic reasons. They do not apply to bounty systems, side hunts, and other organized onslaughts against the larger predatory birds. These constitute warfare, not control, and due to its long-continued intensity and to the smaller numbers of the birds against which it has been directed, the results in some cases have been disastrous.

Such has not been the case, however, with any of the species of either seasonally, or almost totally, vegetarian-feeding habits. Consider for instance the linnet, or house finch, which was the most destructive bird in California in the 'seventies and 'eighties, when horti-

culture was just getting established there. The Pacific Rural Press of those years teems with references to the destructiveness of this bird. It was shot, poisoned, destroyed in every way that occurred to the growers, and it has been fought ever since. Today, after more than sixty years of such treatment, it is still the most destructive bird of the state. What is more, the aggressive actions against it so far as known have not depleted any associated species.

The Crow in the east has been fought for more than 200 years. Since colonial times it has been outlawed, and shot, and poisoned at every opportunity. Nevertheless it has maintained its numbers and steadily extended westward its area of abundance. It has accompanied its enemy man, persisted despite him, and increased with his increase. To take one glance at similar phenomena of the Old World we see Rooks and House Sparrows still abundant there, although persecuted for ages.

The story of the Bobolink, or ricebird, most nearly epitomizes that of "control" of abundant species of largely vegetarian proclivities. The rice industry that developed on the South Atlantic Coast was located exactly in the migration path of Bobolinks, through which the birds funnelled from a range almost continental in width. In myriads they took enthusiastically to the rice, and for more than a hundred years they were fought unceasingly in every imaginable way. Now the rice industry of that region is gone, but the birds remain. The Bobolinks traverse their accustomed migration path, as did their ancestors for ages before them, serenely unaware that there ever was such a thing as bird control.

Efforts at bird control are exceptional indeed if they succeed enough to justify their name; and seldom do they develop into threats against the existence of species. So long as suitable range exists for a widely distributed bird, local action against it is not to be feared, and bird control practically always means local action against abundant species. If suitable range ceases to exist, through human occupation or through destruction of necessary environmental factors, nothing can save the species affected. Only to this trouble, largely an incurable one, and not to bird control, can be properly traced certain of the regrettable cases of impairment of our avifauna.

United States Biological Survey.
Washington, D. C.

ROBINS AND RASPBERRIES

BY GRANT HENDERSON

I have enlarged my patch of tame black raspberries somewhat since the summer of 1930. Prior to that time I had been unable to combat the dread disease, anthracnose, successfully, and was a bit wary of tackling raspberry production on a larger scale. However, I learned a few things about growing them that summer, found that I could control anthracnose and other diseases, so the following spring I added several plants to the original patch.

I shall never forget the summer of 1930. I had prospects for a bumper crop of berries considering the size of the patch, but anthracnose is a curious disease. It attacks the young canes, producing small, purplish spots, which later turn gray or dirty white in the centers. These spots eventually run together, often encircling the cane and thereby cutting off the sap supply. The canes in an effort to heal the wounds become rough, and sometimes they crack. While the disease may not kill the plants, it certainly reduces the berry crop. Diseased plants may produce a quantity of blossoms in the spring and all indications would point to a maximum crop of fruit, but about the time that the berries should begin to turn red they invariably darken and dry up on the vines. This was my experience in the summer of 1930. A third or more of the crop dried up. The remainder, however, took on a reddish hue, a sure indication that the days of harvest were near at hand.

And then the Robins came! The Robins, I may say, had been on the premises all spring but, naturally, they had paid no particular attention to the berry patch. A pair of them had reared a brood of four fat youngsters, and these had for some time been shifting for themselves. The parent birds, at the time of the ripening of the raspberries, were busily engaged in caring for a second brood of five. The first brood had enjoyed the first days of life in a box placed especially for their parents in a poplar in front of the house. The second brood was being reared in a nest that was saddled on a horizontal limb of a hard maple that overhung a strawberry bed situated northwest of the raspberries. And how the parents did gorge those young Robins with raspberries the moment they were ripe. The old birds, together with the four young from the first nest, literally lived in the patch. They had not bothered the strawberries to any extent except to wrench the side out of a plump one now and then, but previous to the ripening of the raspberries they had taken every cherry

from a small cherry tree east of the house. However, these were so wormy that they were unfit for use, so I did not complain. But I did grow a bit warm under the collar when they insisted on devouring every ripe raspberry on the place. I believe that those eleven Robins got a fourth of the crop. Loving almost all birds too well to destroy them, I tried a dozen different methods in an attempt to frighten them from the patch. But did I succeed? No! They were bold enough to help themselves to berries on vines but a few feet from me when I would be picking. Once, as the female adult Robin sat on one of the stakes to which the plants are tied, not more than ten feet from me, I snatched off a green berry and tossed it at her, taking her fairly alongside the head. She gave a saucy "kee-elp" and dived into a clump of raspberries and, appearing a moment later with a ripe berry, she winged her way towards the nest in the hard maple.

They were as painstaking at times as a connoisseur examining a work of art. Damaged berries left in the patch were proof of the fact that the birds were critical when it came to the sense of taste. I usually refrained from picking until the dew was off the berries, but the Robins did not wait, and when I appeared they had, as a rule, retired for the day, leaving me a few ripe and near-ripe berries, and not a few mutilated ones. I have often wondered if the young Robins ever had a change of diet while the raspberry season lasted. I doubt it.

A Wood Thrush or so, several pairs of which I have with me each summer, cousins of the Robins, also sampled the raspberries from time to time but they, I would say, served them as dessert; the Robins seemed to place them at the head of their bill of fare. A few Chewinks visited the patch, and twittered joyously over the deliciousness of the dark, wholesome fruit but they, thicket loving birds that they are, loved more, I believe, the shelter and protection that the bushy brambles afforded them.

As stated earlier, I had learned to control diseases, so the next summer, 1931, saw a full crop of raspberries. I do not believe that I lost a quart from anthracnose. But harder than all to understand, though I had the Robins again, nine in number this time, I am sure that I did not lose a pint of berries on their account. Why? A few Chewinks and a Wood Thrush came to feast occasionally, but the Robins, I am sure, gave little thought to the fruit which they, or others like them, had gone wild over the summer before.

Greensburg, Ind.

ORNITHOLOGICAL REMINISCENCES OF MID-VICTORIAN WASHINGTON

BY MORRIS M. GREEN

These notes are written by one, who, in his teens, was an underling in the Division of Economic Ornithology and Mammalogy, in its pioneer days in our national capital, in the eighties of our last century. At that time, the A. O. U. and its organ, the *Auk*, were quite young, as were also the Biological Society and the Cosmos Club of Washington. There were many chances for an observer to catch thrilling glimpses of the great and future greats of American ornithology, as they dashed in and out of the capital, like birds of passage themselves.

Elliott Coues, a most *distingué* man, with patriarchal beard, flashing eyes, and a frock coat, was passing from the stage. America's far west was then unexplored, hence positions as surgeons in frontier army posts were much appreciated by ambitious pioneers in zoology. Coues, Shufeldt, Merrill, Mearns, all army surgeons, radiated from Washington to make history in the west. Likewise went Captain Bendire, U. S. A., with a charming Teutonic brogue and a bald head that offered no hope to scalping Apaches in Arizona.

Colonel N. S. Goss, tall and straight as a lodgepole pine, occasionally breezed east from the Kansas plains to ensure that things were not "all quiet on the Potomac." Henry W. Henshaw, from western excursions of the U. S. Geological Survey, brought many feathered treasures back to Washington. In the quaint old Smithsonian building Robert Ridgway worked as quietly and as wisely, with brother John as an artistic aid, as the Barn Owls in the tower.

From Boston came William Brewster, the beau ideal of the gentleman and scholar in science; also Charles B. Cory, like an exuberant school boy, off on a joyous lark.

Washington and its suburbs were then unspoiled by the "machine age". Rock Creek was primitive and it was legal for a young collector to carry a pocket shotgun in his sleeve and dead warblers in the crown of a derby hat.

Dr. A. K. Fisher was making a fine collection of local birds, when not dissecting hawks' stomachs. The advertisement—"Body by Fisher" —so often seen today in magazines, suggests, to me, not a machine, but a beautifully molded study skin of a bird, wrapped to produce most life-like curves, by Dr. Fisher.

The patriarchs in Washington, then, were talking of a promising novice in New York, named Frank M. Chapman. In Washington, a high school student, C. W. Richmond, by name, was making wistful calls at the Smithsonian and the Agricultural Department, seeking precious light.

Leaving Washington to enter Cornell University, in 1890, my life there promised to be as tranquil as the trill of a field sparrow on a summer day.

But at Ithaca, a professor's son, whose initials were L. A. F., asked me to give him confidential instruction in skinning birds and obtaining bird books, because his father did not desire him to be a naturalist! So runs the world away!

Ardmore, Pa.

A MENSURAL STUDY OF A COLLECTION OF GRUS CANADENSIS FROM IOWA AND NEBRASKA

BY PHILIP A. DU MONT

In view of the fact that the measurements, as recorded for *Grus canadensis canadensis* (Linnaeus) and *Grus canadensis tabida* (Peters) by most authors, show a rather marked degree of differentiation, it seems advisable to place on record the results of a study of twenty-eight specimens contained in the collection of the Museum of Natural History, University of Iowa. I believe these measurements indicate more nearly the slight differences between these forms, as found in specimens taken through the Missouri River Valley region during migration. This intergradation, therefore, confirms the opinion of Oberholser[1] and Hartert[2], who accorded them subspecific rank.

Grinnell[3] took a series of measurements of museum material totaling 107 specimens almost impartially divided between *canadensis* and *tabida*. The outstanding result of this scrutiny was the complete intergradation of the two races. He found that a plot of wing dimensions showed less division than did that of the tarsus.

In the determination of this material at hand, I have used the factors of wing length and extent of exposed culmen, and, at least for this area, these seem to suffice as subspecific characters.

While the measurements of wing, exposed culmen, culmen from nostril, depth of culmen at base, and length of middle toe (without

[1] *Auk*, XXXVIII, 1921, pp. 80-82.
[2] Vog. Pal. Faun. 3, 1921, p. 1818.
[3] Univ. Calif. Bull. Dept. Sci., Vol. 15, 1925, pp. 318-320.

Grus canadensis canadensis (Linnaeus)

Museum No.	Locality	Date	Sex	Wing	Exp. Cul.	From Nostril	Depth at Base	Tarsus	Bare Tibia	Middle Toe	Tail
6259	Gothenburg, Nebr.	November 29, ——	♂	17.60	3.95	2.75	.98	7.00	2.90	2.82	6.25
5206	Whiting, Iowa	April 18, 1886	♂	19.00	3.70	2.40	.93	7.75	2.90	2.96	6.90
6256	Holly Springs, Iowa	April 8, 1887	♂	19.25	4.10	2.90	.98	7.15	2.80	2.85	6.50
5222	Holly Springs, Iowa	April 18, 1887	♂	19.50	4.24	2.88	1.01	8.75	3.20	3.28	6.40
5215	Holly Springs, Iowa	April 8, 1887	♂	19.70	3.92	2.78	.99	6.50	2.50	2.94	6.00
5201	Whiting, Iowa	April 9, ——	♂	19.80	3.95	2.60	.93	8.00	3.40	3.20	7.20
5211	Holly Springs, Iowa	April 8, ——	♂	19.90	4.38	2.95	.98	8.50	3.30	3.08	6.60
6260	Gothenburg, Nebr.	November 26, ——	♂	20.00	4.04	2.65	1.02	8.75	2.90	2.84	7.00
6255	Sloan, Iowa	No date	♂	20.10	4.28	2.72	.98	9.00	4.00	3.38	6.75
6252	Whiting, Iowa	April 9, 1886	♂	20.20	4.00	2.61	.96	8.50	3.60	3.20	7.00
5223	Elm Creek, Nebr.	November 10, 1886	♂	20.25	4.20	2.88	.88	7.75	3.00	3.14	7.25
5364	Holly Springs, Iowa	April 8, 1887	♂	20.30	4.40	2.92	.99	8.75	3.70	3.26	7.00
5209	Sloan, Iowa	April 28, 1884	?	19.50	4.24	2.70	.97	8.25	3.70	3.10	6.10
5204	Sloan, Iowa	No date	[♀]	17.00	3.38	2.22	.87	7.00	2.90	2.65	5.50
6258	Holly Springs, Iowa	April 8, 1887	♀	17.70	3.74	2.15	.88	6.00	2.80	2.71	6.60
5212	Kearney, Nebr.	April 11, 1886	♀	18.00	3.58	2.50	.88	6.50	2.50	2.58	6.00
6251	Holly Springs, Iowa	April 11, 1887	♀	18.50	4.05	2.80	.95	8.00	3.50	3.25	6.80
5366	Gothenburg, Nebr.	November 29, ——	♀	19.75	4.08	2.82	.97	8.25	3.60	3.09	6.90
5365	Whiting, Iowa	April 6, 1886	♀	19.80	4.04	2.72	1.01	8.25	4.10	3.30	6.50
5207	Plum Creek, Nebr.	November 10, 1885	♀	19.90	4.25	2.86	1.02	8.75	3.70	2.75	7.00
6257	Elm Creek, Nebr.	November 10, 1886	♀	20.25	4.30	2.95	.99	8.90	3.80	3.37	7.50
5221	Elm Creek, Nebr.	November 5, 1884	♀	20.40	4.27	3.02	1.00	8.25	4.00	3.38	7.00

Grus canadensis tabida (Peters)

Museum No.	Locality	Date	Sex	Wing	Exp. Cul.	From Nostril	Depth at Base	Tarsus	Bare Tibia	Middle Toe	Tail
5199	Holly Springs, Iowa	April 18, 1887	♂	20.40	4.78	3.32	1.08	9.25	3.80	3.38	6.70
5363	Whiting, Iowa	April 12, 1886	♂	20.70	4.92	3.26	1.04	8.50	3.70	3.34	7.00
5200	Woodbury Co., Iowa	[1]March 14, 1891	♂	21.00	4.95	3.10	1.09	8.25	4.00	3.50	7.10
5224	Wolf Creek, Nebr.	April 4, ——	♂	21.10	4.85	3.11	1.04	9.60	4.10	3.58	6.20
5225	No record	No date	[♂]	21.50	5.18	3.38	1.06	9.50	4.10	3.38	7.75
5202	Wood River, Nebr.	October 23, 1884	♀	20.25	4.75	3.19	1.03	8.60	3.80	3.28	6.60

[1]Died in captivity.

claw) proved to be tangible factors for determination between *G. c. canadensis* and *G. c. tabida* the measurements of tarsi, exposed portion of tibia, and length of tail so overlapped as to be of little value.

These specimens were secured for D. H. Talbot, of Sioux City, by his collectors at Holly Springs and Sloan, Woodbury County, and Whiting, Monona County, Iowa, during 1884-'86-'87; and at Kearney and Elm Creek, Buffalo County, Gothenburg, Dawson County, Plum Creek and Wolf Creek, Nebraska, during April and November 1884-'85-'86-'87.

It is impossible to say whether this material represents the approximate proportion of these two species as they formerly existed in migration through the Missouri River Valley, or whether a special effort was made by the Talbot collectors to secure a series of the Little Brown Crane.

The folowing ranges of measurements in inches for the two forms are based on the specimens as listed in the table below.

Grus canadensis canadensis (Linnaeus)

Twelve males. Wing (measured along the arc, with a tape, 17.60 to 20.30; exposed culmen, 3.70 to 4.40; depth of culmen at base, .93 to 1.02; bill from nostril, 2.40 to 2.95; tarsus, 6.50 to 9.00; exposed portion of tibia, 2.50 to 4.00; length of middle toe (without claw), 2.82 to 3.38; length of tail, 6.00 to 7.25.

Eight females. Wing, 17.70 to 20.40; exposed culmen, 3.58 to 4.30; depth of culmen at base, .88 to 1.02; bill from nostril, 2.15 to 3.02; tarsus, 6.00 to 8.90; exposed portion of tibia, 2.50 to 4.10; length of middle toe, 2.58 to 3.38; length of tail, 6.00 to 7.50.

Grus canadensis tabida (Peters)

Five males. Wing, 20.40 to 21.50; exposed culmen, 4.78 to 5.18; depth of culmen at base, 1.04 to 1.09; bill from nostril, 3.10 to 3.38; tarsus, 8.25 to 9.60; exposed portion of tibia, 3.70 to 4.10; length of middle toe, 3.34 to 3.58; length of tail, 6.20 to 7.75.

One female. Wing, 20.25; exposed culmen, 4.75; depth of culmen at base, 1.03; bill from nostril, 3.19; tarsus, 8.60; exposed portion of tibia, 3.80; length of middle toe, 3.28; length of tail, 6.60.

Museum of Natural History, University of Iowa.
Iowa City, Iowa.

NOTES ON THE BIRDS FOUND AT LAKE JOHNSTON AND LAST MOUNTAIN LAKE, SASKATCHEWAN, DURING APRIL AND MAY, 1922

BY C. G. HARROLD

Cyril Guy Harrold (1895-1929) died in New York on February 4, 1929, on the eve of his departure for Madagascar as one of the ornithologists to the joint British, American, and Paris Museums' Expedition. (Obituary notices appeared in the *Auk*, Vol. XLVI, April, 1929, p. 285, and the *Canadian Field Naturalist*, Vol. XLIII, Sept., 1929, pp. 132-3).

Recently, through the courtesy of Mr. A. P. Harrold of Tofield, Alta., certain field books and mss. have come into the writer's possession. Of these, the following notes were evidently prepared for publication in 1922 but withheld for some reason which we cannot now ascertain. The principal results of this collecting trip were communicated by C. G. Harrold to H. Hedley Mitchell and incorporated by him in the "Catalogue of the Birds of Saskatchewan" (*Can. Field Nat.*, Vol. XXXVIII, Spec. No., No. 6, pp. 101-119, May, 1924).

In preparing the notes for publication at this time, the new arrangement of the 1931 A. O. U. Check-List has been followed. Where any doubt remained as to subspecies, identification has been left open.

Most of the species mentioned are represented by specimens collected, but in editing the notes it was thought advisable to delete the Greater Snow Goose (*Chen hyperborea atlantica*) which Harrold included on the basis of a sight record on May 5 at Lake Johnston.

The work of correcting the names to accord with the new check-list, arrangement, and typing the manuscript, was all done by Mr. R. D. Harris of Winnipeg, whose help is gratefully acknowledged.—B. W. Cartwright, *Winnipeg, Man.*

Lake Johnston is situated about thirty miles south of Moose Jaw in a rolling, prairie country, practically treeless and dotted everywhere with sloughs of varying size. On the east side of the lake, about ten miles northwest of Expanse, the high ground comes right up to the lakeshore, forming a cliff about a mile in length and having a mean height of about 120 feet. This cliff is quite precipitous at some points, at others it slopes gently down to the shore. Although the surrounding country is open prairie, a large portion of the face of this cliff is thickly covered with shrubs of many kinds, including chokecherry, pincherry, saskatoon, gooseberry, etc., also willows and small poplars. These afford excellent cover for small birds such at nuthatches, warblers, vireos, and sparrows of various kinds. To either side of this ridge, the shore consists of swampy meadows and small mud bars, where many geese, ducks, and waders may be found during their respective migration seasons. The lake, which is over fifty miles in circumference, is very shallow, being less than six feet deep a mile and half from shore. This makes an excellent feeding ground for the swans, which gather here in numbers on their way north in the spring. Pelicans and cormorants were also common, nesting in colonies on an island which lies about five miles from the east shore of the lake.

The first half of May was very cold, with sleet and snow at intervals. The wind was north for the greater part of the first ten days, consequently holding back some of the small migrants.

Horned Grebe. *Colymbus auritus.* First seen May 18. Several seen since that date but this species does not appear to be as common in southern Saskatchewan as it is farther east. (Lake Johnston).

Western Grebe. *Aechmophorus occidentalis.* First seen May 14. Quite plentiful from this date till May 29, preferring the large lake to the smaller sloughs. (Lake Johnston).

White Pelican. *Pelecanus erythrorhynchos.* First seen May 4. Plentiful at Lake Johnston during May.

Double-crested Cormorant. *Phalacrocorax auritus auritus.* First seen May 10. Only a few individuals seen after this date.

Great Blue Heron. *Ardea herodias herodias.* First seen May 4. Common from May 9 till end of month.

American Bittern. *Botaurus lentiginosus.* The only specimens seen were two individuals on May 14.

Whistling Swan. *Cygnus columbianus.* First seen May 1. Very plentiful from 1st to 8th. Last seen May 13.

Canada Goose. *Branta canadensis canadensis.* First seen May 1. Common till May 8. Several pairs remained to nest along east shore of lake.

Hutchins's Goose. *Branta canadensis hutchinsi.* None seen at Lake Johnston. Party of eleven seen on Last Mountain Lake on April 28.

White-fronted Goose. *Anser albifrons albifrons.* Only one seen at Lake Johnston on May 4. Flock of five seen flying north along west shore of Last Mountain Lake on April 26.

Lesser Snow Goose. *Chen hyperborea hyperborea.* First seen May 1. Abundant till May 12, migrating in flocks containing from ten to fifty birds. (Lake Johnston).

Common Mallard. *Anas platyrhynchos platyrhynchos.* First seen May 1. Plentiful on migration on Lake Johnston and nesting around sloughs in this district.

Gadwall. *Chaulelasmus streperus.* First seen on May 6. Very common during May both on the open lake and also in the sloughs. No nests were found, although I feel certain this species nests in the locality.

Baldpate. *Mareca americana.* First seen May 3. Abundant for two weeks after this date; usually seen in pairs.

American Pintail. *Dafila acuta tzitzihoa.* First seen May 1. Common on migration till May 9, also summer resident, several nests being found.

Green-winged Teal. *Nettion carolinense.* First seen May 3. Common but not so plentiful as the Bluewing. Quite numerous between May 9 and 20.

Blue-winged Teal. *Querquedula discors.* First seen May 3. Very common till end of May.

Shoveller. *Spatula clypeata.* First seen May 1. Numerous till about May 15. One nest was found containing seven eggs on May 18.

Redhead. *Nyroca americana.* First seen May 8. Not nearly so common as the Canvas-back. Only a few flocks seen during the rest of the month.

Canvas-back. *Nyroca valisineria.* First seen May 1. A very common migrant at Lake Johnston during May. Also apparently nesting, although I did not actually find the nest.

Lesser Scaup Duck. *Nyroca affinis.* First seen May 1. Not very plentiful at this point, only odd flocks being seen at intervals after this date.

American Golden-eye. *Glaucionetta clangula americana.* First seen May 5. Only about half a dozen individuals noted during my stay at Lake Johnston. One male picked up unable to fly although apparently uninjured.

Buffle-head. *Charitonetta albeola.* First seen May 19. Several pairs seen on sloughs toward the end of the month.

White-winged Scoter. *Melanitta deglandi.* First seen May 19. A common migrant usually seen in small parties some distance from shore.

Ruddy Duck. *Erismatura jamaicensis rubida.* First seen May 23. On this date a flock of about fifteen were seen on Lake Johnston but no more seen afterwards.

American Merganser. *Mergus merganser americanus.* April 26, Last Mountain Lake. First seen at Lake Johnston on May 7. Fairly common for two weeks after this date; seen in pairs or small parties.

Sharp-shinned Hawk. *Accipiter velox velox.* First seen May 9. Migrants fairly numerous till May 18, generally being seen hunting for small birds along the lakeshore.

Western Red-tailed Hawk. *Buteo borealis calurus.* First seen May 7. Not very common but individuals seen every day during remainder of May. One nest found in poplar six feet from ground containing one egg on May 14.

Swainson's Hawk. *Buteo swainsoni.* Only one specimen seen on May 24.

American Rough-legged Hawk. *Buteo lagopus s.-johannis.* First seen May 22. Four more seen between this date and end of month.

Ferruginous Rough-leg. *Buteo regalis.* One seen on May 20.

Northern Bald Eagle. *Haliaeetus leucocephalus alascanus.* One immature specimen found at foot of telephone pole, evidently shot, on May 15.

Marsh Hawk. *Circus hudsonius.* First seen May 2. Common summer resident. One nest found, containing three eggs, on May 18.

Osprey. *Pandion haliaetus carolinensis.* First seen May 2. Also seen on May 9 and 13—probably the same bird.

Prairie Falcon. *Falco mexicanus.* First seen May 18. Several seen during the following week.

Duck Hawk. *Falco peregrinus anatum.* First seen May 2. Several pairs seen along the shore during May. The stomach of a specimen obtained contained two Northern Phalaropes.

Pigeon Hawk. *Falco columbarius.* One seen on May 14 was the only one identified.

Eastern Sparrow Hawk. *Falco sparverius sparverius.* First seen May 8. About a dozen individuals seen during the month of May. One pair nested at "The Cutbanks."

Greater Prairie Chicken. *Tympanuchus cupido americanus.* Two seen in a party of sharptails were the only ones identified, although several more were heard.

Prairie Sharp-tailed Grouse. *Pedioecetes phasianellus campestris.* Fairly common in the district chiefly near the lake. Still in flocks till end of May.

Sandhill Crane. *Grus canadensis tabida.* Party of nine on May 10 were the only ones seen.

Sora. *Porzana carolina.* One specimen seen on May 15.

American Coot. *Fulica americana americana.* First seen May 9. Only a few individuals seen during the remainder of the month.

Piping Plover. *Charadrius melodus.* Party of three seen on May 7 were only specimens seen at Lake Johnston.

Semipalmated Plover. *Charadrius semipalmatus.* First seen May 15. A party of four seen on this date were only ones noted.

Killdeer. *Oxyechus vociferus vociferus.* First seen May 1. The main migration had passed, and those seen after this date evidently intended staying to nest.

American Golden Plover. *Pluvialis dominica dominica.* First seen May 11. After this only three flocks were seen, the last being on May 16. Very few showed full spring plumage.

Black-bellied Plover. *Squatarola squatarola.* First seen May 11, when a flock composed partly of Golden and partly of black-bellies was seen. Only a few individuals seen after this date, last one being on May 17.

Wilson's Snipe. *Capella delicata.* First seen May 6. Not very plentiful, only a few specimens being seen between this date and May 20.

Long-billed Curlew. *Numenius americanus americanus.* One specimen seen on May 9 was only example noted. This was with a party of Marbled Godwits.

Upland Plover. *Bartramia longicauda.* First seen May 8.

Spotted Sandpiper. *Actitis macularia.* First seen May 10. Odd pairs seen almost every day till end of month.

Solitary Sandpiper. *Tringa solitaria.* First seen May 7. Common from May 11 to May 16 around small sloughs; none seen on the lakeshore.

Western Willet. *Catoptrophorus semipalmatus inornatus.* First seen May 3. Common during rest of month; usually seen in pairs and probably summer resident here.

Lesser Yellowlegs. *Totanus flavipes.* First seen May 8. A common but by no means abundant migrant till May 15.

Pectoral Sandpiper. *Pisobia melanotos.* First seen May 10. Common migrant till May 18, moving in small flocks.

Baird's Sandpiper. *Pisobia bairdi.* First seen May 2. Very common both around sloughs and on the lakeshore till May 14.

Least Sandpiper. *Pisobia minutilla.* First seen May 2. Apparently not very numerous in this locality but several parties were noted between May 3 and 10.

Dowitcher. *Limnodromus griseus.* First seen May 10. Migrated in parties, also in company with Pectoral Sandpipers. Last seen May 16.

Stilt Sandpiper. *Micropalama himantopus.* One male was seen on May 11 feeding in company with Baird's Sandpipers by a slough. My experience is that this species is usually to be found in company with Lesser Yellowlegs.

Semipalmated Sandpiper. *Ereunetes pusillus.* First seen May 4. An abundant migrant between May 4 and May 12, usually seen in company with Baird's or Least Sandpipers.

Buff-breasted Sandpiper. *Tryngites subruficollis.* Party of about fifteen seen on May 23 on ploughed land about one and a half miles from the lake. They rise from the ground almost with the speed of a Wilson's Snipe.

Marbled Godwit. *Limosa fedoa.* First seen May 3. Common during the remainder of the month and no doubt nesting, as individuals were so tame you could approach within fifteen yards of them.

Sanderling. *Crocethia alba.* One specimen seen on May 8 and three on May 9 were the only examples noted.

Avocet. *Recurvirostra americana.* First seen May 15. Next specimen seen on May 23. From this date till end of month they were fairly common on the alkaline sloughs, showing a distinct preference for these ponds.

Wilson's Phalarope. *Steganopus tricolor.* First seen May 13. This is apparently a summer resident in the district. Very few seen on migration; usually in pairs. One party of twelve birds were seen.

Northern Phalarope. *Lobipes lobatus.* First seen May 17. For the ten days following this date they were very abundant. On May 20, I counted no fewer than sixty-one flocks passing south along the east shore of Lake Johnston in five minutes (7:10 A. M. to 7:15 A. M.). There were about thirty to fifty birds in a flock on the average.

California Gull. *Larus californicus.* First seen May 1 and no doubt had arrived several days before this date. A very common gull along the shores of Lake Johnston. All specimens seen (with one exception) were in adult plumage.

Ring-billed Gull. *Larus delawarensis.* First seen May 1. Plentiful for three weeks after this date. Practically all seen were in adult plumage.

Franklin's Gull. *Larus pipixcan.* First seen April 26 (Last Mountain Lake). Large migration along east shore of Lake Johnston every evening from May 10 to May 21 in parties of from five to twenty-five.

Common Tern. *Sterna hirundo hirundo.* First noted May 17. Common from this date till end of month.

Black Tern. *Chlidonias nigra surinamensis.* First seen May 21. Plentiful around sloughs till May 29.

Western Mourning Dove. *Zenaidura macroura marginella.* First seen May 11. Not very plentiful. Odd birds seen almost every day till end of month.

Snowy Owl. *Nyctea nyctea.* One seen on May 2 on the ice on Lake Johnston.

Western Burrowing Owl. *Speotyto cunicularia hypugaea.* First seen May 17. Only one pair found nesting in deserted badger den. Nest contained ten eggs, also five field mice, two garter snakes, and one immature salamander. One of the mice was an albino, having pale pinkish colored feet.

Long-eared Owl. *Asio wilsonianus.* Several long-ears were seen on May 8 and the species was fairly common for several days; apparently following the small bird migration. Last seen May 16.

Nighthawk. *Chordeiles minor.* One seen flying over at a great height on May 21.

Northern Flicker. *Colaptes auratus luteus.* Two seen on a telegraph pole on May 10 at Dunkirk.

Eastern Kingbird. *Tyrannus tyrannus.* First seen May 11. Several pairs apparently staying to nest at "The Cutbanks" were the only ones seen.

Say's Phoebe. *Sayornis saya saya.* First seen May 6. A common migrant till May 11. One cold stormy day they were seen taking insects off the weeds washed up along the shore in company with the Least Flycatchers. Last noticed May 17.

Least Flycatcher. *Empidonax minimus.* First seen May 10. Plentiful till May 14, that is, for only two or three days, although I saw odd ones till end of month.

Prairie Horned Lark. *Otocoris alpestris praticola.* First seen May 2. Not very numerous during the month as no doubt the main migration had passed long before I arrived. One nest found containing three eggs on May 4.

Tree Swallow. *Iridoprocne bicolor.* First seen May 21. Several seen during following ten days.

Bank Swallow. *Riparia riparia riparia.* First seen May 16. Very common over sloughs on the 19th. Summer resident.

Barn Swallow. *Hirundo erythrogaster.* One seen on May 27.

Northern Cliff Swallow. *Petrochelidon albifrons albifrons.* First seen May 19. Plentiful around sloughs for several days after this date.

Purple Martin. *Progne subis subis.* Several seen on May 22 flying over slough with Cliff Swallows .

American Magpie. *Pica pica hudsonia.* One individual seen on May 1.

Crow. *Corvus brachyrhynchos* subsp. About half a dozen pairs nested in small trees along the shore.

Long-tailed Chickadee. *Penthestes atricapillus septentrionalis.* One pair seen on May 17.

Red-breasted Nuthatch. *Sitta canadensis.* First seen May 5. Fairly common migrant till May 15. Found among willows on lakeshore.

Western House Wren. *Troglodytes aedon parkmani.* First seen May 14. Only five or six individuals seen during remainder of month.

Eastern Winter Wren. *Nannus hiemalis hiemalis.* Two seen on May 12.

Catbird. *Dumetella carolinensis.* First seen May 18. Apparently a few pairs remain to nest in the thick bush along the shore.

Brown Thrasher. *Toxostoma rufum.* First seen May 22. On May 24 one was seen about 500 yards from the nearest cover (except for a plough) on the open prairie. Several seen during last week in May in bushes along the shore.

Eastern Robin. *Turdus migratorius migratorius.* A pair seen in a village about ten miles from Lake Johnston on May 9.

Eastern Hermit Thrush. *Hylocichla guttata faxoni.* First seen May 11. Very common for several days, especially May 14. Last seen May 20.

Olive-backed Thrush. *Hylocichla ustulata swainsoni.* First seen May 13. Fairly numerous till May 18. One seen on May 24.

Willow Thrush. *Hylocichla fuscescens salicicola.* First seen May 21. Another heard singing on May 27. These were the only ones noted.

Eastern Bluebird. *Sialia sialis sialis.* A female seen on May 19 was only one noted.

Mountain Bluebird. *Sialia currucoides.* Although I did not observe any personally, residents informed me that this species is quite common on migration in April.

Eastern Golden-crowned Kinglet. *Regulus satrapa satrapa.* A pair of this species was seen in the choke cherry bushes along the lakeshore on May 14.

American Pipit. *Anthus spinoletta rubescens.* Only one specimen was noted on May 4. Probably the northward migration had passed by this time.

Sprague's Pipit. *Anthus spraguei.* First seen May 8. Very common till May 20. Apparently nests at this point. Each individual of this species migrates separately, flying about fifty yards from the ground and uttering a double note at intervals very similar to the alarm note of the Barn Swallow.

Bohemian Waxwing. *Bombycilla garrula pallidiceps.* One seen during a sleet storm on May 2.

White-rumped Shrike. *Lanius ludovicianus excubitorides.* One specimen seen on May 17.

Red-eyed Vireo. *Vireo olivaceus.* First seen May 17. Very numerous in bushes along the lakeshore till end of month.

Eastern Warbling Vireo. *Vireo gilvus gilvus.* First seen May 21. Several seen and heard after this date.

Black and White Warbler. *Mniotilta varia.* First seen May 12. The only ones seen after this were two on May 14.

Orange-crowned Warbler. *Vermivora celata celata.* First seen May 6. Very plentiful on May 8 and 9. Last seen May 16.

Eastern Yellow Warbler. *Dendroica aestiva aestiva.* First seen May 11. Abundant from this date till end of month.

Magnolia Warbler. *Dendroica magnolia.* One male seen on May 15 was the only one identified.

Myrtle Warbler. *Dendroica coronata.* One seen on May 6. Common from 8th to 10th. Last seen May 19.

Blackburnian Warbler. *Dendroica fusca.* One male seen and heard singing on May 20.

Black-poll Warbler. *Dendroica striata.* First seen May 14. Very common till May 18. Last seen May 23.

Western Palm Warbler. *Dendroica palmarum palmarum.* One specimen seen on May 15.

Water-Thrush. *Seiurus noveboracensis* subsp. First seen May 11. A few odd ones noted during the next few days; last seen May 16.

Mourning Warbler. *Oporornis philadelphia.* One male seen on May 25 was the only specimen noted.

Yellow-throat. *Geothlypis trichas occidentalis.* First seen May 14. Several seen during following week in scrub along lakeshore.

American Redstart. *Setophaga ruticilla.* First seen May 26. Two more seen on the 28th.

Western Meadowlark. *Sturnella neglecta.* First seen May 1. Common summer resident.

Yellow-headed Blackbird. *Xanthocephalus xanthocephalus.* First seen May 7. Plentiful on migration for about a week. Apparently none stayed to nest at this point. Last seen May 19.

Giant Redwing. *Agelaius phoeniceus arctolegus.* Common summer resident.

Baltimore Oriole. *Icterus galbula.* First seen May 21. Fairly numerous till end of month.

Brewer's Blackbird. *Euphagus cyanocephalus.* First seen May 2. Am uncertain as to the abundance of this blackbird on account of the difficulty of distinguishing it from the Rusty Blackbird in the field. Did not identify the rusty with certainty.

Bronzed Grackle. *Quiscalus quiscula aeneus.* Several pairs seen during the month.

Nevada Cowbird. *Molothrus ater artemisiae.* First seen May 9. Common from May 14 to 20 and a few seen every day till end of month.

Rose-breasted Grosbeak. *Hedymeles ludovicianus.* First seen May 12. Apparently a summer resident at this point.

Rocky Mountain Grosbeak. *Hedymeles melanocephalus papago.* A male was seen on May 15. Its song is loud, clear, and rather Robin-like in character, but unlike that of the lattter bird it is repeated without variation, and at intervals of about thirty seconds.

Redpoll. *Acanthis linaria* subsp. One flock flying high on May 3.

Pale Goldfinch. *Spinus tristis pallidus.* First seen May 23. Abundant after this date till I left.

Arctic Towhee. *Pipilo maculatus arcticus.* First seen May 8. Several noted during week following. Not common.

Savannah Sparrow. *Passerculus sandwichenis* subsp.* First seen May 4. Abundant summer resident.

Western Grasshopper Sparrow. *Ammodramus savannarum bimaculatus.* One male seen on May 16, on the lakeshore.

Baird's Sparrow. *Ammodramus bairdi.* First seen May 17. Common summer resident. A pair could be found at the edge of almost every slough.

Western Vesper Sparrow. *Pooecetes gramineus confinis.* First seen May 7. Not very plentiful on migration, only a few individuals being seen about the middle of the month.

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*Taverner (Proc. Biol. Soc. Wash., Vol. 45, 1932, pp. 201-206) has proposed the subspecific name *campestris* for this race.—B. W. C.

Slate-colored Junco. *Junco hyemalis hyemalis.* Two seen on May 3.

Tree Sparrow. *Spizella arborea* subsp. A party of five seen on May 2.

Eastern Chipping Sparrow. *Spizella passerina passerina.* First seen May 8. Abundant on May 14 and 15. Individuals seen till end of month.

Clay-colored Sparrow. *Spizella pallida.* First seen May 8. Very abundant till May 17 on migration. Also common summer resident.

Brewer's Sparrow. *Spizella breweri breweri.* One on May 16 was only specimen seen. Its song is a weak, disconnected series of notes, somewhat suggesting the song of the Long-billed Marsh Wren but not so loud.

Harris's Sparrow. *Zonotrichia querula.* First seen May 7. Plentiful on migration till May 13. Last seen May 15.

White-crowned Sparrow. *Zonotrichia leucophrys leucophrys.* First seen May 6. A large flight arrived on the 8th. Last seen May 11.

Gambel's Sparrow. *Zonotrichia leucophrys gambeli.* First seen May 6. Common till May 10. Last seen May 12.

White-throated Sparrow. *Zonotrichia albicollis.* First seen May 13. Very plentiful on May 15. One seen on May 20, but I doubt if this species nests here.

McCown's Longspur. *Rhynchophanes mccowni.* First seen May 19. Fairly common from May 20 to 26. Found chiefly in stubble fields on high ridges. The male has a remarkable butterfly-like flight, which is used in conjunction with the song, which consists of only a few notes, one of them having a peculiar squeaky sound quite unlike that of any other bird in tune.

Lapland Longspur. *Calcarius lapponicus.* May 1 (Lake Johnston). Last seen May 7. Huge flocks in flax fields near Liberty from April 26 to 30.

Chestnut-collared Longspur. *Calcarius ornatus.* First noted May 2. Very common summer resident, several nests being found.

Eastern Snow Bunting. *Plectrophenax nivalis nivalis.* One seen on the shore on May 16 was still in winter plumage. It was very tame, allowing me to approach within twelve feet of it.

Deer Lodge,
Winnipeg, Man.

THE WILSON BULLETIN

Published at Sioux City, Iowa, by the Wilson Ornithological Club.

The present editorial organization is as follows: T. C. Stephens, Editor-in-Chief, Sioux City, Iowa; Myron H. Swenk, University of Nebraska, Lincoln, Nebraska; R. D. Hissong, Sioux City, Iowa.

The subscription price in the United States is $1.50 a year, and 50 cents a number; in all other countries of the International Postal Union the price is $1.75 a year, and 60 cents a number. Subscriptions and orders for single copies should be addressed to the Secretary, Lawrence E. Hicks, Dept. of Botany, Ohio State University, Columbus, Ohio.

EDITORIAL

The Columbus Meeting was held as scheduled. In spite of predicted success there was some fear that we could not countervail the throes of the depression. Nevertheless, a most successful meeting was held, with a splendid program and a splendid attendance. As would be expected, the attendance from distant points was small. However, it is doubtful if we have ever had as good attendance from the local state as Ohio provided at this meeting. The following five-year comparison is intended to show something of the status quo of our organization. These figures indicate many interesting facts, but they are results; and there are certain determining factors which they can show only by inference, for example, the enthusiasm, loyalty, and labor of the officers, and the splendid coöperation and coördination between them. It may be truly said that the Wilson Ornithological Club, as an organization, has never been in a stronger position than it is in at the present time. As the depression begins to lift we will look for surprising growth.

	Ann Arbor 1928	Des Moines 1929	Cleveland 1930	New Orleans 1931	Columbus 1932
Local attendance	31	106	41	11	92
Out of town attendance	75	96	122	81	65
Total attendance	106	202	163	92	157
Dinner attendance	50	77	98	35	69
Titles on the program	24	36	33	27	35
Honorary members	4	9	7	7	7
Life members	0	5	7	7	10
Sustaining members	64	66	58	57	75
Active members	248	245	227	214	175
Associate members	383	397	479	461	469
Total membership	702	717	775	744	734
Pages in Bulletin	274	272	312	334	256
Total income	$1981	$2167	$2451	$2686	$2191
Fiscal balance	$527	$530	$675	$731	$547

Officers of the Biological Society of Washington have announced that "The International Rules of Zoological Nomenclature" (28 pp., paper, 1926) may now be obtained for 50 cents, by application to J. S. Wade, Secretary of the Society, U. S. Bureau of Entomology, Washington, D. C. Other papers on the birds of the District of Columbia have also been reduced in price.

The Present Issue of the Bulletin is somewhat smaller than usual. This is merely a provision for safety, pending the uncertainty of income from dues. The magazine will be increased to full size, and more, just as soon as our income warrants it. Not a few other scientific periodicals have been curtailed in number of pages, even thus far this year. Practically all publishing societies are asking their members to do the best they can in paying dues promptly. In these uncertain times each one must decide for himself what his own circumstances will permit him to do toward the support of the societies to which he may belong. We are quite sure that our membership would strongly disapprove the allowance of any deficit in publication costs. Those of us who may be willing and able to pay dues in a higher class of membership may thus materially help to continue our publication through the present crisis. Most of us are optimistic enough to believe that our economic conditions will have greatly improved by the time another dues-paying season comes around.

Up to the Present Time only two designs for a library book plate have been submitted. The officers would like very much to be able to select from a collection of twenty or thirty designs. Some of our members who may not feel that they have artistic ability might, nevertheless, have ideas which could be worked into a design. So, we would encourage anyone to submit even a rough sketch of a book plate design, leaving it to the Committee to have it put in shape for reproduction. One of the designs now in hand is a drawing of a single species, the Long-eared Owl—species named for Alexander Wilson. Another design includes a field glass, a note book, and several other items in the paraphernalia of the bird student. What other symbol, or symbols, of bird study might be appropriately placed on our collection of books? We are very anxious that many more will offer their ideas for a book plate design before the final choice is made. The selected design should be wholly appropriate and satisfactory, since it may be in use for a long time—ten years or a hundred. Your ideas on paper, please!

Suggestions or designs may be sent directly to the W. O. C. Library, Museum of Zoology, Ann Arbor, Mich.

The American Association for the Advancement of Science has announced the following schedule of meetings, which may be of some interest to us in determining our own meetings.

1933.	Boston.	December 27 to January 2.
1934.	Pittsburgh.	December 27 to January 3.
1935.	St. Louis.	December 27 to January 2.
1936.	Washington.	December 28 to January 2.
1937.	Indianapolis.	December 27 to January 1.

Besides these regular winter meetings there will be summer meetings each year in other cities.

GENERAL NOTES

Conducted by M. H. Swenk

Record of the Starling in Arkansas: A Correction.—Regarding Mr. J. D. Black's reference to the January 25, 1930, record of the European Starling from Fayetteville, Arkansas (*antea*, p. 235), the record given in Arkansas Station Bulletin 258 (p. 129) states clearly that a specimen was taken. This specimen is now in the University collection and available for inspection. Mr. Black refers to this record as "a rather uncertain sight observation." I called it the first record because no other record of the Starling in Arkansas had at that time appeared in print.—W. J. Baerg, *University of Arkansas, Fayetteville, Ark.*

Some 1931 Middle Western Records of the Starling.—Several observations of the Starling (*Sturnus vulgaris*) were made recently in localities in middle western states. While none of these observations extend the known westward range of this species, yet they help in showing the increase of this bird along the western edge of its range, as determined at the present time. Although no specimens were taken, identification in each instance was satisfactory.

On September 27, 1931, six Starlings were seen three miles north of Toulon, Illinois. A flock of fourteen was seen September 28, 1931, ten miles north of Peoria, Illinois. On October 16, 1931, two were seen two miles north of Vinita, Oklahoma. A single Starling was seen with a flock of Red-winged Blackbirds about twenty miles south of Kansas City, near Lewisburg, Kansas, on October 17, 1931. One was seen October 17, 1931, ten miles southwest of Bethany, Missouri, near Pattonburg. A flock of eight was seen November 10, 1931, five miles west of Davenport, Iowa. On November 11, 1931, two miles south of Pana, Illinois, a large flock of at least 150 Starlings was seen. And a flock of twelve birds, November 12, 1931, at Muscle Shoals, near Sheffeld, Alabama.—Philip A. DuMont, *Iowa City, Iowa.*

Leconte's Sparrow at Toledo, Ohio.—On September 3, 1932, I was in a marsh along Maumee Bay, just north of the city limits of Toledo, Ohio, looking for Marsh Wrens, when my attention was attracted by a strange sparrow that landed on top of a cat-tail about fifty feet ahead of me. It was followed by two more birds of the same species. These two last birds sought the dense part of the cat-tail growth, and were soon lost to sight, but the first bird remained on top of the cat-tail, affording me an excellent view of it. I succeeded in approaching a little closer, and with the aid of a pair of 8-power glasses and the afternoon sun on my back I was able to carefully study this bird, which was undoubtedly a Leconte's Sparrow (*Passerherbulus caudacutus*). The broad buffy yellow line over each eye and the lighter buff line through the center of the dark crown stood out distinctly. The yellowish buff tinge on the breast and on the faintly streaked sides was also clearly visible. I got a good view of the bird's back when it turned around, which helped in its identification. Upon closer approach all three birds flew across the road into an adjacent marsh where I was unable to locate them. When the birds flew I got an excellent view of the tail. The feathers were narrow with the tips sharply pointed and the outer feathers were much shorter than the center ones. This bird is very rare in Ohio, as far as I know there being only one previous record (Revised List of the Birds of Ohio, M. B. Trautman, 1932).—John H. Ritter, *Dayton, Ohio.*

The Calls of the Barred Owl.—I have seen the Barred Owl (*Strix varia varia*) occasionally but never have heard it "sing" or in a debate, until last spring when in southern Indiana at the home of Mr. and Mrs. Cleo Wesner of Campbellsburg. In that part of the state there are many interesting species of birds, including the Barred and the Great Horned Owls. The Bald Eagle is occasional, (they caught one in a trap), and there are present several members of the heron family; the Whip-poor-will; rare warblers, including the Swainson Warbler (which nests there) and the Kentucky Warbler; the Summer Tanager, which is very common; the Black Vulture; and many other species of birds, including seven species of the woodpecker family, the rarest being the Pileated Woodpecker. But the doings of the Barred Owl were something new to me. They had told us of its "oratory", and when supper was over after dark, I was called to the yard to listen to two Barred Owls having a debate. First one would talk, then the other, arguing and explaining all the while, but in a muffled voice not quite understood by the visiting audience. Then they would say something, perhaps a joke or something very clever and to the point, and this would be followed by the loudest maniacal laughter one could imagine. When this was over, they would resume their argument and again discuss various things which we could not understand. To one listening to such conversation for the first time, it was most interesting and impressive. The birds were a short distance back of the house it seemed, in a ravine at the foot of a wooded hill. Finally the discourse died down and the debate was possibly settled to the satisfaction of at least one of the contestants. That entertainment alone paid us for the trip; but during the night someone tapped on our door calling softly, "Are you awake? Listen to the Whip-poor-wills." But I was already listening with both ears. The hills of southern Indiana are most beautiful and a natural paradise for birds.—Mrs. Horace P. Cook, *Anderson, Ind.*

Late Nestings.—Four instances of late nesting, three of them in Knox County, Illinois, came to the writer's attention this year (1932). A pair of Eastern Field Sparrows (*Spizella pusilla pusilla*) had three half-grown young in a nest August 26, while on September 4 two fledgling Eastern Mourning Doves (*Zenaidura macroura carolinensis*) were on the point of leaving their natal home. The thirty-day period for shooting the latter species in Illinois opens September 1, although nests with eggs or young in mid-August are not of extremely rare occurrence. Whether or not toll is taken to such extent as to be a serious factor is undetermined, but it is quite evident that hereabouts Mourning Doves have not held their own, numerically, for at least a decade. A female Eastern Bob-white (*Colinus virginianus virginianus*) was incubating ten eggs September 16. On September 11, two fairly grown Yellow-billed Cuckoos (*Coccyzus americanus americanus*) were observed in a nest in Des Moines County, Iowa.—Harold M. Holland, *Galesburg, Ill.*

The Western Gnatcatcher Also Moves Its Nest.—In the first three numbers of Volume XLIV (1932) of the Wilson Bulletin, contributions were made on the nesting habits of the Blue-gray Gnatcatcher (*Polioptila caerulea caerulea*). A summary of these contributions may be given as follows: (1) that all nests observed were on top of a limb, near a fork, possibly for protection of some sort; (2) that all nests had been moved or were being moved; and (3) that various factors are responsible for a change in the nesting sites. From evidence submitted it seems fairly safe to say that nest building material is sometimes re-used in

another nest: that this bird deliberately moves its nest at will; and that changing conditions at a chosen site may cause the birds to move the nest to a more favorable location before the eggs are laid.

I have read these contributions with interest, and believe it timely to report some observations made upon its western relative, the Western Gnatcatcher (*Polioptila caerulea amoenissima*). This past summer I had occasion to observe a pair of Western Gnatcatchers about their nest and recorded certain conditions which corroborate observations made on the eastern form. Some new information is also given.

On July 8, 1932, I was collecting in the juniper belt of the Upper Sonoran Zone, between the north base of the San Francisco Mountains, Arizona, and the Painted Desert of the Little Colorado, when I saw a gnatcatcher. Desiring specimens of this species, I followed the bird to a pinyon tree (*Pinus edulis*) where it was joined by another gnatcatcher. I soon saw a nest near one of the birds. No nest of this species had been reported from these mountains. I therefore decided to take the nest and birds, and climbed the tree. The nest was on a live horizontal limb, a few inches out from a fork, the second limb inclining upward and away from the nest. The distance to the ground was about twelve feet. The nest was covered with lichen, but was not closely examined at that time, as it was not quite completed and I planned to return later to make my collections.

The following week I returned but found the nest gone. Closer inspection disclosed only a few fibers still adhering to the limb. I was puzzled by these conditions since I was certain no person other than myself had recently been in the vicinity. In a search beneath the tree I failed to find evidence of nest or eggs. The missing nest could be attributed only to removal by birds, for predatory animals are uncommon in the region and destruction by this means would surely have left a clue. I therefore attributed the cause to my previous visit. By searching the neighborhood I found a gnatcatcher, but time did not permit further search for a nest.

A review of *The Condor* for more than twenty-five years disclosed only two references to gnatcatchers moving their nests. Both however pertain to the Black-tailed Gnatcatcher (*Polioptila melanura californica*), and are recorded by R. S. Woods. In "Home Life of the Black-tailed Gnatcatcher" (Volume XXIII, 1921, p. 175) Mr. Woods casually states that "an inspection of the nest showed that a section of it had been removed, and it was found that only a small portion of the unused nest previously built remained"; also that "the nest appeared looser and bulkier than those built of new material." Several years later in "Nesting of the Black-tailed Gnatcatcher" (Volume XXX, 1928, p. 143) he reports that "the material of the previous nest, which had entirely disappeared, was probably used in its construction." Such casual treatment of these incidents implies a familiarity of the writer with this trait in his birds.

These observations indicate that the Western and Black-tailed Gnatcatchers, like the Blue-gray Gnatcatcher, sometimes move their nest; they corroborate observations of eastern observers; and offer an additional reason why gnatcatchers move the nest. These reasons now are: first, convenient nest building material in the form of an old nest (Lewis, Vol. XLIV, p. 115); second, too close contact with an undesirable bird neighbor (Lloyd, Vol. XLIV, p. 185); and third, molestation by man before the nest is completed.—Lyndon L. Hargrave, *Museum of Northern Arizona, Flagstaff, Ariz.*

Migration Records of Eagles and Snowy Owls in the Upper Missouri Valley.—In this note the writer has collected numerous records of the Golden Eagle (*Aquila chrysaetos canadensis*), Bald Eagle (*Haliaeetus leucocephalus*), and Snowy Owl (*Nyctea nyctea*), and while not complete, they do give a fair estimate of the number of these birds coming to this region yearly. In many cases doubt as to identification has been settled by correspondence with the party who took the bird. It must also be added that the actual date of capture of the birds was not always learned and in such cases the date of the newspaper report is given instead.

Early in January, 1930, a fifteen pound Golden Eagle was shot at Dell Rapids, in eastern South Dakota, and was turned over to the South Dakota State College Museum. Soon after this another Golden Eagle was taken near Slayton, in southwestern Minnesota, and was kept in a cage in the hope that the wing injury would heal and permit flight again. In March, 1930, a young rancher at Gettysburg, in northern South Dakota, lassoed a Golden Eagle and kept the bird for a pet. About May 24, 1930, a Golden Eagle was killed by a stockman near Carroll, in northeastern Nebraska, after the bird had killed several lambs ranging from ten to sixty pounds in weight. The lambs were struck on the back of the neck and killed, after which the eyes were eaten out. One small lamb had been torn open and partly eaten. In June, 1930, a farmer killed a Golden Eagle near Spencer, in northwestern Iowa, when he saw the bird carrying off a fat hen. A search of the top of a nearby hay stack disclosed the remains of a number of chickens.

On October 28, 1930, a large Golden Eagle was killed near Irene, in southeastern South Dakota, and was sent to a taxidermist for mounting. On October 30, 1930, a Golden Eagle was shot by a farmer near Humboldt, in eastern South Dakota, when the bird molested his poultry. This specimen was mounted and presented to the local Masonic Lodge. About November 12, 1930, two Golden Eagles were killed in northeastern Nebraska, one near O'Neill and the other, which had attacked a flock of turkeys, at Dora Lake. A Golden Eagle was winged and captured by two hunters on November 15, 1930, at Ipswich, in northern South Dakota. On November 21, 1930, four hunters near Rushville, in northwestern Nebraska, found a Golden Eagle tangled in a fence where it had killed a grouse. The men freed the bird and allowed it to fly away. On February 5, 1931, two hunters brought down a Golden Eagle, one of two birds flying near Tyndall, in southeastern South Dakota. Another case of an eagle being lassoed occurred on February 6, 1931, when a rancher at Petersburg, in eastern Nebraska, rode his horse near a Golden Eagle and caught the bird by one wing with a quick throw of his lariat.

Records of the Bald Eagle show that this species is a rather casual visitor in this area. On November 11, 1929, a fine mature Bald Eagle was killed at Wayne, in northeastern Nebraska. About December 8, 1930, an adult specimen of this species was taken at Lake Benton, in southwestern Minnesota, and was given to the local American Legion post. On February 13, 1931, a report was received that a farmer at Windom, in southwestern Minnesota, had been assailed by a large bird and had killed it. The bird proved to be an adult Bald Eagle with a wing spread of nearly eight feet.

Not since the great flight of Snowy Owls in 1917-18, has there been a general invasion of this species to this region. Each season, however, brings a few scat-

tered reports of Snowy Owls. During the middle of December, 1929, one of this species was killed at Marshall, in southwestern Minnesota, and another was shot by a school teacher near Meadow, in northwestern South Dakota. A third bird was taken at Mission Hill, in southeastern South Dakota, on December 12, 1929. In January, 1930, a rancher at Redelm, in northwestern South Dakota, killed a large Snowy Owl, which had been taking some of his chickens. On January 8, 1931, a Snowy Owl was captured alive at Wagner, in southeastern South Dakota. The last bird reported was one from Flandreau, in eastern South Dakota, on February 9, 1931.—William Youngworth, *Sioux City, Iowa.*

Some Hoosier Bird Notes.—I was called to two places in one day this past summer (1932) to see Ruby-throated Hummingbird nests. In one nest there were two eggs. One of these eggs had the shell broken, and I was sure the lining of the shell was left about a dead bird. The mother came and went several times while I was there. The nest was eight feet up on a small hanging branch of an apple tree, about forty feet back of the house. In a few days a call came that there was one young bird about the size of a honey bee in the nest. It was glossy black, as if it had had a "shine", and naked except for a small tuft of down on the back. I did not get out to see it right away, so it disappeared when very young.

The second Ruby-throated Hummingbird's nest was several miles away, near Pendleton, Indiana. It was on a horizontal branch of a tree about fifteen feet from the house. In a bird box near by a House Wren was nesting. When I visited the place, something had happened to the hummingbird's nest. The two white eggs had been pierced by some sharp instrument (we thought by the wren, as he is such a fighter), and the eggs had been thrown to the ground. Later the nest was dislodged, and a big part of it disappeared, with a small part left on the ground and some remains yet saddled upon the branch of the tree. It is not known just what happened, but the woman living at the place said she felt sure the wren had destroyed the eggs. Perhaps the hummingbirds then destroyed the the nest, or the wren may have done so.

My aunt, Mrs. J. A. Armstrong of Hollywood, California, was here this summer. She told me of her experience with a hummingbird which built in the hammock-hook on her front porch. She had the privilege of seeing the eggs, the young, and noted the whole process of incubation from first to last, which was most interesting at close range.

As to birds tearing up their own nests, that is true; but a Blue Jay tried to destroy the nest and young birds of a Cardinal here this summer, and I have yet to see another such battle. The nest was turned on the side in the mulberry tree, and the young birds were ready to topple out. The Cardinals won, and the Blue Jays, thoroughly routed, flew up into a nearby tree to straighten their ruffled plumage, which the brave Cardinals had much disarranged. I then got a tall step ladder and stood on top, in order to reach the nest, as it was about ten feet up, the highest I had ever seen a Cardinal's nest. I fastened the upturned nest back with sprouts growing near it, by folding them back and forth and securing the ends firmly beneath. Meanwhile, the Cardinals sat in the tree above me and watched the proceedings without a whimper. I am sure they recognized me as their friend, for they were not afraid at all, and when I climbed from my perch, they went at once to the nest. I never saw the jays bother them again. I have never known a Cardinal to put up such a fight as that. The

jays had a surprise they did not soon forget. The young birds grew up and have been about the bird bath and feeding station ever since.

Recently a teacher called that she had a strange bird which the children had picked up at a country school when the grackles had fought it almost to the finish. They did not know the species, so brought it to me for identification, but it died enroute. It was a young Ovenbird. It did not try to escape when the children rescued it.

Recently a woman called that she had a strange little bird which they had picked up in the yard. It did not try to get away, so she decided it must be injured, and she brought it to me. It was a male Golden-crowned Kinglet, well and lively. We can pick it up anywhere and it will sit on one's shoulder or head as tamely as a canary. We weighed it on the postal scales and it does not even weigh one-fourth of an ounce!

We had the surprise of the season in September when we found a real Whip-poor-will in the back yard. I have never known of but one bird of this species about this part of the state, and have never known of any being in the city. We live four blocks from the busiest corner in the city.—Mrs. Horace P. Cook, *Anderson, Ind.*

An Early Arrival Date of the Great Blue Heron at McMillan, Michigan. —Between one and two hours before sunset on March 29, 1932, I saw a Great Blue Heron (*Ardea herodias herodias*). It was flying rather low over field and cut-over land, and going southward. This arrival date was seven days earlier than my earliest previous record of April 5, 1929, for this locality. The following are my migration records of the Great Blue Heron for McMillan:

First Seen	Number Seen	Next Seen	When Common	Last Seen	Year
April 17					1922
April 19					1923
April 30				September 24	1924
April 6	1	April 7			1925
September 20					1927
May 9	1	May 12	May 9	September 8	1928
April 5	1	May 25	May 25	August 27	1929
May 27	1	May 30	May 27	September 21	1930
May 12	2	May 22	May 12	August 20	1931

The missing seasons—the fall of 1925 to and including the spring of 1927—were spent at Three Rivers, St. Joseph County, Michigan. These are as follows:

First Seen	Number Seen	Next Seen	When Common	Last Seen	Year
				October 31	1926
April 2	1	April 5	April 9	November 7	1925
April 5	1	April 6	April 6		1927

This is the first time that the Great Blue Heron came on my yearly list before the Robins and others of the "first comers" in spring. I am unable to account for this unusually early date. While the weather during December, January, and February this winter was unusually warm—there being very few days of zero weather—the month of March has been stormy and with very few thaws, although some streams are open in places. Snow has fallen on nearly every day this month. The weather on the date of this observation was partly cloudy, temperature ten degrees to forty-three degrees F., and a moderately strong southeast wind.—Oscar McKinley Bryens, *McMillan, Luce County, Mich.*

Some Sight Records from Ohio.—On August 6, 1931, at Guilford State Park, eight miles south of Salem, Ohio, I saw a flock of nine white herons, which, because of the press of time, I approached only close enough to determine that they were not large enough to be American Egrets (*Casmerodius albus egretta*). I assumed at the time that they were Little Blue Herons (*Florida caerulea caerulea*) in the immature plumage, this species having been quite common in 1930. On the same day Grant M. Cook and Edward Minnich also saw the birds and went on the same assumption.

On August 14, however, when there were eight birds remaining, I discovered that none of the eight had any trace of bluish in the primaries. On August 16, when there were seven birds left, several other observers and I were able to approach closely enough to one bird to see the black legs, and I was satisfied that all were Snowy Egrets (*Egretta thula thula*). On August 19, there were four birds present, all of which had the black legs; on August 22 and 23, there were two birds present, and, intermittently to September 3, there was one bird present. On August 22, Mr. Cook and a party of observers again were present, and Mr. Cook was satisfied that at least one of the two was a Snowy Egret. During the period these birds were present, I was able to observe their feeding habits to a limited extend. At some times all were very active; at other, all were quiescent; while at still other times, some were very active and others inactive.

During the summer of 1931 there were no Little Blue Herons or American Egrets present at Guilford Lake, although I saw one bird of the latter species on August 25, at Pine Lake, twelve miles east of Salem. During the summer of 1932, at Guilford Lake, there were five American Egrets present from August 10 to September 5, and thereafter a single bird until September 20. During the same period I noted the birds of the same species at Pine Lake and a single individual at still another lake.

On March 27, 1932, in company with Edward Minnich, E. O. Mellinger, and Myron T. Sturgeon, at Beaver Lake, twelve miles east of Salem, I saw a single male European Widgeon (*Mareca penelope*) with a large number of Baldpates (*Mareca americana*). We studied it for some time at 100 yards with 45x telescopes. A few days later at Guilford State Park, eight miles south of Salem, I again saw a male of this species, also in company with Baldpates, which I observed at ninety feet with 8x binoculars.

On July 3, 1932, near East Liverpool, Ohio, Mr. E. O. Mellinger and I discovered two singing individuals of the Carolina Chickadee (*Penthestes carolinensis carolinensis*). I had long suspected the presence of this species in that region, which is unglaciated, and the flora of which is decidedly Carolinian, but it was not until May 15, 1932, that my suspicion was even tentatively confirmed. On that date, in Beaver County, Pennsylvania, a hundred yards from the Ohio border, I found a pair of chickadees, gathering food for young, which appeared to have no whitish whatever in the feathers of the wings or wing coverts. I did not discover the young of these birds in the half hour or more that I followed them, nor did I hear them sing; hence, I was not satisfied of their identity. On the later date, however, four miles west of the Pennsylvania border, and a mile from the Ohio River, Mr. Mellinger and I observed the second pair, which were

in the same plumage as the first, and which continually sang their four-syllabled song.

This record constitutes an extension northward of the accepted range of the species, but one which is perfectly logical, for, while the region is cartographically a part of northeastern Ohio, it is physiographically and faunally an integral part of southeastern Ohio.—William C. Baker, *Salem, Ohio.*

COMMUNICATIONS

Biographical Corrections

The late Dr. Chas. W. Richmond, to whom I am indebted for much information of an interesting character as well as kindly comment and constructive criticism, in a letter dated less than a month previous to his demise, called my attention to two errors in my paper entitled "Charles W. and Titian R. Peale and the Ornithological Section of the Old Philadelphia Museum" (Wilson Bulletin, XLIV, 1932, pp. 23-35). I have always endeavored to quote correctly and, as I had examined the titles in question, my inaccuracy seems inexcusable.

Inasmuch as the same unfortunate errors appeared in Dr. Stone's short biography of Titian R. Peale (*Cassinia*, XIX, 1915, pp. 1-13) it seems advisable to take up the necessary space for correction. The Cassin edition of "Mammalogy and Ornithology of the U. S. Exploring Expedition" was issued in 1858, not 1852, ten years later than the Peale edition; and Peale's middle name was Ramsay, not Ramsey.

Dr. Richmond informed me that there is a manuscript account by Peale of the history of the U. S. Exploring Expedition in the U. S. National Museum, that there are about four of Peale's journals of the Expedition in the Library of Congress, and there are supposed to be three others missing; also that the suppressed introduction to his work, in his own handwriting, is in the library of the American Museum of Natural History.

Peale wrote this introduction to his volume in which he explained that Lieut. Wilkes had ordered him to describe as new every bird and mammal undescribed at the time it was observed by the expedition, irrespective of whether it had been described in the interim. It was Wilkes' unreasonable interference that obliged him to redescribe the Dodo Pigeon, although it had already been fully described and advertised. Wilkes did not like this and suppressed the introduction, and in the absence of an explanation Peale had to take the blame for his commander's blunder.

I do not wonder that Dr. Richmond thought Peale a much maligned man, for never had a naturalist worked under greater handicap. Cassin, too, was unfriendly and preferred to express his indebtedness to Dr. Chas. Pickering (who was not a rival) as his source of information, rather than acknowledge Peale for his painstaking labor, and he tried in every way to suppress any information of the original edition of the "Mammalia and Ornithology". In a letter to Baird, Cassin warned him to watch Peale as he was trying to get a job at the Smithsonian Institution. These facts give an additional significance to the communications that passed between Ord and Peale, extracts of which have already been published by me.

Frank L. Burns, *Berwyn, Pa.*

PROCEEDINGS OF WILSON ORNITHOLOGICAL CLUB

By Lawrence E. Hicks, Secretary

The Nineteenth Annual Meeting of the Wilson Ornithological Club was held at Columbus, Ohio, on November 25-26-27, 1932. The Wheaton Club and the Columbus Audubon Society served as hosts to the visiting organization. The business and program sessions were held at the general headquarters, The Ohio State Museum on the Ohio State University Campus. Short business sessions were held Friday and Saturday morning. Thirty-five papers, slide talks, and movie presentations were given at the four program sessions Friday and Saturday, morning and afternoon. The maximum attendance at each session was 81, 137, 129, and 146.

Friday evening the Wilson Ornithological Club Annual Dinner was held at the University Faculty Club. The dinner was a success in every way. Following the serving of an attractive menu and musical entertainment, Mr. Edward Sinclair Thomas, serving as toastmaster, introduced Vice-President Morrill of Ohio State University, who gave a short address of welcome to which President Shaver responded for the Wilson Club. Next three minute "thought incubations" were presented by Dr. Josselyn Van Tyne, Dr. Raymond C. Osburn, Mr. Albert F. Ganier, and Dr. S. Prentiss Baldwin.

As the second event of the evening, the group adjourned to the Chemistry Auditorium for a joint meeting with the Columbus Audubon Society. Here a group of 175 enjoyed the double treat of listening to Alfred M. Bailey and seeing his five reels of splendid movies entitled, "The Haunts of the Golden Eagle". These pictures were taken in Colorado by Mr. Bailey, Mr. R. J. Niedrach, and Mr. Francis R. Dickinson for the Colorado Museum of Natural History and the Chicago Academy of Sciences.

Another special feature was the Photography and Painting Exhibit held at the Ohio State Museum in connection with the meetings. A total of 197 exhibits were shown. The usual annual exhibition of local organizations was enlarged by contributions from many sections of the United States and proved to be exceedingly interesting to those attending. Photograph enlargements were shown by H. S. Swarth, Wright M. Pierce, Henry Collins, Jr., Robert B. Gordon, Josselyn Van Tyne, Edward S. Thomas, Lawrence E. Hicks, William Pass, Robert H. McCormick, F. R. Flickinger, Roscoe W. Franks, and Kenneth Gordon. Paintings or Etchings were shown by Paul Forstoefel, Karl Plath, F. R. Flickinger, George Mikseh Sutton, W. E. Clyde Todd, and Kenneth Gordon.

Saturday evening about seventy-five persons who still remained were entertained by the Columbus Audubon Society and the Museum Staff at an Open House at the Ohio State Museum. The entire museum was open for inspection and Mr. Thomas and Mr. Walker made available for those interested the bird skins from the collections of Wheaton, Jaspar, Davie, Henninger, and the large Bale egg collection.

On Sunday, a large enthusiastic group of sixty-four persons traveled by auto to Buckeye Lake, thirty miles east of Columbus, for the annual field trip. The group was led by Milton B. Trautman of the Ohio Division of Conservation, who has made a ten-year study of the birds of that region. In all, more than 285 species have been recorded from the locality. The lake, which is about eight miles long, was slowly circled, frequent stops being made to cover tracts of

swampy forest or observe rafts of waterfowl on the lake. At one o'clock a most welcome dinner was served at the Bruno Inn to the famished trampers and then the search continued. A number of rare species were recorded. The total observations for the day yielded fifty-nine species and about 4500 indivdiuals.

Business Sessions

The first business session was held from 9:30 to 10:00 A. M. Friday, the meeting being called to order by President Shaver.

The minutes of the previous meeting were approved without being read, since they had previously been published in the Wilson Bulletin (Vol. XLIV, No. 1, pp. 50-64). The Secretary's report was considered as very satisfactory, considering the prevailing economic conditions. It showed a total membership of 734, a decrease of ten from the previous year. A list was presented of 113 new members secured during the year and previously confirmed by the Electoral Board. These were elected to membership.

The Editor was not able to attend but had sent a detailed and most carefully worked out report summarizing his activities during his eight-year term of office. This report included a complete table of statistics for each issue of the Bulletin, including costs for each item and the time involved in its preparation. The result tended to emphasize the size of the task involved in publishing the Bulletin and of the tremendous demands made upon the time and energy of an editor. The report was too lengthy to be read but was made available during the meeting to those interested. In the absence of the Treasurer, his report was read by the Secretary. It was referred to the Auditing Committee for consideration.

The following temporary committees were appointed by the President: Nominations, Margaret M. Nice, Dr. Lynds Jones, and Albert F. Ganier; Resolutions and Amendments, Benedict J. Blincoe, Dr. Harry W. Hann, and Lewis W. Campbell; Auditing, Dr. Josselyn Van Tyne and Edward S. Thomas.

At the Saturday morning session, all committees reported. The report of the Committee on Nominations was accepted and, on motion, the Secretary was instructed to cast one ballot for the slate. The new officers thus elected were:

President: Jesse M. Shaver, George Peabody College for Teachers, Nashville, Tennessee.

First Vice-President: Josselyn Van Tyne, Museum of Zoology, Ann Arbor, Michigan.

Second Vice-President: Alfred M. Bailey, Chicago Academy of Sciences, Chicago, Illinois.

Secretary: Lawrence E. Hicks, Department of Botany, Ohio State University, Columbus, Ohio.

Treasurer: W. M. Rosene, City Bank, Ogden, Iowa.

The Committee on Resolutions made the following report which was unanimously adopted:

Resolved, The Wilson Ornithological Club, assembled for its nineteenth annual meeting at Columbus, Ohio, this 26th day of November, 1932, wishes to record its thanks and appreciation to:

The Ohio Archeological and Historical Society and the Ohio State University for the use of their buildings and equipment, so well adapted to our meetings;

To the Wheaton Club of Columbus and to the Columbus Audubon Society for their courtesies and hospitality in entertaining the club at Columbus and at Buckeye Lake:

To our local members and constitutents in the Columbus district, who by their interests and assistance, have helped to make this meeting a success;

To our efficient officers, President Shaver, Secretary Hicks, Treasurer Rosene, and Editor Stephens, who by so generously giving of their time and interest to the club, have enabled it to continue the high standards set in the past.

Whereas, there are laws in some states providing for the payment of bounties on certain hawks and owls, be it

Resolved, that such laws be immediately repealed, since they invite promiscuous slaughter of many useful birds of prey.

Whereas, much propaganda has been dissiminated to the effect that the removal of the Bob-white quail from the game bird list in Ohio has resulted in the deterioration of this species,

And Whereas, the work of Mr. E. L. Wickliffe and Mr. Milton B. Trautman of the Ohio Division of Conservation, has proven this charge to be false, be it

Resolved, that the utmost publicity be given to the findings of this research throughout the United States and Canada.

The Auditing Committee reported that the Treasurer's accounts were well kept, accurate, and balanced. The Committee's report was accepted and the Treasurer's report approved.

At the close of the Saturday afternoon program, President Shaver declared the meeting adjourned.

Program of Papers

The program given below is just as it was carried out and as it was listed on the printed program. The Friday morning session began by an address of welcome by Mr. Henry C. Shetrone, Director, Ohio State Museum, to which President Shaver responded. Following the brief business meeting program papers were presented as abstracted below.

1. A Local Study in Highway Bird Mortality. (15 min.). Ben J. Blincoe, Dayton, Ohio.

2. A Summary of Bird Casualties Dues to Automobiles. (5 min.). Lynds Jones, Oberlin, Ohio.

   A comparison of 1932 observations with a number of previous similar studies.

3. Birds as Material for Investigating Fundamental Problems of Animal Ecology. (10 min.). Jesse M. Shaver, George Peabody College for Teachers, Nashville, Tennessee.

   A number of behaviorisms and unique characteristics of birds as a group were cited which make the bird a valuable subject for field research.

4. Making Ornithology a Planned Science. (15 min.). Henry H. Collins, Jr., Chestnut Hill, Pa. (Read by Title).

5. A New Check-list of the Birds of Missouri. (5 min.). Rudolph Bennitt, Department of Zoology, University of Missouri, Columbia, Mo.

   (Abstract read by R. L. Baird). A report of a new bird catalog for the state, the first since Widmann's list of 1907, listing 388 species and subspecies now known to occur.

6. The Size, Weight, and Present Day Numbers of the Ohio Bob-whites. (15 min.). Milton B. Trautman, Bureau of Scientific Research, Ohio Division of Conservation, Columbus, Ohio.

   Field and laboratory studies of the species were made to determine the validity of contentions as to diminishing size, weight, and abundance due to inbreeding. A number of recently collected birds were compared in various ways with older collections. Nothing was found to support any of these contentions. The concentrations of Bob-whites found varied from one bird per four acres to one bird per twelve acres of land. The commonest distribution was one bird to each eight acres of land.

7. The Response of Birds to the Decrease in Light Intensity at the Time of the Solar Eclipse, August 31, 1932, as Measured by the Macbeth Illuminometer at Nashville, Tennessee. (15 min.). (Lantern). Mrs. Emily Barry Walker, East Texas State Teacher's College, Commerce, Texas. (Read by Title).

8 A Statistical Survey of Ohio Winter Bird Life. (5 min.). Floyd B. Chapman, Columbus, Ohio. (Lawrence E. Hicks, co-author).

   Mimeographed summaries were presented of the results obtained by the compilation of the 392 Christmas Censuses taken in Ohio from 1900 to 1931, as published in *Bird-Lore*. A total of about 520 different ornithologists coöperated in taking censuses during the period from 77 localities in 49 counties, 133 species and 222,825 individuals being listed. These average 24 species and 569 individuals per census.

9. The Tremper Effigy Pipes. (15 min.). (Lantern). Emerson F. Greenman, Ohio State Museum, Columbus, Ohio.

   A fascinating picture story of about twenty-five effigy pipes displaying various bird species, found in the numerous earthworks of the Ohio Mound Builders.

10. Some Prehistoric Ohio Bird Records. (15 min.). Charles F. Walker, Ohio State Museum, Columbus, Ohio.

    An account of various bird species identified from bone remains found in caves of southeastern Ohio which were formerly frequented by prehistoric man. Several species extinct today were found and some indication is given in a few instances as to possible change in the numerical status of a species.

11. The Migratory Instinct in Song Sparrows at Columbus, Ohio. (20 min.). (Lantern). Margaret M. Nice, Columbus, Ohio.

    In a population of breeding *Melospiza melodia beata*, 50% of the males and 12% of the females in 1931 were permanent residents, the other birds migrating south for the winter. In 1932 60% of the males and 22% of the females were stationary. The character of migrating or non-migrating has been stable in thirty birds. Two males have changed status, one summer bird remained last winter, while one resident migrated, both two-year-old birds. As to inheritance, resident fathers have resident sons, a resident pair had a resident son and daughter, while summer resident pairs have had resident sons.

12. Breeding Birds of Ashtabula County, Ohio. (20 min.). (Lantern). Lawrence E. Hicks, Department of Botany, Ohio State University, Columbus, Ohio.

    Ashtabula County, located in the extreme northeastern corner of the state, has preserved more relics of the northern and northeastern flora and fauna than any other Ohio county. From 1924 to 1932, 314 days were spent in field work in the county and 3100 miles covered on foot. The famous Pymatuning Bog area, swamps, northern forest areas, lake shore and stream gorge tracts, gave a habitat variety attractive to many species. During the study, more than 1500 species of vascular plants were collected, including about twenty new

for the state. The total list of breeding birds was 154, of which 145 were verified by nesting records. A number of these species had not been regarded previously as breeding residents of the state. The list includes ten species of the hawk group, seven owls, twenty-two warblers, and nineteen members of the sparrow tribe.

13. Yellow-crowned Night Herons Nesting in Ohio. (15 min.). (Lantern). Roscoe W. Franks, Baldwin Bird Research Laboratory, Gates Mills, Ohio.

A life history study, illustrated by superb colored pictures, of the first known nesting of the species in the state. A single nest was found among a colony of Black-crowned Night Herons at Indian Lake.

14. Returns from Starlings Banded at Columbus, Ohio. (20 min.). (Lantern). Edward S. Thomas, Ohio State Museum, Columbus, Ohio.

More than 7500 Starlings were banded in the Columbus region from 1927-1930 by the combined efforts of the members of the Wheaton Club. To date more than 175 distant returns have been received which indicate that the Starling is generally a migratory species, that the usual migration direction is northeast and southwest, that Starlings wintering at Columbus breed to the northeast in Ohio, Pennsylvania, New York, and southern Canada, that the usual life span is a short three years and that the invasion of new breeding territory was by birds of the year and not by adults.

15. Prairie Bird-life of Saskatchewan. (15 min.). W. E. Clyde Todd, Carnegie Museum, Pittsburg, Pa.

An informal talk concerning the numbers, distribution, and occurrences of various species observed in the region during a trip in the spring of 1932.

16. History of an Ohio Tern Colony. (20 min.). (16 mm. Motion Pictures). Lewis W. Campbell, Toledo, Ohio.

Several years ago a colony of Common Terns became established on a sandy point on the mainland near Toledo. All other colonies were situated on rocky islands of the lake. The colony grew until it consisted of 2,000 or more nests. Then began a series of destructions by wind, wave action, rats, fishermen, and egg hunters. Few young birds were raised and the colony decreased in numbers until its continuation is now doubtful.

17. Getting Acquainted with European Birds. (25 min.). Margaret M. Nice. Columbus, Ohio.

Over a hundred new life birds were identified on a European trip in 1932. Some of the most interesting were the Hobby and the Great Bustard of Germany, the Alpine Chough of Switzerland, and the Kite and Harrier Eagle in Italy. Ornithologists in five different countries were visited, besides zoos, natural history museums, and three acquariums.

18. Climatic Factors Regulating Migration. (20 min.). (Lantern). S. Charles Kendeigh, Biological Laboratory, Western Reserve University, Cleveland, Ohio.

Temperature, formerly considered one of the most important of climatic factors regulating migration, has recently been less emphasized in this connection. Studies at the Baldwin Bird Research Laboratory show, however, that low temperatures are important when combined with periods of time when the bird is unable to get food. Some small passerine species are unable to survive northern winters because the days are too short and the nights are too long, so that they are unable to assimilate sufficient food during the daytime to maintain their resistance over-night. This is in spite of the fact that the resistance against low temperature of birds in the winter is greater than what it is in the summer. Experiments show a difference in resistance to low temperature between species that migrate and those that do not, and

between those that migrate north early in the spring and those that come later. Birds have little resistance against high temperatures. Temperature, relative length of day and night, and availability of food, appear, therefore, to be the most important factors regulating migration.

19. An Unusual Great Blue Heron Colony. (5 min.). (Lantern). Fred A. Hanawalt, Zoology Department, Otterbein College, Westerville, Ohio.

Continued cutting of a swampy forest tract caused a small group of herons to desert and establish a new colony in a very dry upland situation east of Westerville, Ohio.

20. Ohio Game Bird Research. (15 min.). (Lantern). Lawrence E. Hicks, Department of Botany, Ohio State University, Columbus, Ohio.

Upland game bird research studies in Ohio have extended to each township of the eighty-eight counties. An ecological survey has been made of each county to evaluate the possibilities of each for the several species of game birds and related species involved.

21. Method in Bird Study. (15 min.). (Lantern). S. Prentiss Baldwin, Baldwin Bird Research Laboratory, Gates Mills, Ohio.

Some of the bird study methods used at the Laboratory were outlined and some suggestions made for local bird studies. An appeal was made for ornithologists to investigate their own back yard, to select some problem linked with the characteristics of their own locality and follow out that problem in the detail which would make possible a valuable contribution to the knowledge of a region or species.

22. A Preliminary Study of the Birds of Southern Michigan. (20 min.) (Lantern). Harry W. Hann, Department of Zoology, University of Michigan, Ann Arbor, Mich.

An illustrated account of numerous original minor investigations of interest made of the breeding species of the area during the past several seasons.

23. The Hawk Slaughter at Drehersville, Pa. (15 min.). Henry H. Collins, Jr., Chestnut Hill, Pa. (Read by Title).

24. Popularizing Hawk and Owl Conservation. (5 min.). Lewis B. Kalter, Dayton, Ohio.

25. Food Habits of Some Ohio Raptorial Birds. (10 min.). Arthur Stupka, Laurelville, Ohio.

A so-called "vermin campaign" was sponsored by the Ohio Division of Conservation from October, 1931, to May, 1932. Realizing that this would result in the killing of a large number of raptorial birds, the Bureau of Scientific Research, in an effort to gain information which might lead to the passing of intelligent laws concerning hawks and owls, urged the state game protectors to send all such birds to the Ohio State Museum where the stomachs were examined by Mr. Stupka. Altogether, a total of 739 raptorial birds, comprising eight species of hawks and seven species of owls were received in the course of the campaign. Approximately two-thirds of these were taken in traps while the rest had been shot. Investigation of the stomach contents showed that no species could be considered harmful to game birds or poultry while only the rare Sharp-shinned Hawk and the more common Cooper's Hawk proved harmful to smaller non-game birds.

26. The Protection of Hawks and Owls in Ohio. (25 min.). S. Prentiss Baldwin, S. Charles Kendeigh, and Roscoe W. Franks. Baldwin Bird Research Laboratory, Gates Mills, Ohio.

A general discussion of the whole situation concerning the economic status and the protection of hawks and owls. Data were presented from a recent paper by the same title, which reviewed the literature, Ohio data, and recent studies at the Laboratory of all important angles to the problem. The summary substantiated the findings obtained by Mr. Stupka. Proposed legislation was discussed which would abolish bounty laws, prohibit use of the pole trap, and protect all species of hawks and owls except when doing actual damage.

27. Buckeye Lake, the Scene of the Wilson Club Field Trip. (5 min.). Milton B. Trautman, Bureau of Scientific Research, Ohio Division of Conservation, Columbus, Ohio.

Two natural lakes and an extensive swampy and boggy area were united in the development of the Ohio Canal System about a century ago into Buckeye Lake, a body of water about eight miles long and one or two miles wide. In this region comprising thirty square miles, a total of more than 285 species of birds have been recorded, most of which are represented by specimens. A ten-year study has revealed many rare species and disclosed that many migrants, wintering species, or breeding species occur in unusual numbers.

28. The Distribution of Birds in Northern Guatamala. (15 min.). (Lantern). Josselyn Van Tyne, Museum of Zoology, Ann Arbor, Mich.

During extensive field work in the area a large number of specimens have been collected and have recently been identified and studied in relation to certain interesting climatic and biological characteristics of the region. The avifauna of the region may be divided into four principal elements: (1) certain endemic genera and species, clearly relics of a very ancient fauna, (2) a small tropical rain-forest element derived from the Caribbean slope of Central America, (3) an arid tropical zone element which ranges up the Pacific coast of Central America and reaches northern Guatemala by way of the Isthmus of Tehuantepec, and (4) a boreal element derived from North America.

29. The Great Crane-Town at Reelfoot Lake, Tennessee. (25 min.). (Lantern). Albert F. Ganier, Nashville, Tennessee.

An excellent series of colored slides portrayed bird's-eye and general views of the bird habitats found at this earthquake-created lake. This colony is probably the largest herony in the interior of the United States. About 1,000 nests were built in 1932, including 450 of the American Egret, 300 of the Great Blue Heron, 200 of the Double-crested Cormorant, and 50 of the Anhinga.

30. An Ohio Record of the Swallow-tailed Kite. (15 min.), Edward S. Thomas, Curator of Natural History, Ohio State Museum, Columbus, Ohio.

The second Ohio specimen of the Swallow-tailed Kite was recently presented by John Seip to the Museum. Mr. Seip collected the bird at Chillicothe, August 29, 1898, and had it mounted by Mr. Charles Drury of Cincinnati. A bit of interesting history is connected with the find; the collection was reported by Rev. W. F. Henninger in the Wilson Bulletin of September, 1902, but until recently the existence of the specimen was unknown.

31. The Mallophaga Infesting Cowbirds. (10 min.). Robert M. Geist, Department of Zoology, Capital University, Bexley, Ohio.

The study of Mallophaga or body parasites of birds is of great interest in regard to the host and the development of new species in the process of evolution. This is especially true in regard to the parasites of a species like the Cowbird, the young of which are raised in the nests of other species. Of 155 Cowbirds examined for parasites, the several species found fall into three groups: those characteristic of the blackbirds, those characteristic of passerine birds in general, and a third group of species which can be re-

Fig. 1. Group at the Annual Meeting, Columbus, 1932.

garded as stragglers. The degree of infestation is usually small and the number examined is not deemed sufficient to permit the drawing of definite conclusions.

32. The Domestic Fowl as a Subject for the Investigation of Ornithological Problems. (20 min.). E. L. Dakan, Poultry Department, Ohio State University, Columbus, Ohio.

A large number of physiological experiments of various types have been conducted with the domestic fowl where it was often possible to study much greater numbers than would be possible when working with wild species. Many of the results obtained apply at least in part to wild birds and merely need confirmation in other bird groups. A splendid list was presented of references concerning work of this type which would be of general interest to all ornithologists. Many of these would be of interest to bird banders who are able to make external examinations of large numbers of birds. Examples illustrated by graphs and charts dealt with the relation between the food supply, temperature, light, and activity with the development of the sexual organs, egg production, expression of the migration and other instincts, development of plumage, and the condition of the feet, legs, eyes, bill, wattles, comb, and skin.

33. Glimpse of Living Bird Embryos. (40 min.). (35 mm. motion pictures). Bradley M. Patten, Western Reserve Medical College, and Theodare M. Kramer, Baldwin Bird Research Laboratory, Gates Mills, Ohio.

A most remarkable series of photographs, taken in the early phases of development by transmitted light, later by reflected light. What happens inside of an egg is told from the first division of the fertilized egg until the developing embryo becomes a day old chick. The development of the heart beat and the racing of the red blood corpuscles in the capillaries, presents a fascinating picture and adds to our belief that the living bird is indeed a most remarkable creation.

34. Ohio Wild Life Movies. (45 min.). (35 mm. motion pictures). Roscoe W. Franks, Baldwin Bird Research Laboratory, Gates Mills, Ohio.

A series of excellent shorts of birds and animals at home, remarkable for their unusual clearness and close-up portrayal of many species widely regarded as difficult to photograph.

35. Life History of the Red-bellied Hawk. (40 min.). (16 mm. motion pictures). Wright M. Pierce, Claremont, California.

A fine photograph series of happenings during the complete nesting period of a western species closely akin to our eastern Buteos.

KEY TO GROUP PHOTOGRAPH OF THE WILSON ORNITHOLOGICAL CLUB

1. Lawrence D. Hiett. 2. Benjamin J. Blincoe. 3. Frederick R. Flickinger. 4. Roger Conant. 5. Charles B. Mayer. 6.——. 7. Miss Mary Baker. 8. Mrs. Ray Lovell. 9. Mrs. Lawrence E. Hicks. 10. Arthur Stupka. 11. Mrs. Arthur Stupka. 12. Lewis W. Campbell. 13. Milton B. Trautman. 14. W. E. Clyde Todd. 15. Robert B. Geist. 16. Raymond C. Osburn. 17. Robert B. Gordon. 18. Mrs. E. H. Hicks. 19. Miss Marcella Crain. 20. Mrs. W. H. Williams. 21. C. W. Rahe. 22. Mrs. C. W. Rahe. 23. Donald W. Douglas. 24. William Ireland, Jr. 25. Lony B. Strabla. 26. Paul Stewart. 27. Gilford J. Ikenberry. 28. Bernard R. Campbell. 29. Paul Forsthoefel. 30. E. H. Hicks. 31. Miss Marjorie M. Nice. 32. Ralph C. Hall. 33. W. H. Cummings. 34. Louis B. Kalter. 35. John H. Ritter. 36. William C. Baker. 37. Floyd B. Chapman. 38. Robert J. Marsh. 39. J. C. Hambleton. 40. George S. Wolfram. 41. Maurice E. Foote. 42. Dale Kellog. 43. E. L. Moseley. 44. Robert L. Baird. 45. Albert Million. 46. Mrs. Albert Million. 47. Mrs. Benjamin J. Blincoe. 48. Roscoe W. Franks. 49. S. Charles Kendeigh. 50. Miss Erna Gonzalez. 51. Harry W. Hann. 52. Charles F. Walker. 53. Leonard B. Nice. 54. Mrs. Marjorie L. Guest. 55. Mrs. Margaret M. Nice. 56. Alfred M. Bailey. 57. Edward S. Thomas. 58. S. Prentiss Baldwin. 59. Mrs. E. T. Kershaw. 60. Lynds Jones. 61. Jesse M. Shaver. 62. Lawrence E. Hicks. 63. William P. Holt. 64. Josselyn Van Tyne. Photographs of this group may be secured at 75 cents each from the Photography Department, Ohio State University, Columbus, Ohio.

REPORT OF THE SECRETARY FOR 1932*

Columbus, Ohio, December 31, 1932.

To the Officers and Members of the Wilson Ornithological Club:

During the past year, an intensive campaign for new members has been conducted by the Secretary, to aid in offsetting the unusual membership and financial losses due to present economic conditions. This work was handicapped by the increased postal rates, which made wholesale solicitation impossible and by the financial situation, which prevented dozens of interested prospects from affiliating with our organization. The membership as a whole rendered wonderful assistance by sending in nominations.

The campaign was fairly successful, considering the difficulties involved. A total of 113 new members were added to our rolls as follows: Sustaining, 2; Active, 11; Associate, 100. These new members were distributed through 33 states and provinces: Ohio, 32; Michigan, 9; New York and Missouri, 8 each; Massachusetts, 5; Pennsylvania and Illinois, 4 each; Wisconsin, Indiana, Iowa, California, Louisiana, Delaware, and New Jersey, 3 each; Minnesota, Alabama, and the District of Columbia, 2 each: Tennessee, West Virginia, Maine, Texas, Ontario, Nova Scotia, Kansas, Nebraska, Arizona, Hawaii, Montana, New Hampshire, Saskatchewan, New Mexico, Maryland, and Connecticut, 1 each. The Editor's records will show that there has also been an increase in the number of subscribers. Disregarding numerous duplications in nominations, the various members responsible for the applications of the new members were as follows: Lawrence E. Hicks, 96; Jesse M. Shaver, 11; T. C. Stephens, 6; E. L. Moseley, 5; T. Nelson, W. E. Ekblaw, L. B. Kalter, 2 each, and 20 others, one each.

In spite of these increases, the Wilson Ornithologieal Club has slightly fewer members than last year, due to the unusually large number of resignations and delinquencies for 1932 forced by present conditions. Also a number have been removed from the rolls who have been delinquent for two or more years. Several were lost by death. The total number of members lost during the year 1932 was 139, 50 being actives and 89 associates. Life members have increased 3 and Sustaining members 18. Thus there has been a total loss of 10 members during 1932. What certainly would have been a great financial loss in the total amount of dues colleeted, was mostly offset by the large number who raised their membership status due to appeals in the Wilson Bulletin and to the splendidly exeeuted campaign for that purpose waged by President Shaver.

This leaves the present membership of the club at 734, distributed as follows: Honorary, 7; Life, 10 (two are also Honorary); Sustaining, 75; Active, 175; Associate, 469.

Respectfully submitted,

Lawrence E. Hicks, *Secretary*.

*Revised to the end of December, 1932.

REPORT OF THE LIBRARIAN FOR 1932

Ann Arbor, Michigan, January 10, 1933.

I have the honor to present herewith the second report of the Librarian of the Wilson Ornithological Club at the end of the second year of the Library's existence.

EXCHANGES. During the past year the Library has received regularly on exchange *Iowa Bird Life* and the University of Iowa *Studies in Natural History*. Recently the Editor of the BULLETIN completed negotiations for the exchange of our BULLETIN for a complete set of the *Iowa Academy of Science Proceedings* which has been received. Other exchanges are on the way to the Library from the Editor at the present writing. The Librarian cannot overemphasize the value of this material. The exchange of the BULLETIN for not only domestic but also foreign journals will be of inestimable scientific value to the Club and its Library in the field of research. In this field the exchanges may quite naturally become the very backbone of the research library.

REPRINTING. On the matter of reprinting out-of-print numbers of the BULLETIN some progress has been made. Through the efforts of Dr. Lynds Jones BULLETIN No. 9 (July, 1896) was reprinted by the firm of Edwards Bros. of Ann Arbor. One hundred and fifty copies were made by the new lithoprint process. BULLETIN No. 10 should also be done at the earliest possible moment.

PRICE. The price for back numbers of the BULLETIN has been definitely fixed at fifty cents per number for all BULLETINS published from 1900 to date, and one dollar per number for all BULLETINS printed before 1900. A twenty per cent discount is allowed to members of the W. O. C. and no discount is allowed to dealers.

STOCK. During 1932 the stock of BULLETINS in the custody of the Librarian ended with the 1924 BULLETINS but at the present writing the BULLETINS from 1925-1932 are on their way to the Library from the Editor.

BOOK PLATE. As yet no book plate has been adopted by the Club although several have been submitted.

DONORS. The Librarian takes pleasure in acknowledging gifts to the Club Library from the following during 1932:

Mrs. Marcia B. Bready, Chestnut Hill, Massachusetts.
Mr. Francis Harper, Swarthmore, Pennsylvania.
Mr. Lawrence E. Hicks, Columbus, Ohio.
Mr. Leon Kelso, Washington, D. C.
Mr. O. A. Stevens, Fargo, North Dakota.
Dr. Aldred S. Warthin, Ann Arbor, Michigan.
Mr. Warren J. Willis, New York City.

The gifts to the Library for 1932 total 66 bound volumes and 97 separates, reprints, and unbound numbers of periodicals. This makes a total for the two-year period of the existence of the Library of 120 bound volumes and 847 separates.

Respectfully submitted,
F. P. ALLEN, *Librarian.*

REPORT OF THE TREASURER FOR 1932

From December 21, 1931 to November 21, 1932

Receipts for 1932

December 21, 1931, Balance on hand as per last report		$ 731.01
The following was collected from members and subscribers:		
1 Associate member for 1931	$ 1.50	
1 Sustaining member for 1931	5.00	
314 Associate members for 1932	471.00	
149 Active members for 1932	372.50	
35 Sustaining members for 1932	175.00	
42 Associate members for 1933	63.00	
19 Active members for 1933	47.50	
8 Sustaining members for 1933	40.00	
2 Associate members for 1934	3.00	
1 Active member for 1934	2.50	
12 Memberships increased after paying dues	41.00	
From membership dues		1,222.00
1 Subscriber for 1931	1.50	
72 Subscribers for 1932	108 00	
5 Subscribers for 1933	7 50	
1 Active Subscriber for 1932	2.50	
17 Foreign Subscribers	33.90	
From subscriptions		153.40
Received from fractional subscriptions	8.48	
Received for extra Bulletins and back numbers	3.00	
Received four gifts of $5.00 each	20.00	
Received one anonymous gift	50.00	
Received miscellaneous extra on checks, etc.	3.35	
Miscellaneous receipts		84.83
Total receipts		$2,191 24

Disbursements for 1932
(Condensed Form)

Printing four issues of Bulletin	$1,033.50	
Cost of halftones, zincs, etc.	108.27	
Other expenses in Editor's office	90.99	
Publication costs		$1,232.76
Expenses, President's office	51 48	
Expenses, Secretary's office	142.64	
Expenses, Treasurer's office	40.50	
Operating costs		234.62
General printing bills	80.94	
Expenses, Annual Meeting, New Orleans	82.60	
Foreign Exchange and Discount	3.09	
Refunds on subscriptions	9.33	
U. S. Tax on 19 checks at 2 cents each	.38	
Miscellaneous costs		176.34
Total disbursements		$1,643 72
Balance on hand, November 21, 1932		547 52
Total		$2,191.24

(An itemized list of expenditures with vouchers is attached to the Treasurer's Report).

Endowment Fund

December 21, 1931, Balance on hand in Endowment Fund (Refer to last Annual Report)	$ 924.23
Received interest on Endowment Fund, June 1, 1932 (The next semi-annual payment will be due December 1 This being a short year the second payment is not included in this report)	18.48
Received life membership from E. A. McIlhenney	100 00
Received life membership from Mrs. Carll Tucker	100.00
Balance on hand, November 19, 1932	$1.142.71

Nothing was paid from this fund during the year.

Respectfully,

W. M. Rosene, *Treasurer.*

Register of Attendance at the Columbus Meeting

From Illinois: Alfred M. Bailey, Chicago. From Indiana: P. A. Patterson, Linnsburg. From Kansas: Gilford J. Ikenberry, Quinter. From Michigan: Donald W. Douglas, Harry W. Hann, Thomas H. Hinshaw, Josselyn Van Tyne, Leonard W. Wing, Ann Arbor. From Columbus, Ohio: Frances Araut, Mary Araut, Mary Auten, Mary W. Baker, William L. Baker, Mr. and Mrs. Leslie W. Bartow, Donald J. Borror, Stanley W. Bromley, William Brownfield, Amelia Butler, Floyd B. Chapman, Anna Cherry, Helen Chrysler, Mrs. Alice Clark, Grace Collett, Mrs. Cope, Mrs. John C. Crabb, Marcella Crain, Louis F. Cramer, Ruth Donnally, Mrs. Herbert Eagleson, Mr. and Mrs. Joseph Eagleson, Harry Fabert, Emerson Greenman, Ina Ganson, Robert B. Gordon, Mr. and Mrs. Ralph C. Hall, Arthur Haines, Mr. and Mrs. William P. Halencamp, J. C. Hambleton, Mrs J. D. Harlor, Mr. and Mrs. Lawrence E. Hieks, Lena Howard, W. F. Hughes, William Ireland, Jr., Anna Johnson, Mrs. S. C. Kershaw, Doris M. Klie, Josephine Klippert, Mrs. C. G. Landis, Marina H. Langlois, T. H. Langlois, Mrs. Gehard Laurens, Mrs. Theodore Leonard, Laura E. Lovell, Robert J. Marsh, Charles B. Mayer, Robert H. McCormiek, Irene S. McKinley, Eugene W. Mendenhall, James Lewis Morrill, Mary E. Morris, Constanee E. Nice, Leonard B. Niee, Margaret M. Nice, Marjorie D. Niee, Herbert Osborn, Raymond C. Osburn, John W. Price, Isabella Reed, Ned Rowland, Mrs. Norma Selbert, Silas Sharp, Mr. and Mrs. Shofield, Mrs. A. Singleton, Amy Starrett, Laurenee H. Snyder, Florence Pegg Taylor, Edward S. Thomas, John Thomas, Marion Thomas, Raehel M .Thomas, Henry A. Trautman, Milton B. Trautman, Walter A. Tueker, C. E. Venard, Mrs. Percy Waddell, Charles F. Walker, Alfred N. Watson, Mrs. H. C. Werner, Marguerite Werner, Edna M. Wheitzel, Mrs. W. H. Williams, Mrs. Mary B. Wolfram, Henry W. Worley, Ogla Zureher. From Ohio Outside of Columbus: Marjorie Lee Guest, Athens: Robert M. Geist, L. M. Shupe, Bexley: William P. Holt, E. L. Moseley, Bowling Green: George S. Wolfram, Canal Winchester: H. H. Forsthoefel, Paul Forsthoefel, Celina: J. W. Johnson, Circleville: S. Prentiss Baldwin, Roscoe W. Franks, S. Charles Kendeigh, Carl W. Rahe, Cleveland: Mary E. Campbell, Crooksville: Russel Breece, Delaware: Mr. and Mrs. Benjamin J. Blincoe, Florence E. Clippinger, Louis B. Kalter, Mr. and Mrs. A. Million, John H. Ritter, Dayton: Mr. and Mrs. E. H. Hicks, Frederiektown: Dorothy Slagle, Galloway: E. L. Wiekliffe, Grove City: Marcella Crain, Hillards: Mr and Mrs Arthur Stupka, Laurelville: Paul A. Stewart, Lony B. Strabala, Leetonia: Maurice E. Foote, Dale Kellog, Norwalk: Robert L. Baird, Lynds Jones, Oberlin: Malfe T. Pake, Portsmouth: William C. Baker, Myron Sturgeon, Salem: Bernard R Campbell, Louis W. Campbell, Roger Conant, Frederick R. Fliekinger, Lawrence D. Hiett, Toledo: Fred A. Hanawalt, Westerville: Mr. and Mrs. Forest G. Hall, Wilmington: Elsie Dakan, Mr. and Mrs. E. L. Dakan, John H. Kegg, Worthington. From Pennsylvania: W. H. Cummings, Philadelphia: W. E. Clyde Todd, Pittsburg. From Tennessee: Albert F. Ganier, Albert F. Ganier, Jr., Jesse M. Shaver, Nashville. Foreign: Erna Gouzalez, Santiago, Chile.

Summary of Attendance: Illinois, 1: Indiana, 1: Kansas, 1: Michigan, 5: Ohio (outside of Columbus), 51: Columbus, 92: Pennsylvania, 2: Tennessee, 3: Foreign, 1. Total attendanee, 157. Total outside of Columbus, 65. Number at dinner, 69. Number at Bailey lecture, 174 Number at Museum Open House, 78. Number on Field Trip, 64.

TO OUR CONTRIBUTORS

Our members are urged to submit articles for publication in the BULLETIN. Short items are desired for the department of General Notes, as well as longer contributions, especially pertaining to life-history, migration, ecology, behavior, song, economic ornithology, field equipment, and methods, etc. Local faunal lists are also desired, but they should be annotated, at least briefly, and should be based upon sufficient study to be reasonably complete. Authors are asked to include the common name, the scientific name (from the A. O. U. Check-List), and annotations, and they should be arranged in this order. The annotations should include explicit data concerning unusual species. Omit serial numbering.

THE MANUSCRIPT. The manuscript, or copy, should be prepared with due regard for literary style, correct spelling and punctuation. Use sheets of paper of good quality and of letter size (8½x11 inches); write on one side only, and leave wide margins, using double spacing and a reasonably fresh, black ribbon.

The title should be carefully constructed so as to indicate most clearly the nature of the subject matter of the contribution. Where the paper deals with a single species it is desirable to include in the title both the common and the scientific names, or, to include the scientific name in the introductory paragraph. Contributors are requested to mark at the top of the first page of the manuscript the number of words contained. This will save the editor's time and will be appreciated.

Manuscripts intended for publication in any particular issue should be in the hands of the editor sixty to ninety days prior to the date of publication.

ILLUSTRATIONS. To reproduce well prints should have good contrast with detail. In sending prints the author should attach to each one an adequate description or legend.

BIBLIOGRAPHY. The scientific value of some contributions is enhanced by an accompanying list of works cited. Such citations should be complete, giving author's name, full title of the paper, both the year and volume of the periodical, and pages, first and last.

PROOF. Galley proof will be regularly submitted to authors. Page proofs will be submitted only on request. Proof of notes and short articles will not be submitted unless requested. All proofs must be returned within four days. Expensive changes in copy after the type has been set must be charged to the author.

SEPARATES. The Club is unable, under present financial conditions, to furnish reprints to authors gratis. Arrangements will be made, however, for such reprints to be obtained at practically cost. The cost will vary somewhat with the nature of the composition, but will depend mainly upon the number of pages. A scale of rates is appended which will serve as a guide to the approximate printer's costs.

If a blank page is left in the folding this may be used for a title page, which will be set and printed at the rate indicated. If a complete cover with printed title page is desired it may be obtained at the rate shown in the last column. All orders for separates must accompany the returned galley proof upon blanks provided. Orders cannot be taken after the forms have been taken down.

Copies	2	4	8	12	16	20	24	28	32	36	40	Cover
50	$1.25	$2.00	$3.50	$4.75	$6.00	$7.75	$8.50	$9.75	$11.00	$12.25	$13.50	$2.50
100	1.50	2.25	3.75	5.00	6.25	7.50	8.75	10.00	11.25	12.50	13.75	2.75
200	2.00	2.75	4.25	5.50	6.75	8.00	9.25	10.50	11.75	13.00	14.25	3.00
300	2.75	3.50	5.00	6.25	7.50	8.75	10.00	11.25	12.50	13.75	15.00	4.00
400	3.25	4.00	5.50	6.75	8.00	9.25	10.50	11.75	13.00	14.25	15.50	5.00
500	3.75	4.50	6.00	7.25	8.50	9.75	11.00	12.25	13.50	14.75	16.00	6.00

Repaging—25c per page extra. Title Page—$1.25.

Annual Meetings of the Wilson Ornithological Club

	Retiring President
1914—Chicago. February 5. Chicago Academy of Sciences.	
1914—Chicago. December 29-30. New Morrison Hotel	T. C. Stephens
1915—Columbus. December 28-29. With the A. A. A. S.	T. C. Stephens
1916—Chicago. December 27-28. New Morrison Hotel	T. C. Stephens
1917—Pittsburgh. January 1-2, 1918. With the A. A. A. S.	W. F. Henninger
1918—No meeting on account of the exigencies of war	M. H. Swenk
1919—St. Louis. December 29-30. With the A. A. A. S.	M. H. Swenk
1920—Chicago. December 27-28. With the A. A. A. S.	R. M. Strong
1921—Chicago. December 26-27. The Field Museum	R. M. Strong
1922—Chicago. October 26	T. L. Hankinson
1923—Cincinnati. Dec. 31, 1923-Jan. 1, 1924. With the A. A. A. S.	T. L. Hankinson
1924—Nashville. November 28-29-30. Peabody College	A. F. Ganier
1925—Kansas City. December 28-29. With the A. A. A. S.	A. F. Ganier
1926—Chicago. November 26-27. Chicago Academy of Sciences	A. F. Ganier
1927—Nashville. Dec. 30, 1927-Jan. 1, 1928. With the A. A. A. S.	Lynds Jones
1928—Ann Arbor. Nov. 31-Dec. 1, 1928. Museum of Zoology	Lynds Jones
1929—Des Moines. December 27-28. With the A. A. A. S.	Lynds Jones
1930—Cleveland. December 29-30. With the A. A. A. S.	J. W. Stack
1931—New Orleans. December 28-29. With the A. A. A. S.	J. W. Stack
1932—Columbus. November 25-26. The Ohio State Museum	Jesse M. Shaver

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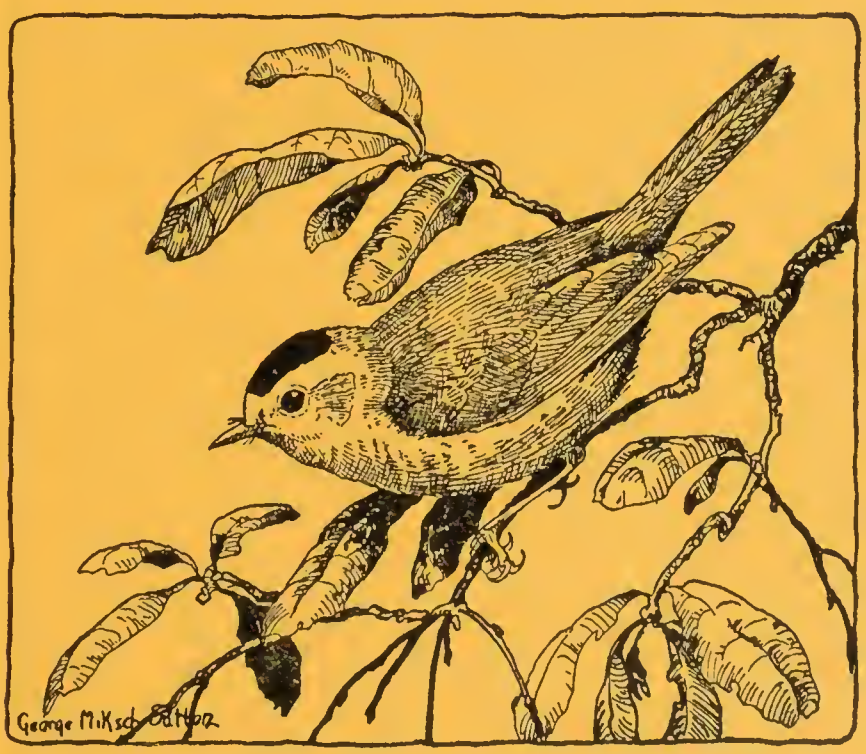
THE WILSON BULLETIN



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THE WILSON BULLETIN

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All articles and communications for publication, books and publications for notice, and exchanges, should be addressed to the Editor.

Claims for lost and undelivered copies of the magazine may be addressed to the Editor.

THE WILSON ORNITHOLOGICAL CLUB

Founded December 3, 1888. Named after Alexander Wilson, the first American ornithologist, and called the "Father of American Ornithology."

The officers for the current year are:

President—Prof. J. M. Shaver, George Peabody College for Teachers, Nashville, Tenn.

First Vice-President—Dr. Josselyn Van Tyne, Museum of Zoology, Ann Arbor, Mich.

Second Vice-President—Mr. Alfred M. Bailey, Chicago Academy of Sciences, Chicago, Ill.

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Editor—T. C. Stephens, Morningside College, Sioux City, Iowa.

The membership dues are—Sustaining membership, $5.00; active membership, $2.50; associate membership, $1.50 per year.

THE WILSON BULLETIN

A QUARTERLY MAGAZINE OF ORNITHOLOGY

Published by the Wilson Ornithological Club

Vol. XLV JUNE, 1933 No. 2

Vol. XL (New Series) Whole Number 163

RELATIONS BETWEEN THE SEXES IN SONG SPARROWS

BY MARGARET MORSE NICE

During the past four years I have concentrated on the study of the Song Sparrows (*Melospiza melodia beata*) that live in large numbers near our home, in 1929 spending all my time on two pairs, but after that taking an interest in more and more birds. I am keeping track of the major events in the population on the forty acres of Central and North Interpont (see Nice, 1931a and 1931b), but at least fourteen banded birds and probably quite a number more have scattered out to all points of the compass, two having settled a whole mile from our house. Up to the present I have banded (with colored as well as aluminum bands) 154 breeding males and 125 breeding females, not to mention about 250 nestlings and about 150 transients and winter residents.

The Relations Between the Pair

About half the breeding males and one-tenth to one-fourth of the females are permanent residents; the rest of the birds leave in October and return from late February to the first week in April. The male is strongly territorial from February to July, but although (if a resident) he stays on or near his territory during the rest of the year, he does not defend it except in the case of a young male settling on it with a view to permanent residence during the molt of the rightful owner. He does not drive his mate from it at the end of the breeding season, as Burkitt (1925) found with the Redbreast (*Erithacus rubecula*); both birds remain but gradually become indifferent to each other.

The male is the guardian of the territory and of his mate and young; he is zealous in feeding the latter, often taking sole charge of the little birds soon after they have left the nest, while his mate busies herself with preparations for the next brood. The female builds the nest, takes entire charge of incubation, broods the young and also feeds them. She is attached to the home territory and helps defend it.

but she never holds territory by herself alone, as do female Redbreasts (Burkitt) and some Shrikes (*Lanius ludovicianus*) according to Miller (1931). The tie with the young is broken when they are about a month old. The tie between the pair is broken at the end of the nesting season, for even when a resident male and female are mated two years in succession and both have stayed in the vicinity of the territory throughout the fall and winter, they do not associate together at these seasons, taking no interest in each other except during the breeding season. This is in contrast to the behavior of some birds —Carolina Chickadees (*Penthestes carolinensis*) and Carolina Wrens (*Thryothorus ludovicianus*) (see Gillespie, 1930) for instance—where a banded pair often remain together throughout the year.

Song Sparrows cannot tell the sex of one of their own kind except by its behavior and notes, unless the birds are personally acquainted with each other. This has been evident in experiences with a new method I have developed for capturing my birds; I find that it is often possible to catch a male by using a male neighbor as decoy in the trap, or a female by means of a female neighbor. But a male or female placed in a territory that is not contiguous to its own, elicits very little interest from the male owner of the territory and even less from the female.

The female in the early breeding season announces her identity by her notes—either a high-pitched, nasal *eeeeeee* or a kind of chatter; she also indulges in various growling, grumbling expressions. The male does not strut, nor puff, nor sing a special love song for the benefit of his new mate; indeed, the suppression of his almost constant singing indicates the arrival of a female. His one method of courting is to fly down suddenly, hit his mate and fly away with a triumphal song! This "pouncing" is evidently analogous to the "sexual flight" described by Howard (1929) in the Yellow Bunting (*Emberiza citrinella*) and Reed Bunting (*Emberiza schoeniclus*); but the Song Sparrow female does not try to escape; she stands her ground and says either *eeeeee* or gives a gruff note of dismissal, *jee*. Mated males "pounce" on neighboring females when the mates of the latter are at the other ends of their territories; the females always repulse them and their husbands usually come dashing to the rescue, whereupon battles ensue. Pouncing takes place from the first arrival of the female to the beginning of egg laying; a new cycle is initiated by the reappearance of pouncing. Copulation comes later—usually shortly before the beginning of nest building—and lasts until incubation begins; the male never gives any note after the act, but the female often says *eeeee*.

The male is very solieitous over his mate when she has first joined him, giving the fear note *tit-tit-tit* at the approaeh of a person; he watehes after her, usually mounting bushes and trees, while he is careful to keep between her and another male. She follows him at times, again he follows her. During the first few days they usually do not keep close together, but after that they may almost always be found in company.

Sehjelderup-Ebbe (1924) makes mueh of "despotism" between birds, stating that the normal situation is that of a benevolent despotism of the male. Between Song Sparrow mates eaeh bird is the despot in certain relations, the male notably so in his pouneing and in driving his mate home if she happens to be frightened from the territory by a person, but the female rules in the little affairs of every day life. He never drives nor peeks her, but she often opens her bill at him, gives him small pecks or drives him to a moderate extent. She says *jee* to him, but he never says it to her.

The Situation During One Season

My Song Sparrows usually remain with the same mates throughout one nesting season. There are two reasons why these birds are generally faithful in contrast to the House Wren (*Troglodytes aedon*) (Baldwin, 1921) that usually change mates, and the Bluebird (*Sialia sialis*) and Brown Thrasher (*Toxostoma rufum*) that often do so (Niee, 1930a). First, they are so markedly sessile on their territories that they seldom stray from them; seeond, their nesting eyeles usually overlap, so that there is no opportunity for the parents to beeome separated.

There is a high mortality of both males and females during the nesting season (Niee, 1931a, 1932); the loss of females is always greater than that of the males, but the replacement in this sex is also greater. The disappearanee of the females has averaged thirty per eent during three seasons, while replaeements have amounted to slightly over one-third as many—i. e., of 115 females[1] 41 disappeared during the breeding season, while 15 new birds eame after the nesting season was well under way. Of 96 males 22 disappeared and 6 new ones came in during this same period.

Only onee has a new male appeared and joined a widow that was trying to raise a young family alone (Nice, 1932). Replacement in

[1]These statistics are based on the Song Sparrows on Central Interpont in 1930 throughout the nesting season, and in 1931 until June 6; in 1932 the birds on North Interpont were also included and the record kept until June 14. A few of these birds were not banded.

the case of females is seldom prompt; almost always a male has to sing for several weeks—one as long as six weeks—before being joined by a new mate, while a number remain widowers till the end of the season.

Is there a reserve supply of unmated birds? There is a slight preponderance of males in the population, but the unmated birds, almost without exception, are settled on territories. Sometimes a male tries in rather a half-hearted way to establish a territory and later disappears. One such bird returned the following year and procured his home and mate with little trouble. When there is a surplus of birds as was the case in 1932, a few of the young resident males appeared to be crowded out by the adult summer residents. Whether such a bird finds a territory elsewhere, or wanders about during this year I do not know. I believe he would settle down, if it were at all possible. The few males that have come into Interpont during the nesting season, might well have been dispossessed of their territories by human activities.

I do not believe there is any floating population of unmated birds among the Song Sparrows. Both males and females that come into Interpont during the nesting season seem to me probably birds that have been for one reason or another driven out from their original homes.

Desertions. In only one case has a male deserted a female and here two abnormal features were involved. The pair—27M[2] and K29[2]—were driven from their territory south of Central Interpont by the ploughing of their land on April 12, 1930: after some difficulties they settled some 300 yards to the north. On May 20 I tried to capture the birds by placing a trap over their nest containing two six-day-old Cowbirds (*Molothrus ater ater*); K29 entered readily, but 27M was so upset that he deserted. I believe he settled about 200 yards to the west, where I caught a new male I called 29M. In the meantime K29 continued to care for her step-children and on June 4 her neighbor 26M was seen assisting her in her onerous task and afterwards they raised a brood together.

Howard (1929) never found a female that deserted her mate after once joining him. With my Song Sparrows faithfulness is the rule, yet I have observed a number of cases of desertion with banded birds,

[2]The birds are given field numbers in the order in which I become acquainted with them; the males 1M, 2M, etc., the females K1, K2, etc., each number belonging exclusively to one bird and not referring in any way to its mate. I thought at first (Nice, 1930b) that it would be sufficient to name a female according to her mates, but this has proved impracticable.

especially in the "bethrothal period", or Howard's "second phase"—the period (which may last almost two months) between the arrival of the female and the start of copulation. Two desertions have taken place just at the beginning of nesting activities—Howard's "third phase"—and two in between broods.

In two cases desertions occurred when the pairs were driven from their homes. This spring Interpont has been taken over for gardens for the unemployed, and the consequent "cleaning up" of the weeds and elders that started March 1, drove two pairs and two unmated males from North Interpont. Two of the males have moved so far away that I have not been able to find them; one settled just across the river; and another came down into Central Interpont some 300 yards south of his former territory. The mate of one of the first two birds joined a male in Central Interpont about 150 yards from her former home, while the mate of the fourth male disappeared entirely.

Four birds (with no reason that I could see) have changed their minds as to which mate they wished to stay with. One resident, K42, joined 9M on February 22, but on March 2 was with 66M; from March 5 to 17 she stayed with 11M, but rejoined 9M by March 22 and remained and nested; all these males were fairly near together. K58 has moved from one mate to another two years in succession. In 1932 she returned to her former territory March 3; her last year's mate was dead, but she stayed with his young successor until March 19, when she took up her abode with 9M about 100 yards southeast. This spring she joined 4M who has settled on 9M's land (the latter having died) on March 13, but three days later had moved 100 yards west and became 143M's mate. Two other females deserted mates for no known reason, one having been with her first choice from February 15 till March 25, but the other making the change after only about a week's stay with the first bird. In this last instance an interval of bleak weather had disorganized the pairs, but usually in such cases the birds return to their proper mates.

By February 15 K83 had joined a juvenile resident male, but when on February 26 he was driven out by the summer resident owner of the territory, his mate stayed with the victor. This is my only instance where a mated male has been driven out by a later comer: typically territory affairs are pretty well settled before mating begins.

In all these cases the deserted males were normal individuals that later raised families with other mates. But in two cases there was an abnormality in the male. 95M sustained a broken leg that never

healed properly, so that it hung useless; he sang less than most of the normal males, nevertheless by March 30 he had a mate, K106. On April 22, when the other Song Sparrows were starting to build, I found a curious situation in the family; 95M was singing busily, but K106 was sitting high in a tree. 95M came near to feed, but she failed to join him. Ordinarily a female keeps low in the bushes and the pair are almost constantly together. I never saw this female again. 95M sang to some extent, but soon became inconspicuous; he was seen in December, but evidently came to his end before spring.

The story of 68M is rather strange. In 1931 his mate, K60, laid five eggs; one of these disappeared; two were infertile; one hatched into a normal bird, but the other nestling was deformed. At the age of nine days when it died, its right side showed development proper for a six-day-old bird, but its left only four days. Its right femur was 27 mm in length, its left 16 mm; its right toes 8 and 11 mm, its left 5 and 6 mm; the sheaths of its right primaries 21 mm, its left 4 mm.

In 1932 68M returned February 27 and got a mate, K100, March 26. K60 came two days later and joined the male next to the south; her first set contained four eggs, all of which hatched and were raised successfully. So it would appear as if the defect were in 68M. On April 28 or 29 K100 deserted 68M and joined 66M 100 yards to the west, 66M having lost his first mate about April 26; these two birds nested and achieved the unexampled feat of raising two Cowbirds and two of their own young. It looks as if 68M, although normal in size, weight, and singing behavior were somehow lacking in his sexual behavior. He has returned for the third season and has for his mate a bird I banded in the nest in 1932.

In two cases mothers have followed their young into the territories of widowers, and instead of returning to their mates, have stayed and nested.

The Situation from Year to Year

In only five instances has there been remating a second year among my banded Song Sparrows. In two of these cases the females were residents: they stayed permanently in the same regions, and their former mates having survived, it is natural that they should remate the second year.

Other banders with only a few pairs of Song Sparrows in their vicinity often report the presence of the same pair two years in succession (Baasch, 1927, Burtch, 1925, Haldeman, 1931, Hamill, 1926, Higgins, 1926). I believe it is of comparatively rare occurrence on

Interpont because of the large number of birds and the many chances a male has to get a mate before his former mate arrives, the presence of the resident females being a complicating factor. I do not have any case of a female joining a new mate when the old was available; either the former husband was dead or was already mated, or, in one case, returned later than she did.

Female Song Sparrows do not fight each other over mates. They do exhibit a defensive attitude towards their neighbors of like sex, dogging each other's footsteps in a hunched up or puffed out attitude, in the meantime busily eating. In 1929 the two pairs I was studying often met at the feeding station I maintained on the boundary line, whereupon the males would threaten each other and the females do the same, once the latter staging a real battle.

Bigamy

Twice I have found male Song Sparrows with two mates at the same time. The habit of the male of pouncing on neighboring females opens the way for the acquisition of an extra mate, although under ordinary circumstances a female repulses any male but her mate.

It was most astonishing to me to discover on May 1, 1931, that 48M had two mates. The two nests were about fifty yards apart in the same ditch; the young in the nest with his original mate, K51, left May 12; those in the other nest hatched May 13 and 14. It was not until the latter date that I realized that 48M was doing double duty, feeding the young out of the nest and calling K76 off of her nest, besides driving other birds from its vicinity. During the hour and a half that I watched, 48M did not feed the small young in the west nest. The two females did not meet while I was there. Unfortunately K76 was killed on her nest that night by a dog and her young were dead beneath her.

The second case I had much more chance to observe. On February 26, 1932, I first noticed a sooty-looking (and hence a resident) male, 113M, in the ditch next to 12M's land. He was a puzzle to me, for he almost never sang and his neighbors did not seem to resent his presence. He remained and finally—April 18—got a mate, K131, whom I had banded as a nestling the previous summer.

About April 24 my fine old male 12M disappeared and his mate, K89, instead of joining one of the mateless males in the vicinity, simply stayed on as the second wife of 113M. She must have had a nest started with 12M and thus felt anchored to her territory; I never found this nest which was evidently destroyed, for she built

another in which she laid May 11 to 15. K131 laid her set May 8 to 11. Each female stayed in her respective ditch for the most part; once I saw them meet on the dike, but neither showed hostility. 113M shared his time between them, although appearing to prefer K89 and to be more anxious when her nest was visited than the other. He called both of them off the nest, and helped feed both broods, although not zealously. Both nests held Cowbird eggs. Some enemy must have carried off all the Song Sparrow young from K89's nest, so only a Cowbird was raised. K131 had three young of her own (one egg being sterile); a severe drought was causing losses in most of the Song Sparrow nests at this time, and K131 had but inefficient help from her preoccupied husband; she succeeded in raising only one of her own young besides the Cowbird.

It was a curious situation that such a self-effacing male should have two mates, while eight or ten of the other males on Interpont were mateless, including his next-door neighbor. In 1933 113M got a mate in February; when his two former mates returned in March, neither insisted on becoming a supernumerary mate, but joined other males in the vicinity.

Some Concluding Observations

The male chooses the territory, although it seems to be more or less haphazard and without much intelligence. At any rate those territories with water or with large trees, those less frequented by people, and those that appeal acsthetically to us, are not taken any more readily than those covered merely with bushes or even with weeds and rubbish. The male appears to exercise no choice as to his mate, but is happy to welcome the first comer that greets him with the appropriate notes.

The female returns to her former nesting site if possible; if that is preoccupied, she usually settles as near as she can. She appears to exercise no choice as to desirability of territory, as to beauty or variety of song in the male, nor even in the matter of physical perfection. 11M had half of one of his legs shot off, but both years he got mates earlier than some of his neighbors. (I know the history of only one of his nestings; in this three out of five eggs were infertile). A female with only one foot was at no disadvantage in getting a mate; she was able to build an elaborate nest and raise a brood. When we also remember 95M, we are forced to conclude that Song Sparrows are not very observant when choosing mates.

We are accustomed to think that birds that hold territory must do so vigorously or fail ignominiously to reproduce themselves. Nichol-

son says (1929:27), "The proper quota of inhabitants will be made up from the strongest and most self-assertive birds". But, although most of my Song Sparrows are zealous in singing and in territory defense, a few are not, yet they appear to prosper equally well. This has been true of 57M, although inconspicuousness is his rule of life; and I have seldom heard him sing. He was hatched June 6, 1930, and has lived on North Interpont ever since. Each year he has had a mate, yet he is so retiring that it is usually impossible to find him, although I repeatedly search his territory. Thus this bird that never properly proclaims territory has survived for nearly three years and raised young at least once and probably several times. 113M is also an example of an unassertive bird that was doubly successful.

I hope that this paper will not give a false impression of the marital relations of my Song Sparrows; although considerable space has been devoted to desertions and to two cases where males had two mates at one time, yet the majority of my birds are models of devotion to home, mate, and family.

BIBLIOGRAPHY

Baasch, K. W. 1927. A Permanent Resident Song Sparrow. Bull. Northeastern Bird-Banding Ass. 3, p. 19.

Baldwin, S. P. 1921. The Marriage Relations of the House Wren. Auk, 38, pp. 237-244.

Burkitt, J. P. 1925. A Study of the Robin by Means of Marked Birds. British Birds, 18, pp. 250-257.

Burtch, V. 1925. Notes from Branchport, N. Y. Bull. Northeastern Bird-Banding Ass. 2, p. 20.

Gillespie, M. 1930. The Gayest of the Wrens. Bird-Lore, 32, pp. 108-110.

Haldeman, D. W. 1931. A Study of the Eastern Song Sparrow *Melospiza melodia melodia*. Auk, 48, pp. 385-406.

Hamill, L. C. 1926. Notes on the Mating of Song Sparrows and their Range-limits during the Nesting Period. Bull. Northeastern Bird-Banding Ass. 2, pp. 7-10.

Higgins, A. W. 1926. Nesting Records of Song Sparrows 25935 and 39235. Bull. Northeastern Bird-Banding Ass. 2, p. 39.

Howard, H. E. 1929. An Introduction to the Study of Bird Behaviour. Cambridge Univ. Press.

Miller, A. H. 1931. Systematic Revision and Natural History of the American Shrikes (Lanius). Univ. California Pub. Zool., 38, pp. 11-242.

Nice, M. M. 1930a. Do Birds Usually Change Mates for the Second Brood? Bird-Banding, 1, pp. 70-72.

——. 1930b. The Technique of Studying Nesting Song Sparrows. Bird-Banding, 1, pp. 177-181.

——. 1931a. Survival and Reproduction in a Song Sparrow Population During One Season. Wilson Bulletin, 43, pp. 91-102.

——. 1931b. Returns of Song Sparrows in 1931. Bird-Banding, 2, pp. 89-98.

——. 1932. The Song Sparrow Breeding Season of 1931. Bird-Banding, 3, pp. 45-50.

Nicholson, E. M. 1929. How Birds Live. 2nd Ed. London. Williams and Norgate.

Schjelderup-Ebbe, T. 1924. Zur Sozialpsychologie der Vögel. Ztschr. f. Psych. u. Phys. 88, pp. 225-252.

Columbus, Ohio.

IN THE HAUNTS OF CAIRN'S WARBLER—A RETROSPECT AND A COMPARISON*

BY G. EIFRIG

The locality under discussion is Accident, Garrett County, Maryland, and its vicinity. Garrett is the westernmost and the most elevated county in Maryland. The mountains cross the county from southwest to northeast. They are not so conspicuous for their height, but rather for their long, unbroken contour or crest, which at the same time is broad. Even before the lumberman's ax desecrated this garden spot, there were numerous open, grassy places, called glades, on the forest-covered crests, which then invited and now have partly given way to farms. The mountains to the east of Accident are Negro, Meadow, Great Backbone Mountains, the last continued northwardly by the Big Savage, on the eastern slope of which Frostburg is situated.

The region is much dissected by ravines eroded by the rivers and creeks. Some of the drainage goes into the Youghiogheny, a tributary of the Monongahela, which, in turn, empties into the Ohio, and eventually into the Gulf of Mexico, the remainder into the Potomac, and with it into the Atlantic. These creekbeds, usually lined with fine old hemlocks and dense thickets of rhododendron are the typical home of Cairn's Warbler, also on the tops of the mountains wherever hemlocks and rhododendrons are. This is the combination: Cairn's Warbler is found wherever rhododendron grows; this as a rule grows only where hemlock is found, and that is always along or near water.

Although the elevations above sea-level are not so great, the effect on flora and fauna is most remarkable. The geological survey plug in front of my hosts' house in the village of Accident shows 2395 feet, while that on George's Hill nearby gives 3004 feet. Thus the fauna and flora is a mixture of Carolinian, Transition, and Canadian. That is what makes the region so fascinating to the naturalist. Almost side by side with such northerly species of trees as hemlock and white spruce are found the tulip and cucumber trees, members of the magnolia family; also sassafras, flowering dogwood, and witch hazel; and in the lowest part of the course of Big Bear Creek, near Friendsville, on my last visit this past summer (1928) I found for the first time Hercules club (*Aralia spinosa*); also, on the Great Backbone across

*This paper was written five years ago. Last year another change for the worse took place, the death of my friend, companion, and guide, Mr. Fred Burkhard. He was a keen observer, and a lover of nature. G. E.

the boundary in West Virginia, the pipe vine, *Aristolochia macrophylla*, the northern *Oxalis acetosella* and the southerly *stricta*, *Clintonia borealis* and *umbellata*. Many species of oak and maple are here, also several lady-slippers, habenaria, cranberry, and sundew.

This mixture of northern and southern species is just as apparent, or more so, in the fauna, especially the avifauna. The same stream may harbor the Louisiana and the Northern Water-Thrushes as breeding birds, and the Bewick's and Winter Wrens, the Golden-winged and the Canada Warblers. I have never seen the Canada Warbler anywhere in Canada as numerous as in certain spots in these mountains. The same is almost, if not quite, true of the Magnolia and Blackburnian Warblers. The following shows the striking effects of such a relatively small altitude in this latitude. There may be much snow, with a long time of sleigh-riding, and much sub-zero weather at Accident and even Frostburg, the latter only twelve miles from Cumberland, while at the last-named place there is no snow all winter, or not much of it, and mild weather throughout. Here the principal breeding warblers are the Prairie, Hooded, and Worm-eating, none of which are ever seen at Accident. Cumberland has an elevation of 750 feet.

I have been going to Accident off and on since 1901. Not much change is observable. That is what makes it so attractive and restful to me. No shrieking, puffing locomotive here, for there is no railway. The narrow gauge that ran from Friendsville along Big Bear Creek up to Meadow Mountain has long since fallen into decay. Owing to inaccessibility or to the love of some owners for their fine old trees—ancestral heirlooms in most cases—lumber companies did not get all the fine old hemlocks and white spruce, no doubt much to their disgust. A fine new, hard, highway has been built through the valley from Oakland to the old Cumberland Pike at Keyser's Ridge. The only changes I noticed this past summer (1928) were these: electric light had been introduced, the Starlings had established themselves, and the chestnut blight had killed most of the chestnut trees on the rocky mountain tops and sides. But even these wounds have been beneficently healed over by Mother Nature.

Now as to the birds of the region. The last visit was the first one since 1920. One will, under such conditions, naturally make comparisons. The results will, in this case, not be simply imagination, as I have made it a habit for many years to record the number of birds of each species seen during a walk.

Waterbirds are few and far between here. This is to be expected, because beside the usually narrow runs and creeks, flowing in steep-sided little valleys or even gullies, there are no water-bodies, with the exception of two small artificial ponds. Here is where Killdeer and Spotted Sandpipers breed, a Green Heron on Big Bear Creek. This condition is being changed, however, owing to the construction of a dam on Deep Creek for power purposes, which has resulted in a large lake, about twelve miles from Accident, where gulls and ducks have already been seen.

Of gallinaceous birds there are only the Ruffed Grouse and the Bob-white; the former has decreased, the latter increased in numbers in the last eight years. The Wild Turkey has disappeared since the time of my first visits.

There are few birds of prey, largely because the natives have a strong antipathy to them and shoot as many as they can. Still I know of one place on Negro Mountain where a pair of redtails may be seen year after year. At another place a pair of sharpshins has been holding forth for ten years, and were there at my last visit, much to the disgust of nearby Kingbirds, whom I have seen darting at one while fairly screaming with rage. The Sparrow Hawk had at this list visit disappeared from its accustomed haunts.

The Mourning Dove breeds sparingly. Both cuckoos are regular breeders. A nearly full-grown Black-billed Cuckoo I saw on my last visit had whitish edgings to the feathers of the tail and back and thus looked remarkably like an European Cuckoo.

Of woodpeckers the Flicker is the most common. Formerly it was the red-head, but this has strangely almost disappeared. What can be the reason? There are no longer quite so many dead trees in the clearings, but there are still enough to go around. Also the fine cherry trees are still there. So why should they have become so rare? What hidden influences are at work in nature that work for the increase or decrease of species of animals or plants and even eliminate some entirely? We do not seem to be making much headway in that line of investigation. The fine Pileated Woodpecker is still found in one place on Negro Mountain, his hold on existence being evidently precarious. The Downy and Hairy Woodpeckers occur, but by no means as numerously as one would expect in such a relatively heavily wooded region. The northerly Yellow-bellied Sapsucker comes as a distinct surprise in a region as far south as Maryland; it can be found every summer and all summer on Negro Mountain, and probably in other suitable places.

The Nighthawk can be seen circling overhead in small numbers here and there, but the Whip-poor-will has almost gone entirely. The same condition I find to be true wherever I go and where it was formerly common. What can be happening to this fine species? I have heard of a few places where they are just as numerous as before, if not more so. I hope there are many such. Chimney Swifts and hummingbirds are here, of the latter I have found a nest with young.

In my journal of 1918 I find this entry made during my visit at Accident: "Every orchard has a pair of Chebecs, and every second one a pair of Kingbirds and Baltimore Orioles." This had distinctly changed for the worse in 1928, when I saw no Least Flycatchers at all, and fewer Kingbirds and Orioles. The Wood Pewee is common and the Phoebe was formerly, but is no longer. Of the Phoebe the same remarks hold good as of the Whip-poor-will. This year even the old wooden bridge or culvert over Big Bear Creek, near Kaese's mill did not harbor a pair, where in other years one could always be sure of finding one. What is happening to them?

The Prairie Horned Lark is still found breeding in a few places. This part of Maryland is probably the only one where it is found as a breeding species. At Cumberland it is only a migrant.

The crow and jay family is not strongly represented here. Blue Jays are common enough, as indeed they seem to be everywhere, but the crow is far from plentiful.

Of the blackbirds and Starlings only the Bronzed Grackle which seems here to be intermediate between this species and the Purple Grackle, can be called common or even abundant. Wherever there is a little alluvial, swampy tract along a creek, the redwing is certain to be found, as on the swampy, alder-covered glades on Negro Mountain, and on Big Bear Creek. Here I once found a nest of a pair in an apple tree twenty feet up. The Baltimore Oriole has decreased in numbers, the Cowbird holds its own, unfortunately, and the Bobolink is nesting in small colonies in timothy fields. It is, if anything, increasing in numbers, which is rather astonishing for a state as far south as Maryland. It does not think of nesting near Cumberland. The Meadowlark is only moderately common.

An unwelcome addition has appeared here in the Starling. There was a band of about forty roving about. They were feeding in a newly-cut hayfield, then in cherry trees that had not been picked. When flying overhead, they can at once be told by their short tail, which is quite different from that of any of our blackbirds, and by their rapid flight. I tried to get a few specimens, but found them

extremely wary and unapproachable. Later, in Cumberland, I found them voraciously feeding on pears in the garden of my host, where I could have gotten some easily. The way they slashed into those pears, not troubling about finishing up such as dropped to the ground, seems to me to spell trouble to fruit-growers in the future, if they become plentiful, which seems probable.

The finch and sparrow family is well represented here. The Chipping Sparrow and the Song Sparrow are dooryard birds, breeding in every garden. The song of the Vesper and Grasshopper Sparrows can be heard wherever the roads wind through fields. In the low, warmer hollows the Cardinal is even represented there and on the hills the Indigobird as well. The Rose-breasted Grosbeak is not too rare a breeder. The Goldfinch was extremely abundant in 1928; one was hardly ever out of hearing of its voice. This species is distinctly on the increase wherever I have been in the last two or three years, in Illinois, Indiana, West Virginia, and Pennslyvania. That the Swamp Sparrow is found here comes in the nature of a surprise. They are found only in the cold, swampy glades on Negro Mountain and near Oakland.

The most interesting finch of the region, however, is undoubtedly the Carolina Junco. This lives and breeds from an elevation of about 2500 feet up, in dark, mossy hemlock banks as well as in the high, dry, rocky stands of chestnut, which latter are rapidly being replaced by other second growth, as we have seen above. Their appearance and song is exactly like that of *Junco hyemalis*, but the tail noticeably averages a little longer. One I saw and heard on my last visit had an entirely different song in this wise: *la la la la la* (loud and musical) *dree dree dree*, the last rasping and warbler-like. There were several warblers breeding in that immediate vicinity, so it got this song probably by imitation. The young are heavily streaked above and below.

Barn and Cliff Swallows are common, the latter even more than the former. Long lines of old and young of both species were strung out on telephone wires, while I was trying to stalk the Starlings. One large nesting place of former years on a certain barn had, however, been deserted by the Cliff Swallows, perhaps due to depredations of English Sparrows, who wanted to use their nests for their own families. Near Oakland I once saw a breeding pair of Tree Swallows. I did not notice any Purple Martins during any of my last visits, but there was a large colony of them at Cove, about four miles north of

Accident, and there are many at Frostburg, on the slope of Big Savage Mountain, twenty-five miles away.

Cedar Waxwings are common, shrikes absent, and of vireos only the Red-eyed, which tries to make up by its numbers the lack of the others. Just once I saw the Yellow-throated Vireo.

It is the warblers that are a revelation to anyone first visiting this region. They were to me at any rate. I thought I had been suddenly transported to Canada. There were and are there now the Black-throated Blue (which later turned out to be Cairn's) and Green, the Magnolia, the Blackburnian, and the Canada Warblers, the Northern Water-Thrush, beside such wider-ranging ones as the Parula, Maryland Yellow-throat, Chestnut-sided, Yellow, and Oven-bird; also more southerly ones as the Louisiana Water-Thrush, Golden-winged Warbler, and even the Chat, which was here one year only. At my last visit this year, the warblers gave me another surprise by their greatly diminished numbers. Thus, where I had seen twenty Canadas in 1918, there was this year only one; on Negro Mountain where in 1918 I counted twelve, there were none this year. The Magnolia stands ten to three, the Chestnut-sided fifty to three, Cairn's ten to four. Again, why this difference? Was it on account of the cold, wet spring they had this year? That is not improbable. My host had found several dead Flickers after a snow-storm they had in April. If such hardy birds succumb, how much more the tender warblers? But for all we know there may be entirely different forces and influences at work that make the numbers of birds fluctuate so strangely.

Of thrashers, the Catbird is common, the Brown Thrasher much less so. Wrens are represented by the House Wren and Bewick's Wren. The former seems to be increasing, the latter decreasing in numbers. I suspect that in this case the presence of the former is the reason for the decrease of the latter. Once only did I find the Winter Wren breeding, and that in a place which seems to be a bit of Canada bodily transported here—a stand of original hemlock and white spruce on Negro Mountain. There also the Blackburnian Warbler is in its glory.

The White-breasted Nuthatch is not common, not even the Chickadee. The Tufted Titmouse, so common at Cumberland, is entirely absent here.

Of thrushes the Veery was always common, locally even abundant. On the mountain crests and sides, as well as in the ravines one would every few steps hear their querulous alarm note. This year we did not see one, although we searched for them. How can

that be accounted for? Neither did we see or hear a single Wood Thrush. The Robins, on the contrary, are becoming more numerous—thirty years ago there were few here—and the Bluebirds are holding their own. On George's hill we came across a band of twenty to thirty Bluebirds busily feeding on red elder berries (*Sambucus canadensis*) and a little lower down one of ten to twenty gorging themselves on pinchberries. So it seems that when Bluebirds disappear from their haunts in July, they are simply congregating in places where wild fruit abounds.

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FRANKLIN HIRAM KING*

BY MRS. H. J. TAYLOR

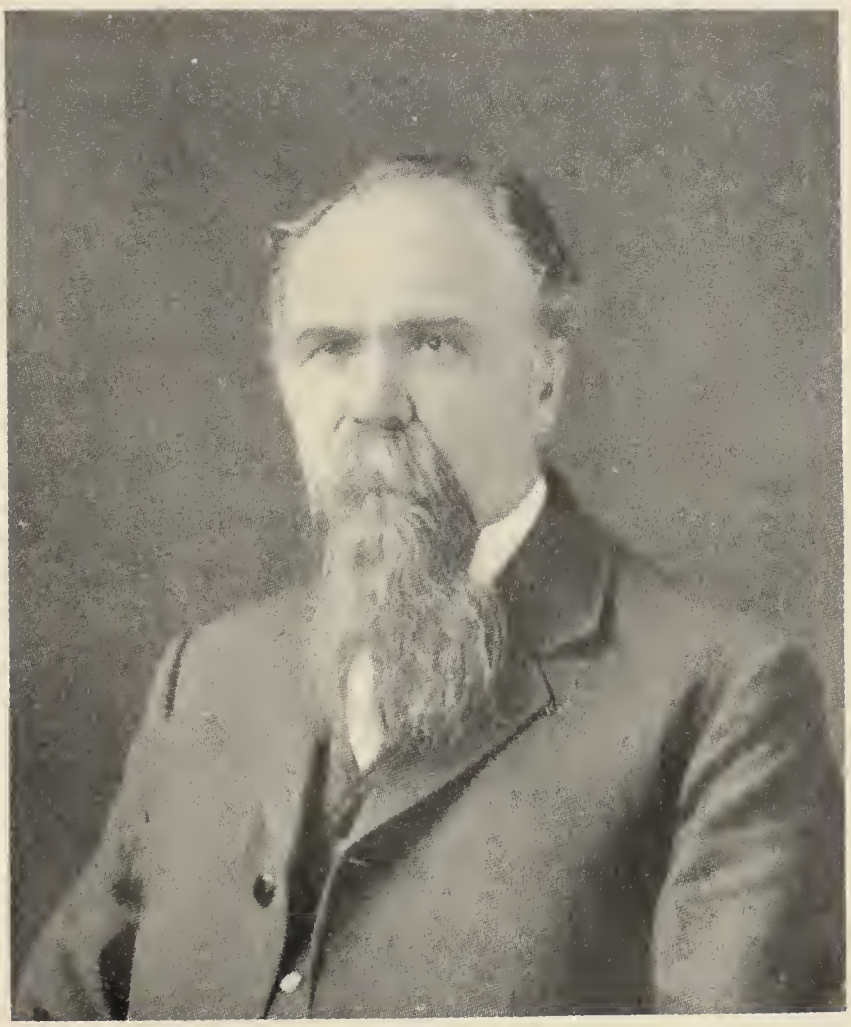
Franklin Hiram King was born near Whitewater, Wisconsin, on June 8, 1848. He died at Madison, Wisconsin, on August 4, 1911.

The only school in which Professor King graduated was the State Normal School, now called Teachers' College, at Whitewater, in 1872. After his stay at Cornell University, mentioned below, he spent a summer at Beaufort, N. C., in the biological station then maintained by Johns Hopkins University. In 1910 the University of Wisconsin conferred upon him the honorary degree of Doctor of Science.

From 1878 to 1888 King taught in the Normal School at River Falls, Wisconsin. In 1888 the University of Wisconsin called him to the Chair of Agricultural Physics, the first of its kind in America. He prepared his own textbook for this work. It was so successful that six editions were published. He remained in this connection until 1901. From 1901 to 1904 he held the position of Chief of the Division of Soil Management, in Washington, D. C.

King's contribution to economic ornithology consists of a paper entitled "Economic Relations of Wisconsin Birds", published in the "Geology of Wisconsin" (Survey of 1873-1879, Vol. I, Part II, pp. 441-610). King began working on this subject in 1873. In 1875 the State of Wisconsin invited him to make an official report on the economic importance of birds in relation to agriculture. He then realized the necessity of a thorough knowledge of insects. He began to

*Mrs. Taylor published a sketch of F. H. King as a part of another paper in the Wilson Bulletin, XLIII, September, 1931, pp. 188-189. In the meantime additional material has been obtained, together with a portrait of Professor King. At the Editor's request Mrs. Taylor has re-written this sketch, incorporating both the old and new material.—Editor.



Franklin Hiram King, 1848-1911

make collections of insects in order that he might become acquainted with them for purposes of identification. He also observed them at work, and studied what was known concerning their beneficial or harmful effects on farm crops.

Beginning in the fall of 1876, he spent two years at Cornell University, pursuing the study of entomology.

King was born and chiefly educated in Wisconsin, and became a teacher in her highest institutions of learning.

King's interest in ornithology was wholly incidental to the major interest of his life—agriculture. So, we find his attention reverting to farming in the broadest sense. It was his desire to share his specialized knowledge with those who were actually tilling the soil, dairying, or feeding cattle.

In 1895 he published a book on "The Soil". This was followed in 1899 by "Irrigation and Drainage". This book is not a discussion of the general subject of irrigation and drainage with reference to arid tracts and swamp lands. It treats only of the cultural phases of the subject and presents specifically the fundamental principles which underlie methods of culture by irrigation and drainage. The farmer, the horticulturist, the gardener, must have a clear understanding of the relations of water to soil and to trees and plants, in order to act rationally in controlling the moisture of the soil.

The five years following his sojourn in Washington were spent in writing and lecturing. In 1908 he published "Ventilation for Dwellings, Rural Schools, and Stables". This book was enthusiastically received by the general public. It contained important information presented in language which the layman could understand. *Hoards' Dairyman* said of this book: "The subject is so widely and strongly, and so profoundly treated . . . that we are sure that it will be regarded by all classes of society as one of the most important contributions to human knowledge that has yet appeared. All the knowledge Prof. King uses exists in the great domain of scientific investigation. But it is here brought down to the average comprehension in a way that makes it of the greatest importance to every household in the land." This little book of 125 pages did its work well in educating all classes to the need of fresh air, sunshine, and sanitation. Today these things are accepted as a matter of course.

A letter received from Mrs. King in September, 1931, says: "In 1909 Mr. King went to China, Korea, and Japan in a pilgrimage to learn, if possible, what an older soil management than that of this country or Europe had accomplished. He had planned much writing

as the result of that study, when his death occurred suddenly on August 4, 1911. He had finished the preparation of his book, 'Farmers of Forty Centuries', except the last chapter, which was never written." The typesetting for this book was started on the day of Kings' death. It was published in Madison by Mrs. King. In her letter she states: "The first edition was 1000 copies. The second edition was 4000. In 1927 a third edition was issued in London. The latter edition does not contain quite all the earlier ones do. A few of the illustrations and some of the more personal things were left out."

It can scarcely be doubted that "Farmers of Forty Centuries" did not reach the public as it would have had King lived. Local printing could not give a book the publicity which a publishing house gives. Nevertheless, the book received many favorable reviews from many sources. And it also received the first award from the Grant Squires Fund. Among the reviews we may mention only one or two. Dr. J. Kawaguchi, Director of the Agricultural Station, Japan, wrote: "Mr. King's 'Farmers of Forty Centruies' is the greatest work written in a European language to set forth the conditions of our Oriental agriculture." *The Living Age* said: "Professor King's book has all the interest of a book of travel, but it has much greater value, for the author's observations went deeper than those of the ordinary traveller."

This book, covering forty centuries of farming, is more fascinating than one might suppose. In it the author tells how successful an ancient people have been in cultivating their lands and keeping their soil productive over a period of 4000 years. He shows the young and boastful new world that it has still much to learn from the old. This book is, doubtlessly, to be regarded as the climax of Professor King's life. Yet, in our field, cognate to agriculture, we recognize his early studies on the food habits of birds, by the method of stomach examination and by the method of field observation, as a fundamental and pioneer contribution.

Berkeley, California.

SUMMER WARBLERS OF THE CRAWFORD COUNTY, MICHIGAN, UPLANDS

BY LEONARD W. WING

Little ornithological work has been done in Crawford County, Michigan. A few ornithologists have visited there, but no systematic study has been undertaken. My own work centers in the northeast corner of the county, about latitude 44°. Crawford County is a region of both upland and lowland. Publication of these notes on the uplands seems warranted at this time, because they provide a new breeding bird for Michigan (Palm Warbler), and add considerable data for others. It is hoped eventually to have a list of the birds of the county prepared and published, but a great amount of field work there still remains to be done.

I am indebted to Wm. G. Fargo for assistance in the field work and preparation of the manuscript, and to Milton B. Trautman for notes on his work in the county in 1925-6. I have received further assistance from A. D. Tinker and R. E. Olson, who have very kindly loaned me their notes. They have worked in the county both with me and independently.

The soil of Crawford County is mostly sand and gravel, consequently there is little successful agriculture. The northeast corner is typical of the whole country. It is wild and uninhabited. The North Branch of the Au Sable River flows southeast across the northeast corner. The North Branch follows roughly the inner edge of a terminal moraine. Back of the moraine, to the north and east, is a large outwash plain. The hills of the moraine are well rounded and rise not more than a hundred feet above this plain. The edge of the moraine, facing the plain, is a steep bluff-like slope.

The moraine was originally covered with a heavy white pine (*Pinus strobus*), red pine (*Pinus resinosa*), and mixed hardwood growth. The timber was removed forty or fifty years ago. Forest fires have burned the area many times, so that it is now a region of charred stumps and brush. A few red pines that survived the lumbermen and escaped the fire are occasionally found. They still bear deep fire scars.

The chief brush of the country is maple (*Acer saccharum*). The fires have burned the young trees so many times that they are now large clumps of suckers. There are numerous patches of thorns (*Crataegus*). Sweet fern (*Myrica asplenifolia*) grows luxuriantly and practically completes the cover.

North of the river there is a jack pine plain. It is situated on the outwash plain previously mentioned and is composed of Grayling sand. This jack pine plain is quite typical of nearly all such plains of Michigan. They are all more or less primeval and appear to be much as before the arrival of the white man. What little white and red pine remained scattered over the plains has been taken off. The jack pine has little commercial value, so has been left untouched by the lumberman. There are numerous scattered burns over the plains and in many places they have grown up into a short jungle-like growth "as thick as timothy hay".

The particular burn near the river where I carried on my investigations was formerly covered with large jack pines. The trees were thirty to sixty feet high with trunk diameters of six to ten inches. Most of the tall trees fell, though some still stand as stubs. The heat from the fires aids in liberating the seed. The jack pine is very prolific; the seed is very hardy and has a high germination percentage, so that thousands have sprouted and lived, to form, in 1930, a mass of fresh growth six to twelve feet high. In places it is so thick one has great difficulty in working through. It is so dense that the lower branches die young. Here, close to the ground, where it is open, we generally find our birds, and it is only by working low that they may be observed. The plains are very deficient in food in early summer, so that when the birds are not singing it takes an almost unbelievable amount of peeking and peering to locate them.

Black and White Warbler. *Mniotilta varia.* August 6, 1931, I secured an immature bird from a mixed flock in the jack pine burn. The flock consisted of Chipping Sparrows, Nashville Warblers, and Chickadees. I do not think that it nests in the uplands but moves into the jack pines after the nesting period.

Nashville Warbler. *Vermivora ruficapilla ruficapilla.* This is a common nesting bird of spruce and cedar swamps. As soon as the young are able to fly, the whole family seems to move into the jack pines. June 30, 1930, great numbers of them were in the jack pines east of Grayling. I collected a male and a juvenile on that date. August 6, 1931, I found a flock of old and young in the burn near the North Branch, collecting two. The young, though well able to fly, constantly begged for food. On June 30 the males were singing even when feeding the full-grown young.

Myrtle Warbler. *Dendroica coronata coronata.* July 21, 1930, Josselyn Van Tyne and I collected a juvenile female Myrtle Warbler in the burn near the river. July 5, 1931, I secured a juvenile male

and female. The same day Mr. Tinker also took two, an adult male with a juvenile. August 7, N. A. Wood and I collected two more young birds. The Myrtle Warbler breeds in the swamps and appears to enter the jack pine only after the nesting season.

Chestnut-sided Warbler. *Dendroica pensylvanica.* The Chestnut-sided Warbler is an abundant warbler of the hills south of the river. Mr. Trautman found them abundant in 1925.

Kirtland's Warbler. *Dendroica kirtlandi.* Kirtland's Warbler is a very common warbler of the jack pine burns. Due to the restricted number of suitable burns, it is doubtful if more than four or five thousand individuals are in existence.

The song and method of delivery of Kirtland's Warbler is decidedly unlike that of any member of the genus *Dendroica* of which I have field knowledge. I find no citations in literature that indicate a song approaching it. The song is loud, clear, and ringing, delivered with a tremendous gusto. The bird throws the head back, the body assumes a perpendicular attitude with the tail projecting downward. The notes seem to shoot forth, the body trembling with emotion. I have written this song as *ba tu' tu' weet' weet'*, accented as indicated.

Occasionally another song is heard, but I have not determined its significance. It may be expressed as *butte butte weet" weet" weet" weet"*. There is no inflection and the accents are slight, as indicated. It is reminiscent of the alarm call of the Wood Thrush.

Kirtland's Warbler is probably a very old species. Its high specialization and restricted habitat leads one to believe that it has reached (and perhaps passed) the climax of racial senescence. The plumage, when compared with other members of the genus, shows that at similar molts it is in earlier stages of development. It retains the pattern of the early plumage for some time. It appears that at least two years are required for the complete plumage.

A number of other members of the genus, as mentioned elsewhere, share with the Kirtland the habit of tail-wagging. *Dendroica castanea* and *Dendroica striata* also show traces of this habit when young. It leads to the conclusion that this is an old character that is being lost. Some species have completely lost the habit, while others exhibit it in early life. This indicates a recapitulation of the tail-wag.. If so, we can readily perceive the direction of evolution of this habit.

The conclusions from the plumage and tail-wag agree in placing Kirtland's Warbler as the most primitive member of the genus. Possibly we may interpret the distinctive song in the same way.

If this is the oldest form, it is interesting to speculate on what the *dendroican* ancestor was like. It may have been a heavily streaked bird, living in a dense jungle. It probably had a very loud song, and continually wagged its tail. In the subsequent evolution of the race, this form failed to keep pace. Perhaps we should consider it as a sub-genus.

Pine Warbler. *Dendroica vigorsi vigorsi.* The Pine Warbler is an abundant bird of the larger and older jack pines. Young fully-grown birds are found by the first of July. The adult birds stay in the taller jack pines except after the young are flying. Then they will be found in the burns with the young.

The song of the Pine Warbler is a simple trill. It is extremely difficult to distinguish it from the songs of a number of other species of the same general territory. The Eastern Chipping Sparrow (*Spizella passerina passerina*), Slate-colored Junco (*Junco hyemalis hyemalis*), Myrtle Warbler, and palm warbler, all have trills that resemble the song of the Pine Warbler. It is quite impossible for the listener to distinguish them with certainty. Musicians say that some of these songs are reiterations of the same tone, rather than trills.

The young Pine Warblers occasionally wag the tail in the manner of palm warblers. The adults were not seen to do this.

By late June the post-juvenal molt begins. It is first noticed in the wing coverts where a few new feathers appear. The molt continues through July and is completed about the middle of August. The sex of the young Pine Warblers may be determined in the field by the middle of July, the males being much yellower than the females. The males acquire a yellow breast and brownish-olive back while the females acquire a grayish-brown breast with a slight tinge of yellow, and a brown back.

The adults molt later than the young. The beginning of the molt is not constant, probably caused by prolonged attention to the young. The earliest sign of molt appeared July 24 in the males and a little later in the females. It progresses rapidly; by August 7 most birds are growing new tail feathers to replace the old ones which were shed simultaneously. The edgings of the fresh feathers are olive in the adults, the same as in the young.

Western Palm Warbler. *Dendroica palmarum palmarum.* June 3, 1931, I collected a male palm warbler in the burn near the river. The specimen is now number 67489 (original number W258) in the Museum of Zoology. As far as we have been able to ascertain, this is the first breeding specimen for Michigan. June 14, two more palm

warblers were collected, and three observed. A female was flushed from the ground. She trailed the ground for some distance, so the nest was not discovered. July 4, a fourth specimen was obtained. The young bird was not out of the nest more than a week or ten days. I saw another adult with a young bird but did not get it. July 5, a female was taken. She was with a fledgling barely able to fly, but the young bird was lost in the thick jack pines.

H. A. Olsen and R. E. Olsen, accompanied by L. H. Walkinshaw of Battle Creek, visited the spot June 15 and found two pairs of palm warblers carrying food. They located three young not able to fly, which the parents fed while they watched. Unfortunately the birds were not collected, though they were photographed and banded.

Altogether, I found fifteen adults and six young, of which number five adults and one young were collected. The palm warbler appears to be a rare breeding bird in the jack pine country.

The palm warbler is not a shy bird. Sometimes it fed within a few feet of the observer. It is said to be terrestrial to a great extent, though I failed to notice it on the ground for any appreciable length of time. The birds appeared to feed exclusively on insects and worms gleaned from the jack pines. The individual bird's territory seemed to occupy but a few acres. In feeding it prefers the denser growth, spending most of its time in the lower branches, generally within a few feet of the ground. It works the branches very thoroughly in a manner identical with that of Kirtland's Warbler. In the thinner growth, it worked to the upper branches, generally spiralling around the tree, then flew or rather dropped to the lower branches of an adjacent jack pine.

The most noticeable characteristic of the palm warbler is the wagging of the tail. The young bird also wagged its tail, though it was scarcely a month old. As it was breeding with Kirtland's Warbler I had every opportunity to compare the tail-wag of the two. I would say that the tail-wag of Kirtland's Warbler is more pronounced than that of the palm, and it is delivered with greater vigor. The kirtland wags its tail more frequently and continuously and the arc through which the tail moves is longer than the corresponding arc of the palm.

On its breeding grounds, the palm warbler was heard to have two distinct songs and an ordinary warbler *chip*. The first song, which appears to be the song of the mated or nesting bird, is delivered from a favorite perch, generally the tallest pine in the bird's territory. It is given with the body erect, the head thrown back and the tail point-

ing straight down. I have written the song as *hee″-u hee″-u hee′-u hee′-u*. The first notes are delivered slowly; the last two a little more rapidly; they are higher pitched and accented as indicated. The whole song, however, is delivered in a slow, unhurried manner. The tone is rich, soft, and liquid. It has a cool, distant quality.

The second song, which may be the courting song, is almost indistinguishable from the songs of the Pine Warbler or the Eastern Chipping Sparrow. Indeed, it bears a striking resemblance to the song of the Slate-colored Junco and Myrtle Warbler. However, the Pine Warbler sings only from the taller, older trees; the Western Palm Warbler prefers the fresh growth. The song is a trill, sweeter and more musical than the song of the Eastern Chipping Sparrow and stronger than the song of the Pine Warbler. It is generally given while the bird is moving (sometimes very rapidly) through the jack pines. The singing bird stays in the same territory, though he circles a great deal. Occasionally a feeding bird bursts out with this song. It is heard oftener than the song first described. I have written it *weet weet weet weet*, with no inflection.

Northern Prairie Warbler. *Dendroica discolor discolor.* The distribution of the prairie warbler in Michigan is not very well known. In the past, observers have found it only in the southern part of the state and at rare intervals. May 10 to May 20, 1927, I found them in numbers migrating on Fish Point in Saginaw Bay. N. A. Wood found them on Charity Islands, also in Saginaw Bay, in 1911; Frothingham has reported seeing and hearing a male in an oak coppice near Higgins Lake, Crawford County, July 6, 1905. Kitteredge saw one near Lovells, July 3, 1927.

July 3, 1931, prairie warblers were located in the hills south of the North Branch. It is a common bird in the cut-over and burned-over lands. It frequents the heavier and thicker parts of the brush country. July 2, I collected a female constructing a nest. July 4, a male and a fledgling barely able to fly were collected.

The males are found singing from the tops of the many dead trees, from an occasional jack pine or the lower branches of a red pine. In the last case they generally select a tree without branches for the first forty feet. The birds usually feed in the lower branches though frequently they are seen on the ground under the bushes. A very noticeable characteristic of the prairie warbler is the wagging of the tail, which occurs in both sexes and the young. The tail-wag is much slower and intervals between movements much longer in the

prairie than in the palm warbler. The arc through which the tail moves is shorter that the corresponding arc of the palm warbler.

The males are shy when singing, yet allow close approach when feeding. Sometimes they permit the observer to come within a few feet without visible alarm.

The call of the prairie warbler is a soft *chip*. The song is distinctive and easily recognized. It is a series of five or six notes that rise in pitch and volume with each succeeding note. It can be written as *dee dee dee dee dee dee*. There appears to be no individual variation. The song is weak, yet in the hill country it carries amazingly great distances, often eighty rods.

The nest that I found was well concealed in a bunch of hazelnut shoots. It was constructed of grasses woven together and placed in a fork twenty-four inches from the ground.

Oven-bird. *Seiurus aurocapillus*. Frothingham lists the Oven-bird as common in the jack pine. I found them uncommon anywhere in the uplands, and, when seen, only near the edges of swamps. They are generally in the deciduous growth, though occasionally found in an old burn where the thick jack pines are from fifteen to thirty feet high.

Northern Yellow-throat. *Geothlypis thrichas brachidactyla*. The Northern Yellow-throat is not uncommon throughout the dry sand-hills south of the river. It is found in the same general territory as the prairie warbler. The birds sing constantly and are not difficult to find. I did not hunt a nest, but Milton Trautman found one June 28, 1925. He says, "It contained four eggs, was on the ground within one foot of a decaying log and sheltered by a sweet fern".

American Redstart. *Sctophaga ruticilla*. A. D. Tinker and R. E. Olsen found one in a fresh growth of jack pine near the river, May 30, 1931.

BIBLIOGRAPHY.

1906. Frothingham, E. H. Eighth Report Mich. Acad. Sci., Arts and Letts. 1906. Pp. 156-161.
1911. Wood, Norman A. Wilson Bulletin, No. 75, June, 1911. Pp. 78-112.
1924. Leopold, Nathan F. Auk, Vol. 41, Jan., 1924. Pp. 44-48.
1925. Kitteredge, Joseph, Jr. Auk, Vol. 42, Jan., 1925. P. 144.

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EDITORIAL

WHAT is the best and surest way of describing the locality of specimens, so that the location will be intelligible one hundred years hence? We have recently had occasion to look over the lists of specimens compiled by Prof. S. F. Baird in Volume IX of the Pacific Railroad Reports, published in 1858. Localities which were then well known, doubtless, are now more or less puzzling. For instance, many records were credited to this and that place in Nebraska Territory. But at that time Nebraska Territory included Wyoming, Montana, and both Dakotas, besides the present state of Nebraska. Political boundaries, even though they seem to be more stable now, are subject to change in a hundred years. We note also that many records are attributed to islands in the Missouri River. Even if these islands still exist some effort is required to locate them, since the abandonment of river traffic has removed our attention from the river and its islands. And the river, in cutting from one side of its flood plain to the other, has often changed the boundaries of states.

A great many records are located by the early frontier forts. While they are unfamiliar in many cases, they can be traced and related to present geography. Still other specimens are assigned to such obscure early localities as Pole Creek, Bijoux Hill, The Tower, Loup Fork, Little Blue, Iowa Point, Bridger's Pass, etc., etc., all somewhere within the boundaries of the present five states which then comprised Nebraska Territory. With such a method of location of specimens the zoologist will have to take his turn as historian and geographer. The only alternative we can see for him is to take training as astronomer and navigator, and locate his specimens with the aid of compass and theodolite. The authors of seventy-five years ago little realized how soon their locality terms would become obsolete; nor do we probably realize the changes which will take place in the next similar period of time. An unstable nomenclature is surely worry enough, without the addition of instability or uncertainty of location. Perhaps the only suggestion to be made is concerning the importance of including with every locality record, or list, a very full geographical description.

As an indication of the bibliographer's difficulty we may point out that the Volume IX previously cited lists Bridger's Pass, Nebr. (p. 19), Bridger's Pass, Utah (p. 312), Bridger's Pass, K. T. (p. 520), and Bridger's Pass, no state location (p. 40).

The Sketch of the life of Dr. C. W. Richmond by Dr. Stone in the *Auk* for for January brings to our mind again the loss which frequently comes to science in the death of men who work unostentatiously and whose labor is appreciated most after it ceases. Dr. Richmond had many friends among people who never had met him personally. There were two outstanding characteristics of Dr. Richmond to account for this, viz., his profound knowledge of ornithological literature and his exalted unselfishness. Apparently, he was always ready to share his knowledge, or go to some trouble to look up information for inquirers, and then to allow them the privilege of publication. And even more unusual it was that his kindnesses seemed to be just as available to strangers as to closer acquaintances. It is always a privilege to know such men, and a real loss not to have had the opportunity of acquaintance.

No Doubt the museums will always be concerned primarily with the preservation of organic remains, and hence will be dealing with morphological material. And so Dr. Stone was perhaps justified in taking exception (*Auk*, L, April, 1933, p. 251) to our rather sweeping comparison between modern morphological and physiological research (Wilson Bulletin, XLIV, p. 231). Nevertheless, we do think that physiological researches are at present in the ascendency. And we believe that this is true not only in ornithology but throughout the entire range of zoology. This view will probably be easily verified by perusal of the zoological programs at any recent A. A. A. S. meeting. And in the ornithological field alone we may point to the work of Lillie and his colleagues in Illinois on feather pigmentation; and to the work of Miller in California on the same subject; to the work of Baldwin and his colleagues in Ohio on temperature; to the work of Shaver and his colleagues in Tennessee on bird song; to mention only a few of the more recent publications. The whole subject of territory behavior is wide open. Mrs. Nice's work on territory habit in Song Sparrows and other phases of behavior is another example. Perhaps most of the problems which are being solved by the aid of the bird banding method should be classified under the broad head of physiology.

GENERAL NOTES

Conducted by M. H. Swenk

A Partial Albino Red-tailed Hawk.—On April 14, 1932, the Pennsylvania State Game Commission received a partial albino female Red-tailed Hawk (*Buteo borealis borealis*) which had been killed a few days before at Bradford, Pennsylvania. Fifty per cent of the plumage was of abnormal color. The distribution of it was very irregular, but in nearly every case the feathers of each wing matched in color. In the tail the color of the sides was uneven. The eyes were too much damaged to show color. This is the first case of albinism I have seen in the fifteen birds of this species that I have skinned.—Merrill Wood, *Harrisburg, Pa.*

A Flight of Broad-winged Hawks.—On September 14, 1932, while standing on a little knoll at the outskirts of Dows, Wright County, Iowa, I saw a flock of thirty-eight Broad-winged Hawks (*Buteo platypterus platypterus*). The Iowa River here takes a southeasterly course, and the birds were strung along in the air over the river for a distance of perhaps two miles. After the manner of the White Pelican, they were circling and at the same time making progress with the course of the stream. They kept directly over the river and at varying distances above the trees. A few small groups of six or eight moved together, but the majority of birds were separated as individuals.

On September 21, 1932, I visited Backbone State Park in Delaware County, Iowa, accompanied by Fred J. Pierce of Winthrop. During the course of the day we counted 140 Broad-winged Hawks flying over. We estimated that they were about 500 feet over our heads. The birds appeared singly at times and at others from ten to fifteen in a group would wheel about in the air, each circle described carrying them a little bit farther southward. On one occasion, while we had our glasses on the birds, four Ruby-throated Hummingbirds crossed the field of vision at a height of about 100 feet and flying directly south.—Charles J. Spiker, *New Hampton, Iowa.*

First Record of the White Gyrfalcon for Michigan.—A White Gyrfalcon (*Falco rusticolus candicans*), the first record for Michigan, was shot January 21, 1932, near Sault Ste. Marie, and is now in the University Museum at Ann Arbor. When shot it had just struck down a Greater Prairie Chicken. Ten years ago the Greater Prairie Chicken was practically unknown in the eastern part of the Upper Peninsula of Michigan, but now it is quite common in many places. This note was received from Mr. M. J. Magee, the well known bird bander of Sault Ste. Marie.—Ralph Beebe, *Ecorse, Mich.*

The Pomarine Jaeger in South Dakota.—During the past fall a specimen of the Pomarine Jaeger (*Stercorarius pomarinus*) was sent to the Museum of Natural History of the University of Minnesota by Mr. Alfred Peterson of Pipestone, Minnesota. The bird had been taken on October 9, 1932, by Mr. R. A. Hyde near Madison, South Dakota. It was in the dark immature plumage, with the central tail feathers hardly appreciably longer than the other rectrices. An examination of the stomach contents revealed that it had recently fed on a portion of an adult Franklin's Gull (*Larus pepixcan*). This bird is known to prey on small birds, and if hard pressed, might be capable of taking a Franklin's Gull, but very likely it was playing the role of scavenger in feeding on this bird.—W. J. Breckenridge, *Museum of Natural History, Minneapolis, Minn.*

The 1932 Fall Migration at Cleveland's Public Square.—In my searches at the Public Square in Cleveland in the fall of 1932, I was successful in finding nineteen species of native birds. From August 29, when the first warbler appeared, a little greenish fellow of undetermined species, until December 17, when the one remaining White-throated Sparrow was last seen, I made eighty-nine visits and found birds on all but fifteen days. The season was somewhat warmer than normal. My records are as follows:

Species	First Record	Last Record	No. of Days Seen	Largest No. in one Day
Sparrow Hawk	Nov. 18	.....	1	1
Bob-white	Oct. 13	Oct. 15	3	1
Herring Gull	Nov. 1	Nov. 17	3	5
Northern Flicker	Oct. 7	.....	1	1
Yellow-bellied Sapsucker	Sept. 28	Oct. 1	2	1
Blue Jay	Oct. 1	.....	1	1
Winter Wren	Oct. 14	.....	1	1
Catbird	Oct. 1	Oct. 21	13	2
Hermit Thrush	Oct. 14	.....	1	1
Ruby-crowned Kinglet	Sept. 26	.....	1	1
Palm Warbler	Sept. 16	Oct. 13	12	3
Northern Yellow-throat	Sept. 24	Oct. 15	12	2
Savannah Sparrow	Oct. 4	.....	1	2
Tree Sparrow	Oct. 19	Nov. 23	3	2
White-crowned Sparrow	Sept. 23	Nov. 22	32	6
White-throated Sparrow	Sept. 23	Dec. 17	67	19
Lincoln's Sparrow	Sept. 23	Oct. 29	16	2
Swamp Sparrow	Oct. 7	Dec. 5	22	1
Song Sparrow	Sept. 26	Nov. 10	23	6

The most unexpected migrant of the season was the Bob-white which spent three active days about the one large bush in the Square, not particularly fearful of the many passersby. It arrived on a raw, windy day, probably forced down in a flight across the city. The Blue Jay flew about among the plane trees, screaming merrily, and followed by a dozen chattering English Sparrows. This must have been the first jay these city-bred sparrows had ever seen.

An idea of the length of time which individual birds may spend at the Square is indicated by the following. A tailless palm warbler showed up first on September 19 and was seen at intervals until October 3 when it had acquired a fair start at a new tail. This example, of course, might be considered a cripple, but the bird seemed to fly well. Incidentally this bird wagged its taillessness just as energetically as any completely equipped palm warbler.

The Starling population of the Square amounted to some 15,000 again this season and persisted in greater numbers than usual through the mild winter.—William H. Watterson, *Cleveland, Ohio.*

A Heavy Case of Internal Parasitism of the Belted Kingfisher.—A Belted Kingfisher (*Megaceryle alcyon alcyon*) brought to me on December 24, 1931, by Alden Risser, proved to be rather heavily parasitized. Mr. Risser reported that the bird was unable to fly more than a few rods, and it was easily taken in the hand after a few such flights. Since no external injuries were apparent it was thought at first that starvation may have caused the weakness of the bird, for most of the fishing grounds of the kingfisher are frozen in this region at the season indicated. However, the stream near which the bird was taken was open in many places, and an examination of the stomach contents of the bird disclosed the remains of two small fishes, only one of which could be identified, a stickleback (*Eucalia inconstans*).

It was then found that the body cavity of the bird was nearly filled, especially about the liver, with nineteen filariid roundworms. These worms have since been identified by E. E. Wehr of the U. S. Bureau of Animal Industry, as *Monopetalonema physalurum* (Bremser) Diesing. Since this species has thus far been reported only from Brazilian kingfishers (*Alcedo* spp.) it does not seem unlikely that the present species may, on closer study, prove to be distinct. The female worms were about twelve to thirteen inches in length and the males about

Fig. 3. Aerial view of the Public Square, Cleveland, Ohio. The Square is located slightly below the center of the picture. The view shows, to some extent, the isolation of the Public Square from other open territory which might afford food or shelter to wild birds. There are a few small trees and shrubs in the fore quarters of the Square, where many of the birds were found; others were observed on the lawn and flower beds. Mr. Watterson's note in this issue is the fourth successive, annual census of the birds of the Cleveland Public Square published in the June numbers of the Wilson Bulletin.

six or seven inches, and nineteen such worms constitute a rather heavy infestation. Undoubtedly the blood of the bird must have been teeming with the microfilariae, but the bird had been dead so long when examined by me that a blood examination could not be made. In the particular group of roundworms to which this species belongs the larval worms are passed into the blood stream, from whence they are transferred to another bird usually through the agency of a blood sucking insect. Such a heavy infestation of the worms as the one here recorded was probably enough to account for the weakened condition of the bird. Another species of internal parasite, a fluke of the genus *Crassiphiala*, was pres-

ent in the intestines in large numbers, but there is no evidence that this worm has any pathogenic effect on the host.

In midwinter the Belted Kingfisher is not ordinarily present in Minnesota, except in very mild winters, and even then it is found only rarely. Certainly a bird with the filariid infection of the one here reported would not be able to migrate any great distance, and it seems entirely possible that others of the birds which do remain over winter may have been prevented from migrating by such parasitic infections, or other factors, tending to weaken them. It is true, however, that only a very small percentage of worm parasites have such serious effects on their hosts.—Gustav Swanson, *Minneapolis, Minn.*

The Snowy Owl in Iowa.—The recent papers by Gross (*Auk*, XLIV and XLVIII) and Hicks (*antea*, XLIV) very ably supplement the investigations instigated by Ruthven Deane relative to the periodic invasions of the Snowy Owl (*Nyctea nyctea*) into the United States and southern Canada. These invasions were found to have been most pronounced during the winters of 1876-77, 1882-83, 1889-90, 1892-93, 1896-97, 1901-02, 1905-06, 1917-18, 1926-27, and 1930-31.

In the summaries treating of these occurrences there appears to be a lack of Iowa records, from which one might conclude that the birds had not been present. Such has not been the case. Anderson (*Birds of Iowa*, 1907) cites records of one in Kossuth County in 1900; nine in Mitchell County during the winter of 1883-84; and many in Woodbury County during February, 1883. Widmann (*Birds of Missouri*, 1907) lists records of this owl at Keokuk, Lee County, on November 20, 1895, and December 6, 1886. Bailey (*Bull. 6, Iowa Geol. Survey*, 1918) indicates the occurrence (without dates) of this species in the following Iowa counties: Lee, Des Moines, Van Buren, Lucas, Decatur, Madison, Mills, Boone, Johnson, Cedar, Linn, Benton, Winneshiek, Floyd, Winnebago, Palo Alto, Clay, Buena Vista, and Woodbury. Stephens (*Proc. Iowa Acad. Sci.*, XXV, 1918) gave a useful summary of the Snowy Owl in the Missouri Valley, near Sioux City, from 1900. He states that, "In going over Mr. Anderson's records I find that he has mounted forty-six specimens of Snowy Owls between 1900 and 1917. While he has never had so many in one season as in this year, yet in the winter of 1905-06 he received thirteen specimens." A list of forty specimens taken or seen during the winter of 1917-18, is contained in this paper, of which twenty-three were from Iowa. Recently Youngworth (*antea*, pp. 32-33) recorded four occurrences of the Snowy Owl during December, 1929, January and February, 1931, in southwestern Minnesota and southeastern South Dakota.

Probably the most important records that we have of the Snowy Owl in Iowa, South Dakota, and Nebraska are contained in the material secured by D. H. Talbot and his collectors between the years 1884 and 1887. The forty-nine specimens in this collection, now in the Museum of Natural History, University of Iowa, are from the following localities: Twenty-three are from northwest Iowa; eight are from (South) Dakota; one from Nebraska; and seventeen without locality. Most of these specimens were sent to Talbot by hunters, but some few were secured on his farm in Woodbury County. The fact that Talbot could accumulate such a number of these birds, during seasons which were not generally recognized as invasion years, leads to the conclusion that the Snowy Owl formerly, at least, was a more or less regular winter visitor into the northwestern corner of the state.

In addition to the twenty-three Talbot specimens listed below, the Museum contains three other Iowa specimens; two from Johnson County (one without date, the other March 17, 1890); and one from Forest City, Winnebago County, March, 1901.

Museum No.	Sex	Locality	County	Date
8752	Male	Sioux City	Woodbury	March 17, 1884
8768	Female	Bradgate	Humboldt	Dec. 17, 1884
8722	Male	Aurelia	Cherokee	Jan. 13, 1885
8714	Male	Sioux City	Woodbury	Dec. 12, 1885
8711	.....	Sioux City	Woodbury	Dec. 23, 1885
8743	.....	Alta	Buena Vista	—— —, 1885
8777	Male	Jolley	Calhoun	—— —, 1885
8731	.....	Hawarden	Sioux	Jan. 3, 1886
8717	Male	Sibley	Osceola	Jan. 19, 1886
8770	.....	Sioux City	Woodbury	March 7, 1886
8746	Female	Sloan	Woodbury	Dec. 17, 1886
8747	Male	Merrill	Plymouth	Jan. 23, 1887
8772	Male	Plover	Osceola	Jan. 24, 1887
8744	Male	Sheldon	O'Brien	Jan. 25, 1887
8736	Male	Sioux City	Woodbury	March 14, 1887
8737	Male	Sioux City	Woodbury	March 15, 1887
8751	Male	Sioux City	Woodbury	March 17, 1887
8767	Male	Hospers	Sioux	March —, 1887
8727	Female	Sioux City*	Woodbury	April 16, 1887
8741	Female	Sioux City	Woodbury	—— —, ——
8778	Male	Little Sioux	Harrison	—— —, ——
10379	Male	Sioux City	Woodbury	—— —, ——
10382	.....	Rock Rapids	Lyon	—— —, ——

*Died in captivity.

—Philip A. DuMont, *Museum of Natural History, University of Iowa, Iowa City, Iowa.*

The Blue Goose in Kentucky.—On March 13, 1933, when the great tornado came in this vicinity, three Blue Geese (*Chen caerulescens*) "blew in" at my temporary lake near here, the first I have ever seen outside a zoological garden. I have visited the three geese twice, and have found them fairly tame. They probably were attracted by some Canada Geese which have been on this farm for many years. Several times I made them fly to be sure that I was seeing all their colors; they would circle around over the fields and come back to the same pasture where they had been feeding. Two are adults, the other immature. On the same temporary lake, which has again been large this winter, I have seen Mallards, Pintails, Blue-winged Teal, Coots, Yellow-legs, Wilson's Snipes, Pectoral Sandpipers, and hosts of ducks that were too far away for me to be sure of, even with my glasses. Yesterday there were some 500 ducks alone on the pond. The water is now over about 100 acres, but it has been more than twice that high this winter.—Gordon Wilson, *Bowling Green, Ky.*

Early Snowy Owl Records from Nebraska, Iowa, South Dakota, and Minnesota.—Following Mr. DuMont's note seems to be a proper place to record some relatively early captures of the Snowy Owl in the Missouri Valley country. So far as I know, none of these records has been published previously. All of the specimens here noted were mounted by Mr. A. J. Anderson for hunters who wished to have them for trophies or for ornamental purposes. Mr. Anderson was the leading taxidermist in Sioux City for many years. In later years, after

making contacts with other ornithologists, Mr. Anderson was careful to sex his specimens and also to attach a serial number to all specimens handled by him. The earlier specimens lack both number and the sex designation. The data for locality and date were copied by me from Mr. Anderson's ledger book records two or three years before his death in 1923. So, in this tabulation of material, only two data can be given for each specimen.

December	30, 1900.	One, probably from South Dakota.
January	21, 1902.	One, from Crystal Lake, Dakota County, Nebr.
January	26, 1902.	One, from Mt. Vernon, S. D.
December	21, 1902.	One, from Marcus, Cherokee County, Iowa.
February	22, 1903.	One, from Struble, Plymouth County, Iowa.
February	10, 1904.	One, from Parkston, S. D.
February	19, 1905.	One, from Sioux City, Woodbury County, Iowa.
November	13, 1905.	One, locality unknown.
November	19, 1905.	One, from Struble, Plymouth County, Iowa.
November	29, 1905.	One, from Struble, Plymouth County, Iowa.
December	3, 1905.	One, from Sioux City, Woodbury County, Iowa.
December	13, 1905.	One, from Hinton, Plymouth County, Iowa.
December	13, 1905.	One, from Laurel, Cedar County, Nebr.
December	26, 1905.	One, from Woodbury County, Iowa.
January	3, 1906.	One, from Lake Park, Dickinson County, Iowa.
January	13, 1906.	One, from Menno, S. D.
January	29, 1906.	One, from Lake Park, Dickinson County, Iowa.
February	13, 1906.	One, from Zeeland, N. D.
February	15, 1906.	One, from Zeeland, N. D.
February	26, 1906.	One, from Zeeland, N. D.
December	8, 1907.	One, from Sioux City, Woodbury County, Iowa.
December	16, 1908.	One, from LeMars, Plymouth County, Iowa.
May	5, 1909.	One, from Crystal Lake, Dakota County, Nebr.
December	25, 1909.	One, from Ethan, S. D.
January	4, 1910.	One, from Milltown, S. D.
January	4, 1910.	A second one, from Milltown, S. D.
January	11, 1910.	One, from Hinton, Plymouth County, Iowa.
January	13, 1910.	One, from Milltown, S. D.
January	13, 1910.	One, from Wessington Springs, S. D.
January	16, 1910.	One, from Sioux City, Woodbury County, Iowa.
February	1, 1910.	One, from Wessington Springs, S. D.
February	4, 1910.	One, from Sioux City Bird Store, locality unknown.
February	10, 1910.	One, from Jackson, Dakota County, Nebr.
February	26, 1910.	One, from Curio Store, locality unknown.
February	28, 1910.	One, from Sioux City, Woodbury County, Iowa.
March	7, 1910.	One, from Sergeant Bluff, Woodbury County, Iowa.
November	13, 1910.	One, from Scotland, S. D.
January	16, 1911.	One, from Knight's Store, locality unknown.
January	21, 1911.	One, from Zeeland, N. D.
February	21, 1911.	One, from Aberdeen, S. D.
December	31, 1913.	One, from Freeborn, Minn.
February	20, 1914.	One, from Sioux City, Woodbury County, Iowa.
November	20, 1914.	One, from Curio Store, locality unknown.
November	21, 1914.	One, from Zeeland, N. D.
December	11, 1914.	One, from Centerville, S. D.
February	1, 1915.	One, from Centerville, S. D.

This list accounts for the forty-six specimens of Snowy Owls referred to in my previous paper (1918), except one which I have now eliminated because of uncertain data. With the publication of these notes, together with the Talbot specimens reported by Mr. DuMont, we have a fairly comprehensive history of the Snowy Owl, in what we have been accustomed to call the "Upper Missouri

Valley", over a period of nearly fifty years. The Anderson specimens listed herein make a good contribution to the flight of 1905-1906. And they also show a strong flight during the winter of 1909-1910 which seems not to have been hitherto recognized as a major flight.—T. C. Stephens, *Sioux City, Iowa.*

The 1932 Fall Flight of Ducks through Northwestern Iowa.—In connection with some waterfowl studies carried on in Clay and Palo Alto Counties, Iowa (Virgin, Round, Lost Island, Trumbull, and Elk Lakes, Green and Brown Sloughs) data were obtained on the 1932 fall flight of the species listed below. Clay and Palo Alto Counties are representative of the best waterfowl country in the state. Reference in this note is meant only to migrants, not to ducks breeding in the area.

Wood Duck. *Aix sponsa* (Linnaeus). The total number of these ducks seen did not exceed one hundred. They were observed from September 15 to October 12, being most numerous from October 9 to 12.

Hooded Merganser. *Lophodytes cucullatus* (Linnaeus). The flight of this species, if it can be called a flight, coincided with that of the Wood Duck. Possibly twenty-five were seen.

Ruddy Duck. *Erismatura jamaicensis rubida* (Wilson). This duck was seen frequently from September 28 to October 17. Probably several thousand passed through the region during the season. They were most abundant from October 11 to 17.

Shoveller. *Spatula clypeata* (Linnaeus). Shovellers were observed from September 27 to November 10, with the greatest numbers noted between October 12 and 19. They were quite common until forced southward by a three-day blizzard beginning November 8.

Baldpate. *Mareca americana* (Gmelin). Although this duck was not present in large numbers it was taken frequently by hunters. It was observed from October 1 to 17, particularly the last four days of the period.

Red-breasted Merganser. *Mergus serrator* (Linnaeus). Observations made on this duck were similar to those of the Wood Duck and the Hooded Merganser. Hardly enough were seen to constitute a true flight. About twenty birds were killed or observed between October 13 and 18.

Buffle-head. *Charitonetta albeola* (Linnaeus). Very few of these ducks were seen. A number were reported as having been killed around October 15.

Blue-winged Teal. *Querquedula discors* (Linnaeus). The heaviest flight of Blue-winged Teal occurred from October 15 to 22, and the birds were present in lesser numbers until forced out by the blizzard of November 8.

Gadwall. *Chaulelasmus streperus* (Linnaeus). Very few of these ducks were seen or taken, but the species was most conspicuous between October 16 and 21.

Lesser Scaup. *Nyroca affinis* (Eyton). This duck was plentiful throughout the fall until about November 10. The greatest numbers were observed from October 19 to 25.

Ring-necked Duck. *Nyroca collaris* (Donovan). Small numbers of this species were present during the month of October. They were almost always seen with the Lesser Scaup, and their flight, if a true flight, was at the same time.

Green-winged Teal. *Nettion carolinense* (Gmelin). Great numbers passed through this territory between Oetober 21 and 25. Their presence was noted from the latter part of September until November 10.

Canvas-baek. *Nyroca valisineria* (Wilson). This deep water bird was observed only on Virgin and Elk Lakes. Two floeks of between fifty and sixty were noted from Oetober 25 to November 5. They were last seen November 10.

Redhead. *Nyroca americana* (Eyton). About two hundred birds of this diving species were seen on Virgin and Elk Lakes. The main flight was from October 27 to November 6. Between seventy-five and one hundred remained in that locality until November 10.

Pintail. *Dafila acuta tzitzihoa* (Vieillot). Migrating birds were seen from the latter part of September until November 10. The Pintail was one of the most abundant species, the main flight extending from November 5 to 10.

Mallard. *Anas platyrhynchos* (Linnaeus). Our most plentiful and most popular duck was present in large numbers from the latter part of September throughout the fall and winter. The strongest flight took place between November 5 and 10.

Black Duek. *Anas rubripes tristis* (Brewster). Although few dueks of this speeies were taken, I suspeet that migration was contemporaneous with that of the Mallard.

The fall flight of 1932 through this region was early. By the end of October all speeies of dueks exeept the Mallard and Pintail had reached the peak of their migration; the final flight of the latter two was precipitated by the snow storm and eold weather of November 8. Virtually the only dueks remaining after November 10 were several thousand Mallards that spent the winter on Round Lake.—Logan J. Bennett, *Ames, Iowa.*

An August Day's Toll of Birds' Lives on Primary Iowa Roads.—Like many other travelers by auto, the author at times has busied himself by eounting the remains of dead birds on the road ahead. Several times he has pondered over the number of birds that might be destroyed in one day on the primary roads of the state. Last August (1932) opportunity was afforded to get an estimate of the numbers destroyed daily. Several days about the middle of August brought us sueeessive heavy rains that, with the assistanee of the auto wheels, swept the roads elean of all refuse. August 18 was mostly clear and the dead birds accumulated to remain on the highway. After the start at 7:30 A. M., August 19, the author, driving thirty miles on pavement north and west of Ames, counted as dead twenty-three English Sparrows and one adult Red-headed Woodpecker, vietims of August 18. The loeations of the remains were recorded by speedometer readings. On the morning of August 20 observations made during a drive over the same thirty miles added seventeen English Sparrows, four Red-headed Woodpeckers (three adult, one immature), and one Northern Flicker to the toll, as the kill of August 19. In those two days at least forty English Sparrows, five Red-headed Woodpeekers, and one Flicker were in the toll of bird lives taken over thirty miles of pavement: and the average was twenty-three birds per day. If the same ratio held true for eaeh of the 7,290 miles of improved primary highways in Iowa, a day's kill in August might total 5,589 birds of whieh English Sparrows might number 4,860.—George O. Hendrickson, *Iowa State College, Ames, Iowa.*

Notes on Waterfowl in Central West Virginia.—Since published records of water birds in West Virginia are scarce, I will record some recent observations. On the morning of November 2, 1932, we had what was, for central West Virginia, an unusually heavy flight of wild ducks and geese. On that morning I was fortunate enough to be taking a group of students on a field trip along the Buckhannon River, in Upshur County, and we recorded five flocks of geese and twenty of ducks in an hour. Most of the ducks were scaups, but two which alighted quite close to us were Shovellers. These were carefully observed with 6x glasses. Later in the day I examined a specimen of Bufflehead killed by Mr. B. A. Hall of Buckhannon, West Virginia. Both of these latter ducks are considered rare in this state.

On December 26, 1932, I saw an American Bittern flying along French Creek, in Upshur County. This is an exceedingly rare winter species in this locality.—Maurice Brooks, *French Creek, W. Va.*

Winter Range of Tufted Titmice.—Tufted Titmice (*Baeolophus bicolor*) have visited my traps during only three of the six winters that we have spent in Columbus, namely, 1927-28, the following fall, and 1932-33. They were here in considerable numbers from October to the middle of April, and thirteen were banded with aluminum and celluloid bands. During the early part of the winter the birds remained in small flocks with definite ranges; the flock of eight birds which fed daily at my shelf trap ranged over about twenty acres. Other flocks of approximately the same size were met to the north, west, and southwest of the home flock. The latter part of February the flocks broke up and I began to catch my banded birds (as well as unbanded ones) in the traps set for Song Sparrows (*Melospiza melodia beata*) more than a quarter mile from our house, besides getting two new birds in the range of the home flock.

The weights of the titmice varied between 20.3 and 25.3 grams, the median of thirty-five findings being 22 grams. The lightest bird yielded six weights ranging from 20.3 to 23.7 grams, the heaviest seven weights ranging from 23.1 to 25.3 grams. No tendency to grow fat in winter was found with these birds, in contrast to the behavior of the Song Sparrows here.—Margaret M. Nice, *Columbus, Ohio.*

A Day with the Bald Eagles.—On March 2, 1933, I visited a few nests of the Bald Eagle (*Haliaeetus leucocephalus*) which were already known to me in James City County, Virginia. After breakfast we headed for Jamestown Island, where Captain John Smith and the early Virginia settlers landed. There were two eagle nests on the island which had been used each season for at last twenty years, and collecting eggs from a place so rich in historical interest appealed to me more than usual, so the trip was anticipated with much pleasure. The Bald Eagles of this section of the state invariably build their nests in live original growth long-leaved pines (*Pinus palustris*), and never build in dead trees like the Ospreys nearly always do. Sometimes the tree dies after they have had their nest in its for a number of years, and where this occurs they will continue to use the nest until it falls. The nest is never found far from water, as their food supply comes from the rivers and ponds where fish, ducks, and muskrats can easily be procured.

We drove the car to the lower end of the island, and parked only a few hundred yards from the nest. Nest No. 1 was in a pine growing along the edge of the tidewater marsh, and before we reached the tree the old white-headed

female eagle left the nest, and the racket that she made soon brought her mate to the scene. They both circled around the tree continuously, but did not come very close to us. The nest tree was not as large as those usually harboring eagles' nests, so getting to the nest was not much trouble. To reach the top of the nest was another problem, and it took nearly an hour to pull out part of the bottom and side of the nest so as to clear up a limb on which to climb around the nest. With a very high cold wind blowing in from the bay this proved to be a cold experience, but the top of the nest was finally reached and the three eggs lowered to the ground in a binocular case. These eggs proved to be odd, in that they were glossy like the eggs of the woodpeckers. Incubation had gone on about ten days. The distance from the ground to the top of the nest was seventy-seven feet. The outside of the nest was ten feet deep by five and one-half-feet across the top and seven feet in diameter near the middle. The interior was fourteen by five inches.

Nest No. 2 was supposed to be in a dead tree less than half a mile distant, but as the tree was in plain sight and no nest could be seen we knew that the tree had broken off with the accumulated weight of the nest. Before we reached the old tree we could see the nest in a green pine close by, and while still some distance away several deer which we jumped in passing close to the nesting tree flushed the old bird from the nest. This eagle did not make much of a disturbance, owing to her eggs being newly laid, and after making a few wide circles and getting into an argument with some Fish Crows, she left and was not seen again. This tree was a large one, forty-two inches in diameter and an even ninety feet to the nest, which was reached without any difficulty. Two eggs were collected and lowered to the ground. The nest proved to be new, and had been built only this year, as the old nest had fallen just a short time ago. The exterior width was four and one-half feet, and the exterior depth was four feet. The interior measurements were sixteen by twelve inches. We next went over to take a look at the old nest, or what used to be a nest, and found that the old birds had repaired it this season, apparently with the expectation of raising another family there. Quantities of fish bones and feathers were found throughout the whole nest, and the amount of material which comprised the nest was fifty-one cubic feet. This ended the morning and we drove back to town for dinner.

In the afternoon we visited a nest on Green Spring farm, the former home of Governor Bacon of colonial days, but it developed that a bootlegger had killed one of the eagles two weeks previously and the other bird had deserted the nest. This nest was two years old and built near the top of a large pine leaning over a marsh along the James River, and from the way the bark was scratched many raccoons had been using it for a sun parlor at times. The top of the nest was flat and measured six feet wide by three and one-half feet deep. Previous to building here the eagles had occupied a pine tree a short distance away, and owing to the limbs not being properly spaced for continuous building from year to year, the eagles had a three-story affair. Two years ago lightning struck the tree and killed it, after which the eagles deserted it and took the nest of a Red-tailed Hawk as the foundation of their new nest.

Nest No. 4 was on Pine Dell, in a dense swamp making back from the river, and not having been to the nest for two years I became confused in my bearings, and after walking around for about an hour I had to make a fresh start from where I first went into the swamp. This time I did better, and on arriving at

the tree found that the old eagle was at home. This nest also was in a large green pine, ninety-seven feet up from the ground, and was three years old. This nest contained two eggs which were considerably larger than those collected in the morning. They measured 3.03x2.35 and 2.88x2.37, and were incubated about ten days. The exterior of the nest was six feet in width by four feet in depth, and the interior was twelve by six inches. The bulk of the nest, as all others, was composed of sticks with enough discarded ones lying around the base of the tree to build a fair-sized nest. The lining was of shredded cedar bark and green pine twigs, while the other three were lined with marsh grass, cattail down and seaweed.

By the side of an old fish pond was an eagle's nest which I used to regard with admiration when a boy, and whenever in the neighborhood I generally pay it a visit. To pass it by this time would have made it seem that something was lacking in the day's program with the eagles. Long before we reached the nest we could see it plainly, even through the big timber, and on account of the isolated situation the birds were not wild at all. The old eagle did not leave the nest until we were at the foot of the tree. This pine tree was still living and one of the few nest trees which I never had any designs on collecting the eggs from, as it must have been ninety feet to the first limb and no trees growing very close to it. The nest was at least fifty years old, and it was one which most any eagle could be proud of, if bulk were taken into consideration. Going around to another cove of the pond I counted seventeen eagles sitting in one pine tree and quite a number of others flying around. These were all in immature plumage, some appearing almost black, others gray and some having a mottled appearance. This is not unusual, however, for I have frequently seen flocks of immature eagles, but not as many together as on this occasion. As far as I have observed the eagles do not breed until past four years old, for none but the white-headed ones were ever seen at a nest. I had other nests in view which in the beginning I had intended to visit before returning home, but as the eggs were further advanced in incubation than I wanted them, I decided that day with the eagles was sufficient for the season.—F. M. Jones, *Independence, Va.*

The Iowa Specimen of Pacific Loon Re-examined.—On November 16, 1895, an immature male Pacific Loon (*Gavia arctica pacifica*) was shot by W. H. Eldredge of Sabula. This bird was swimming in the Mississippi River in front of the town of Sabula, Jackson County, Iowa. The specimen was given to Harold J. Giddings, who mounted it, and since that time (except for a few months when it was forwarded to the Biological Survey, Washington, D. C., for examination) it has remained in Mr. Giddings' collection at his farm home, three miles northwest of Sabula.

This specimen was examined by the writer on April 15, 1933, and its identity as *Gavia a. pacifica* was satisfactorily corroborated. This loon is in winter plumage with the throat and entire underparts white, somewhat discolored due, no doubt, to the many years it has stood as an *objet d'art* in the "sitting room" of the Giddings' home. Each dark feather on the back of the bird is faintly margined with grayish, an entirely different pattern than the spotted-backed appearance of *Gavia stellata.*

Measurements of the specimen, in inches, recently taken by the writer are: wing, 11.95; tail, 2.28; tarsus, 2.70; exposed culmen, 2.02; depth of culmen at base, .54; depth of culmen at nostril, .48; culmen from nostril, 1.53. The dis-

tance from the base of the culmen to the anterior point of the loral feathers is less than from the latter point to the anterior extremity of the nostril. The culmen is slightly convex and definitely does not have the concave line at the nostril, as found in *G. stellata*. The length of the tarsus is less than the inner toe with claw.

R. M. Anderson (*Birds of Iowa*, pp. 151-152, 1907) includes the account of the capture of this bird published by Giddings in the *Iowa Ornithologist*, II, p. 73, 1896. Anderson stated that the bird was taken by Mr. W. Eldridge, while it was swimming in the Mississippi River a little way from the shore opposite Sabula, on November 15, 1895. The slightly different details of its capture as I have stated them above were contained in a letter received from Mr. Giddings on October 11, 1932, and recently verified at the time of examining the specimen.

F. Seymour Hersey has shown (*Auk*, pp. 283-290, 1917) that all records of *Gavia arctica* from the United States and Canada actually refer to *G. a. pacifica* or to some other species of loon, the range of the Siberian bird being restricted to the west coast of Alaska, with a straggling record at Victoria, British Columbia. Based upon Hersey's study, no doubt, the A. O. U. Check-List, 4th Edition, stated the wintering range of *G. a. pacifica* as, "mainly on the Pacific coast of North America from southeastern Alaska and British Columbia to southern Lower California. Accidental in Arizona, New Mexico, New Hampshire, and New York (Long Lsland)." It should now be amended to include this single Iowa occurrence.—Philip A. DuMont. *Museum of Natural History, University of Iowa, Iowa City, Iowa.*

Cardinals Re-claim a Deserted Nest.—On May 2, 1932, I found the nest of an Eastern Cardinal (*Richmondena cardinalis cardinalis*) containing a single egg of the Eastern Cowbird (*Molothrus ater ater*). On May 6 the nest still contained the single egg, and I decided that the Cardinals had deserted the nest. I had observed on a number of occasions that if a Cowbird deposits an egg in the nest of another bird before it is finished, or before the owners of the nest have deposited an egg, the owners will, almost without exception, desert the nest. On the other hand, if the Cowbird is patient enough to wait until the owners of the nest have deposited even one egg, before depositing her own, she may rest content that her egg or eggs will almost always be accepted and cared for.

I do not know what I had in mind on May 6, 1932. I didn't expect the Cardinals to return. But the parasitic habits of the Cowbird exasperate me at times, and I tossed the egg out of the Cardinal's nest. And the Cardinals returned! On May 7, the nest contained one of their eggs; on May 8, another, and so on until four eggs were laid. In due time three young Cardinals clamored for food, one egg having failed of the proper issue. Again the parent birds deserted the nest, now sadly showing signs of abuse, but the three youngsters accompanied them.

I wondered why the Cardinals had returned to the deserted nest. Surely they had not been idle during those days when the nest housed a Cowbird's egg. I was inclined to believe that a second attempt at nest building elsewhere had met with failure and they, in passing, had discovered that the first built nest had in some inexplicable way again become fit for Cardinal habitation, and had hastened to benefit by the discovery.—Grant Henderson, *Greensburg, Ind.*

Large Flocks of the Golden Plover and White Pelican Near Sioux City, Iowa.—On October 20 and 21, 1931, the writer had the pleasure of watching the activities of a good many Golden Plovers (*Pluvialis dominica dominica*). On the first day I counted flocks of twenty-six, forty-seven, and twenty-five birds, and estimated two other flocks at forty and two hundred birds. The plovers were feeding on fields that had been planted with winter wheat and the sprouts were about two inches high. One field of wheat which was four or five inches high was frequented by one small flock of birds, but in every other case the birds were found on the more open fields. The second visit to these bottoms, about fifteen miles below Sioux City, found most of the birds gone, and only about one hundred birds were seen.

The first fall migrant White Pelicans (*Pelecanus erythrorhynchos*) were seen on October 1, when a flock of fifteen birds were seen on the Missouri River. The afternoon of October 4 furnished an inspiring sight, when a flock, carefully estimated at from 2,000 to 2,500 pelicans, was seen over the Missouri River about twelve miles south of Sioux City. The great mass of birds circled and milled around for a long time, and gradually passed to the south. I was just ready to start for home, when I happened to look toward the river and saw another cloud of white appearing from the north. The second flock contained between 1,000 and 1,500 birds and was executing the same aerial maneuvers as the first group. These two flocks of pelicans must have constituted a considerable portion of all of the White Pelicans that still nest in the prairie provinces of Canada.—William Youngworth, *Sioux City, Iowa.*

ORNITHOLOGICAL LITERATURE

Les Oiseaux de France. By A. Menegaux. Published by Paul Lechevalier & Sons, 12 Rue de Tournon, Paris, VI. Pp. 1-290, figs. 1-107, col. pls. 1-64, 1932. Price, 50 fr.

In this pocket handbook in the French language we find just the book that many of us need to use in brushing up in our reading of French. The information will be sufficient to hold the interest and the exercise will carry its own reward. "The Birds of France" is projected as a series of three volumes, of which this one is the first. It contains an introduction to the study of ornithology and descriptive treatment of the birds of prey, the gallinaceous birds, the doves, and the woodpeckers. The second volume will contain the water birds, and the third volume will contain the passerine birds, "qui font le charme des campagnes franeaises".

The first part of this volume, consisting of the Introduction and covering the first 197 pages, includes brief discussions of zoological nomenclature, zoogeographical regions, structure of the bird, banding and migration, methods of collecting and caring for skins and eggs, insect pests of collections, and insect parasites of living birds. The second part of the volume, called the Atlas, is illustrated with sixty-four colored plates, one species to each plate. We judge that these portraits are produced by coloring the photographs of mounted birds. There is also an accompanying description of each species.—T. C. S.

A Distributional List of the Birds of Tennessee. By Albert F. Ganier. Tenn. Avifauna No. 1. Pub. by Tenn. Ornith. Soc. Nashville, 1933. Pp. 1-64. Price, 50 cents.

The author has produced a very serviceable bird list for his state. The total number of birds included in the list is 302, nine of which are, however, extinct, introduced, or accidental. The State of Tennessee is naturally divided into three regions, known as East, Middle, and West Tennessee, presumably ecological regions; the status of each species is given for these three regions. In order to contain all the data to be presented the format has been very much modifid from that of the usual list—almost approaching tabular form; but it is a very systematic arrangement of facts, and should facilitate the finding of information. The preparation of so complete a catalogue of information represents a great amount of work, and requires a detailed knowledge of an area which is possessed by few amateur ornithologists. Such a carefully prepared list establishes a new basis upon which to begin research.—T. C. S.

Game Management. By Aldo Leopold. Published by Charles Scribner's Sons, 597 Fifth Ave., New York. 1933. Pp. i-xxi+1-481, figs. 1-35, tables 1-53. Price, $5.00.

This is a new book in a relatively new field. The author draws a distinction between conservation and management in the following way: "The conservation movement has sought to restore wild life by the control of guns alone, with little visible success. Management seeks the same end, but by more versatile means. We seem to have two choices: try it, or hunt rabbits." We did not know that the two terms were in contra-distinction. We had looked upon management as a new factor, or method, in the conservation program—a means, not an end. However we may regard this matter, the management of game and wild life seems to be a progressive step. It is a positive, or constructive, program. Even with this new and constructive practice we will hardly be able to discard the regulatory effects of law, though we need not depend wholly upon the latter.

Just what is game management? This is what the book attempts to answer. The author calls game management the "art of making land produce sustained annual crops of wild game for recreational use". The reviewer, who has done at least desultory reading during the past twenty years on many of the problems of wild life, is nevertheless surprised at the mass of organized material, fact, and theory, brought together in this first comprehensive survey of the subject. Population density, cycles, radius of mobility, environmental and race tolerances, sex ratios, flock organizations—these are just a few of the topics in the theoretical discussion. Under the general heading "Management Technique" we find chapters on such matters as, measurement of game populations and census, life equations, game refuges, control of hunting, predator control, control of food and water, control of cover, control of disease, accidents, etc.

This is all very interesting and readable, even to the ornithologist. It is a scientific analysis and presentation of facts. The one thing that is not entirely clear to us is, what is the ultimate aim and goal of game management? In so far as it is simply restoration of native game many would find little fault, even though it is understood that excess populations will be used for hunting purposes. To what extent importation, introduction of exotic species, meddling with natural ranges, artificial breeding, etc., go along with the concept of

game management remains yet to be seen. These are probably the controversial topics, which possibly may dissipate as knowledge and understanding of facts and viewpoints develop. Every lover of nature is a conservationist at heart. He is an optimist, a philanthropist, an altruist, and hence he desires that some of this old world may be handed on to posterity as God made it, not altogether as man has improved it. And it is most reassuring to observe that such sentiments are now being held by an increasing proportion of game hunters. Apparently this book is written for, and undoubtedly reflects, the highest type of American sportsmanship. And it can not be other than fascinating reading for the bird lover.—T. C. S.

Water Birds of Reelfoot Lake. By Albert F. Ganier. Tenn. Avifauna No. 2. Revised and reprinted from Jr. Tenn. Acad. Sci., VIII, No. 1, Jan., 1933, pp. 65-83.

Fifty-nine forms of water birds are listed and annotated; a few species of land birds are mentioned in the introduction.—T. C. S.

Postjuvenal Molt and the Appearance of Sexual Characters of Plumage in Phainopepla Nitens. By Alden H. Miller. Univ. Calif. Pub. Zool., Vol. 38, No. 13, pp. 425-446, 1933.

It is interesting to note that the observations of Dr. Miller on the relation between gonadal development and feather pattern in the wild form, Phainopepla, tend to confirm the findings of Dr. Lillie and his colleagues on domesticated species. There is also the bare suggestion that variation in gonadal development, and hence in feather pattern, may be correlated with geographical distribution and climatic factors.—T. C. S.

A Statistical Study of Ohio Bird Life. By Lawrence E. Hicks and Floyd B. Chapman. Ohio Jr. Sci., XXXIII, No. 2, March, 1933, pp. 135-150, 2 figs., 2 tables.

A very interesting and useful study of accumulated data on winter bird life in Ohio.—T. C. S.

Abundance and Conservation of the Bob-white in Ohio. By S. Charles Kendeigh. Ohio Jr. Sci., XXXIII, Jan., 1933, p. 18.

The figures presented show that the population of Bob-white in Ohio has roughly trebled since the species was placed on a non-game basis in 1913: for a period of years it had more than quadrupled. The author repudiates the old argument that hunting improves the stock by scattering the covey and preventing inbreeding. The paper takes up a number of other very practical problems for consideration in the light of recent scientific theory. The conclusion is that it would be inadvisable to have a general open hunting season in Ohio; at most hunting should be confined to local areas where the species is sufficiently abundant, but the author does not say that he favors this.—T. C. S.

Birds of the Region of Point Barrow, Alaska. By Alfred M. Bailey, Charles D. Brower, and Louis B. Bishop. Program of Activities Chicago Acad. Sci., IV, No. 2, April, 1933, pp. 15-40. Price, 25 cents.

This paper gives a history of the ornithological work in the region of Point Barrow, covering an area of approximately one hundred and fifty miles inland. The list includes material collected by the authors, and summarizes the records in the literature. The list is, therefore, probably a comprehensive one. A bibliography is appended.—T. C. S.

Methods of Collecting and Preserving Vertebrate Animals. By R. M. Anderson. Bull. No. 69, Nat. Mus. Canada. 1932. Pp. i-v+1-141, figs. 1-46. Price, 25 cents in paper, 50 cents in cloth, and obtainable from the Director, National Museum of Canada, Ottawa.

This handbook is dated 1932, though distributed early in 1933. In it Dr. Anderson has prepared a vade mecum which will be most useful to all field collectors of vertebrates. The introductory chapter treats of the general principles of zoological collecting; other chapters deal with collecting mammals, skinning mammals, collecting and skinning birds, collecting cold-blooded vertebrates, and preparing skeletons. The mammals have received the greatest attention, but the chapter on making a bird skin is, we judge, quite complete. Directions are not given for mounting the specimens. The instructions for cleaning bones will be as useful to teachers as they are to museum workers. This is, by all means, the most practical and useful aid to the preparator which we have seen.—T. C. S.

Fauna of the National Parks of the United States. By George M. Wright, Joseph S. Dixon, and Ben H. Thompson. Fauna Series No. 1, Wild Life Survey, National Park Service, Washington, D. C., 1932, pp. 1-157, figs. 1-56. (Distributed, April, 1933). Price, 20 cents.

This report is the result of work by the Preliminary Wild Life Survey of the National Parks, with headquarters at Berkeley, California. We understand that this survey originated as a private enterprise, supported by private funds, but that in 1931 public appropriations were obtained which helped to finance the work and give it official status. The purposes of the Survey are stated to be 1) the establishment of a rational wild life policy for the National Parks; 2) to assist in the solution of wild life problems of immediate urgency; 3) to study the existing status of wild life in the Parks.

The present paper deals chiefly with the third of these objectives, and takes account only of the vertebrate life, chiefly the mammals; birds are very lightly touched. Perhaps we might say that the report deals mainly with the analysis of the problems and procedure. One very interesting point brought out is that the horses used for the pleasure of tourists are pastured in the Parks. These horses use food which should be left for the wild game. Since in many cases the public buys hay for the game during the winter the matter becomes also one of economy. The report also calls attention to the fact that removal of dead trees from the roadsides eliminates many nesting sites of certain birds, and reduces the chances of visitors seeing such species. Whether in practice these trees are removed except in the interest of safety is not shown.

In certain of the Parks oil has, apparently, been spread upon the lake waters for the benefit of human inhabitants, and to the harm of wild life, especially birds. These are examples of the many wild life problems arising in the administration of the Parks, and which this report aims to gather up for analysis and solution.

Numerous references to the literature are given in the foot-notes; nevertheless we believe the usefulness of the report would have been considerably increased by a bibliography of literature relating to the wild life of the Parks.—T. C. S.

Temperature and Relative Humidity in Relation to the Ending of the Evening Song of Birds. By Paul R. Elliott. Journ. Tenn. Acad. Sci., VII, No. 3, 1932, pp. 204-213.

This rather technical paper is especially instructive in showing the method of studying the problem indicated in the title. Ten of the more common birds were studied. The Mockingbird seemed to show a temperature correlation, but in the other cases it did not seem to be evident. The analysis of the external physical factors regulating song seems to be still a very wide and open field for study, and deserves more attention from field workers.—T. C. S.

1. Blood Money for the Audubon Association. By Mrs. Edward Breck. Published by the Anti-Steel-Trap League, Inc., 1731 K St., N. W., Washington, D. C.
2. Conservation To-Day. By Rosalie Edge. Emergency Conservation Committee.
3. Hands Off Yellowstone Lake. Emergency Conservation Committee.
4. Blacker than the Crow. Emergency Conservation Committee, 113 East 72d St., New York, N. Y.

These are all militant leaflets in behalf of wild life, and should be read by everybody whether they agree or disagree. It would not seem that there is any chance to impute selfish motives to this propaganda.—T. C. S.

Scientific Studies of Natural Flight. By Maurice Boel. Aeronautical Engineering, Vol. I, No. 4, Oct.-Dec., 1929, pp. 217-242.

The author discusses flight under four headings, viz., gliding, soaring, flapping, and propulsive flight. He defines gliding flight as the descent of a body at constant speed following a trajectory somewhat inclined to the horizontal. Soaring flight is a passive form which depends upon vertical air currents for motive power. Flapping flight "appears to be the most ingenious and perhaps the most efficient process of aerial locomotion known . . . it can be represented as a succession of short descents in gliding flight". Propulsive flight, the author says, is a special type of flight utilizing the primary wing feathers for horizontal translational motion. "To this class of fliers belong certain birds of prey such as the condor, the vulture, and the eagle". In experiments with a vulture the removal of the forward barbs of the primaries resulted in inability to fly.—L. W. Wing.

1. The Protection of Hawks and Owls in Ohio. By S. Prentiss Baldwin, S. Charles Kendeigh, and Roscoe W. Franks. Ohio Journ. Sci., XXXII, No. 5, Sept., 1932, pp. 403-424.
2. The Birds of Prey. By George E. Hix. Pp. 1-32. 1933. Privately published. Price, 25 cents. Order from the author, 337 72d St., New York, N. Y.
3. Food Habits of Southern Wisconsin Raptores. Part II, Hawks. By Paul L. Errington. Condor, XXXV, Jan.-Feb., 1933, pp. 19-29.
4. Hawks and Owls of Ontario. By L. L. Snyder. Toronto, 1932. (Previously cited in these pages, *antea* page 126).

The numerous papers on the economic aspect of hawks and owls, which have appeared recently, indicate a considerable interest in the subject; and it is possible that officials and the public may yet be stimulated into a correct attitude towards the birds of prey. The paper by Dr. Baldwin and colleagues (No. 1 above) contains important data on the numbers of hawks and owls in Ohio at

present. It also presents a helpful summary of the arguments against the continued devastation of these birds. A valuable bibliography is included.

The paper by Mr. Hix (No. 2 above) is written especially for the instruction of Boy Scouts. The species treated are those which "are more or less generally distributed over North America", and hence the pamphlet will be useful as a Scout guide on hawks and owls in most parts of the country, giving, as it does, descriptions of structure and habits.

The paper by Dr. Errington (No. 3 above) presents numerous original facts upon the food habits of certain hawks. The studies are especially full on the Marsh Hawk, the Red-tailed Hawk, and two or three of the injurious species, as the Goshawk, the Cooper's Hawk, and the Duck Hawk.

Mr. Snyder's pamphlet (No. 4 above) is also a good general guide in identification and on the habits of these birds. All of them are probably still available. No. 1 may probably still be obtained as a reprint from Dr. S. P. Baldwin, Gates Mills, Ohio. No. 2 is obtainable as mentioned above. No. 3 may not have been issued separately. No. 4 may be secured from the Royal Ontario Museum of Zoology, Toronto, Canada, for 35 cents. Reprints of Mr. Gloyd's paper on the diurnal raptores (published in the Wilson Bulletin for September, 1925) may be obtained from the Editor for eight cents in stamps.—T. C. S.

Unintelligent Nest Building. By Paul Amos Moody. Vermont Botanical and Bird Club—Joint Bulletin, No. 15, May, 1932, pp. 18-22.

Dr. Moody discusses an interesting case of interruption of the mechanism of chain reflexes in nest building. Wind blew away the nest materials as fast as the bird brought them, but she kept on until many times the necessary amount of material had been wasted; and finally she laid three eggs on the bare surface where the nest should have been—and the eggs were blown off too. At this stage efforts at this location ceased. What is the psychological explanation? The study of bird behavior is in its infancy, but it offers a fascinating and promising field.—T. C. S.

Birds of Keweenaw Point, Michigan. By Norman A. Wood. Reprinted from Papers of the Mich. Acad. Sci. Arts, Letters, Vol. XVII, 1932, pp. 713-733.

The area considered in this paper is the largest promontory of Michigan projecting into Lake Superior, and is noted as a copper mine region. The observations were made in the spring of 1931. The list includes 121 forms. The author refers to Kneeland's observations in the same region in 1856-57 and his list of 147 species (Proc. Boston Soc. Nat. Hist., VI, pp. 231-241). The long period of time between the two studies should offer an opportunity for an interesting comparison, especially if significant changes could be found. Considerable attention has been given to Isle Royal, and it is rather surprising to find that no more attention has been given to the area treated in this paper.—T. C. S.

The Annual Bulletin for 1933 of the Illinois Audubon Society was distributed during the spring. Mr. Tappan Gregory presents a narrative of some field work in northern Michigan, showing two very unusual flashlight photographs, one of a Bald Eagle and one of a Ruffed Grouse. Dr. Lewy and E. R. Ford recount their field experiences in northern Minnesota. A. M. Bailey presents some excellent photographs of a female American Eider Duck on her nest. Clayton H. Tanner describes the flocking behavior of the Purple Martin, and

mentions their habit of daytime roosting on the roofs of buildings. Many other interesting items are included. The Annual is published by the Society, with headquarters at the Chicago Academy of Sciences, Lincoln Park, Chicago.

Since our last survey of the ornithological literature which has reached us, a new printed serial has appeared, the *Nebraska Bird Review*. It is the official organ of the Nebraska Ornithologists' Union, is published quarterly, and the two numbers thus far received have had 24 and 32 pages respectively. Prof. M. H. Swenk is the Editor. Since he is also the Secretary-Treasurer of the Union, all subscriptions should be addressed to him at 1410 N. 37th St., Lincoln. The rate is $1 per year in the United States, and $1.25 elsewhere. The January number contains a census of the birds along a five-mile strip of highway in central Nebraska, thirty years ago, by the late J. M. Bates. Eleven pages of interesting general notes make up the bulk of this issue. The April number is equally readable, and the Society and its Editor are entitled to praise for the quality of material and the neatness of format. This organization has now passed its thirty-first annual meeting.

The *Raven* has appeared at regular monthly intervals since our last account. The February, 1933, number contains the minutes of the fourth annual meeting. The March number is taken up entirely with "A brief history of Virginia Ornithology", by James J. Murray. This paper seems to be an excellent example of the type of a preliminary survey of ornithological literature which many states now need. It probably should not be qualified as "preliminary", since it is a complete survey in every respect.

The *St. Louis Bird Club Bulletin* is being issued monthly in mimeographed form. The March, 1933, number gives special attention to the European Tree Sparrow, which was imported and established in the St. Louis region in 1870. The status of this species in our country is a matter of interest to all ornithologists. A feature of each number is the "Widmann Column", presenting a timely communication from Mr. Otto Widmann.

The *Chickadee* is the organ of the Forbush Bird Club at Worcester, Mass. The frequency of issue and the number of pages (mimeographed) of material indicate the activity of this eastern bird club. In an article on plumage changes in the most recent number, Mr. Thomas F. Power, Jr. has some interesting remarks on the variation in iris color in individual birds, and the apparent seasonal change in such pigment. Mrs. K. B. Wetherbee observes that the Bluebird family remains grouped until at least late fall. Mrs. W. Gray Harris gives important facts on the feeding habits of the Catbird as a winter sojourner in the north.

The *Flicker* begins its Volume Five with the issue of February, 1933. We find in it a very interesting article by Stanley Stein about the numerous and unusual difficulties he has had in operating his traps for banding birds.

News from the Bird Banders (published quarterly by the Western Bird-Banding Association) for November, 1932, contains a splendid review of the literature on territory in bird life, together with a useful, though incomplete, bibliography. It is unfortunate that so excellent a summary should be presented anonymously. The January, 1933, issue contains instructive discussion of the use of colored celluloid bands for identifying birds out of hand, and also a

splendid anonymous review of Schüz and Weigold's Atlas of Bird Migration. In the April issue there is more discussion of colored bands, and a summary of the banding work for 1932 in the fourteen western states and provinces of the Association. The question is raised concerning the availability and utility of the increasing mass of data in the archives of the Biological Survey at Washington. The whole work becomes useless if the data are merely to be stored.

Inland Bird Banding News (published quarterly by the Inland Bird Banding Association) for December, 1932, contains a report of the last annual meeting, at Chicago. Mr. M. J. Magee writes on the cat problem. He does not believe that the cat license idea will work as expected, and thinks that in no case should cats be protected off their owner's premises. The March, 1933, issue contains papers on banding activities by Professors Louis A. and Frederick H. Test, in Indiana; by Harold C. Wilson, in Wisconsin; by F. E. Ludwig, in Michigan, and by F. W. Robl, Kansas.

The Bulletin to the Schools, of the University of the State of New York, for March 15, 1933, is a Bird Day number. It contains articles by E. H. Eaton, on "Our birds of prey"; by Dayton Stoner, on "Superstitions and facts about Kingfishers"; by Chas. J. Spiker, on "Some fall and winter birds of a farm dooryard"; by Dr. George S. Britten, on "Nesting warblers of central New York"; by C. Huber Watson, on "Early nesting of the Great Horned Owl"; and three papers on bird banding, by Allan C. Fraser, Daniel Smiley, Jr., and Goeffrey Gill.

Bulletin No. 12 of the International Cat Society was distributed in April. All of these bulletins carry information of interest to bird lovers. It occurs to us that this organization should be called a cat abatement society, to indicate which side of the cat question it is on. This Bulletin No. 12 gives information concerning the rats on Rikers Island, a refuse dump for New York city. It is estimated that there are a million rats on the island (not at all hard to believe). When cats were placed there to destroy the rats, the rats chased the cats, so they say. Dogs had no better success.

We have previously given the business addresses of the periodicals here noticed, and will do so again from time to time. The Editor will always be glad to give any address to those who may have missed the earlier notices. The number of local publications in ornithology is on the increase. Only a few are, at present, printed. Some are quarterly, others are monthly. Those which are mimeographed are all printed on letter-size paper, and some are printed in single column, while others are in double column. Some have covers, others do not. They exhibit much variation in quality of paper and legibility of printing.

There has been some discussion lately as to whether a mimeographed journal provides true publication. So long as the facts are authentic it is difficult to see how future workers can ignore mimeograph publication. Restricted distribution will, of course, be a handicap; but the information will be there recorded, for those who can find it. Some authors may hesitate about citing mimeographed publications in bibliography, but we are inclined to think that this will have to be done for complete accuracy. For these reasons we believe that those who are responsible for these publications should use the utmost care to make the printing clear and legible, and also to see that a file of their serial is preserved permanently in a selected list of libraries.

Our Library

The Wilson Ornithological Research Lirbary at Ann Arbor is now an establishment, but with empty shelves. The arrangement with the Museum of Zoology of the University of Michigan is printed in full in the last (March) issue of the WILSON BULLETIN. This Library now solicits contributions from the members and friends. Publications on ornithology, and the allied subejcts of ecology, anatomy, exploration, travel, etc., are desired. And the following types of publications are suggested as especially desirable:

Single volumes, bound or unbound

Magazines, sets, volumes, and numbers, foreign or domestic

Authors' reprints

Maps

Reports and journals of explorations

Biographies

Bibliographies, printed and manuscript

State natural history and geological surveys

Proceedings or transactions of state scientific societies

Manuscript notebooks

Original paintings or drawings of birds

Photographs of birds, nests, eggs, habitats, etc.

Portraits of ornithologists

All portraits and photographs should be accompanied with full identifying data. Authors are requested to deposit a set of reprints of their publications. Members who wish to bequeath their libraries are invited to correspond with the officers of the Club. All gifts should be addressed to

THE W. O. C. ORNITHOLOGICAL LIBRARY,
Museum of Zoology,
ANN ARBOR, MICHIGAN

Hotel Accommodations for World's Fair Visitors

For the benefit of our readers we list the following hotels on the South Side of Chicago:

Blackstone Apartments, 6247 Blackstone Avenue. One block from the Illinois Central Electric, eight minutes from Fair Grounds. One-and-a-half room kitchenette apartments with accommodations for four people. All apartments with private bath and daily maid service. Weekly rates, $10 to $15.

Kimberly Hotel, 1430 East 67th Street. One-half block from Illinois Central Electric, ten minutes from Fair Grounds. Rooms with bath and with or without kitchenette. Weekly rates, two people, $10 to $13.50.

Euclid Hotel, 6733 Stony Island Avenue. Two blocks from Illinois Central Electric, ten minutes from World's Fair. Rooms with bath. Weekly rates, two people, $7 to $8.50; four people, $10 to $12; kitchenette, $9.50 to $12.

New Park Hotel, 1547 East 67th Place. Two blocks from Illinois Central Electric, ten minutes from World's Fair. Rooms with bath. Two people, $8 to $13; four people, $11 to $14; kitchenette, $9 to $14.

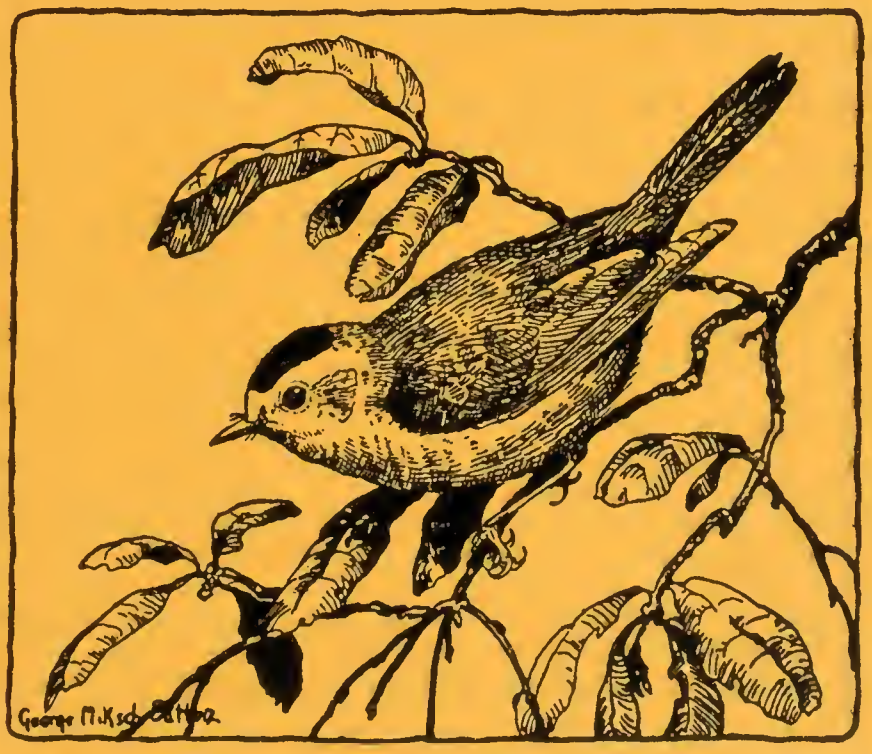
These hotels have been selected and recommended to us bv the General Biological Supply House, 761-763 East 69th Place, Chicago. They (hotels) are selected for their convenience to transportation to the Fair Grounds and economy. They are neither new nor large establishments, but they provide comfortable, clean quarters at rates as reasonable as it is possible to obtain. Make your reservations directly with the hotels. The General Biological has offered to furnish information concerning the World's Fair to biologists who inquire.

The Church Housing Commission has also established an office intended to place World's Fair visitors in touch with rooms at private homes. The church public will be offered private rooms at $1 to $2 single; $1.50 to $2.50 double; and special weeklv rates. Eight large church denominations are concerned in this plan. Correspond with Bert E. Smith, 211 South Wabash Ave., Chicago, for arrangements, stating church affiliation.

This is not an advertisement.

Vol. XLV SEPTEMBER, 1933 No. 3

THE WILSON BULLETIN



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All articles and communications for publication, books and publications for notice, and exchanges, should be addressed to the Editor.

Claims for lost and undelivered copies of the magazine may be addressed to the Editor.

THE WILSON ORNITHOLOGICAL CLUB

Founded December 3, 1888. Named after Alexander Wilson, the first American ornithologist, and called the "Father of American Ornithology."

The officers for the current year are:

President—Prof. J. M. Shaver, George Peabody College for Teachers, Nashville, Tenn.

First Vice-President—Dr. Josselyn Van Tyne, Museum of Zoology, Ann Arbor, Mich.

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The membership dues are—Sustaining membership, $5.00; active membership, $2.50; associate membership, $1.50 per year.

THE WILSON BULLETIN

A QUARTERLY MAGAZINE OF ORNITHOLOGY

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THE SANDHILL CRANE IN A MICHIGAN MARSH

BY LAWRENCE H. WALKINSHAW

In a great marsh, the "Big Marsh", as the farmers call it, in Calhoun County, Michigan, I remember boyhood days when I penetrated its heart searching for marsh birds, regardless of warnings from my father concerning the large number of rattlesnakes to be found there. Only once do I recall observing the Sandhill Crane. That was in September, 1921, when three of these birds were seen, slowly flying, high overhead, as we worked near its edge. Even then I questioned the authenticity of the man's word because so many farmers, and others, give this name to any large, long-legged bird which might be seen.

Nine years passed, when once again I roamed the heart of the same marsh, searching for large white herons which were so abundant in the larger marshes that summer. The search was so uneventful that I was about to return when a loud honking, wild to its very depth, resembling a wild goose note, sounded from behind a small peninsula in front of me. It required only a short time to reach the opposite side of that peninsula where I looked closely over the marsh to see and hear nothing more. After a few minutes of waiting the same wild honking, seemingly a part of the great marsh, sounded closer and in only a short time three large birds, with necks outstretched flew slowly down the marsh, from where their voices carried back through the stillness of the August afternoon. At last I had found the Sandhill Crane (*Grus canadensis tabida*).

To the south a rolling field stretched back away from the marsh, forming a natural observation point for the greater part of the clearings. Here I returned with friends and on two different occasions observed not three, but eight and six birds respectively. This was much more than I had ever expected, and I determined to return and search the area for a nest the following spring.

May 3, 1931, found me in search of cranes. The water was below normal for this time of the year but the wading was hard, and

time and time again I nearly went in over my hip boots, but at last I reached the tamaracks of the opposite side. Here I rested for a few minutes then climbed a small tamarack to gaze across on a cultivated field on the other side only about a quarter of a mile distant, so I elected to again cross the largest marshy area, the one which I had just crossed. The sun swung low over the trees as I neared the starting shore, tired and discouraged for not a crane had appeared. But surprises are always in store for one interested in birds and when I had nearly reached the small peninsulas of bushes extending from the shore two Sandhill Cranes rose within a few rods of me and, flying in the late afternoon sunshine, circled to the east then flew down the marsh in a few minutes, the distance which I had covered in half an hour. The brown of their plumage was noted as they flew, due to the extraordinarily good light from my position. The rolling call resounded from the north, then, as if the birds had been talking, one arose and returned toward where I stood motionless since they had flushed, and instead of climbing higher into the air she dropped to the ground only a few rods in front of me, where I was amazed to see that large bird droop her wings and with a quivering motion try to distract my attention from the area where she had first flushed. The day had progressed so far that I decided to return later and verify the location a little better. On May 5, with two scouts, I returned early in the morning and had just cleared the bushy shore when a single crane arose and, calling loudly, flew down the marsh. I walked right to the nest, a large mound of sedge which contained two large drab-colored eggs, spotted and streaked with long splotches of brown, lavender, and darker buff. The nest, about three feet in diameter, built among the sedge and cattails, was about six inches above the water, which was only a few inches deep. I remained only long enough to examine the structure without touching it or its contents, but did observe at the end of the marsh three cranes nervously clamoring for my hurried departure.

I visited the nest with Dr. Miles D. Pirnie on May 10. We thought particularly of photography and spent just a few minutes in the beginning of a blind of willow boughs in a favorable location to the southeast. After another week had passed I returned to continue the blind only to find that the cranes were gone. There had been quite a little rain during the previous week and the nest was rather wet-appearing and deserted, so I tried the eggs for incubation heat, finding them cold and wet. We hated to leave the eggs for crows and wondered if it were possible for the old birds to return, but search

FIG. 4. Nest and Eggs of the Sandhill Crane in Calhoun County, Michigan, May 10, 1931. The photograph by Dr. Miles D. Pirnie.

as we would no signs of the cranes could be found, so we returned on the following day and took the eggs. These were turned over to the University of Michigan Museum. They measured 94.5x60.75 and 93.5x61.5 mm. The former was of an oval shape while the latter was more elliptical. The embryos had been nearly ready to hatch but were dead. I managed to remove them and they are now in the Battle Creek Public School Museum.

Discouraged over the outcome, I searched for the birds on May 24 and was elated to see two birds nearer the heart of the marsh rise from the reeds and clamor at my appearance with their loud rolling calls, but I did not wish to disturb them, and left them to their belated nesting. August trips in 1931 failed to locate any cranes. However, I was much surprised to find on the shore of a small tamarack bordered lake in Barry County, on September 27, two gray-colored cranes which raised their heads and uttered that loud ringing call. We retreated and left them to the solitude of the little lake suspecting that they were migrating birds.

The winter passed and on April 3 I drove to the "Big Marsh" where I flushed two cranes far out on the swamp before I had barely left the bordering bushes. I counted the days and planned to return on May 1. The marsh appeared deserted as far as cranes were concerned, for I tramped and tramped across the clearings with no results. Fearing the birds had stopped only in migration, I began another round about the marsh. This time a crane glided over the tamaracks and alighted far ahead where he again rose as I approached, leading me on and on.

The day had progressed and I was tired so I retraced my steps, watching a Red-tailed Hawk circle high overhead as I passed his nest in a tamarack tree near where the crane had first appeared. A week passed, then, once again I drove early to the Big Marsh and was surprised to have a Wilson's Snipe fly from a nest of four eggs right at the border of the swamp. I crossed the clearing and was elated to see the single crane almost immediately, trying again to lead me down the marsh. Marsh wrens chattered near at hand and Swamp Sparrows scolded at my intrusion. Across the creek dull booming noises sounded and I knew that the Prairie Chickens were performing not far away. In my search I approached the creek and glancing to the dry grassy area which extended beyond for another mile, observed eleven males strutting and booming only a short distance away; but I must not be distracted so returned to almost immediately flush a crane where I thought I had already walked. Again I gazed at a flat

FIG. 5. The Second Nest of the Sandhill Crane in Calhoun County, May 8, 1932.

FIG. 6. Young Sandhill Cranes. One yet so weak he can hardly stand, the other much stronger. May 15, 1932.

platform of sedge with its two buff-colored eggs and again I hurriedly departed leaving things undisturbed.

E. M. Brigham, Jr., Mrs. Walkinshaw, and I returned the following week with a small blind, cameras, tripods, and other paraphernalia. We left the blind at the edge, and I showed them the nest, empty, with only a few traces of egg-shells. The little ones had hatched as we could tell by the clamoring of two old cranes about an eighth of a mile distant. But, as we stood watching them, a "*peep*" attracted our attention and we located one of the little fellows, a brown ball on two stilt-like legs, several feet from the nest. Later the other was located and we succeeded in getting photographs of the younger birds. Although I was covered and hidden near the nest in a hastily constructed blind for three hours, the old birds would not return so I righted things as much as possible and we left the area wondering what the world would hold in store for the little Sandhill Cranes which came in contact with man so early in life.

In 1933 we visited the region several times. The cranes were not there on March 12, but on the 26th the two birds circled high overhead, then returned to the place from which they rose. On April 16 only one bird could be located indicating that the other bird must be on a nest. The nest was located almost immediately when we arrived on April 30.

This nest, like the previous two, contained two ovate-shaped eggs, but was built in shorter sedge and reeds. The region was much dryer, there being very little water about. It was the type of locality where the Short-billed rather than the Long-billed Marsh Wren was found. Only a short distance from the nest we flushed a Yellow Rail and later picked it up from the reeds where it had hidden. On May 14 the nest still contained two eggs but on the 21st contained the remains of one unfertile egg, crows having probably accounted for the large hole in one side. The cranes uttering their loud rolling call flew about me as I left the marsh. The following morning friends called and wished to see the cranes if possible, so I arranged to accompany them and we had soon flushed the adults some little distance from the nest-site. Here a peep attracted our attention and the rich brown youngster was soon located. He was as pleased as we, cuddling down in one's hand to absorb the heat. After a short investigation we retreated, leaving the single little offspring with parents circling overhead. As we left I wondered what other secrets would later be unfolded in this Big Marsh, where the crane's rolling call, the Prairie Chicken's boom, even

the drumming of the grouse ean be heard, where few men penetrate during the summer months and where Nature holds her own.

Summary: The nests were large mounds of sedge from two and one-half feet to three feet in diameter and from six to twelve inehes in depth. All three nests had standing water about them, but were loeated at various distanees from the edge of the tamaraek peninsulas; one was only a few rods while the farthest was five or six times as far. One nest was loeated among cattails and the large-leafed sedge, while the seeond was a little nearer the small leafed sedge with eat-

Fig. 7. The "Big Marsh" in Calhoun County, Michigan, where the Sandhill Cranes nested. May 17, 1931.

tails nowhere about. The third was nearer the dryer marshy meadow, there being royal ferns, golden-rod, and small willow saplings seattered throughout the area.

The eggs were two in eaeh case. They were brownish drab in eolor with markings of darker gray or brown splotched and scrawled over the whole surfaee, but often thicker about the larger end. The eggs were variations of the ovoid shape and the three which were taken measured 94.5x60.75 mm., 93.5x61.5 mm., and 94.5x60.00 mm. The other eggs were untouched.

The young are covered with a golden brown down when first hatched, deepest on the baek of the head and neek along the baek and on the wings. They were able to cover some distance from the nest where they were very hard to see if they remained motionless. The entire head was eovered with down and this lasted for at least two months. The primaries, seeondaries, and eoverts of the wings were

well advanced at two months of age. The bill increased in length remarkably during this period as did the length of the legs. They were slaty colored during this entire period. Their call was a quavering peep having an indication of dragging it out in a faint r-r-r-r accent.

The adult birds at all three nests were very brown on the back of the neck, back, and wings, in fact I would say it was the predominant color. One bird was a little larger than the other. The birds observed in Barry County in September, 1931, were entirely gray, much different from the Calhoun County birds during the nesting season.

Migrations. March 27, 1932, and March 26, 1933. September 27, 1931. A farmer who lives near the marsh said that two of the cranes were seen in his cornfield during the mild winter of 1930-31. I can not verify this myself but do know that the man knows the birds.

Bibliography

Allen, A. A. The Sandhill Crane. Bird-Lore, XXXIV, 1932, pp. 414-423.
Barrows, W. B. Michigan Bird Life.
Bent, A. C. Bull. 135 U. S. Nat. Museum, pp. 241-253. 1926.
Holt, E. G. Nesting of the Sandhill Crane in Florida. Wilson Bull., XLII, 1930, pp. 163-183.

Battle Creek, Mich.

DIURNAL ACTIVITY OF THE WOODCOCK

BY MARCIA B. CLAY

Over a large section of country in August, 1925, drought was prevalent. In Trumbull County, Ohio, rainfall during that month was only .75 inches, whereas the average rainfall for thirty years amounted to 3.34 inches. My lawn on the slope of the ravine at North Bristol was bone dry, but at the foot of the slope a spring-fed brook still contained water, and though the swampy floor of the ravine showed unmistakable signs of the drought there was still a considerable boggy area.

On August second I flushed a Woodcock (*Philohela minor*) on the slope from under a clump of evergreens in a patch of brambles. It tumbled into the ravine behind a mass of swamp rose. A few days later from almost the same spot I saw a Woodcock fly from an open boggy track leading across the ravine where I am sure it was feeding. The bird disappeared behind a bend of the hill and when I came up it flushed, and again tumbled into good alder cover in the edge of the swamp.

Thereafter I began to watch for this bird, and on August 15 I saw it sitting across the ravine from my yard, under some overhanging

trees on the bank of the brook at the foot of a steep hill. As I watched the motionless bird sitting plainly in view, unscreened by any vegetation, a chipmunk suddenly ran along a low pendant branch of an overhanging tree and jumped to the ground a few feet from the bird. The latter, startled, jumped swiftly into the air. My eye lost it for a moment, but almost immediately discovered it again a few feet farther along the bank. Instead of dozing again the Woodcock suddenly fluffed out its feathers until it seemed twice its former size, and thus broad, squat and grotesque, it began a teetering, undulating movement as it probed with its long bill, moving slowly along the boggy run and into the swamp. The ground was soft, and the Woodcock ran its long bill deeply into the mire, though not to the base, and that it was abundantly rewarded was evident from the frequency with which it gave its head a quick shake, as though working some morsel back towards the throat. The thrusts of the bill into the bog were not rapid, but were made with a steady rhythm that reminded me of the action of an old-fashioned hand cornplanter in the hands of a skillful farmer.

Occasionally too, the bird fanned out and flirted its short tail. In fact the bog-bird's whole body was decidedly animated, as it worked slowly into the swamp, and toward me. Occasionally the probing ceased for a few minutes while the Woodcock either stood perfectly still, or preened its breast feathers with its long bill after the manner of a duck.

The day was very clear and warm, and the ravine was flooded with sunshine. A large herd of cows had recently eaten or trampled the vegetation made scanty by drought, so there was no difficulty in observing the Woodcock. After watching the bird for a long time, I went down the slope determined to flush it. Advancing into the swamp a few feet until I was within twenty-five feet of the now quiet bird, I threw some sticks at it as it stood regarding me. Not until the third stick went hurtling over did the Woodcock budge, when it ran very swiftly across the brook and up the bank where it stood stock-still with its back to me, and without a vestige of vegetation to screen it, protected only by a few fallen leaves lying around. Again it had shrunk amazingly in size, by flattening the feathers tightly against the body.

It remained thus ten minutes perhaps, until I moved away up the slope, when very, very slowly the bird edged toward a small weed. Having gained this small shelter, it began probing again along the brookside. It was a commonplace looking bird as it froze on the

bank, but when feeding with feathers fluffed out, with wide back and waddling gait, it became grotesque, admirable chiefly for its untiring industry and a certain furtive alertness. During the next two or three hours, the Woodcock worked up the ravine about seventy-five feet to a tiny mud flat just below a spring, and here in the open, with the sun beating down it continued to probe.

At 5:30 P. M. I went down the slope again. The bog-bird stopped probing and stood perfectly still for a few minutes while we eyed each other at a distance of perhaps twenty feet. Suddenly it dawned upon me that the bird was moving. I could scarcely see it move, but its relative position was changing, as, with an almost imperceptible easing away it was nearing a clump of coarse grass and sweet flag. Even as I gazed entranced the bog-bird suddenly darted out of sight.

At 7:30 P. M. when next I looked for the Woodcock, it was feeding again on the little mud flat, and continued there probing until darkness drew a curtain between us. As twilight deepened, however, the thrusts became more rapid. At eight o'clock the next morning, the bird was feeding just where darkness had found it the night before. I could not watch it much that day, but saw it probing at noon under a blazing sun.

On August 17, the Woodcock was probing in the same locality from 11:00 A. M. till noon. At 1:30 P. M. seeing the bird sitting in an open place near a tuft of grass, I went down the slope determined to flush it. Stopping near the spring and only fifteen feet from the Woodcock, I watched it for a time. It sat perfectly still returning my gaze until I lowered my glasses and took another step forward, when it rose instantly and flew swiftly on whistling wings directly away on a line a little higher than my head, and dropped in the shelter of an overhanging bank.

August 22 my record says: Saw Woodcock feeding at noon and again at 2:30 P. M.

August 23 at 8:00 A. M. the bog-bird was still probing just below my house in the swamp. A very heavy dew of the previous night covered the vegetation like rain. The bird, too, was wet, and frequently shook its wings and tail to dislodge the water. Finally stopping on a sunny hummock, it preened its feathers with its long bill, parting the feathers of its breast and sides, and stroking and shaking the wings. Completing the toilet, it began again to probe, working along for several rods to its favorite location near the spring. Here the bird spent the entire morning ceaselessly probing. At one time a horse pasturing in the lot came directly across the bird's feeding

ground, but the Woodcoek simply ran nimbly a few feet to one side until the disturber had passed, and then returned to its old grounds. It reacted similarly when two or three chickens came along.

On August 26, at noon, the bog-bird made its last appearanee below the spring. I did not follow its movements except to note that its fondness for food was undiminished.

The summer of 1926 found vegetation and swampy areas in the ravine normal. July 20, 1926, was a hot day, 90° with a blazing sun. While watching a pair of Killdeers running along the brook, my eye was drawn to a bird directly opposite me sitting on the bank of the brook preening itself. Noting its cinnamon breast, I at first took it for a Robin, but a second look disclosed the long bill of a Woodcock. It soon began to move along the brook picking from the top of the ground and occasionally probing slightly. The bird upon observing me began to sidle along toward some weeds, and having gained this desired shelter it enconced itself in the cool shade partially concealed from sight. Returning in an hour I saw the bird moving slowly along probing in a desultory and not very ambitious manner.

July 21. Blazing sun again. Second hottest day known to the Weather Burcau. At 9 A. M. the Woodcock was sitting at the brookside under some trees. It soon began to probe, but upon discovering me it moved up along the bank toward better cover at the mouth of the ravine. The slope to be traversed was steep, sandy, bare, and in a blazing sun. With head erect, and body rocking back and forth, the bird advanced one foot as far ahead as possible, as though feeling its way in the dark, then after two or three more teeterings it shifted its weight to the foot in advance. Then very, very slowly and carefully the other foot reached forward, and the movement was repeated, while all the time the bird's eye was centered on me. Patiently and stealthily this snail-like pace persisted until the Woodcock had traveled two or three rods, and to within a few feet of the desired cover, when suddenly it darted nimbly out of sight. However, at 1 P. M. this bird was back in the ravine again, sitting under the bank in the shade of its favorite trees.

July 31, at 9 A. M. Woodcock in same place and went through the same performance traversing the washbank, except at the end it flew noiselessly to cover.

August 7, at 7:30 A. M. Bog-bird under the bank in ravine, poking along, probing now lightly, now deeply. Tapped the earth once with its foot. At 8:30, I left it on the bank preening.

August 9, I saw the bog-bird flapping its wings in the open bog at 8 A. M. It fed around until 9:30 A. M. but I did not see it go.

August 12, at 6 P. M. Woodcock feeding in open swamp. At 7 P. M. I went down to within a few feet of it, when it whistled away to the old spring where I found the bird sitting in the open upon some leaves, but it whistled away again along the slope to my yard where I flushed it half an hour later, and again it whistled across the ravine to the old haunts under the bank.

August 19. Bog-bird preening on the bank at 5 P. M. facing me. It soon worked off into the weeds along the brook, teetering and probing.

August 20, at noon the Woodcock was undulating slowly along the brook across the bog to the other bank, probing but evidently not finding much. Finally it came to rest near the hill. At 3 P. M., I stood looking down at the bog, but could not see the bird until it suddenly rose and flew silently straight away to the slope across from me. It lit on a washbank where it sat a while and then meandered down hill under tthe trees, and was lost in the weeds along the brook. At 4 P. M. the bird appeared again in the open bog, having come back. It probed energetically during all the remainder of daylight, with short spells of resting.

September 1. Under a bright sun, a Woodcock probed diligently at noon. As I watched, the bird raised its wings straight up and flapped, then slowly closed them and shook its tail. It worked for about two hours. This being the last appearance for the season.

This bird was smaller than the one of the previous year, and not nearly so energetic. Owing to more rainfall the swamp had much better cover, but the smaller Woodcock was much more timid than the other. I am strongly of the opinion that I saw only one bird each year.

In July, 1927, following a torrid week which left the uplands dry, I secured four records of a Woodcock feeding in this same ravine in mid-day under a blazing sun. The dates were July 10, 12, 17, and 21. This bird resembled in size and manner the bird of 1925. It was large and energetic and gave ample proof of an abounding industry during the day.

North Bristol, Ohio, via Bristolville.

THE PRESENT STATUS OF BREWER'S BLACKBIRD IN THE SOUTHEAST

BY THOMAS D. BURLEIGH

On November 25, 1930, while crossing an open field in the wide fertile valley of the Mills River, near Asheville, North Carolina, I saw a large blackbird feeding near me that I first thought was a grackle. Something about its appearance, however, aroused my curiosity. There was no apparent reason why its identity should puzzle me, yet I felt instinctively that something about it differed from the blackbirds with which I was familiar. So I collected it and found that it was a male Brewer's Blackbird (*Euphagus cyanocephalus*). Subsequent search that evening of what literature was available dealing with the birds of North Carolina revealed the fact that there was no other record for this species in the State. Accordingly I considered it merely one of those accidental occurrences that at one time or another can involve almost any species and, while gratified at having added the bird to the North Carolina list, attached no other importance to this unexpected record.

The following spring, on April 6, 1931, while I was driving by a large pasture midway between Swannanoa and the town of Black Mountain, and approximately twelve miles east of Asheville, two blackbirds that were feeding a little apart from a flock of Red-winged Blackbirds in the same field attracted my attention. Looking at them through my binoculars I saw at once that they were Brewer's Blackbirds, a male and a female. On my approach they flew into the top of a near-by tree, where the male uttered notes suggesting those of the grackle and quite unlike those of the Rusty Blackbird (*Euphagus carolinus*), which the Brewer's Blackbird more closely resembles. That there might be no question of my identification, the male was collected and this species definitely recorded for the State for the second time.

With the additional occurrence of this western bird in western North Carolina I now wondered if it might not prove to be a regular migrant there, overlooked in past years by other observers. On this supposition I devoted considerable time that fall (1931) to a more or less thorough search of all spots suitable for this species, and by early December was convinced that my suspicions were well justified.

The first birds, a flock of ten in which both sexes were in equal numbers, were seen on November 16, and during the following three weeks other flocks of varying sizes were noted almost daily. At times

individual birds were found feeding alone, but usually four to eight birds comprised the flocks that were seen, and it was not uncommon to find as many as fifteen or twenty individuals together. They were seemingly rather exacting in their requirements, showing a decided preference for open fields and pastures but almost invariably remaining close to barns and farm houses. While such conditions attracted other blackbirds, Brewer's Blackbirds rarely associated with them, feeding a little apart and appearing entirely satisfied with their own company. In common with the Cowbirds they seemed to prefer the vicinity of cattle or horses and were frequently found in such situations. On December 8, 1931, four birds, all males, were seen at the edge of an old apple orchard in the open Mills River valley. These were the last of this species noted that fall.

As spring approached I again made the occurrence of these birds in this region one of my special objectives, and I found them as plentiful as they had been the preceding fall. A single bird, a female, appeared on February 25, 1932; within a week small flocks were observed almost daily, and as late as April 12 two birds, a male and a female, were seen feeding about cows in a pasture.

In the fall of 1932 the first birds, a male and two females, were seen on November 14 in a field near Swannanoa, and soon afterwards small flocks were of common occurrence. Early in December the bulk of this species had gone; but a few individuals were noted at irregular intervals during the month, and as late as December 26 two males were seen feeding at the edge of a stream in a marshy field.

As it gradually became evident that Brewer's Blackbird actually was not only a regular but a common migrant in the mountains of western North Carolina, I became curious as to the whereabouts of this species during the winter months. The fourth edition of the A. O. U. Check-List gives the winter range as "southern British Columbia and Wisconsin and Kansas south to Guatemala. Casual in Illinois, Missouri, Louisiana, Southern Florida and South Carolina." Inquiry revealed the fact that there were no definite records for Florida, and that the inclusion of that State in the range of this species was open to question. For South Carolina there are three published records. Leverett M. Loomis first recorded this western bird in the State after collecting five specimens from a flock of a dozen found at Chester, on December 9 and 10, 1886 (*Auk*, Vol. IV, p. 76, 1887). Forty years later Prof. Franklin Sherman and George E. Hudson found this species at Clemson College, collecting a male on April 17, 1926, and a male and a female from a flock of twenty on December 18, 1926 (*Auk*, Vol.

XLIV, p. 567, 1927). Even these few records indicate that Brewer's Blackbirds passed through at least the Piedmont region of South Carolina in past migrations, and it seemed rather surprising that they were not observed oftener or were not recorded at all south of Chester or Clemson College. As the birds had appeared with such regularity and in such relatively large numbers each spring and fall for the past three years about Asheville, I could not help but feel that unquestionably they wintered regularly somewhere in Georgia or Florida. That this assumption was warranted, at least in part, seemed evident on a short field trip I made to Augusta, Georgia, the latter part of November, 1932. While I have no way of knowing whether I was too early or too late to observe the majority of these birds in Georgia, I experienced little difficulty in locating a flock of ten that were feeding, on the morning of November 30, in an open pasture a few miles north of Augusta. A female collected that day is the first definite record for the occurrence of this species in the State.

While it is true that the present status of Brewer's Blackbird south of Augusta is still a matter of conjecture, it would seem now that the birds have been overlooked. To one familiar with the bird this may appear rather surprising, for despite its general resemblance to both the Grackle (*Quiscalus quiscula*) and the Rusty Blackbird, its notes are quite distinctive and its appearance in the field almost equally so on close scrutiny. However, when one remembers the vast hordes of blackbirds that winter in southern Georgia and Florida, the ease with which a species associating with these immense flocks could escape observation is more readily apparent. It is well known that in recent years Brewer's Blackbird has been extending its breeding range eastward, and this may account in some degree for its present abundance in western North Carolina. That it actually winters in fairly large numbers south of these mountain valleys seems now to be an established fact, and it will be interesting for bird students to determine in future years just where these birds go, and to attempt to answer the question of why they have heretofore so completely escaped observation.

U. S. Bureau of Biological Survey,
Asheville, N. C.

NOTES ON THE FAMILY LIFE OF A PAIR OF AMERICAN PIPITS

BY HAZEL S. JOHNSON

Among the many species of birds recorded in migration throughout the eastern states, the American Pipit (*Anthus spinoletta rubescens*) is fairly common. Due, however, to the northern latitude of its nesting range much is yet to be learned concerning its breeding habits. While spending the summer of 1931 at Wolf Bay on the Labrador coast—a station near Cape Whittle, I made the following observations on the family life of a nesting pair of this species. These notes cover a period of five weeks but refer particularly to the time that the young were in the nest.

The nest was located on a southern slope somewhat protected from the weather by an overhanging mat of Crowberry vines which formed the ground cover.

Pipped eggs were noted on the evening of July 1. By the evening of the 2nd all six eggs had hatched. A blind was placed four feet from the nest, thus enabling me to make close observations even during dense fogs. The birds readily accepted the blind, showing no concern over wind movements of the canvas. Observations were made at various hours on different days to secure notes on the activities of the birds from early morning until they went to sleep at night.

While in the nest the young were fed at quite regular intervals throughout the long July days (see table). My notes show that they were fed as early as 4:30 A. M.. (I believe that feeding started even earlier) and continued as late as 8:55 P. M. Rain and fog did not seem to retard feeding activities of the parent birds.

Sex differentiation between the old birds was at first undiscernible. But after studying the two close together it was evident that the coloring of one was a bit darker and that the fuscous splotches about the throat formed a more definite pattern. This darker bird did all the hovering according to my observations. It was presumed to be the female and is so designated in my notes. When the female went on the nest her manner of spreading the breast feathers indicated that the belly was bare (this condition was noted in a specimen collected).

Sometimes as I approached the nesting site I would be challenged by a Savannah Sparrow at a distance of a hundred yards. If this bird followed me with any insistence, the male Pipit would appear and with agitated chirpings would follow me to the blind. After the third day this action did not cause the female to leave the nest.

During the two weeks of the brooding period the growth of the young seemed uniform. No difference in size or plumage development

was apparent. On July 4 one young bird was found outside the nest, pushed out perhaps as the female left hurriedly. Although cold and seemingly lifeless when found, it was replaced in the nest. It recovered and grew normally. The female would frequently adjust the young in the nest by scooping under them with the beak. Brooding was frequently interrupted for this performance until the young were strong enough to compete for nest space themselves. On July 6 pin feathers were through the skin. By the 11th they were out of the sheaths. The birds now seemed crowded in the nest. They were last

Fig. 8. Male Pipit leaving its nest. Wolf Bay County, Quebec.

seen in the nest in the late afternoon of the 15th. That evening they were out of the nest but nearby. Next morning a hawk was shot near the nest site and was reported to have been attacking young birds. This may account for the fact that but three of the brood were seen on the 17th, with the two parent birds.

Between July 16 and August 3 the family of three young with one or both parents was often seen about the woodpile and house of a local family about 300 yards from the nest site. Another family of Pipits was frequently seen in this same territory but there was no apparent intermingling of the two broods (the brood under study was identified by bands). During the first two weeks out of the nest the young birds seemed to make little effort to find food for themselves

but waited until the parent birds brought food and placed it in their mouths. Sometimes the old birds would utter a twittering chirp when food was found, whereupon one or more young would go to the parent to receive it.

Some change was noticeable in the actions of the old birds while the young were in the nest. During the first week the brood was aroused by a low gurgling chirp from the parent bird as it approached the nest with food. By the eighth day it was obvious that the young recognized the old birds or were aroused by their wing vibrations. As the female spent the greater part of her time on the nest, the male brought most of the food during the first six days. Flies and small larvae were the main diet. One large larva or from two to four smaller ones were brought at one time so that each trip represented a fairly constant quantity of food.

It was noted that late in the evening the female seemed reluctant to rise and allow the male to feed. He would thrust his beak full of food first on one side then the other of her head and neck before she would stand up.

The female often examined food brought by the male with her beak before it was given to the young. Sometimes one parent did all the feeding but more often the food was divided and both fed, placing all of it in the mouth of one young bird then removing bits which they gave to others. Very rarely did the female eat any of the food brought by her mate.

After feeding both birds would look expectantly at the nest. When a mass of excreta appeared it was promptly seized and consumed or carried away. In most cases the female secured it but evidently there was some competition between the parents for this privilege. During the last few days of the nesting period excreta were carried off and the nature of its disposal is unknown. Examination showed that it was enclosed in a membranous sac.

My notes record a few instances of the female leaving the nest apparently in answer to the call of her mate. Presently one or both birds returned with food. Once I saw her fly to him and both appeared to join in a struggle to extricate something from the lichens. Then both came to the nest, the male carrying an unusually large grub, which he fed to the young. Later in the brooding period the female would sometimes search for food a few yards from the nest. If the male approached her she would dart at him as though hostile.

As I could not see from the blind farther than a few yards about the nest, it was impossible to tell whether or not the male Pipit spent

DATA ON THE BROODING ACTIVITIES OF A PAIR OF PIPITS

Date	Hours of Observation	Total	No. of Feedings	Avg. Time Between Feedings	Weather	No. of Absences	Total Time Off Nest	Percentages Time in Blind
July 3	1:15-2:30 P. M. 2:55-4:00 P. M. 7:23-9:00 P. M.	3 hrs. 53 min.	21	8¾ min.	Heavy fog. Fair Light	4	42 min.	17.59
July 4	9:00-10:20 A. M.	1 hr. 20 min.	9	6½ min.	High wind followed by fog	2	27 min.	33.75
July 6	6:45-8:50 P. M.	2 hrs. 5 min.	19	6½ min.	Rain Wind	5	17 min.	13.60
July 7	8:10-10:06 A. M.	56 min	11	11 min.	Fog	1	At least 1 hr. 56 min.	100
July 8	11:02-12:05 A. M.	1 hr. 3 min.	11	5 min.	Rain Wind	2	23 min.	36.34
July 9	4:15-6:15 P. M.	2 hrs.	5	19 min.	Rain Heavy fog	1	At least 2 hrs.	100
July 11	8:20-10:30 A. M.	2 hrs. 10 min.	6	10⅔ min.	Fog Clear	1	At least 2 hrs. 10 min.	100

his time near the nest. He would utter a chirp as he approached the nest with food and a sort of excited twitter from the field at which the female would usually fly in his direction but I never heard him sing from the air.

The accompanying table shows the brooding routine during periods of observation. While the percentages of time spent off the nest can not be considered as satisfactorily indicating the intensity of brooding, they are nevertheless interesting in that connection. Due to the short periods of time spent in the blind and the various times of day at which data were recorded these percentages can be considered only in that they suggest a general trend.

Oneonta, New York.

INFLUENCE OF THE GREAT LAKES ON THE MIGRATION OF BIRDS

BY RALPH BEEBE

The above topic was first brought to my attention when, as a very young boy in my farm home in Schoolcraft County, I observed in autumn the great numbers of hawks which passed along in their autumnal migration. So great was the concentration that the earth was appreciably darkened at times as the hordes passed over. Many were Cooper's Hawks but there were also Red-tailed, Red-shouldered, Broad-winged, and many too high up to identify. After the flight came the Goshawk, which sometimes lingered all winter.

Our farm was located in the hardwood belt, which extended back from Lake Michigan for a considerable distance, except for a belt of pine barrens about two miles wide along the shore and coming to within a half mile of our farm.

Subsequently, from about 1909 to 1916, observations were conducted near Newberry, Luce County, about midway between Lake Michigan and Lake Superior. The country there is mostly cut over land, there is some virgin timber remaining and there are farms of considerable area. The land is sandy except the swamps, rolling in contour, the hills of glacial origin as attested by the soil strata observed when an excavation is made. Solitary boulders, some as large as a small house, testify to the moving abilities of the ice in former ages. There were occasional small lakes, dug out by the shifting ice. Here I was privileged to make some careful observations, some of the results of which I will endeavor to relate. They are by no means complete but may suggest a line for future investigations.

The hawks first mentioned were the most conspicuous and easiest observed on account of their size and diurnal habit. The Cooper's Hawk is a breeding bird but immense numbers formerly migrated in autumn along the shore of Lake Michigan, keeping within the timber belt and avoiding the open pine barrens. The Red-tailed, Red-shouldered, and Broad-winged Hawks kept high in the air and did not tarry along the way as the Cooper's Hawk sometimes did, to the detriment of our poultry yard. The Sparrow Hawk invariably laid his course through the fields and pine barrens, avoiding the heavy forest. Duck Hawks were sometimes seen and they are known to nest along the Pictured Rocks on Lake Superior.

All these raptorial birds migrated in a westerly direction in the autumn and in an easterly direction in the spring. The autumnal migration was much larger. Many of the birds passing through in

autumn came from the interior of Canada. At Whitefish Point on Lake Superior the State maintains a hawk hunter, who posts himself there and shoots the injurious species as they appear. The route then lies along the northerly shore of Lake Michigan into Wisconsin instead of across the Straits of Mackinac. The Straits are only about ten miles wide and there are islands for resting places between, yet apparently few hawks cross there. In spring the route is reversed.

In September and October the traveler along the north shore of Lake Michigan will see little parties of Sanderlings, bobbing along

the wave line, occasionally taking wing but always proceeding westward. In spring the return journey is made. At East Tawas on the west shore of Lake Huron from September 26 to October 7, 1930, none were observed, although they were migrating along the north shore of Lake Michigan at the time.

The migration route from Wisconsin through the Upper Peninsula of Michigan appears to be an important one, bringing many western species into the region. Some of these may be noted. Unless otherwise noted they are sight records although made under conditions which I have never felt permitted any uncertainty of identification.

Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*). Observed in Schoolcraft County, April 9, 1904.

Western Meadowlark (*Sturnella neglecta*). At Newberry, May 14, 19, 1909; May 25, 1912; May 1, 3, 1913; April 27, 1914; and April 8, 15, 1915.

Chestnut-collared Longspur (*Calcarius ornatus*). There was a heavy flight from May 19 to 26, 1909. Many thousands were seen. Other flocks were noted May 25, 1912 (50); May 17, 1914 (4); and May 19, 1914 (30).

Western Yellow-throat (*Geothlypas trichas occidentalis*). At Newberry, May 25, 27, 1909 (3).

Mr. M. J. Magee of Sault Ste. Marie, has trapped and banded several Gambel's Sparrows. The species has also been taken in the lower peninsula. The Harris's and Clay-colored Sparrows are recorded but I have never seen them.

The Swainson's Hawk (*Buteo swainsoni*) has been taken at Hessel near the Straits of Mackinac, October 13, 1908 (Taverner, *Auk*, XXVI, 1909). It was also taken by Wood near Cheboygan across the straits, October, 1883. (*Auk*, XIV, 1897). I saw one near Newberry, September 13, 1910.

The Horned Lark (*Otocoris alpestris alpestris*) was seen in large flocks along the shore of Lake Michigan but was rare in the interior. The Prairie Horned Lark (*Otocoris alpestris praticola*) and the Lapland Longspur (*Calcarius lapponicus lapponicus*) appeared in immense flocks in spring and fall, following the usual migration route.

The Pipit (*Anthus spinoletta rubescens*) occurs abundantly in autumn and less commonly in spring. I believe that the Sprague's Pipit (*Anthus spraguei*) is also found but as yet there are no specimens to substantiate it.

The single known exception to the usual custom of migrating westward in autumn and eastward in spring appears to be in the case of the Evening Grosbeak. Visual observations and banding records of the species indicate that it migrates eastward in autumn and westward in spring. It has recently been established that it is a breeding bird in the area.

Naturally, the lakes attract many species usually marine. Some of these may be noted.

Pomarine Jaeger (*Stercorarius pomarinus*). Three were seen near Newberry on May 23, 1913, flying rapidly southward.

Purple Sandpiper (*Arquatella maritima*). At Newberry, November 25, 1909; November 7, 1910 (specimen); November 7, 1914; and October 21, 1915.

Great Black-backed Gull (*Larus marinus*). At Newberry, January 22, 1916.

Arctic Tern (*Sterna paradisaea*). At Detroit River near Belle Isle, December 14, 1920, and at East Tawas, October 6, 7, 1930 (400).

Another phase of the migration route through Wisconsin is the fact that some species arrive in the spring before or at about the same time as they arrive in the Lower Peninssula. The Meadowlark arrives at Lansing from March 3 to March 28, average March 12. (Barrow's Mich. Bird Life, p. 444). At Newberry I have dates of arrival as follows: March 4, 1910; February 23, 1911; March 2, 1912; February 26, 1913; February 26, 1914; February 17, 1915; and March 11, 1916. Newberry is about 300 miles north of Lansing.

The Veery (Barrow's Mich. Bird Life, p. 713), enters the Lower Peninsula the first week in May or a little earlier. The earliest record at Detroit is given as April 22 and the latest May 4. At Ann Arbor, about fifty miles west, the earliest record in twenty-five years is given as April 16, 1889, and the average appearance the first week in May. At Newberry I have arrival records of April 23, 1913; April 26, 1914; April 24, 1915; and April 16, 1916. But in 1909 it was first recorded May 30, in 1910 on June 4, in 1911 on May 30, and in 1912 on May 24. It would seem improbable that such a wide variation would be due to insufficient observation as it is a common and conspicuous species. I believe that the divergent dates represent arrivals from different sources. The later dates would be consistent with a migratory movement through the Lower Peninsula, while the earlier ones are about equal to the earliest dates of arrival in the Lower Peninsula and suggest a simultaneous movement from the southwest through Wisconsin and Lower Michigan.

The Sharp-tailed Grouse (*Pedioecetes phasianellus phasianellus*) and the Thick-billed Redwing (*Agelaius phoeniceus fortis*) occur in Michigan only on Isle Royale in Lake Superior as far as known.

The Wisconsin route into the Upper Peninsula is used by forms of life other than birds. The coyote has within the past twenty years spread over the Upper Peninsula, coming in from the west and it is now invading the Lower Peninsula. Western species of insects follow the same route.

More than a hundred years ago a marauding band of Sioux Indians came in from the west. They remained for about three years, the relatively peaceable native tribes being unable to resist the fierce invaders. They finally encamped on an island in the St. Marys River. The native tribes had now gathered in force and when the invaders finally left the island the natives fell upon them and left few survivors to return to the western plains.

Detroit, Mich.

THE NESTING AND THE LIFE EQUATION OF THE WISCONSIN BOB-WHITE

BY PAUL L. ERRINGTON

The nesting of the bob-white has already been exhaustively studied in the course of Stoddard's (1931) classic work in the south. He was also concerned with the working out of a coherent life equation through a study of the various mortality factors determining population levels for the species. Ecological research on the northern bob-white has been the aim of the quail investigation (1929-'32) which was established at the University of Wisconsin by the Sporting Arms and Ammunition Manufacturers' Institute and the U. S. Biological Survey. Although in a great many respects the Georgia life history findings hold true for northern as well as for southern quail, yet the north has very much its own problems, its own factors of shifting values. The Wisconsin nest studies, then, do not represent a northern attempt to duplicate in entirety Stoddard's program, but advantage has been taken of his methods.

Cock quail the season of 1931 began calling "bob-white" about the last of March (earliest record March 26) and were calling quite frequently by mid-April. At this time the birds were loosely pairing up, but still attached to the old coveys. The flocking habit was weakening, however, and by late April the covey as a social unit had generally disintegrated. I suspect that many of the pairings were not of any degree of permanence before May 1. Eleven of the sixty-nine Wisconsin quail nests on which I have personal data were calculated to have received their first eggs between May 2 and May 10, but one of the University bird banders got an egg in a trap April 27! It may be that the nesting season of 1931 was somewhat early over Wisconsin quail country as a whole, for the quail came through the mild, almost snowless winter in splendid condition. Populations that barely squeeze through a long winter of hunger may not be ready for laying by the fore part of May.

The topographic location of nests is largely determined by the location of nesting cover available, mainly bluegrass (*Poa*, June grass). Unless pastured, burnt, or mowed off, this bluegrass occurs in the most satisfactory density and proximity to feeding grounds along roadsides and field fencerows, where twenty-five and fourteen nests were found respectively. It also occurs prominently in orchards and ornamental plantings, in which were situated ten more nests. Three nests were built in woodland bluegrass patches. Fourteen were in hay fields, one on a pastured hillside, one on a sandy knoll, and

one on the edge of an erosion gully. Thirty-two were within a few yards of cultivated fields.

Thirty-three of the sixty-nine nests were in nearly pure bluegrass stands; seventeen in bluegrass mixed with other grasses (quack grass, timothy, etc.). In midsummer almost any herbaceous vegetation, open yet affording concealment, may be utilized. Nine nests had backgrounds of alfalfa, six of timothy, one of panic grass (*Panicum*), one of mixed wild barley (*Hordeum*) and pigeon grass (*Setaria*), and two were on virtually bare ground but roofed over with mint stems (*Monarda*) in one case and with bluegrass stems in the other. The last mentioned was constructed half-way up a steep cut bank entirely from materials carried to the spot and skillfully woven to form a roof.

Fifty-two out of sixty-five were either roofed over or in vegetation sufficiently thick to provide the equivalent of roofing; eleven were partially concealed from most angles; and two had no top covering whatever. The nest openings did not face any constant direction. Eleven were exposed to the southeast; nine to the east; nine to the north; eight to the south; eight to the southwest; five to the northwest; five to the northeast; four to the west; and eight had no discernible exposure. Thiry-seven nests were in places sun-lit during most of the day; five in morning sunlight; nine in afternoon; eighteen in places briefly or diffusely illuminated, exemplified by alfalfa fields or open woodlands.

Nest sites were well chosen as to drainage, twenty-seven being adjudged excellent; twenty-eight good; ten fair; and three poor. The three poorly drained nests were located in low spots in hay fields, certainly not because of necessity, for there was abundant alternative cover.

The exact positions for eighteen nests (principally May nests) were chosen with reference to tufts of dry grass, weed stems, fallen branches, saplings, small briar canes, etc., which may serve to supplement nesting cover not too inviting early in the season. That mechanical obstruction to large moving dangers such as trampling domestic animals as well as concealment may likewise be gained is indicated by the establishment of fourteen nests under fence wires; eight at the base of posts; one under a stump; one partly under a log; and one under a low conifer.

Whether there is a definite evolutionary tendency for quail to nest more and more under fence wires and in similarly protected places, I cannot say. An inimical agency selective enough against non-conformers might ultimately modify the nesting habits of the species. An agency of this kind we might have in the mowing machine.

The prevalent practice in my observational areas is to mow both roadsides and hayfields during the last half of the main nesting season, a practice responsible for fourteen out of my thirty-five nest failures. In only one instance did a hay-field nest hatch before the hay was cut; in two instances adults remained on mowed-over nests to hatch out the young. I might observe parenthetically that a cheap and practical iron rod designed by Peterson (1931) for attachment to mowing machines has received favorable comment as a device to flush incubating Hungarian Partridges from hay-field nests, thus enabling the farmer to stop the team before the nests are destroyed.* It has not been tested on quail.

Man was closely responsible for the failure of eight other nests, viz., three desertions on account of human snoopers; two desertions presumably because of the activities of workmen near by; one nest crushed by a saddle horse (?); one by a wagon wheel; and one accidentally hoed out of a cultivated tract. A cow cropped away the covering of another nest, as a result of which something filched the eggs. Three nests were deserted from unknown causes, including one maybe through my fault.

Direct predaceous influences were detected in the destruction of five nests: three by striped ground squirrels (*Citellus tridecemlineatus*); one by a skunk (*Mephitis*); and one by a dog. Three were broken up without any perceptible clue, and another under circumstances that seemed to point to fox squirrel. The preceding losses given in this paragraph relate to live nests; most of the clutches exposed by mowing were soon rifled, especially when abandonment left the eggs in plain sight. Two mowed-over clutches were devoured in the typical slobbery canine manner; others disappeared in a way suggestive of crows.

Adult mortality during the nesting season? The incubating bird of one of the mowed-over nests was hit by the sickle, but the seriousness of the injury is not known. Several farmers have told me of having killed or injured quail while mowing. The past two summers four banded quail were known to have been killed in steel traps set for ground squirrels on one suburban property. The remains of an old bird (a kill of about three days) were found in front of a hatched-out nest; the evidence indicated housecat as strongly as anything, but it was very inconclusive. Contemporaneous studies on raptor food habits, particularly Great Horned Owls, Cooper's Hawks, Marsh

*Information on other flushing devices of later origin may be obtained from the Iowa Fish and Game Department, Des Moines, or from American Game Association, Investment Building, Washington, D. C.

Hawks, and redtails disclosed no summer quail leakage save for a single July individual taken by a Great Horned Owl. I was unable to obtain many data on the summer food habits of mammalian predators (foxes, Mustelidae, etc.), so the question of their role as enemies of adult bob-whites at this season will have to remain open.

In one case a cock took over nesting duties some days after incubation had been started by the hen. Does this hint the demise of the hen? Altogether, three of the twenty-four incubating birds, the sex of which could be identified, were males. The other two began incubation upon completion of the clutches, a normal occurrence (Stoddard, 1931).

I am not ready to hazard an opinion as to the likelihood of the three mysteriously abandoned nests representing mortality. While my data reveal no preponderance of desertions at any time of the season, quail have been noted to exhibit no great fidelity to their nests until incubation has begun, and may be expected to desert during the laying period at practically any time that something happens of which they do not approve. As the hatching date of the eggs draws near the birds become less "touchy" about disturbances, even some (mowing) which must seem cataclysmic to them.

Clutches appear to have equally good prospects for hatching if laying is begun either previous to June 1 or delayed until the latter part of the month.

Clutches began		Hatched	Lost	Remarks
First half of May,	14	8	6	2 deserted
Last half of May,	7	4	3	2 deserted
First half of June,	13	2	11	3 deserted, 5 mowed over
Last half of June,	8	5	3	1 deserted, 2 mowed over
First half of July,	5	3	2	1 deserted, 1 mowed over
Last half of July,	3	3	0	
August,	3	2	1	

A broad statement might be made that the early clutches are the largest and that later ones decrease progressively until the approach of fall. This does not imply that a pair will raise more than one brood in a season; it is simply the manifestation of repcated attempts to bring forth young after breaking up or desertion of previous nests.

Complete clutches began		Average number of eggs
First half of May,	11	19.2
Last half of May,	6	16.6
First half of June,	9	17.0
Last half of June,	6	14.2
First half of July,	5	13.8
Last half of July,	3	11.3
August,	2	9.0

Complete data were not obtainable on the thirty-four successful nests of the sixty-nine, but of these eight hatched in June; nine in the first half of July; four in the last half of July; three in the first half of August; four in the last half of August; and two in September. The continued June and July hatching, despite the widespread mowing operations of these months, is due to the advantageous locations of the nests started before luxuriant growths of timothy and alfalfa tempted the birds away from the comparatively safe but restricted fencerow bluegrass.

Very late clutches in addition to being small may also hatch imperfectly, and the young may be hopelessly backward to meet cold weather. My latest brood had three live chicks (of ten eggs, six didn't pip and one chick died beside the nest) hatched September 24, 1930. Occasionally an observer encounters half-grown quail, or smaller, along in November, but the evidence is scant that many of them get much farther. I would judge that a quail must be hatched by September 1 in order to have a fighting chance to survive a moderately rigorous winter.

Thirty-one nests produced 420 living young or an average of 13.6 per nest. Left in these nests were forty-five, or 9.7 per cent, unhatched eggs, most of which were sterile or contained dead embryos. The usual cause of death of embryos appeared to be chilling; for example, seven out of a clutch of seventeen were killed at the point of hatching apparently by water collecting in the bottom of a nest during a heavy rain. Sometimes, too, individual eggs were noticed to be uncovered by the incubating bird. One chick was partially eaten by small animals (ants?) in an opened shell. Two young were found dead on the ground in the vicinity of the nests.

The quantitative measurement of chick mortality so far has been quite too much of a problem for me, but a few observations illustrate how heavily peril weighs upon the young in the early helpless stages. Two chicks (15 and 20 grams) became wedged and died under (not inside) the wire floor of a cage bird trap. Another was cut in two by a mower sickle. I have been told of chicks that couldn't climb out of a plowed furrow. The body of a newly hatched quail chick was retrieved from a domestic chicken in a farmyard. Stoddard mentions cats attracted by peeping of hatching young, and I have strong evidence of a striped ground squirrel bringing ruin to a nest under similar conditions. The counterpart of Stoddard's (1931 and unpublished) terrifically destructive ants I have not discovered in the North.

Let us, by the juggling of what data we have, endeavor to secure

some kind of evaluation of some factors governing bob-white populations.

The central portion of one of my observational areas at Prairie du Sac, Wisconsin, gave an accurate census of seventy-three quail at New Years, 1930. At New Years, 1931, the census was 184, an increase of 152 per cent. The central portion differed to no radical degree from the surrounding territory, either with respect to quail populations or environmental types, so it is thought that errors due to summer ingress or egress of birds should compensate for each other.

The quail of this area lost no more than 5 per cent from New Years, 1930, up to the breeding season, thus leaving sixty-nine birds as stock. A sex tally on 305 Wisconsin bob-whites, mainly random specimens and birds trapped for banding, shows but 42.3 per cent females. This ratio applied to sixty-nine birds gives twenty-nine females, and hence a maximum of twenty-nine pairs. The percentage of non-breeding females in another area (University Marsh Farm, Madison, Wis.) was computed to be 15 per cent.* If we may be permitted to transpose this percentage of non-breeding (?) females to the Prairie du Sac area, the twenty-nine pairs would be lessened by four.

If the twenty-five breedings pairs nest early in May and are so fortunate as corresponding early nesters actually studied, they will be 57 per cent successful in their initial attempts. Their 14.3 successful nests will average 19.2 eggs, of which 9.7 per cent will not hatch. This gives 248 live young and leaves 10.7 pairs to make renesting attempts.

Of the 10.7 unsuccessful pairs two-thirds or 7.1 pairs (on basis of advancement of clutches when lost) are in condition to continue their laying with but brief interruption after the breaking up of their first nests. Their chances for success will be the same as for the first and 57 per cent or four nests will succeed and 3.1 will fail. The average clutch will be 16.6 eggs minus 9.7 per cent (eggs not hatching) or sixty live young for the four pairs.

There are 6.7 pairs left, which if they raise young at all are not destined to raise an early brood. Of these, let us say, five pairs are still able to renest the first half of June. To no slight extent on ac-

*University Marsh Farm census of eighty-nine quail, March 2, 1930. A loss of three (assumed, but based on some data) up to breeding time leaves eighty-six birds. General banding records for area show 46.2 per cent females or a ratio of forty females to forty-six males. This gives an excess of six cocks. An observed July, 1930, excess of twelve whistling unmated cocks may then be indicative of six non-breeding females or fifteen per cent of the forty. Possible sources of error: unknown spring-summer reduction of hens or influx of cocks from outside.

count of mowing, only 15.4 per cent or .8 nests will succeed, and the population will be increased by twelve live young.

The six unsuccessful pairs may be rather worn out by this time but will probably try again in July or August. In this event 68.4 per cent or 4.1 nests will succeed, which high percentage will be offset by the smaller clutches and will give us only forty-eight young.

The season is now over, and, assuming no adult mortality, after a total of forty-three trials, 23.2 out of the twenty-five pairs were able to hatch out broods varying in size from four to twenty-one. The total number of chicks (248+60+12+48) equals 368, or an average of 14.7 young for the twenty-five pairs (15.9 for the 23.2) despite the failure of 44 per cent of the nesting attempts. The percentage of loss shown by the 1929-31 data is 51 per cent, though the fourteen nests spoiled by mowing may not represent the correct proportion, as several were found only as rendered conspicuous by removal of the cover. Since the observed 51 per cent loss is not beyond comparison with the hypothetical 44 per cent of the Prairie du Sac area, nor the observed average of 13.6 young per successful nest with the hypothetical average of 15.9, we therefore have some grounds for accepting the Prairie du Sac calculations as indicative of about what happens. Discrepancies between calculations and observational data may be attributed principally to fortuitous hatching variations in the individual nest data lumped to obtain averages.

The best estimate I can make on summer losses to adult birds, based upon inferences from unsolved nest desertions and upon detached bits of data from mowing and traffic accidents and a very few predator kills, is 10 per cent or seven birds, which would leave sixty-two adult survivors for Prairie du Sac at the conclusion of nesting. Seven birds from the population would mean 2.5 breeding pairs, one of which might be lost before reproduction could be consummated. This would cut the 23.2 more or less successful pairs to 22.2.

If we now correct our calculated 15.9 chick per successful nest average to the observed 13.6 average and multiply by the above calculated 22.2 successful pairs, we get a probably more representative total of 302 chicks instead of 368. We then have for the Prairie du Sac area 302 chicks plus sixty-two adults or a population peak of 364 individuals. The fact that some broods have been suffering mortality two months or so before others hatch should not upset our reasoning.

How does a population of 364 become reduced to 184 by New Years? This brings us to a realm of tantalizing unknowns into which no one, of whom I am aware, has penetrated very deeply. True, glimpses of juvenile mortality are now and then obtained, but quan-

titative data on this phase of the bob-white's life history are almost utterly lacking. From here on we must assign increasingly arbitrary values to our factors.

Let us reduce the average size of each brood from 13.6 to ten to allow for the post-nesting juvenile losses up to the time that part-grown young are frequently seen in late summer or early fall. Broods from seven to fifteen are common (all of same size and with one or two adults—not the heterogeneous mixtures of later coveys), and an average of ten may perhaps be as logical as any. Eighty chicks would thereby be eliminated at semi-helpless stages, the victims of accident, vicissitudes of weather, and hungry creatures from which hiding ability and feeble running or flight powers might not always enable them to escape.

By September 15, we may call our population 62 old birds and 222 young of divers sizes. One hundred birds are to die in the next three and one-half months, to be apportioned largely among pot-shooting rabbit hunters in November and December, Cooper's Hawks, and to some extent among Great Horned Owls and migrating Sharp-shinned Hawks.

Losses from Prairie du Sac Great Horned Owls from October to January ran at a rather uniform rate of 1.5 per cent for the 1929-'31 quail population, so five birds might be subtracted from the doomed hundred. An allowance for partly fledged youngsters that succumb to the first October ice storm and for losses from accidents and possibly from Marsh Hawks, foxes, and other of the less efficient avian predators and those mammals which occasionally capture birds lacking resourcefulness, experience, or full physical capacity to take care of themselves might be set at fifteen, though this value is unsubstantiated by actual data.

The residual mortality of eighty birds can be attributed to the pot-hunters, Cooper's Hawks, and Sharp-shinned Hawks. I am inclined to doubt that the sharp-shins get many, for they seem to follow their own food supply (warblers, finches, etc.) southward, and I have never observed them attending quail. A loss of five may be charged to sharp-shins, for want of a better figure.

Winter observations on 473 quail for an average of seventy days disclosed a Cooper's Hawk loss that could be established at 2 per cent and a pot-hunting loss of 1.7 per cent. Both loss rates should be much higher in the fall when the young quail are more numerous and less wary, equally with respect to their native and to their human enemies. If we assume that the ratio of Cooper's Hawk kills to poaching kills is still 2:1.7 for the fall (in probability illegal shooting does far more

damage than Cooper's Hawks in the fore part of November when the opening of the rabbit hunting season draws out all sorts of irresponsibles), we can put down forty birds for the Cooper's Hawks and thirty-five for the pot-hunters. This very conveniently accounts for the remaining 75 missing bob-whites, however remote it may be from the truth.

Thus we have improvised, for a better than average Wisconsin environment a bob-white life equation, which, while it limps badly toward the end, is still an equation and as such is conceivably superior to no equation at all. It at least illustrates a method.

By this we may gain something of an idea how a thriving population ascends in one year from 73 to 184 mature birds. Apart from the direct losses occasioned through man, it is to be remarked that the annual mortality from what we call natural causes is extremely high—extremely high in terms of slow-breeding animals like man himself.

Examined more carefully, the losses take on a less formidable aspect. It is to be seen that nature is most prodigal with the lives of those in which a minimum is invested. The destruction of a dozen newly laid eggs early in the season may cost the species practically nothing. A dead day-old chick has not as much significance to the species as a dead bird that has reached breeding age, irrespective of the potentialities of the chick. Lastly, let it be made clear that a given environment, year in, year out, can support only about so many birds. When the species has filled up the tolerable environmental niches, something has to befall the surplus—unless the environment is improved to accommodate it.

If any one season in the Wisconsin bob-white's life history is supremely critical, it is winter. The complete failure of a summer's nesting need not be as disastrous to the species as a wretched winter survival. The trivial 5 per cent wintering loss given for the Prairie du Sac coveys should not be mistaken for an index as to what commonly occurs. To coveys forced by agricultural practices, emergencies, and the like, to live under adverse environmental conditions—such as prevail throughout much if not most of the Wisconsin quail range—winter means 50 per cent losses or higher, even up to annihilation (Errington 1933).

No, it is not the cold except as the cold kills the starving and those otherwise subnormal. Nor have I yet reason to believe that it is largely the snow, except as snow covers up the food supply and so promotes starvation; nor have I reason to believe it is to any extent a matter of predaceous enemies except where the birds are very much

handicapped, as by territorial deficiencies, starvation, wounds, or possibly disease. The major part of the wintering losses, according to the data at hand, can be laid to inadequacy or unavailability of high grade food or to lack of cover which prevents the birds from finding immediate refuge in case of danger (Errington 1931a, 1931b, 1933). There are many large quail-vacant spaces where some intelligently distributed fencerow brush or a few shocks of corn may mean all the difference between no coveys and perhaps two or three.

TABULAR RECAPITULATION OF THE LIFE-EQUATION OF THE WISCONSIN BOB-WHITE

on three square miles east of Prairie du Sac, January 1, 1930 to January 1, 1931.

Date	Items and Computations	Gain	Loss	Current population
Jan. 1, 1930	Census of quail in area			73
May 1 (pairing)	5% loss since New Years (based on data)		4	69
	General Wisconsin quail sex ratio is 57.7 males to 42.3 females. 42.3% of 69=29 females or 29 possible pairs. Non-breeding females (?), 15% (calculated in another area). 15% of 29 is 4, which subtracted from 29 leaves 25 pairs			
May 1-15 (first nesting attempt	General data show 57% success of nests begun at this time, an average clutch of 19.2 eggs and an average loss of 9.7% eggs through failure to hatch. 57% of 25 initial attempts give 14.3 hatchings. 14.3×19.2=275 eggs. 275 minus 27 (the 9.7%) leaves 248 living young	248		317
May 16-31	Two-thirds of the 10.7 unsuccessful pairs or 7.1 are in condition for prompt renesting (clutches were lost while incomplete). Nests begun at this time are 57% successful, average 16.6 eggs. The 9.7% of unhatched eggs may be considered constant for the summer. 57% of 7.1 attempts give 4 hatchings. 4×16.6=66 eggs. 66 minus 6 (9.7%) leaves 60 young	60		377
June 1-15	Five of the 6.7 unsuccessful pairs (on basis of some data) may be able to renest now. Nesting attempts are only 15.4% successful (destruction through mowing high), average 17 eggs per nest. 15.4% of 5 attempts give .8 hatchings. .8×17=14 eggs. 14 minus 2 (unhatched) leaves 12 young	12		389

Date	Items and Computations	Gain	Loss	Current population
June 16-30 July, and August	The 6 unsuccessful pairs try again during the summer. Their attempts are 68.4% successful, average 12.9 eggs. 68.4% of 6 attempts give 4.1 hatchings. 4.1×12.9=53 eggs. 53 minus 5 (9.7%) leaves 48 young	48		437
	The above calculations give 368 young for the 23.2 eventually successful nests or an average of 15.9 chicks. For this average (which is likely too high to be representative) we may substitute an average of 13.6 actually arrived at from field studies.			
	15.9 (cal. av.)×23.2 (calc. successful pairs)= 368			
	13.6 (obs. av.)×22.2 (corrected calc. successful pairs)*=302			
	Difference due to correction 66 yg.		*66*	371
Summer	Adult losses (calc. on basis of mowing, traffic, and misc. mortality data)		7	364
	Small chick losses (almost wholly arbitrary but based on fragments of weather, predator, and misc. mortality data)		80	284
Fall	Illegal shooting (arbitrary, but based on some data)		35	249
	Mammalian and slow avian predator losses, accidents, misc. (arbitrary)		15	234
	Horned owls (well supported by data)		5	229
	Migrant sharp-shinned hawks (arbitrary)		5	224
	Cooper's hawk (arbitrary, but based on some data)		40	184
Jan. 1, 1931	Census of quail on area			184

*Loss of a pair assumed before reproduction was accomplished.

References

Errington, Paul L.
1931a. The bob-white's winter food. American Game, Vol. 20, pp. 75-78, September-October.
1931b. The bob-white's winter cover. American Game, Vol. 20, pp. 90-93, November-December.
1933. The wintering of the Wisconsin bob-white. Trans. Wisconsin Acad. Sci. Arts and Letters, Vol. 28, pp. 1-35.
Peterson, A. J.
1931. An iron rod that beats any law. American Game, Vol. 20, September-October, 1931, page 72.
Stoddard, H. L.
1931. The bob-white quail (New York, Scribner's).

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EDITORIAL

It Has Been Decided that there will be no meeting of the Wilson Ornithological Club this year. General conditions made the matter of attendance an uncertainty. Furthermore, the American Ornithologists' Union will this year hold an unusual meeting in celebration of its semi-centennial anniversary. If any of us should be able to attend only one scientific meeting this year, the A. O. U. meeting in New York city should be the one chosen. Hence for this additional reason it has been wise to skip our W. O. C. meeting this year. Except for the year 1918 our meetings have been held with regularity since the first one in 1914. It might be well to bear in mind that the American Association for the Advancement of Science meets in St. Louis in 1935, and in Indianapolis in 1937. Our meetings for 1934 and 1936 will have to be otherwise provided for.

The Eighth International Ornithological Congress will meet at Oxford, England, from Monday, July 2, to Saturday, July 7, 1934, under the presidency of Dr. E. Stresemann, of Berlin. Previous meetings have been held at irregular intervals, but the present plan is to convene the Congress quadrennially. Those who attend the Oxford meeting will have the privilege of living for the time in certain colleges of the University. Those who contemplate attending the Congress are requested to communicate with the Secretary of the Congress, Rev. F. C. R. Jourdain, Whitekirk, Southbourne, Bournemouth, England.

The University of Wisconsin announces the organization of a Chair of Game Management in its Agricultural College. The Chair has been financed for five years by the Wisconsin Alumni Research Foundation, and will be in charge of Mr. Aldo Leopold. The work will be limited to research, no undergraduate courses being contemplated.

Mr. W. M. Rosene, our Treasurer, in his business as a banker, has run across an interesting farm lease in his county. The Litchfield Realty Company, of New York, owns a large number of farms in central Iowa. Paragraph No. 11 of their standard lease contains the following text: "The owner of said land, believing it to be for the best interests of the district to encourage the propagation of prairie chickens, pheasants and quail, to that end hereby prohibits, and the tenant hereby agrees to refrain at all times from shooting or trapping of prairie chickens, pheasants and quail on the premises embraced in their lease."

GENERAL NOTES

Conducted by M. H. Swenk

Fifteen Minutes of Bird Observation in a Duck Blind in Indiana.—During the last fifteen years, I have done a considerable amount of field work in connection with bird study and as a nature guide. During the month of March, 1933, I was at the Indiana Department of Conservation Jasper-Pulaski Game Preserve, taking a wild life census of the five thousand acres of the preserve. Part of this time was spent in a corn crib which we had fixed up as a duck blind twenty feet from the duck pond, which lies in about the center of the preserve. On several occasions, Mr. Nathan Anderson, also of the Department, and I had seen a thousand ducks of three or four species on the pond at one time, but never, I believe, have I seen as many kinds as I saw on the afternoon of March 25. On the preceding night a three-inch snow had fallen, the day had been cloudy and very cold, and at 6:30 P. M. the birds were apparently hustling around to feed before nightfall. The corn crib in which we were concealed was set on posts about three feet from the ground, giving us a good observation of the grounds before us. We had cleared snow from several places on the ground and had scattered corn there, as well as on the water at the edge of the land. Within a period of fifteen minutes from 6:30 P. M. on, all within forty feet of our observation post, the following birds were seen, feeding on the ground or the edge of the water unless otherwise noted:

One hundred male Red-winged Blackbirds, chattering and calling; twenty-eight male and twelve female Cowbirds squeeking; one male Cardinal; five Meadowlarks, singing and calling (during the fifteen minute period two male Meadowlarks had a very vicious fight in front of us); six Crows, cawing and flapping their wings as they walked and fed before us; six Mourning Doves; two Bluebirds, singing as they sat on a sunflower stalk to our right; seventy-five Slate-colored Juncos; two Killdeers (one flock of eight flew over our heads, calling as they flew); twenty Tree Sparrows; six Song Sparrows, two singing; eleven Bob-whites, crooning and eating under the corn crib directly under our feet; a male and a female Marsh Hawk flying low over the marsh close by; one White-breasted Nuthatch calling as he fed on the ground; eighteen Robins, calling and singing; twelve Blue Jays, squeaking as they fed; two Downy Woodpeckers, calling as they fed on the ground; one Red-headed Woodpecker; and at the pond's edge before us the following: one Great Blue Heron; five Coots; three Baldpates; twenty-eight Mallards; thirty Ring-necked Ducks; two Red-legged Black Ducks; and two Pintails (several other flocks of ducks of various kinds were seen flying north during that time). The total seen during the fifteen minutes was 389 individuals of twenty-five species.—Sidney R. Esten, *Indianapolis, Ind.*

Some Birds of Judith Basin County, Montana.—In 1903, P. M. Silloway published "Birds of Fergus County, Montana" (Bulletin No. 1, Fergus County Free High School), an annotated list of 179 species of birds observed by him in that county, or reported from that locality by earlier workers—drawing particularly upon an early publication by J. A. Allen (Notes on the Natural History of Portions of Montana and Dakota. Proc. Boston Soc. Nat. Hist., XVII, 1874). Since that time, so far as I know, very little has been published concerning the bird life of that central section of Montana. The territory included within the boundaries of Fergus County in 1903, and covered by Silloway's list of birds,

now includes Fergus, Petroleum, and parts of Musselshell, Golden Valley, Wheatland, and Judith Basin Counties.

From July 5, 1925, until September 22, 1926, I was stationed at the Judith Basin Branch Experiment Station, two miles west of Moccasin, in Judith Basin County. During that time I became well acquainted with the birds that nested on, or visited, the Station farm, including the migrants that paused at an experimental plot of shelter belt trees and shrubs occupying an area of about two acres. A few trips into other portions of the county were made on Sundays when I was able to leave the Station.

At that time I did not publish any notes concerning the bird life of that locality. Being unable to secure a copy of Silloway's bulletin, I did not know whether any of my observations would add to the knowledge of the birds of that portion of Montana. Recently I obtained a copy of his list, and found that it did not include the following species of birds which I observed in the part of Judith Basin County formerly included in Fergus County.

American Rough-legged Hawk (*Buteo lagopus s. johannis*). A rare fall and winter visitor. Observed at the Station, December 2 and 4, 1925, and September 13, 1926. One was seen in the Little Belt Mountains southwest of Utica, September 19, 1926.

Prairie Falcon (*Falco mexicanus*). Observed as a rare permanent resident. Observed occasionally throughout the year in various parts of the county. Three birds lingered at the Station farm from May 15 to 21, 1926.

White-throated Swift (*Aeronautes saxatalis saxatalis*). Several White-throated Swifts were observed in a rocky canyon near Yogo Creek, in the Little Belt Mountains, August 2, 1925. This species probably breeds locally in the county.

Calliope Hummingbird (*Stellula calliope*). One bird of this species, evidently a migrant, visited the Station shelter belt, June 3, 1926.

Northern Hairy Woodpecker (*Dryobates villosus septentrionalis*). One bird, apparently typical of this subspecies, was seen in the Little Belt Mountains along the South Fork of the Judith River, September 19, 1926. A few days later, September 22, one was observed on a fence post in prairie country near Hobson. It was watched closely for several minutes, and its typical markings were carefully noted.

Silloway (*op. cit.*, p. 35) lists *D. v. monticola* as a common resident of the timbered country in that locality. The only previous record of the occurrence of *D. v. septentrionalis* in that part of Montana is that of a specimen taken in the Big Snowy Mountains (Anthony, *Auk*, XIII, pp. 31-34, 1896).

Olive-sided Flycatcher (*Nuttallornis mesoleucus*). Observed in the Little Belt Mountains near Yogo, August 2, 1925. This represents one of the easternmost summer records for this species in Montana. It has been previously reported from the Belt Mountains (Williams, *Bull. Nutt. Orn. Club*, VII, p. 62, 1882).

Violet-green Swallow (*Tachycineta thalassina lepida*). Two birds of this species were seen flying about the face of a high cliff in the Little Belt Mountains, near the South Fork of the Judith River, July 25, 1926.

Rough-winged Swallow (*Stelgidopteryx ruficollis serripennis*). Observed as a fairly common summer resident along the Judith River throughout its course in the prairie portion of the county .

Wilson's Warbler (*Wilsonia pusilla pusilla*). A few Wilson's Warblers visited the Station shelter belt during their fall migration in 1926. The first ones were recorded August 19, when about twenty stopped at the shelter belt. Thereafter a few birds were seen frequently until September 17 (I left the locality September 22). About fifty individuals, all females except one, were observed September 13.

Northern Pileolated Warbler (*Wilsonia pusilla pileolata*). Birds of this subspecies also visited the shelter belt during their fall migrations, but in much smaller numbers than those of the preceding subspecies. Observed September 5, 7, and 8, 1925; a female and a male seen August 20, were the only ones observed during 1926.

Cassin's Purple Finch (*Carpodacus cassini*). A male Cassin's Purple Finch visited the Station shelter belt, May 12, 1926, singing several times soon after sunrise.

Pale Goldfinch (*Spinus tristis pallidus*). Silloway (*op. cit.*, p. 51) lists *S. t. tristis* as the form of this species occurring in Fergus County. So far as I could determine, from close observation, the breeding form at Moccasin was *S. t. pallidus*, and *tristis* occurred as a late summer and fall visitor. Possibly intergradation occurs in that locality. (See Saunders, Pac. Coast Avifauna No. 14, p. 112, 1921). In 1926, five pairs of Goldfinches which I believe to have been *pallidus* nested in the Station shelter belt. The species was first recorded that spring on May 24.

Northern Sage Sparrow (*Amphispiza nevadensis nevadensis*). Six birds of this species visited the Station shelter belt, August 19, 1926, probably in migration. Three were seen there the following day. Previous records of this species in Montana appear to be restricted to Gallatin and Park Counties (Saunders, *op. cit.*, p. 128).

Slate-colored Junco (*Junco hyemalis hyemalis*). Observed as a regular migrant at the Station. Latest date in 1925, September 22. Observed April 25, May 14, and from September 13 to 19, 1926.

On July 25, 1926, at an altitude of about 6500 feet in the Little Belt Mountains near the South Fork of the Judith River, I observed three broods of young Slate-colored Juncos on the wing with adults. There appears to be only one published record of the breeding of this species in Montana (Thorne, *Auk*, XII, p. 217, 1895), and Saunders (*op. cit.*, p. 125) suggests that this record may be inaccurate.

White-crowned Sparrow (*Zonotrichia leucophrys leucophrys*). Six migrant birds of this species were observed in the Station shelter belt, September 13, 1926.

Slate-colored Fox Sparrow (*Passerella iliaca schistacea*). Several Slate-colored Fox Sparrows were observed along the Judith River southwest of Utica, July 25, 1926.—Winton Weydemeyer, *Fortine, Mont.*

Bird Life Along the Kankakee.—During the spring of 1930, it was my privilege to spend several weeks along the Kankakee River in the northeastern part of Illinois, collecting and observing birds. Arrangements had been made some time before to rent a cabin from the owner of one of the numerous summer resorts which are to be found along both banks of this river, and which are well patronized during the summer months. We had made our plans to get there during the height of the migration period, but did not arrive until nearly a week after it was in full swing.

The main purpose of this trip was to get as many different species of North American warblers as possible, to be used for the systematic series, and also other birds which were needed for the same purpose. Sixty different species of birds were seen, of which forty-five species were taken. Most of the birds seen were just passing through on their way to northern breeding grounds, but quite a few remained in this locality to breed.

The first week after our arrival one could not help noticing the great numbers of Tennessee Warblers (*Vermivora peregrina*) that were about. The woods were full of them and I believe it safe to say that one saw three Tennessee Warblers to one of any other kind of bird. This was between the dates of May 8 and 15. The second week, or between the dates of May 15 and 22, the Tennessee Warblers were leaving and their places were taken by the Chestnut-sided Warblers (*Dendroica pensylvanica*) in as great numbers. I do not believe after the beginning of the second week, that is, about May 22, that more than one or two Tennessee Warblers were seen. These two species were the most numerous of the warblers observed in this locality.

One evening as we were returning to our cabin from up the river, quite a number of Rough-winged Swallows (*Stelgidopteryx serripennis*) were seen flying about near the middle of the river, as we were returning in a boat with the current. We let the boat drift slowly down stream, and succeeded in getting a few good specimens, shooting them as they swooped down to the surface of the water in search of food. These birds were quite a welcome addition to our collection, as they were the only ones seen during our stay.

Of the most numerous birds seen in this locality at that time of the year (May), I believe the Catbirds (*Dumetella carolinensis*) will come first. They were in so great numbers that one not only saw one at a time, but two and on numerous occasions, three and four. The Towhees (*Pipilo erythrophthalmus*) were also abundant, hopping around on the ground or perched on low bushes in search of food. There were also many thrushes, with the Gray-cheeked (*Hylocichla minima aliciae*) and Olive-backed (*Hylocichla ustulata swainsoni*) heading the list. I might also mention the Redstarts (*Setophaga ruticilla*), as quite a number of these birds were seen every day, flashing by from tree to tree as one walked through the woods.

One morning as we were going through a large pasture field in which a small herd of cattle were grazing, both the Eastern Meadowlark (*Sturnella magna magna*) and Western Meadowlark (*Sturnella neglecta*) were heard singing. These birds were both in the same field and only about two or three hundred yards apart. We watched one of them through our glasses, singing away perched upon a tuft of dried grass; later, one of each species was taken not far from there.

Quite an unusual story was told to us by the people living in the farmhouse near our cabin, of a Prothonotary Warbler (*Protonotaria citrea*) that had built its nest for three consecutive years in the pocket of an old hunting coat that was left hanging in their garage, which was only about twenty-five feet away from the house. The bird hatched out a brood of from four to six young each year, even though the garage was used continuously by the people in running their car in and out. Each fall at the opening of the hunting season, the farmer would take the coat off the hook, clean out the nest, which was made of dried grasses, use it during the season and then hang it back on the same hook, and the next year the bird would be back again and set to work to build a nest in the pocket and to raise another brood.

This year while we were there, what was believed to be the same bird started to build its nest in the spout of the pump which was standing alongside the house, and where the drinking water was obtained, making it necessary to tie a cloth over the spout so that it would not clog. This did not discourage the bird though, as she soon found another place—in an empty flowerpot which was left standing on the sill of the basement window of the house. She had just finished building when we were ready to leave and upon examining the nest it was found to be made entirely of dried moss.

Quite a few nests of the Prothonotary Warbler were found along the banks of the river, most of them in hollow trees, either leaning out over the water or not far back from the river's edge.

It was on this trip that the peculiarly marked specimen of Rose-breasted Grosbeak (*Hedymeles ludoviciana*) was collected which was described in the *Auk*, XLVII, No. 4, October, 1930. The under-wing coverts of this specimen, which was a female, were rose-pink instead of saffron, this being the normal color for the female, while rose-pink predominates in the males. I have come across only two other cases like this. This specimen was taken on May 16, from a large sycamore tree growing about seventy-five feet from the river's edge.

During our short stay, quite a few interesting observations were made of the nesting habits of the Woodcock (*Philohela minor*). On a small section of ground, approximately one square acre, along one side of which the Kankakee River flowed, and surrounded on the other three sides by heavy woods and second growth thickets, one could always flush from fifteen to twenty birds each time he walked through this particular spot. This small area of ground was thickly covered with brush and other under-growth, and from the number of birds seen and the nests that were found, it was estimated that between ten and twenty birds were nesting there.

On May 17, a nest with four eggs was found, after flushing the bird. We watched every day very closely for the eggs to hatch, but had to bring our stay to a close before the young came out of their shells. On May 19, another nest which contained only one egg was found, also after flushing the bird. We went back the next day, but did not see the bird nor was there another egg in the nest. But on the third day, when we returned again, the nest was found to contain two eggs. But the bird had left before we arrived, so did not get to see her this time either. These two nests were about 150 yards apart, both built right on the ground, of small sticks with a very little dried grass woven in amongst the sticks. While the bird was incubating her eggs, and also when she left the nest, the grass that was growing around was pulled down and over to conceal her and the eggs, so that one would have to look very closely to find out if she was on the nest or not. I noticed that each time a bird was flushed it went about the same distance and direction before alighting, even though we came upon it from different directions just to see what it would do, but each time it would swing around us before settling down again. Could we have arranged to stay longer I am sure that many more interesting observations could have been made of these well-known and delightful birds, which furnish real sport to the hunter in the fall of the year.

It was certainly surprising to find the number of species of birds that we did, so close to the second largest city in the United States, as we were only sixty or sixty-five miles from Chicago's "loop".—John William Moyer, *Field Museum of Natural History, Chicago, Ill.*

A Statistical Study of Ohio Raptorial Birds.—The writer for many years has been interested in the relative abundance and the fluctuation in numbers of the two vultures, the ten owls, and the fifteen hawks known to have occurred in Ohio. During the years 1918 to 1931, inclusive, a careful record has been kept of the exact numbers recorded of each species on all field trips taken. During this period 1,575 whole or part days have been spent in the field, totaling 12,694 hours of observations, 8,071 miles covered on foot and more than 96,000 miles by auto transportation. Every township in the state has been visited and some work has been done in each county of the state during each of the last five years, so the observations have been fairly evenly divided among all sections of the state. A summary of the total numbers of each species enumerated during the fourteen years is as follows:

Turkey Vulture (*Cathartes aura septentrionalis*)	15,745
Eastern Sparrow Hawk (*Falco sparverius sparverius*)	3,841
Marsh Hawk (*Circus hudsonius*)	1,284
Eastern Screech Owl (*Otus asio naevius*)	651
Eastern Red-tailed Hawk (*Buteo borealis borealis*)	538
Cooper's Hawk (*Accipiter cooperi*)	442
Barn Owl (*Tyto alba pratincola*)	301
Northern Red-shouldered Hawk (*Buteo lineatus lineatus*)	263
Great Horned Owl(*Bubo virginianus virginianus*)	236
Sharp-shinned Hawk (*Accipiter velox velox*)	127
Black Vulture (*Coragyps atratus atratus*)	111
Northern Barred Owl (*Strix varia varia*)	70
Short-eared Owl (*Asio flammeus flammeus*)	69
Northern Bald Eagle (*Haliaeetus leucocephalus leucocephalus*)	37
Osprey (*Pandion haliaetus carolinensis*)	37
Eastern Pigeon Hawk (*Falco columbarius columbarius*)	33
American Rough-legged Hawk (*Buteo lagopus s. johannis*)	26
Eastern Goshawk (*Astur atricapillus atricapillus*)	15
Saw-whet Owl (*Cryptoglaux acadica acadica*)	14
Long-eared Owl (*Asio wilsonianus*)	14
Broad-winged Hawk (*Buteo platypterus platypterus*)	11
Snowy Owl (*Nyctea nyctea*)	8
Duck Hawk (*Falco peregrinus anatum*)	5

The total number of raptorials observed in the fourteen years was 23,876. The count by years was: 1918, 697; 1919, 1142; 1920, 923; 1921, 1679; 1922, 1273; 1923, 1648; 1924, 1352; 1925, 2237; 1926, 1315; 1927, 1698; 1928, 2244; 1929, 3434; 1930, 2266; and 1931, 2207. This represents an average of about fifteen raptorials for each day spent in the field, two per hour in the field and three to each mile on foot. The vultures totaled 15,856 individuals, or ten birds per field trip; the hawk group totals 6,654 individuals, or 4.2 birds per field trip; and the owls total 1366 individuals or an average of .9 birds per day in the field. In comparing numbers of field counts of various species, the general habits of the species and its conspicuousness and ease of identification should be taken into consideration. Owls are always much more abundant than the number actually observed would seem to indicate, due to their nocturnal habits and secretiveness. The figures would seem to indicate that hawks were about five times as common as the owls and that the Sparrow Hawk was about six times as common as the Screech Owl, while actually the two species are believed to be of about equal abundance over a large portion of the state.—Lawrence E. Hicks, *Ohio State University, Columbus, Ohio.*

The Cedar Waxwing Breeding at Nashville, Tennessee.—In the Wilson Bulletin of September, 1924, page 138, the writer reported a number of June and July occurrences of the Cedar Waxwing (*Bombycilla cedrorum*) at Nashville, Tennessee. Since that time a number of additional summer records have been obtained, together with one instance of the breeding of the species.

On June 9, 1928, a single waxwing was found in a boxelder just west of the Parthenon in Centennial Park. This seemed strange, since late migrants frequent mulberry trees only. On the 16th, two birds were discovered in the same tree. A few minutes' observation was rewarded by seeing one of the birds go to the neighboring tree and settle upon a nest.

This nest was placed about fifteen feet up, near the end of a long limb, in a small, diseased boxelder. It was viewed only from the ground, and details of its construction, as well as the number and date of laying of the eggs, remain unknown. Apparently some of the eggs had been deposited when the nest was found. It was visited daily, and the birds watched briefly. On July 3, the heads of the young were first noted above the nest rim. On the 12th, they still seemed small, yet had evidently left the nest on the 15th, although they could not then be found. On the 17th they were located in the next tree along the drive, where their parents were caring for them. These birds were very recently out of the nest; their tail feathers were very short, showing only the yellow tips. Search of the whole neighborhood on succeeding days failed to locate the family and no more waxwings were seen until the fall migration.

The adult waxwings ranged widely over the one hundred acre park during the whole nesting period. They invariably flew long distances on leaving the nest, and were often observed at points several hundred yards from their home. This is exactly like the behavior of the birds observed in this same locality in 1924. In fact, the writer feels certain that the waxwings he recorded in June and July, 1924, nested somewhere on the eastern slope of Centennial Park hill.

Since this nest was found a special effort has been made to learn if the species is beginning to establish itself in this region, but with negative results. A lone waxwing flew over my home on the afternoon of August 4, 1929. What looked like a promising record was made on June 21, 1930, when two birds were found at Radnor Lake. An orchard and rows of trees growing along fence lines seemed to offer suitable nesting sites, but the birds were never seen again. This completes the record up to July 15, 1933.—Harry C. Monk, *Nashville, Tenn.*

Too Much Red?—While walking near a tract of fine young oak woodland, on May 18, 1933, I heard at some distance a Scotch version of the song of the Rose-breasted Grosbeak, with a few measures of the Robin's song added. This was interesting, indeed. I advanced very cautiously in the direction from whence the music came. Soon I arrived in sight of the singer, a fine specimen of the Scarlet Tanager. I had just placed myself in a position to observe his beautiful colors and enjoy his song, when suddenly a male Cardinal darted down upon him, brushing first one side and then the other, harassing and tormenting the tanager quite noticeably. The latter adroitly dodged the Cardinal several times, but evidently his disposition as well as his feathers became ruffled, and he started off at high speed over the cultivated fields to the northwest. I watched the reddish glint of his plumage in the bright sunlight through my glasses until he faded from view. It is two miles in that direction to the nearest tract of forest. The tanager

had evidently decided to put enough space between himself and the Cardinal to make renewed conflict between the red and the scarlet impossible. Neither Mrs. Tanager nor Mrs. Cardinal were seen, but the fierce attack of the Cardinal would indicate that his lady probably was warming three or four eggs in a snug nest near by, and according to my observations Mrs. Tanager does not migrate to the north until her brilliantly attired spouse has gone on several days ahead.—E. D. Nauman, *Sigourney, Iowa.*

Notes on Rare Birds in Indiana.—A Snowy Owl (*Nyctea nyctea*) was brought to my home for identification last winter, it having been shot and crippled while sitting in a tree along the street. It was a beautiful specimen, and I made arrangements for the man, who was a stranger, to place it in a window of a bank for others to see, giving him a cage in which to display it. But it did not appear in the window, and I afterwards discovered that the man sold it to someone (he said) for eighteen dollars. But I never saw the cage again!

We found a flock of about fifty Golden Plovers (*Pluvialis dominica dominica*) twenty-six miles north of this place May 4, 1929, in a flooded area near the road, after a heavy rain. The birds were very tame, and were feeding and resting in the shallow water. They did not fly as we stopped to observe them with high power binoculars from the auto. I have never seen them in this vicinity on any other occasion.

I found the Blue Grosbeak (*Guiraca caerulea caerulea*) near here in 1930, a beautiful male which flew down on the ground about ten feet in front of me in the bright May sunshine, giving me a perfect view of him. Not long before this I had seen a pair of these rare birds when out with a class of students and their teachers near Earlham College. In May of this year (1931) I found another Blue Grosbeak in the forest preserve near Oak Park, Ill., and had a good view of him, a young male in changing plumage.

Many American Egrets (*Herodias albus egretta*) and Little Blue Herons (*Florida caerulea caerulea*) from the South were in this part of the country last summer (1930) for several weeks, fishing along streams. Many were killed by boys and men. We have several Great Blue Heron colonies, and also colonies of the Black-crowned Night Heron within a few miles of Anderson. Farmers are driving them out and shooting them.—Mrs. Horace P. Cook. *Anderson, Ind.*

The Song of the Female Orchard Oriole.—Alden H. Miller in the Wilson Bulletin for June, 1931, gives an account of the song of the female Bullock's Oriole (*Icterus bullocki*). The writer would like to follow up that article with a note on the song of the female Orchard Oriole (*Icterus spurius*). On May 31, 1932, while working with Fred M. Dille in Cherry County, Nebraska, I heard what sounded like a shortened song of the Orchard Oriole. The bird was soon found and the lack of black on the throat was as puzzling as the song was when it was first heard. The bird was observed for a long time and gave a song about two-thirds the length of the average Orchard Oriole song. It was obviously not an immature male bird and dissection proved it to be a female.—William Youngworth, *Sioux City, Iowa.*

New Records for Bowling Green, Kentucky.—The long-continued rainy season in the spring of 1933 caused another large transient lake on the McElroy farm, ten miles south of Bowling Green (see "Bird Life of a Transient Lake in Kentucky", Wilson Bulletin, XLI, pp. 177-185, September, 1929). Of the thirty-one species of water and wading birds seen from March 17 to May 26, the following five are new records for this area:

Blue Goose (*Chen caerulescens*). Two adults and one immature bird of this species appeared on the farm on the night of March 13, when a tornado visited Nashville, fifty-six miles away. Another adult and another immature one joined these on March 20. The five remained on the farm until about April 13, according to the managers of the estate. I saw the three on March 17 and 18 and the five on March 24 and 31 (see "The Blue Goose in Kentucky", Wilson Bulletin, XLV, p. 83, June, 1933).

Florida Gallinule (*Gallinula chloropus cachinnans*). One recorded on May 11 and another on May 21. The only other record of this species that I have is questionable.

Black-Bellied Plover (*Squatarola squatarola*). Five recorded around the last remnants of the lake on May 11. They were very noisy and active.

Piping Plover (*Aegialitis meloda*). Several dozen found in company with Semipalmated Plovers and numerous species of sandpipers on May 21.

Wilson's Phalarope (*Steganopus tricolor*). Two females seen on May 11 in company with Semipalmated and Least Sandpipers.

Other species recorded that were new for the farm, but not for my territory, were the American Woodcock (*Philohela minor*) on May 2, and the American Egret (*Casmerodius albus egretta*) on April 27 and 29.

Since the publication of my former study I have also added the following species not mentioned already in these notes: Green-winged Teal (*Nettion carolinense*) on April 3, 1932: Shoveller (*Spatula clypeata*) on April 3, 1932; April 29 and May 2, 1933; and Lesser Scaup Duck (*Nyroca affinis*) on April 3, 1932; March 31 and April 29, 1933. All told, in the twenty-one years that I have studied the transient lake on this farm, I have recorded forty-two species of water and wading birds.—Gordon Wilson, *Bowling Green, Ky.*

Brewer's Blackbirds in Waukesha County, Wisconsin.—Brewer's Blackbird (*Euphagus cyanocephalus*) was first observed in Waukesha County, Wisconsin, by S. Paul Jones and the writer on May 28, 1933. A small colony of ten pairs have established themselves on a savannah seven miles southwest of Waukesha. We found a nest with four eggs on May 30, but were unable to locate any others. This nest subsequently was destroyed. By June 18, all young birds were apparently out of the nests but were still in the vicinity and being fed by the parents. Later, while working on an ecological survey of a large area of wet prairie south of Waukesha, on June 3, 1933, C. P. Gale and I encountered a second colony of about eight pairs. No nests were found, but young birds were seen on June 18. Both localities are similar—being mainly a *Carex* association, with scattered shrubs of *Potentilla fructicosa*. On several occasions I noticed small flocks walking along the freshly-turned earth behind a farmer's plow. In their search for food they often came within six feet of him. This is the first record of Brewer's Blackbird in the county, and one of very few for the state.—J. T. Curtis, *Carroll College, Waukesha, Wis.*

The Mockingbird in Wisconsin.—On December 14, 1932, a Mockingbird appeared at my home at 2222 Van Hise Avenue, Madison. I immediately notified Messrs. John S. Main and A. W. Schorger, who verified the identification. When first seen the bird was feeding on the berries of a heavily-fruited bittersweet vine trained upon an elm tree pruned for the purpose of encouraging the vine. For the succeeding two months the Mockingbird visited this vine daily. The berries of Japanese love-vine also seemed to be eaten to some extent, but a heavily-laden mountain ash tree near by was apparently ignored as a source of food. So also was a chunk of suet maintained on the trunk of the elm, and a feeding platform supplied with corn and a mixture of ragweed and foxtail seed gathered the preceding fall from under a silage-cutter.

The weather throughout January was mild. On February 8, however, a severe blizzard set in. Snow, wind, and sub-zero temperatures prevailed for a week. The Mockingbird appeared the first day of the blizzard, but never again.

Will a straight diet of wild fruit, however abundant, sustain a bird in severe weather? The ornithological literature would seem to assume that wild fruit has material sustenance value for all birds which eat it. Paul L. Errington ("Quail Winter Food and Cover", *American Game*, pp. 7-8, November-December, 1931), however, has now disproved this assumption for Bob-Whites. Possibly this assumption should be re-examined, species by species, since there is no warrant for assuming that their respective digestive powers or physiological needs are all alike.—Aldo Leopold, *Madison, Wis.*

Boldness of Barred Owls when Danger Threatens Young.—I had known for quite a while that a pair of Northern Barred Owls (*Strix varia varia*) had a nest in the woods across the big bottom from my place, for they always acted peculiarly when I happened to be in that vicinity, and every time I neared a certain part of the woods they, both male and female, gave vent to odd noises, a sort of a chortling cry, notes that I had never heard them make before. On May 4, 1932, I chanced to be in that locality and, as usual, the big birds showed themselves almost immediately; they followed me closely, and their cries, more odd than usual, had a note of viciousness in them. I had little time to look for a nest and did not attempt to do so, but you may guess that I was surprised when I happened upon a young Barred Owl sitting at the base of a red oak tree. The parent birds apparently knew the moment I spied him that he had been discovered, for they came still nearer, alighting in the trees very near me, hooting, and snapping their bills.

The young one could not fly well, though if given a start or if starting from an elevation he could fly a short distance. I carried him part way to the houses, the adults still following, hooting, and snapping their bills as before. After a bit I tossed the young one into the air and he sailed back about half way across the bottom where he alighted on a small red elm. One of the adults followed him closely while the other, perched in a beech not more than thirty feet away, kept its yellow eyes glued upon me until I quitted the vicinity.—Grant Henderson, *Greensburg, Ind.*

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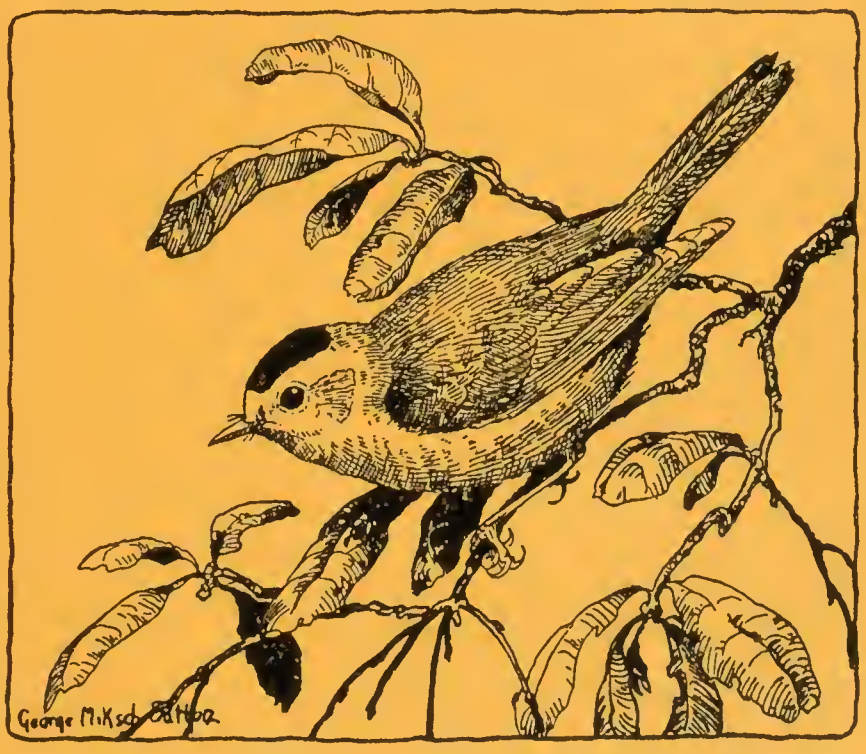
THE WILSON BULLETIN



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WAYS OF THE BLACK SKIMMER

BY IVAN R. TOMKINS

Nearly everyone within the range of the Black Skimmer (*Rynchops nigra nigra*) is familiar with it by one name or other, and many of these names refer to its habit of skimming for food. Champlain, in 1605[1], noticed this species, and described it unmistakably. Since then many others have added various facts, but since it is not possible to tell everything about any one species, this account may perhaps add a little or present old information in a different light.

The place of the observations recorded here is about the entrance of the Savannah River, and the nesting places are on Oysterbed Island, in Georgia, and the Long Island Fill, mostly in South Carolina. The elevation runs up to twenty-two feet above low water, but a tidal rise of six to nine feet makes much of this area untenable for skimmer nests. The colony sites of one year are often abandoned the next, due to the encroaching grass or shrubs, as the skimmers, with their long wings and light bodies do not maneuver well around vegetation. The dredges that pump sand from the neighboring river, furnish new and clear nesting grounds every year or so.

My acquaintance with nesting skimmers extends somewhat casually over portions of ten summers, but the best chance for observation came in 1932, when my floating home was near the Long Island Fill from June 29 till fall. At one time our pipeline went directly through a colony, but with care in laying the line very little damage resulted, and that little arose more from the shyness of certain individuals, than from actual physical disturbance.

No hawks remain in this section during the summer, except a red-tail on Turtle Island, about three miles to the northward, and the Fish Crows that damage the earlier nesting birds, are separated into pairs, and stay close to their own nests through June and July, and so are not much of a menace. But the sudden rain squalls of summer are the worst destroyers of the skimmer nests. A half hour of hard rain will wash away the easily eroded sand, and bury and scatter eggs

everywhere. Some female skimmer with a good sense of location may scratch out the sand from around her clutch, if they are not scattered, but most of the parents will leave the place, and lay another set some days later. When the first hard gusts of wind before the storm blow tiny grains of sand over the grounds, the nesting birds rise like one into the air, there to circle madly for a few minutes, then settle again on the eggs if the wind is not too strong. So the nesting time is extended from the last of May until almost September.

Some earlier writers have said that these birds make their nests by squatting on the sand, turning round, and boring with their bodies.[2] This does not seem like a careful statement from anyone who has handled many breeding birds, and seen the unbroken and immaculate feathers of the breast. I have seen many birds settle into the nest hollows even after incubation is well advanced, and kick backward to remove sand, then sink into the hollow to see how well it fitted. The skimmer usually faces into the wind, and its folded wings and tail make a wind-vane of it, and perhaps the roundness of the nest is due to the fact that the wind goes around the compass at least once every twenty-four hours, on most summer days. The nest hollows always show the scratchings of tiny feet unless a breeze has smoothed out the marks, and not the revolutions of an animated feather duster.

My blind, made of a couple of crocus bags, was in the middle of a small colony, and I prepared a few gauze swabs smeared with prussian blue. These were placed in certain nests, and I retired into the blind. Two birds went at once to their nests, resting against the swabs, and marking their breasts with blue smears. But one was too shy, and would not go into the nest. Another tugged and pulled at the swab, trying to remove it. At each tug her mate would swoop down, and together they zoomed fifty feet into the air, to return almost at once. It was evident he believed that she was about to harm the eggs. In a few minutes I removed the swabs, put numbered sticks by the nests, and then had a chance to register the comings and goings of each incubating bird so marked. Though I was in the blind on several successive days, at no time did any other than the marked birds return to these nests, and as one nest had eggs laid in it during these days, it seems that the females must do all the incubating. One day after scaring them all off the nests, I swapped two sets of eggs (four in one case, five in the other) from birds that were differently marked. In less than five minutes after going into the blind, both birds returned and at once settled on their nests—and their neighbor's eggs. In the colony was one Least Tern, and the bird did not return so quickly to

FIG. 10. 1. Oysterbed Island, in June. 2. A nest with five eggs. 3. The chick is about four days old. 4. The hiding pose. 5 and 6. Nearly ready to fly.

the nest as did the skimmers, and always had to run a gauntlet of lunges and jabs from the birds already settled on the nests. They even did not seem to trust their own kind too close to the nesting territory.

The young birds hatched a day or so apart, showing that incubation started when the first egg was laid, as indeed must have been necessary, with that hot sun beating down on the sand. The old birds fed the young directly so far as I could see, but the adults, like the hawks, owls, and the gulls, regurgitate the scales and indigestible matter from their own food,[3] and the young chicks picking at it might have easily appeared like being fed by regurgitation. Often a young bird too small to run from the nest would have the tail of a small fish sticking out of its mouth. And the adults are to be seen coming to the colony with fish or shrimp crosswise in the bill soon after the first eggs are laid.

The common shrimp, *Penaeus*, is often found on the ground near the nests where it has mummified after being refused or dropped. Small mullet and menhaden are also brought in, and once I found an eight inch long garfish discarded among the nests. If a young bird but little over four inches long, tried to swallow head first this garfish, with a head about one-third its length, it might be hard to get much nourishment from it.

When the birds are about a week old they leave the nest to run about, and down below high watermark where the sand is moist and cool, each scratches a hollow just right to lie in. Their feet are nearly as large as those of the parents, and of several hundred which I banded, none showed any discomfort later from too loose bands. It became very common to catch a youngster and find a band placed three weeks before. At about five weeks old they begin to fly, to develop the longer, horny sheath to the lower bill, and then they begin to show the reddish color on the bill, and to display a voice, as plainly juvenile as is that of a young crow. In May, 1933, one of those swooping over a proposed nesting site had a trace of immaturity in its voice.

No one seems to have recorded the fact that some skimmers remain in winter plumage, with a white band or spot on the hind neck, throughout the summer, and do not frequent the breeding grounds. Presumably these are non-breeders.

The "skimming" way of feeding is the only one I have ever observed, and though many hours have been spent watching them, I have never seen one actually catch a fish that way. I have seen a piece of drift sedge the size of a lead pencil carried many feet into the air,

and dropped. And when the tide is low, and the area of shallow water over the mudflats distant and small, there has been a regular procession of skimmers going out and others returning with food. The skimming activities are greater at dusk and at low tide, while the hoarse notes can be heard all night as they come and go overhead. One night in November we went back to a small pond, teeming with mummichogs, to find a lone skimmer swinging across and back in the moonlight. When skimming the wing beat is quickened and shortened, with the motion mostly in the "hand" of the wing, and the long "forearm" taking small part in the beat, except to keep the wing high above the water. The bill opening is increased through the elastic hinge of the forehead, which allows the lower bill to be carried more nearly parallel to the water surface.

During late September, before there was any great liklihood of migrants from other breeding grounds, and after all the young were awing, I counted the young and old in several flocks that were resting on the sandbars, and found 156 young to 586 adults, or an increase of 26.6 per cent. This means of course only that this was a probable percentage of increase on the breeding birds up to the end of the season, in what seemed to me a normal year. The yearly increase, or rather replacement, would be affected by the mortality of young and of adults during the rest of the year, and by the proportion of non-breeders that then were absent from the flocks. Possibly these last may be found to be birds too immature for nesting in the first or second summer, a common thing with the larger gulls. But that is not proven, and may be one of the things that banding may yet assist in ascertaining.

References

Forbush, E. H. Birds of Massachusetts and other New England States. Volume I, p. 133.

Chapman, F. M. Handbook of Birds of Eastern North America. 1924. P. 172.

Sprunt, Alexander, Jr. An Avian City of the South Carolina Coast. Auk, XLII, 1925, p. 317.

U. S. Dredge Morgan,

Savannah, Ga.

A TEN-YEAR-OLD CARDINAL

BY ALBERT F. GANIER

Mortality among the smaller birds is surprisingly large due to the hazards of a life without shelter from the elements and exposure to natural enemies. Some conception of how short lived our birds really are may be had when one stops to consider that through the years most of our common birds neither increase nor decrease, yet the smaller species bring forth two broods (average) a season, in all, about eight young. If all of these birds returned the following spring there would be ten birds where there were two the year before, and on the third spring there would be fifty. If, as it usually happens, on the second spring there survives only one pair, it means that four pairs have perished and that the average life of these birds has been less than three months. Settlement of new territory and widening of range accounts for only a small percentage of this apparent loss. When a bird has reached the full maturity of its first mating season it has become worldly wise to the extent that its life expectancy has greatly increased and it is probable that a bird which has celebrated its second birthday may look forward to two more. If it lives on beyond that time it may be classed as "lucky" or having had a degree of protection and food supply far better than the average.

During the winters of 1923-24-25, the writer banded at his home, forty-six adult Cardinals (*Richmondena c. cardinalis*), twenty-six of which were males. On one of these males, on February 12, 1924, he placed band No. 73082. Between that date and spring, nine more Cardinals were banded, three of which repeated, but No. 73082 was not handled again. During the next winter twenty-three more of this species were banded and there were a number of repeats, but again No. 73082 was not among them. A real estate development about my home in 1926, effected such a cleanup that few birds remained or returned to visit my premises, so I gave my traps to others for use at other points. During the years which followed, however, I maintained each winter, a feeding shelf which was patronized by a Mockingbird, a pair and sometimes a flock of Cardinals, together with other transient species. In 1930 and again in 1931 I noted that the male Cardinal of the pair wore a band but several attempts to trap him failed. Always, winter and summer, there was a pair of Cardinals about my grounds, and with ample shrubbery as well as fruited hackberry trees, water, and a feeding shelf, they seemed to be entirely at home. During warm days in late winter the male would herald the approaching

spring with his loud, clear whistle from the top of one of the trees in the yard.

In January, 1933, birds had begun to increase in the neighborhood and Cardinals visited my "cafeteria" several times each day, usually in a flock of eight or ten males and females. More often ,they could be seen on the lawn, sedately hulling the fallen hackberries which they found in the grass. I decided to resume trapping on a limited scale and during the first three months, banded nineteen Cardinals, fourteen of which were males. A surprising thing to me was that these birds rarely repeated and instead of being visited by the same flock each day, it developed that they were roving flocks, very few of which returned. On January 29, 1933, I placed band No. B227540 on a male and with a hurried glance, I released him as being of no particular interest. During the balance of the winter I failed to find him among the seven repeats. In late October I set a drop trap outside my bedroom window, which I could watch as I dressed, and on the 28th, I pulled the string as my pair of Cardinals entered it together. The female was found to have been banded the preceding February and the male was No. B227540. Looking him over, I found that he was in good condition except that some of his new neck feathers had not grown out to full length and the outer tail feathers were as yet only about half the length of those at the center. He appeared unusually quiet and made no particular effort to bite or get away. As I examined him I was much surprised to find that on his left (wrong) leg he wore a snug and well worn band. Securing the assistance of my son I carefully removed this and released the bird. The number was not among those I had placed early in the year so I sought out my old record book and was soon elated to find that the band, No. 73082, was the one placed on this bird February 12, 1924. The figures are clearly visible although it had been worn nearly ten years; the band has been sent to the U. S. Biological Survey to keep in its archives. Since the bird was at least six months old when first banded, here is an authentic instance of a Cardinal having attained a life of more than ten years.

I have reason to believe that this male has used my yard as a home during his entire lifetime. A pair of Cardinals build at least three nests each year in the shrubbery about the place. The first of these nests each season for six years past has been built in an Amoor River privet which grows against the south window of a bedroom. In late March the male leads the female into this early leafing shrub and, although she inspects other sites, this one is chosen, even to the same crotch. Both birds bring in material and when the female is shaping

the nest, the male "hands" her his material and she weaves it into the structure. This first nest is usually completed from ten to twenty days before the first egg is laid. It was noted this spring, through the glass of the window two feet away, that both birds wore bands. The young left this nest successfully, as they usually do, and shortly afterwards a second brood was brought forth from a nest in a trellis. Three more nests were built in an effort to raise a third brood but grackles robbed each of them.

On October 12 I noted a male banded Cardinal at my feeding shelf in such poor plumage that I at first took him to be a young one. The bird was molting. A moment later, another male flew beside him, all spick and span with full new plumage. The latter immediately began to quiver his wings and beg for food which the molting bird proceeded to pick up and place in his mouth. This procedure was noted again a few days later and serves to show how the parental devotion persists long after the young are able to shift for themselves. I feel certain that the banded bird was No. 73082.

This pair of Cardinals furnished interesting data in June, 1932, on the ability of diurnal birds to see at night. On the night in question the moon was nearly full but the sky was overcast so that its light was much subdued. At 9:15 P. M., I was walking along the side of my tall privet hedge and, noting some projecting shoots, proceeded to cut them off with my knife. A bird fluttered out above my head and I then perceived its nest in silhouette a few inches from where my hand had been. The bird had flown into a large hackberry tree about thirty feet away. I immediately withdrew and from hiding watched for thirty minutes to see if the bird would fly back. There was certainly no direct return during that period. I went into the house and two hours later, with shaded flashlight, carefully approached and was gratified to see that the bird, a female Cardinal, was again on the nest.

Nashville, Tenn.

EXPERIMENTS ON THE DIGESTION OF FOOD BY BIRDS*

BY JAMES STEVENSON

Introduction

Food is a factor of considerable importance in bird life because of the high rate of metabolism maintained in the body and the consequent rapid digestion of food required to maintain such a rate. This high rate of metabolism is indicated by the high body temperature, great rapidity of heart beat and respiration, and ceaseless activity.

Few birds are confined to one particular type of food and many are omnivorous. The quantity of food available, as well as the quality, is of primary importance in bird life. Many data, compiled by the United States Biological Survey under the direction of W. L. McAtee, indicate that birds, within limits, feed on the kind of food most readily available. Much information has been collected in the last fifty years on the kind of food which birds eat, but the amount which is consumed is less often considered. The Biological Survey and other investigators have spent much time in determining the percentage of insects, seeds, and other types of food that are in the stomach at any one time. Most work of this sort is undertaken to determine the economic importance of birds to man. The study, here reported, takes a different point of view in considering the rôle of food in the physiology and activity of the birds themselves. This paper is intended to serve only as an introduction to the general problem. The results are of a preliminary nature but may be suggestive for further research.

Time of Feeding and Holding Capacity of the Stomach

At the Baldwin Bird Research Laboratory, Gates Mills, Ohio, where systematic trapping is carried on each year, it has been found that passerine birds spend a large proportion of the day in feeding. Opening the stomachs of over 200 birds, taken at all seasons of the year, has revealed less than ten that were empty. These birds were taken at all hours of the day but not at night, and show that our small birds apparently do not fill their crops and stomachs and then wait until they are empty before refilling them, but eat from time to time. A study was made of the weight of stomach contents in a few species, and Table I gives these data separately for adults and juvenals.

In the English Sparrow (*Passer d. domesticus*) the lower end of the oesophagus was found in a few individuals to be enlarged in the

*Contribution from the Baldwin Bird Research Laboratory (No. 27) and the Biological Laboratory, Western Reserve University, Cleveland, Ohio.

TABLE I. Weight of Stomach Contents in Some Passerine Birds.

Species	Age	Number of Records	Average Weight of Bird	Average Weight of Stomach Contents	Weight of Contents Divided by Body Weight	Maximum Weight of Stomach Contents
			Grams	Grams		Grams
Song Sparrow	Adult	5	20.3	0.261	0.0128	0.390
Song Sparrow	Juvenal	6	18.9	0.335	0.0177	0.730
English Sparrow	Adult	6	27.4	0.269	0.0098	0.387
English Sparrow	Juvenal	24	26.0	0.326	0.0125	0.650
Starling	Adult	4	80.8	1.490	0 0185	1.880
Starling	Juvenal	2	79.9	2.290	0.0287	2.820
Northern White-breasted Nuthatch	Adult	10	20.7	0.311	0.0150	0.550

form of a crop. In adults, the weight of the crop contents averaged 0.228 grams, and in the juvenals, 0.277 grams. The food of English Sparrows and Song Sparrows (*Melospiza melodia*) consisted almost entirely of grain, and that of the Starlings (*Sturnus v. vulgaris*) and Northern White-breasted Nuthatches (*Sitta c. carolinensis*) was composed of insects.

In addition to showing the amount of food contained in the stomach at one time, Table I indicates also that juvenal birds out of the nest may carry more food in their stomachs than do the adults, although the number of records are few. In addition to the data in Table I, the following is of interest in this connection. Five nestling Starlings taken at ages ranging from three to sixteen days had an average full stomach content of 2.85 grams, which is to be compared with 1.49 grams in four adults whose stomachs were full. The three-day nestling had a stomach content weighing 2.86 grams. Nestling birds may require relatively more food than adults, as this is used in their rapid growth.

A few measurements on the size of the stomach (length and width) in adult and nestling birds taken after food had been removed indicate further what may prove to be the greater food-carrying capacity

TABLE II. Size of Stomach in Adult and Nestling Birds.

Species	Age	No. of Records	Average Length	Average Width	Range in Length	Range in Width
			Centimeters	Centimeters	Centimeters	Centimeters
Eastern House Wren	Adult	4	1.0	0.9	0.9-1.1	0.8-1.0
Eastern House Wren	Nestling	4	1.2	1.0	1.1-1.3	0.9-1.1
English Sparrow	Adult	2	1.4	1.2	1.3-1.5	1.2-1.3
English Sparrow	Nestling	8	1.7	1.5	1.3-2.1	1.2-1.8
Starling	Adult	3	2.0	1.6	1.9-2.2	1.5-1.6
Starling	Nestling	6	2.2	1.8	2.0-2.4	1 5-2.4

of young birds over adults (Table II). It is desirable that more material on this subject be obtained, as the present data are scanty.

Length of Small Intestine

A study was made of the length of the small intestine in birds collected at the laboratory. Most of these were passerine birds, but a few individuals of other orders were obtained. An attempt was made to distinguish possible differences in the length of intestine in male and female adults and in nestling birds. It was desired to correlate the length of intestine with the length of time for food to pass through the body, with the amount of food consumed, and with the type of food eaten. Of course, the length of intestine is not the actual area of absorption in the intestines. Future studies should take in the width of intestine as well as the length to give more dependable figures on this area. The length of the small intestine was taken to be the distance from stomach to caeca. The large intestine is short and was not included in this study. Gadow and Selenka (1891) have several measurements on the length of the small intestine in their monographic work.

Variation with Sex—The small intestine shows a relationship to sex which will be considered here (Table III). More records were obtained on the Eastern House Wren (*Troglodytes a. aedon*), Starling, and English Sparrow than on any other species. The small intestine of the females of the Eastern House Wren and English Sparrow were found to be 17.9% and 13.0% longer, respectively, in "actual" length than the small intestines of the males. Starling figures favor the males slightly (0.67%). To obtain a better comparison, since the size of the body often varies with sex, the length of the intestine in centimeters was divided by the weight of the body in grams, which gives a measure of the percentage length of the small intestine in terms of the body size (weight). In all three cases, including that of the Starling, the greater proportional length of intestine then favors the female. In the male birds of twenty species studied, the average small intestinal measurement in proportion to body weight averaged 0.762. In females this proportion averaged 0.929, showing that a longer intestine for the female sex is, with a few exceptions, rather generally true in Passeriformes. Riddle and Flemion (1928) found from data on 1,157 ring doves that female doves possessed longer small intestines (from 5% to 10%) than did the males.

Variation with Age—The rate of growth of the small intestine was determined in nestling House Wrens. These data are given in Table IV.

TABLE III. Sex Difference in Length of Small Intestines in Birds.

Species	MALES				FEMALES			
	Number of Birds	Average Length of Intestine	Average Body Weight	Length Divided by Weight	Number of Birds	Average Length of Intestine	Average Body Weight	Length Divided by Weight
		Centimeters	Grams			Centimeters	Grams	
Eastern House Wren	12	10.3	10.7	.962	4	12.15	12.2	.966
Starling	16	29.5	80.4	.367	10	29.3	78.7	.372
English Sparrow	11	17.15	26.3	.652	14	19.5	27.1	.723
Eastern Cowbird	1	13.9	46.7	.297	2	17.5	41.8	.418
Red-eyed Towhee	5	21.34	41.6	.513	3	22.36	39.8	.562
Eastern Purple Finch	7	36.1	25.3	1.425	1	33.0	25.4	1.299
Slate-colored Junco	2	17.8	21.2	.840	1	19.8	21.3	.930
Eastern Field Sparrow	1	14.0	13.7	1.022	1	12.4	12.7	.976
Song Sparrow	8	17.8	20.6	.856	1	17.6	18.0	.980
Eastern Chipping Sparrow	5	12.5	11.5	1.087	3	13.1	11.7	1.199
Red-eyed Vireo	2	14.1	16.0	.881	4	16.2	16.7	.970
Ovenbird	3	15.9	19.2	.828	2	17.8	19.3	.922
Redstart	4	11.3	8.0	1.295	1	9.5	7.2	1.319
Bronzed Grackle	3	31.3	110.4	.283	1	25.0	98.9	.253
Blackburnian Warbler	1	10.0	11.1	.901	1	10.0	9.5	1.053
Eastern Catbird	2	16.8	31.1	.542	1	21.1	38.1	.554
Black-capped Chickadee	7	12.3	12.2	1.008	3	13.2	10.6	1.242
Northern White-breasted Nuthatch	6	15.2	21.0	.724	4	16.4	20.2	.724
Eastern Robin	7	24.2	82.3	.293	2	28.7	77.8	.369
Eastern Hermit Thrush	1	15.5	32.7	.474	1	16.8	31.4	.535
TOTAL, 20 species	104 records			Average .762	60 records			Average .929

TABLE IV. Increase of Intestinal Length in Nestling House Wrens.

Age	Number of Records	Average Length of Intestine	Average Body Weight	Length of Intestine Divided by Body Weight
Days		Centimeters	Grams	
1	2	4.2	1.5	2.80
2	3	6.5	2.7	2.41
3	3	6.5	3.3	1.97
4	2	7.3	4.1	1.78
5	6	10.4	6.3	1.65
6	7	10.6	6.7	1.58
7	4	11.0	7.1	1.55
8	9	11.6	8.2	1.41
9	3	11.6	8.3	1.40
10	3	12.2	9.3	1.31
11	3	12.5	9.5	1.31
12	2	11.8	9.6	1.23
13	2	11.7	10.3	1.13
14	2	11.6	10.6	1.09
15	3	11.7	10.6	1.10

From Table IV, it is evident that growth in the length of the small intestine is very rapid up to the age of eight days, after which it becomes slower. The maximum length is attained at eleven days, after which there appears to be some actual shrinkage to the length characteristic of the adult (Table IV). The rate of growth of the small intestine in proportion to body weight is shown in the last column. There is a gradual decrease in this proportion with increasing age until the birds become adult. In eight nestling Starlings, the length of the small intestine in proportion to body weight was found to be 0.411, while in twenty-six adults it averaged 0.369; in fourteen nestling English Sparrows this proportion was 0.985, while in twenty-five adults it averaged 0.682. All these data indicate a relatively, if not actually, longer small intestine in nestling birds than in adults.

Variation with Type of Food Consumed—Different species of birds feed on somewhat different types of food. Some correlation is possible between type of food consumed and length of intestine. In Table V this correlation is brought out by comparing the length of the intestine with the total length of the body. The length of body was considered to be the length from shoulder to coccyx and was measured in the manner prescribed by Baldwin, Oberholser, and Worley (1931, p. 62).

The length of the small intestine in the species studied is relatively uniform among insectivorous and omnivorous feeders. In birds feeding upon mammals and birds it appears to be somewhat longer. In one species feeding largely on fish and amphibians, it was found to

TABLE V. Relation between Type of Food Consumed and Length of Intestine in Different Species of Birds.

Species	Predominant Type of Food Consumed	Number of Records	Average Length of Small Intestine	Total Length of Body	Length of Intestine Divided by Body Length
			Centimeters	Centimeters	
Eastern House Wren	Insects	11	10.8	3.6	3.0
Black-capped Chickadee	Insects	6	13.1	3.6	3.6
Northern Downy Woodpecker	Insects	4	20.4	5.7	3.6
Eastern Hairy Woodpecker	Insects	3	24.4	7.3	3.3
Song Sparrow	Omnivorous	6	18.3	4.6	4.0
English Sparrow	Omnivorous	16	18.8	5.3	3.6
Eastern Chipping Sparrow	Omnivorous	5	13.5	3.8	3.6
Red-eyed Towhee	Omnivorous	5	21.2	5 9	3.6
Eastern Robin	Omnivorous	4	24.6	7.6	3.2
Starling	Omnivorous	21	29.4	8.1	3.6
Northern White-breasted Nuthatch	Omnivorous	6	14.7	4.6	3.2
Broad-winged Hawk	Mammals, Birds, etc.	2	89.0	13.8	6 0
Cooper's Hawk	Mammals, Birds, etc.	3	54.7	13.3	4.1
Eastern Least Bittern	Fish, Amphibians, etc.	2	69.6	8.2	8.5

be very much longer. A nine-day-old Bald Eagle (*Haliaeetus l. alascanus*[1]) that had been hatched at Western Reserve University possessed an intestine 117 centimeters long, or twenty-two and one-half times its body length.

An explanation of the differences discovered in intestinal length is not attempted in this paper. A long intestine might work to advantage if it furnishes a greater area for food absorption. Allen (1925, p. 68) says, "The digestion of birds is very rapid, and this is perhaps due in part to the great length of their small intestine." On this basis a longer intestine in adult females and in nestlings may indicate more rapid or efficient absorption than in adult males.

[1]The author's manuscript followed the nomenclature of Peters' "Check-List of the Birds of the World" (Vol. I, p. 258) in designating this subspecies as *washingtoniensis*. The editor has changed it to *alascanus* in conformity with the A. O. U. Check-List, which we accept as authority. If Peters' work were complete so that it might be followed consistently, our practice might be otherwise. —Editor.

Rate of Food Passage through Digestive Tract

A study was made of the rate of food passage through the digestive tract of birds. Birds were placed in cages outside a laboratory window and left without food for at least two hours. Screens made of black cloth containing a small peep hole were placed between the birds and the observer so that the birds might be watched without being disturbed. Finely cracked corn, stained with neutral red, gentian violet, or Janus green, was given the birds in order to note the first appearance of waste particles of this stained food in the excrement. In these cases no difference in time was noted between birds fed unstained food and those given stained grain. A method similar to this was used by Kaupp and Ivey (1923) on chickens. Miller (1931) found that elderberries passed through the digestive tract of shrikes in about three hours.

Table VI. Rate of Food Passage through the Digestive Tract of Passerine Birds.

Species	Age	Number of Records	Average Time until First Colored Excrement	Shortest Time Recorded
Birds Starved Two or More Hours, then Fed Stained Cracked Corn				
Song Sparrow	Juvenal	38	1 hour 34 minutes	58 minutes
Song Sparrow	Adult	4	1 hour 42 minutes	1 hour 22 minutes
Eastern Chipping Sparrow	Juvenal	5	1 hour 18 minutes	1 hour
Eastern Chipping Sparrow	Adult	2	1 hour 2 minutes	
Eastern Field Sparrow	Juvenal	2	1 hour 37 minutes	1 hour 14 minutes
Eastern Field Sparrow	Adult	2	1 hour 41 minutes	
English Sparrow	Juvenal	1	1 hour 25 minutes	
Red-eyed Towhee	Juvenal	3	1 hour 32 minutes	1 hour 20 minutes
Five species Fringillidae		57	1 hour 32 minutes	
Birds Starved Two or More Hours, then Fed on Fruit (Raspberries)				
Cedar Waxwing	Juvenal	2	1 hour 40 minutes	
Birds Starved Two or More Hours, then Fed on Insects (Beetle and Moth Larvae—Mealworms)				
Scarlet Tanager	Adult	6	1 hour 25 minutes	
Average Length of Time between Last Stained Food Eaten and Last Colored Excrement Voided				
Song Sparrow		11	2 hours 14 minutes	
Eastern Field Sparrow		3	2 hours 30 minutes	
Birds not Starved Previously (Other Food in Digestive Tract)				
Song Sparrow	Juvenal	5	2 hours 33 minutes	

The average time required for the first stained food to pass through the digestive tract in previously starved birds (Fringillidae) was 1 hour and 32 minutes (Table VI). In instances where birds

were not starved previously there was a delay of approximately an hour in the appearance of the first colored excrement. This agrees with the delay of nearly an hour in the interval between last food eaten and last excrement voided. There is evidently a delay, probably in the stomach, in the passage of food after some has already been taken into the alimentary system. It may be noticed that the rate of passage in birds fed insects, fruit, or grain, is practically the same. With such rapid assimilation of food material, birds must keep searching actively for nourishment.

Amount of Food Consumed Daily

The number of meals per day, or times that the stomach is filled daily, has been estimated by various ornithologists. Allen (1914) calculated that adult birds eat eight full meals a day, and Bailey (1905) thought that insectivorous birds filled their stomachs five or six times daily. Rörig (1905) determined amount of food in dry weight consumed daily by certain European birds. This varied in different species from 8-13.4 per cent of the body weight in winter to 11.9-19.5 per cent in summer. Taber (1928) has deduced that a dove will consume from 11 to 20 per cent of its weight daily in grain or weed seeds. Bryant (1914) concluded that meadowlarks could completely digest a meal in four hours and that they took only three meals a day. He believed that grain took longer to digest than insects and that the amount of grain found in a stomach would equal nearly one-half the daily requirement. Miller (1931) working on captive shrikes found that they might eat between fifteen and twenty grams of beefsteak or mice in one day.

If the time required to empty completely the stomach and intestines in a Song Sparrow is 2 hours 14 minutes, and the average daily duration of total possible sunlight during June, July, and August is 14 hours 35 minutes at Cleveland, Ohio, then this species must consume the equivalent of six and one-half meals per day. Since birds may be active before sunrise and after sunset (Shaver and Walker, 1931), another meal may be consumed, which is not fully digested until after dark, to make a total of seven and one-half meals per day. If the average weight of a normal stomach full of food in the song sparrow is 0.261 grams, the total food consumed during the day will equal 1.957 grams, or 9.6 per cent of the body weight of the adult. Experiments on a Scarlet Tanager fed meal worms, the larvae of moths and beetles, showed that the bird would eat an amount equivalent to 32.1 per cent to 40.8 per cent of its body weight daily.

Percentage of Food Digested

Most of the food given sparrows used in these experiments consisted of "chick feed" or finely cracked corn. In order to determine the percentage digested (Table VII) a specific amount of food was given in each case and the amount eaten was calculated by subtracting what was left at the end of the experiment. The "sac" in which the excrement was voided, was separated from the undigested food, and later the air dried feces were weighed on a chainomatic balance. A total of nineteen records showed that 90.4 per cent of the food eaten was digested and absorbed.

Table VII. Percentage of Food Digested and Absorbed by Birds Fed Finely Cracked Corn.

Species	Records	Average Amount of Air-dried Food Eaten	Average Amount of Air-dried Excrement	Percentage Digested and Absorbed
		Grams	Grams	
Song Sparrow	11	0 254	0.0296	91.1
Eastern Chipping Sparrow	3	0 334	0.060	85.3
Eastern Field Sparrow	3	0 207	0 015	92.9
English Sparrow	1	0.124	0 010	91.9
Slate-colored Junco	1	0.384	0.038	90.0
Average of 5 species	(19)	0.259	0.0315	90.4

Effect of Environment on Rate of Feeding

Certain environmental factors influence the extent of feeding and may curtail activity along this line for periods of time. Wind or rain storms will send birds hurrying to cover just as periods of intense heat will decrease movements and tend to keep birds rather quiet and in the shade. In this latter case the amount of movement is reduced but some feeding does take place.

In order to study the effect of air temperature upon amount of feeding by birds, a study was made of banding records. For the past several years, intensive bird trapping for banding purposes has been accomplished at the laboratory during the warmer months. Traps were baited with various foods and were visited regularly throughout the day. The birds captured were taken to the laboratory, weighed, and immediately released. The traps were not operated during severe rain storms, although light rain, not lasting over a few hours, does not seem detrimental, as far as occupancy of the traps is concerned.

A survey taken of the number of new, return, and repeat birds in the traps daily was made for the months of June (latter portion only), July, and August of the years 1925, 1926, 1928, and 1930. Birds taken were resident species and included both adults and juve-

nals. Table VIII tabulates trapping of Song, Eastern Field, and Eastern Chipping Sparrows during these months. Some individuals exhibited little fear, visiting the traps four or five times daily for food, and handling does not appear to frighten birds. The trapping days were assorted into groups having the same mean temperature within 5° F., and an average was made of the number of birds taken in the traps on those days. The lower ranges of air temperature are not included since they occur early in the summer when juvenal birds are not available and so are not comparable with records obtained later. A rapid decline is shown in the number of birds trapped daily when the mean daily temperature rises above 71° F.

Table VIII. Effect of Daily Mean Temperature on the Feeding and Trapping of Song, Eastern Field, and Eastern Chipping Sparrows.

Daily Mean Temperature	Number of Days	Average Number Trapped Daily
71-75° F.	71	7.6
76-80° F.	44	4.7
81-85° F.	9	3.7

Survival Time of Birds without Food

The amount of reserve food in the body which the bird can call on in times of stress is of considerable importance in affecting its abundance and migration. Experiments by S. C. Kendeigh and the author (unpublished) on resistance of birds to various degrees of air temperature show that certain species, such as the English Sparrow, have the longest survival time without food at a relatively high air temperature. Sixteen English Sparrows, confined one or two at a time in an incubator at a constant temperature of 92.2° F. and a relative humidity of 56 per cent, lived, on the average, for 47.9 hours. Apparently death was here due to complete starvation and exhaustion of food reserves. At higher or lower air temperatures, the regulation of body temperature is affected and death comes more quickly, apparently before complete exhaustion of reserve food can take place. The average loss in weight at death of these birds at 92.2° F. was 34.5 per cent of their original weight at the beginning of the experiments. This represents a loss of 0.7 per cent of the original weight during each hour of survival. Excrement was voided more or less regularly throughout the survival period, in spite of the fact that no food was passing through the alimentary tract. It probably consisted largely of urinary wastes. This experiment indicates that even at the most favorable air temperature, the survival time of birds without food is relatively short, although considerable emaciation of the body occurs before death results.

Discussion

Among many theories as to the cause of bird migration and the determination of the time at which migration occurs, the importance of food has received much support. Change in temperature is another factor of importance and a combination of the food and temperature factors may well be made. Migration in its early stages, according to Taverner (1904), was a dispersal to seek food. This search for a shifting food supply may have become habitual, and the direction and time of this movement may be influenced by temperature. Obtaining an adequate amount of food is necessary to maintain a resistance against low air temperature, particularly at night. The hours of daylight in which this food may be obtained are shorter in winter, and hence those species, which are not physiologically adjusted, migrate out of the region in autumn.

English (1923) has brought out the point that birds that breed in northern latitudes have larger broods than those species that nest further south. There may be some relation here between size of broods and the longer period of daylight available for securing food. This would indicate an advantage in a northward spring migration away from the tropics.

Movements of birds are not all regular migrations but may consist of sporadic invasions or dispersals instigated on most occasions as a search for food. Snowy Owls (*Nyctea nyctea*) travel south at the sign of a scarcity of rabbits, and crossbills and waxwings will move if their winter supply of pine seeds and berries is lacking. Even normal winter residents will effect a slight seasonal movement if the food supply fails. The regular resident species in northeastern United States are those that make use of food not easily obscured by snow.

Food is often an important direct factor controlling the number of species wintering in northern Ohio, wherein climate may act only as an indirect factor. Severe storms with snow obscuring the ground and ice covering tree trunks are fatal to many birds (Rice, 1924; Wetmore, 1926; Errington, 1931). There are some birds capable of withstanding low winter temperatures providing they are able to find food. In mild winters food is less difficult to find and representatives of species that normally move southward may remain in the vicinity. The winter of 1930-31 was a mild one in northern Ohio with little snow. It was accompanied by the occurrence of eighty-three species of birds, some of which are not normally resident at this season, and testified to a sufficient food supply for this population.

Food is also a factor in regulating the abundance of birds. In this instance, food plays a part in determining the relative size of the territory set up by adult birds during the nesting season. In winter great mortality and diminution in abundance of a species may result when food becomes unavailable.

Summary

1. Passerine birds feed more or less continuously during the daylight hours.

2. Female birds of several passerine species possess relatively longer small intestines than do males, and immature birds of some species possess relatively longer intestines than do the adults. The relative length of the small intestine is uniform among many insectivorous and omnivorous species, but there is an indication that it is longer in some birds living on small mammals, birds, amphibians, and fish.

3. In some species of passerine birds, the first voided excrement from a stomach full of food appears in about one and one-half hours, the last in about two and one-half hours.

4. Some species of birds when feeding on grain daily consume an amount equivalent to 9.6 per cent of their body weight. About 90.4 per cent of the food ingested is utilized by the bird, the rest is excreted.

5. Passerine birds tend to decrease the amount of their feeding on hot days.

6. The survival time of small passerine birds without food is relatively short, even at the most favorable temperature.

7. Food in sufficient quantity is a factor of considerable importance in controlling the migration and regulating the abundance of birds.

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Bibliography

Allen, A. A. 1914. Birds in Their Relation to the Agriculture in New York State. The Cornell Reading Courses, Vol. 4, No. 76, 56 pages.

Allen, G. M. 1925. Birds and Their Attributes. Boston. Marshall Jones Co., 338 pages.

Bailey, V. 1905. Birds Known to Eat the Boll Weevil. U. S. Dept. Agri., Biol. Surv. Bull. No 22.

Baldwin, S P., Oberholser, H. C., and Worley, L. G. 1931. Measurements of Birds. Cleveland, Ohio. Scient. Publ. Cleve. Mus. Nat. Hist. II. Pp. i-ix, 1-165.

Beal, F E. L. 1915. Some Common Birds Useful to the Farmer. U. S. Dept. Agri. Farmers' Bull. No. 630.

Bryant, H C. 1914. A Determination of the Economic Status of the Western Meadowlark (*Sturnella neglecta*) in California. Univ. Calif. Publ. Zool. Vol. 11, pp. 377-510, pl. 21-24, 5 text figs.

English, T. M. S. 1923. On the Greater Length of the Day in High Latitudes as a Reason for Spring Migration. Ibis, 11th Series, Vol. 5, pp. 418-423.

Errington, P. L. 1931. Winter Killing of Barn Owls in Wisconsin. Wilson Bull., 43, p. 60.

Gadow, Hans, and Selenka, Emil. 1891. Vogel. I Anatomischer Theil. Bronn's Klassen und Ordnungen des Thier-reichs; sechster Band, Vierte Abteilung. Leipzig s. 1-1008.

Judd, S. 1901. The Food of Nestling Birds. Yearbook of U. S. Dept. Agri. for 1900, pp. 411-36.

Kalmbach, E. R. 1922. A Comparison of the Food Habits of British and American Starlings. Auk, 39, pp. 189-95.

Kaupp. B. F., and Ivey, J. E. 1923. Time Required for Food to Pass through the Intestinal Tract of Fowls. Jr. Agri. Research, 23, pp. 721-25.

Miller, A H. 1931. Systematic Revision and Natural History of the American Shrikes (Lanius). Univ. Calif. Publ. Zool., 38, 11-242. 65 text figs.

Rice, J. H. 1924. Destruction of Birds in South Carolina. Auk, 41, pp. 171-72.

Riddle, O., and Flemion, F. 1928. A Sex Difference in Intestinal Length and Its Relation to Pituitary Size. Endocrinology, 12, pp. 203-208.

Rörig, G. 1905. Studien uber die wirtschaftliche Bedeutung der insektenfressenden Vogel. Biologischen Abteilung fur Land und Forstwirtschaft am Kaiserlichten Gesundheitsamte, Band 4, 1905. S. 1-50.

Shaver, Jesse M., and Walker, Ruby. 1931. A Preliminary Report on the Influence of Light Intensity upon the Time of Ending of the Evening Song of the Robin and Mockingbird. Wilson Bull., Vol. XLIII, No. 1, Mar. 1931, pp. 9-18.

Taber, W. B. 1928. A Method to Determine Weight of Food Digested Daily by Birds. Auk, 45, p. 339.

Taverner, P. A. 1904. A Discussion of the Origin of Bird Migration. Auk, 21, pp. 322-33.

Wetmore, A. 1926. Migration of Birds. Harvard University Press, Cambridge, Mass. 217 pages.

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THE BREEDING BIRDS OF ASHTABULA COUNTY, OHIO

BY LAWRENCE E. HICKS

Ashtabula County, located in the extreme northeastern corner of the state and bordering on Lake Erie and northwestern Pennsylvania, has preserved more relics (both in number of individuals and species) of the northern and northeastern flora and fauna than any other Ohio county. Various physiographic and historical influences, poor drainage of heavy soils having a high water table and a high rainfall-evaporation ratio, have combined to produce in many of the little disturbed areas, cool, moist, humid environments suitable to the preservation of many species now rare or absent in other portions of the state.

Ashtabula is the largest Ohio county, having 687 square miles. The important natural features and the localities of particular ornithological interest can best be located by referring to the accompanying topography map. The county can be divided into two distinct areas, a lake plain belt averaging about three miles in width, and an upland area, including all of the area south of the lake plain. These two areas are separated by a distinct east-and-west escarpment known as the South Ridge, and by a sudden rise from the lake plain to the upland area. Another ridge, North Ridge, parallels about a mile to the north. These ridges are of sandy and gravelly materials and represent the former shore line levels of glacial lakes formed in the past when ice dams blocked the present outlets of the Great Lakes System.

The present lake shore consists of a cliff cut in the till sheet and varying from 10 to 90 feet in height. The lake plain is nearly level, sloping gently to the north, except where affected by stream erosion. Several fine small marshy areas, swamp forests, and ponds are to be found in the lake plain belt. To the east generous remnants remain of the original forest of hemlock, chestnut, and white pine and many of their accompanying species.

Three large streams, Conneaut River, Ashtabula River, and Grand River, flow into Lake Erie. All have remarkably tortuous channels and have cut very deep gorges with rich flora combinations and extreme variations in light and moisture conditions. A branch of the Grand River, Phelps Creek, has cut a similar gorge in the southwestern corner of the county, where many southern species are found which do not occur elsewhere in the county. Another large branch of the Grand, Rock Creek, arises in the large swampy Orwell Bog. This bog is a part of the famous Bloomfield Bog area of Trumbull County and at one time was truly remarkable in many ways, but has had most of its fine features destroyed by the activities of man.

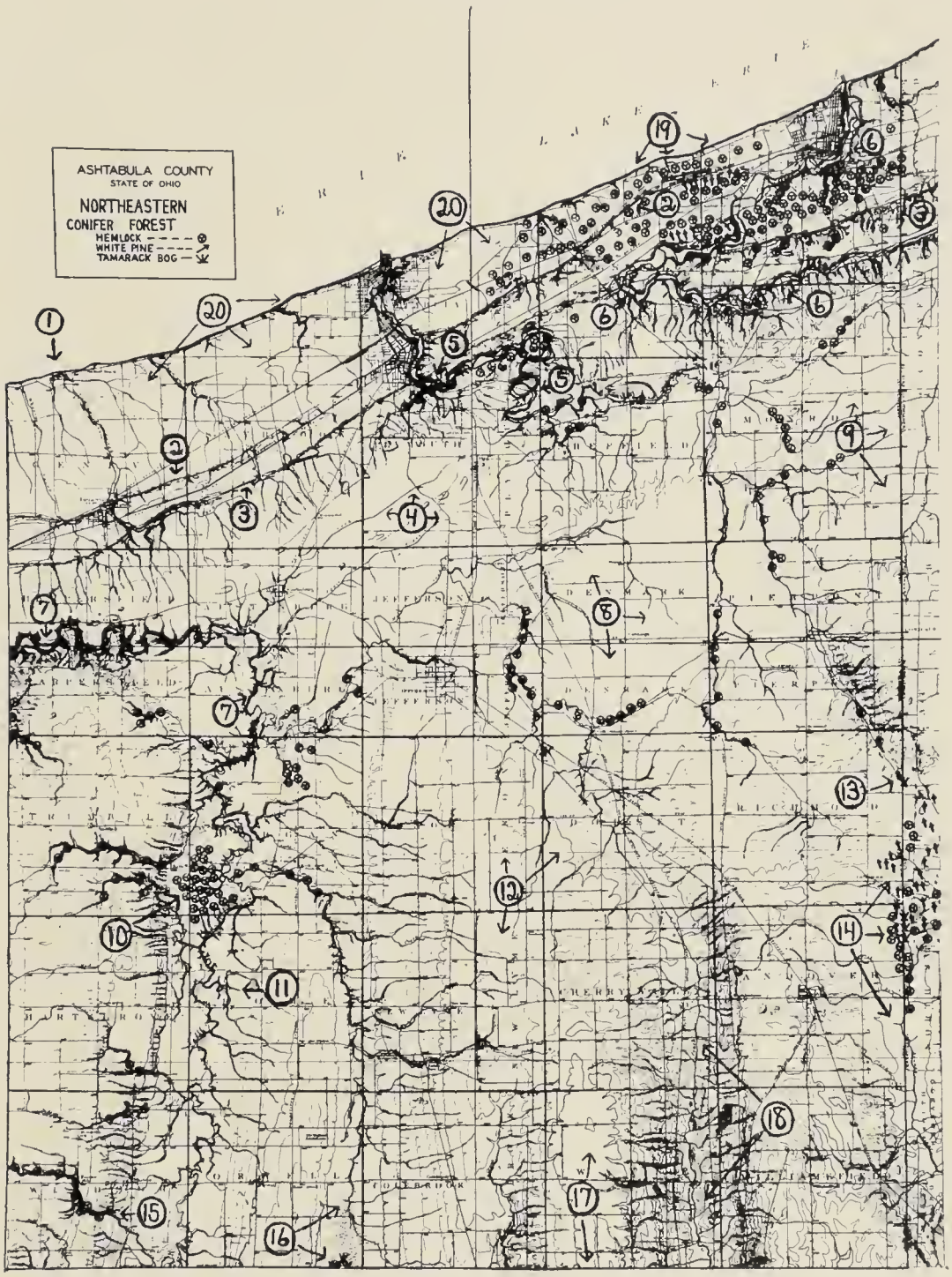

FIG. 11. Map of Ashtabula County, Ohio. This map has been prepared from the Ashtabula, Conneaut, Orwell, and Andover quadrangles of the United States Geological Survey. Stamped overprint indicates the original areas of hemlock, white pine, and tamarack forest. The circled numbers designate the following localities of particular ornithological interest: 1. Geneva-on-the-Lake Marshes. 2. North Lake Ridge. 3. South Lake Ridge. 4. Plymouth Marshes. 5. Ashtabula River Gorge. 6. Conneaut River Gorge. 7. Grand River Gorge. 8. Denmark Township Upland Flats. 9. Eastern Monroe Township. 10. Morgan Swamp. 11. Lake Cardinal. 12. Upland Flats of Lenox, Dorset, and New Lyme Townships. 13. Penn-Line Bog. 14. Pymatuning Bog-Shenango River. 15. Phelps Creek Gorge. 16. Orwell Bog. 17. Wayne Township Upland Flats. 18. Pymatuning River. 19. Lake Belt Hemlock Forests. 20. Lake Belt Swamp Forests.

West of the Grand River, the land rises abruptly by a series of terraces to the upland, much of which is poorly drained and forested by wet beech flats, swamp forest or swamp oak species. Morgan Swamp was formerly a large area covered mostly by a dense hemlock forest. Though sadly exploited, many fine species of flora and fauna still remain. Lake Cardinal, along the east bank of the Grand, is attractive to many bird species. Most of the townships to the south and east, especially Wayne, New Lyme, Lenox, Cherry Valley, Dorset, Denmark, and eastern Monroe, have large areas of upland heavy wet soils covered with little disturbed second growth thickets and swampy forests. The water table is high and the forests very cool with high humidities. Many rare northern plant and animal species occur in regular abundance, the forest floor frequently being carpeted with sphagnum moss or dense growths of ferns or club mosses.

Mosquito Creek, the Shenango River, and the Pymatuning River are the only streams flowing south into the Ohio-Mississippi drainage. The latter stream, especially, has a broad valley with numerous branches and extensive swampy or boggy areas attractive to many rare species. Several boggy areas, including the fine Penn-Line Bog, occur at the headwaters of the Ashtabula River.

The Pymatuning Bog is a crescent-shaped area of about twenty-five square miles of mostly wooded swamp and bog. The major part of the Pymatuning Bog is in Pennsylvania, but the Ohio portion originally covered about 2,200 acres in Richmond, Andover, and Williamsfield townships. The Ohio part, though not so extensive, included some of the best parts of the whole area. All of the bird species reported by Sutton from the Pennsylvania side have been found breeding on the Ohio side and the writer has been able to find but one species of vascular plant in the whole Pymatuning area which has not been collected in the Ohio portion.

The author first became interested in the flora and fauna of Ashtabula County in 1924. For three years thereafter only a limited amount of field work was done, as the area was not readily accessible. During the summer of 1928 and 1929, he was able to engage in field work in the county for the United States Bureau of Plant Industry. Hundreds of miles were covered on foot, systematically surveying areas of all types and penetrating into almost inaccessible thickets, bogs, and swamps, or covering very mediocre appearing localities which might have been considered unproductive and avoided in a biological survey. Thus a most valuable cross-cut study was made of

seven townships of the county and special trips were made to all other areas of importance.

During the summer of 1930 considerable time was spent in the county while making some special studies of the Ruffed Grouse for the Ohio Division of Conservation. In 1932 part of June and nearly all of August and September were spent in revisiting every square of land in the county and checking all previous observations made. During the eight-year period, all other time available during the growing season, was spent in the county or in related studies in Pennsylvania (Pymatuning Bog and Allegany National Forest), southern Ontario, western New York (Allegany State Park), and the White Mountains. This made it possible to become thoroughly acquainted with the characteristic northern flora and fauna and to compare and relate these areas with conditions in northeastern Ohio.

My records show the following field work for Ashtabula County:

Year	Days in Field	Hours in Field	Miles on Foot	Miles by Auto
1925	9	68	84	270
1926	11	118	107	445
1927	14	153	148	572
1928	103	1102	984	4084
1929	71	88	702	3550
1930	31	342	407	3280
1931	28	301	291	2530
1932	47	561	421	5180
Total	314	2733	3144	19911

During this time special ecological studies were made of the breeding bird species and attempts were made to correlate their distribution and numbers with various environmental factors. An attempt was made to collect all of the vascular plants occurring in the county. The state herbarium and my own herbarium now have a total of approximately 4,000 Ashtabula specimens, representing 1,547 vascular plant species. A large number are very rare plants and twenty-nine native species are now known to occur which are unknown elsewhere in Ohio. This is the largest total list and also the largest list of native plants known from any Ohio county. Wherever unusual plant combinations were found ornithological rarities usually accompanied.

The present paper is an attempt to make an accurate historical record of the status of each breeding species of the county. The study on which it is based was a timely one for undisturbed tracts of northeastern types are very rapidly disappearing. Pronounced changes have taken place during the eight years of the study. The breeding

warbler and water bird populations have shifted surprisingly in many localities. Plant life has shown even more conspicuous effects. The foremost influenec has been drainage and the rapid lowering of the water table, coupled with the drouth effects of 1930. Lumbering and agricultural operations have made big changes. Most regrettable has been the complete destruction of the Ohio portion of the Pymatuning Bog during 1932 in the construction of a new reservoir. It seems probable that several species will be eliminated as breeding species by these changes and many will be considerably reduced in numbers.

The distribution and abundance of many species of breeding birds are closely linked with the forest types present in the county. The area was formerly heavily forested, small parts of which have never been molested. Extensive areas were only partially lumbered so that many localities now have forests rather similar to the original ones. Many of the heavy soils proved unprofitable for farming, especially after the decline of the dairying industry. Thus hundreds of abandoned farms occur, giving shelter to plant and animal life which would otherwise have disappeared. Many large undrained tracts of 100 to 500 or more acres occur in most sections, representing dozens of mixed combinations in the various stages of reversion to the original forest. This provides a variety of habitats favorable to the support of species of unlike requirements and a diversity and interspersion of types capable of sustaining large numbers of birds per unit of area.

Fine examples of all of the original forest types still remain, occurring in not far from their original proportions, though reduced in area by the cleared land and by the secondary forests and thickets of spice bush, witch hazel, trembling aspen, black cherry, hickory, and white elm. All of the original and present vegetation types occurring in the county were carefully mapped. Types originally represented and the percentage of the total area of the county devoted to each, were approximately as follows: beech-sugar maple, 57%; wet beech flats, 11%; oak-hickory, 4%; oak-chestnut, 10%; white elm-white or black ash-red maple, 10%; hemlock-beech or hemlock-chestnut, 4%; swamp oak, 2%; white pine-chestnut or white pine-hemlock, 1%; tamarack bog, less than 1%.

A beautiful series of succession changes takes place in the bird life of an open area as it is invaded by forest and passes through the thicket stages to a mature sugar maple-beech forest. The forest crown forms and closes over. The temporary species, the lower branches, and all but the most successful individuals, disappear. Great changes take place in the undergrowth and amount of dead tree parts. Various

FIG. 12. A second growth swamp forest in southern Wayne Township, typical of numerous similar areas throughout the county, where a large portion of the forest floor is covered with shallow pools of water throughout the summer months. The constant water supply, low temperature, and high humidities have preserved in abundance many rare northern species.

FIG. 13. Luxuriant growth of cinnamon fern in the Pymatuning Bog among tamarack, cranberry tree, and hobblebush. The ground cover is of gold-thread, Clinton's Lily, twin flower, and Dalibarda. Four species of club mosses are common. Sixteen species of warblers nest here.

local conditions may accelerate or retard these changes and variations occur when some other climax type develops. It is extremely fascinating and illuminating to correlate these successions with the successions occurring simultaneously in the bird life.

When from one to ten feet high the tree growth consists mostly of sprouts and seedlings of temporary species and there are large open spaces between the crowns. At this stage five bird species predominate, the Indigo Bunting, the Field Sparrow, the Blue-winged Warbler, the Chestnut-sided Warbler, the Towhee, and in moist areas, the Northern Yellow-throat. When from about ten to eighteen or twenty feet high, the forest crown converges and slowly closes over and soil humus begins to accumulate. The species named begin to disappear and are replaced by the Robin, Red-eyed Vireo, Ovenbird, Rose-breasted Grosbeak, Goldfinch, and Least Flycatcher. When from twenty to thirty-five or forty feet the temporary species disappear, herbacious plants develop on the forest floor and in certain localities young hemlocks begin to develop. The last named species continue and several new ones come in, including the Ruffed Grouse, Scarlet Tanager, Junco, Black-capped Chickadee, and Blue Jay.

At from thirty to fifty feet the smaller dead trees begin to appear, having been overtopped and starved out due to shading by more successful individuals. The Black-throated Green Warbler and in some areas the Blue-headed Vireo appear at this stage. At from fifty to sixty-five feet many large dead trees appear. The Rose-breasted Grosbeak now drops out and a large number of new species come in, including the Wood Thrush, Hairy and Downy Woodpeckers, Crow, Magnolia Warbler, Veery, and in certain areas, the Black-throated Blue Warbler and the Blackburnian Warbler. Finally at from sixty-five to ninety feet the mature forest develops, having numerous old logs and stumps. Where subjected to storms, windfalls and upturned roots modify the habitat. By this time considerable undergrowth has developed which shades out the smaller herbacious plants of the forest floor. The Robin, Ruffed Grouse, and Black-capped Chickadee now disappear and the Wood Pewee, White-breasted Nuthatch, and perhaps the Hooded Warbler, occur for the first time.

Other special studies were made of nesting activities, number of eggs, seasonal variations, extremes of nesting dates, yearly fluctuations and the percentage of successful nestings. The results obtained will be compared with those of studies in other portions of the state and reported upon later. Most of the field work was done individually but on numerous occasions the writer was accompanied on field trips by

S. V. Wharrum, of Austinburg, Robert H. McCormick, of the Ohio Division of Conservation, Charles F. Walker, of the Ohio State Museum, Ray T. Everley, of the United States Bureau of Entomology, Roscoe W. Franks, of the Baldwin Bird Research Laboratories, Roger Conant, of the Toledo Zoological Society, or by various agents of the United States Bureau of Plant Industry. The writer wishes to thank them for frequent valuable assistance in some of the field studies. Only a limited amount of collecting of bird specimens was done as the species involved were all readily identifiable under field conditions and extensive collecting would have made it necessary to curb much of the study program. A number of skins or eggs of the unusual species are to be found in the collections of Otterbein College and the Ohio State Museum. Field workers from the Cleveland Museum of Natural History have also made numerous collections in the Pymatuning Bog region.

The total number of bird species recorded from Ashtabula County which can be regarded as certain breeding species totals 154. The actual breeding of 145 of these has been established by the finding of nests with eggs or young. Juvenile birds, capable of flight, have been observed in the breeding season of most of the remaining species, but these can hardly be interpreted as positive breeding records.

Mr. George M. Sutton, who made a study of the birds of the Pennsylvania portions of the Pymatuning Swamp, listed 134 birds which he considered as nesting species. All of these have been recorded in the Ohio portion of the swamp or elsewhere in the county. Twenty-one species not listed by Sutton for Crawford County, Pennsylvania, are now known as breeding species in Ashtabula County.

The following species on the Ashtabula County list were not regarded definitely as breeding species in Ohio by either Jones or Dawson: Broad-winged Hawk, Eastern Pigeon Hawk, Yellow Rail, Wilson's Snipe, Yellow-bellied Sapsucker, Least Flycatcher, Olive-sided Flycatcher, Red-breasted Nuthatch, Brown Creeper, Hermit Thrush, Blue-headed Vireo, Nashville Warbler, Magnolia Warbler, Black-throated Blue Warbler, Blackburnian Warbler, Pine Warbler, Grinnell's Water-Thrush, Canadian Warbler, Purple Finch, Pine Siskin, Slate-colored Junco, White-throated Sparrow.

At least seventeen other species were recorded in the county during what would be considered the breeding season, but none of them nest. These are: American Egret, Little Blue Heron, Black-crowned Night Heron, Pintail, Shoveller, Osprey, Duck Hawk, Solitary Sandpiper, Greater Yellow-legs, Lesser Yellow-legs, Red-backed Sandpiper,

Semipalmated Sandpiper, Least Sandpiper, Herring Gull, Ring-billed Gull, Common Tern, and Caspian Tern.

Due to drainage resulting in lowering of the water table, and to forestry and agricultural activities, for the most part, the following species can be considered as decreasing in numbers: Broad-winged Hawk, Marsh Hawk, Virginia Rail, American Woodcock, Wilson's Snipe, Yellow-bellied Sapsucker, Least Flycatcher, Tree Swallow, Prairie Marsh Wren, Short-billed Marsh Wren, Veery, Magnolia Warbler, Grinnell's Water-Thrush, Slate-colored Junco, and White-throated Sparrow. To these should be added those rare species known solely or chiefly in the now destroyed Pymatuning Bog.

In the following annotated list the scientific name is followed by a number which indicates the number of nesting records obtained for that species. For the most part this number includes only nests of the species found containing young or eggs. In a few of the rarer species, or those building nests very difficult to locate, the number includes as a nesting record young birds just out of the nest and not capable of sustained flight, even though the actual nest was not found. Birds designated as general occur in at least twenty-five of the twenty-eight townships of the county. Birds listed as rather general probably occur in at least eight or ten scattered townships. Birds having a very discontinuous distribution or occurring in only very small isolated areas are listed as local. The nomenclature used is that of the Fourth Edition (1931) of the A. O. U. Check-List.

Annotated List

[This list includes 154 breeding species]

Pied-billed Grebe. *Podilymbus p. podiceps.* (2). A rare and irregular summer resident. One nest with eight eggs was found at Ashtabula Harbor pond in July, 1930, and an old bird was seen repeatedly with small young in the marsh at Geneva-on-the-Lake in June, 1931.

Great Blue Heron. *Ardea h. herodias.* Formerly a large colony was located near Jefferson but continued cutting of the nesting trees caused the birds to desert. Two new colonies have been established, neither of which are within the confines of the county, although the birds feed rather commonly over the whole area. One colony was established about 1920 south of Orwell at the junction of Phelps Creek and the Grand River on the Griswold estate, Mesopotamia Township, Trumbull County. The nests, however, are located only a few rods from the Ashtabula County line. They are in beech, sour gum, and red maple trees. This heronry increased to about sixty nests in 1930,

FIGURE 14

FIG. 14. A living tree with decayed heart, in Pymatuning Bog, which has been trademarked by the Pileated Woodpecker. This is the haunt of the Veery, the Sapsucker, the Grinnell's Water-Thrush. Beneath the poison sumac and the royal and cinnamon ferns, the rare painted trilliums, pink lady's slippers, and Pennsylvania saxifrage grow in abundance.

FIG. 15. Open areas of sedges, rushes, or cattails in the Pymatuning Bog which are being invaded by tamarack. In such situations three species of rails, Wilson's Snipe, and the Prairie Marsh Wren breed.

FIGURE 15

but due to cutting of trees and shooting, was reduced to seventeen nests in 1932. The second colony is located south and east of Conneaut across the line a short distance in Pennsylvania, adjacent to the Frank Joiners farm in Beaver Township, Erie County. In 1932 sixteen nests were built.

Eastern Green Heron. *Butorides v. virescens.* (8). General and fairly common but not nearly so numerous as one would expect from the habitats available.

American Bittern. *Botaurus lentiginosus.* (6). Rather rare, a few pairs nesting locally in especially favorable situations.

Eastern Least Bittern. *Ixobrychus e. exilis.* (2). Rare. Two nests with eggs were found in Pymatuning Bog on July 11, 1928, and in Plymouth Marshes on August 3, 1929.

Common Mallard. *Anas p. platyrhynchos.* (2). Very rare and local. A hen bird with six ducklings was studied on a small woodland pond in the Plymouth Marshes, July 4, 1929; and a nest with twelve eggs was found at the Geneva-on-the-Lake Marsh on June 14, 1932.

Common Black Duck. *Anas rubripes tristis.* (5). Rare and local. Old birds with small young were recorded four times, and a nest with nine eggs was found at a small pond south of Ashtabula on June 12, 1931.

Blue-winged Teal. *Querquedula discors.* (1). Very rare. Three adults seen in the breeding season, including a hen with six ducklings at Ashtabula Harbor pond on July 3, 1929.

Wood Duck. *Aix sponsa.* (8). A rare but regular resident locally. Formerly not uncommon in the Plymouth Marsh region but disappearing with the general lowering of the water table. Young birds were recorded on seven occasions and one nest found in Wayne Township on June 10, 1930.

Turkey Vulture. *Cathartes aura septentrionalis.* (8). General but rather uncommon except locally. Much more frequent in late summer and during migrations. Three nests were located in fallen hollow logs, four in hollow broken stubs, while the eighth record is of two half-grown birds which clambered about a brush pile in Wayne Township. The eggs, apparently, had been placed in a small depression on the ground between the roots of a tree stump which was partially covered by the brush pile.

Sharp-shinned Hawk. *Accipiter v. velox.* (2). Rare, though more common than sight records of adults would indicate. A nest with five eggs was found along the lower Grand River near the Lake County line in a tall white pine on July 12, 1928, and a second with four

newly hatched young in the white pine forest at Farnham along the Conneaut River on June 14, 1931.

Cooper's Hawk. *Accipiter cooperi.* (6). Uncommon to rare and local. Most frequent along the Conneaut, Ashtabula, and Grand Rivers. A nest found in a hemlock at Phelps Creek on July 21, 1929, contained two hatching eggs and a young bird which could have been no less than ten days old.

Eastern Red-tailed Hawk. *Buteo b. borealis.* (18). General and fairly common.

Northern Red-shouldered Hawk. *Buteo l. lineatus.* (3). Local and uncommon to rare.

Broad-winged Hawk. *Buteo p. platypterus.* (3). Very rare and local. Three nests; three young on July 12, 1928, in Wayne Township; four young on July 12, 1930, at Pymatuning Bog; and four eggs on June 13, 1931, in eastern Monroe Township.

Northern Bald Eagle. *Haliaeetus leucocephalus alascanus.* (10). Adults rather frequently seen in summer, especially near the lake shore and along the three large rivers emptying into the lake. Sometimes several adults and a number of the immature are seen at the same time but there is no evidence of more than one pair nesting each year, at least in recent years. Residents report that eagles have nested somewhere in Saybrook or Geneva Townships for at least seventy years, the nests usually being placed in numerous suitable forest tracts within one or two miles of the lake shore. In the last eight years no less than ten nests have been built at six different locations, the first nest having been destroyed by storms on two occasions.

Marsh Hawk. *Circus hudsonicus.* (18). Numerous nests have been found due to much work in suitable locations, but the species must be regarded as a rather uncommon and local summer resident.

Eastern Pigeon Hawk. *Falco c. columbarius.* Adults have been recorded foruteen times during the breeding season, mostly along the Conneaut, Ashtabula, and Grand River gorges. Although no nests have been found the species certainly breeds. In August, 1932, an adult was seen repeatedly along the lower Grand River near the Lake County line, and on August 18 an immature of the species was seen with an adult.

Eastern Sparrow Hawk. *Falco s. sparverius.* (19). General and common.

Eastern Ruffed Grouse. *Bonasa u. umbellus.* (16). Occurs at least sparingly in every township and is often locally common to abundant, especially to the south and east. There has been consid-

erable fluctuation in numbers during the eight years of field work. Special studies of this species made in part for the Ohio Division of Conservation, will be reported upon later. From July 5 to September 29, 1928, 848 miles were covered on foot and 309 grouse recorded, or four per day. In 1929, from July 5 to August 1, 186 grouse were counted in 263 miles, or seven per day. Most of these birds were seen in Wayne, Williamsfield, Cherry Valley, Andover, Monroe, and Orwell Townships.

European Partridge. *Perdix p. perdix.* (3). The county game protector liberated twenty-four adult birds in Cherry Valley Township in the spring of 1930. At least two broods of young were raised that year and a nest with twelve eggs was found in the southwestern corner of the township on June 14, 1931. No trace of the birds was found in 1932 and it is believed that they will soon entirely disappear, as the county is not suited to their requirements.

Eastern Bob-white. *Colinus v. virginianus.* (32). General and common to uncommon or rare. Numbers are everywhere less than are to be found in most other counties of the state. Much of the county is too northern in its general aspects to be suitable for the species and it appears to be entirely absent from a number of large tracts rich in boreal flora and fauna.

Ring-necked Pheasant. *Phasianus colchicus torquatus* . (4). Pheasants have been planted repeatedly in the county, and recently a number of pairs nearly every year. The birds survive but do not increase to any great extent and do not hold up very well under hunting. They appear to be entirely absent from about half of the townships and range from rare to locally common in the remainder.

Eastern Turkey. *Meleagris gallopavo silvestris.* Reported by the older residents to have been at one time a general resident of the county, being locally common to abundant, especially in the Pymatuning Bog area. The last birds seem to have disappeared about 1880.

King Rail. *Rallus e. elegans.* (2). Very rare and local. A nest with seven eggs was found at the Ashtabula Harbor pond on June 30, 1928, and an adult with at least four young at Pymatuning Bog on June 15, 1931.

Virginia Rail. *Rallus l. limicola.* (8). Rather general in suitable areas but local and rather uncommon.

Sora. *Porzana carolina.* (2). Rather rare though much more frequent than adults seen would indicate. One nest with eight eggs at Geneva-on-the-Lake Marsh on June 6, 1925, and another with ten eggs in the Pymatuning Bog, July 7, 1929.

Yellow Rail. *Coturnicops noveboracensis.* No nests found but an adult seen in the Pymatuning Bog, July 2, 1928, and an immature bird about half grown found dead at the same place on the Pennsylvania-Ohio line, August 9, 1932.

Florida Gallinule. *Gallinula chloropus cachinnans.* (2). Rare and irregular summer resident and not known except along the lake shore. An adult observed with four young at Geneva-on-the-Lake Marsh on August 8, 1924, and a nest with seven eggs was found at Ashtabula Harbor pond on June 12, 1931.

American Coot. *Fulica a. americana.* (1). Rare and irregular summer resident and not recorded except near the lake shore. One nest with eleven eggs found at Geneva-on-the-Lake Marsh on July 3, 1928.

Piping Plover. *Charadrius melodus.* (1). Though repeatedly searched for, this species was unknown until June 16, 1933, when Floyd B. Chapman and the writer collected a set of three eggs on West Ashtabula Beach.

Killdeer. *Oxyechus v. vociferus.* (31). General and common to abundant.

American Woodcock. *Philohela minor.* (18). General and locally common to abundant. The species nests early before the majority of the field work was done, but six nests were found with eggs in June, three in July, and one nest with four eggs hatched in Wayne Township on August 7, 1928. During the summer months family groups with young were frequently encountered. In 1928 the number of birds recorded by months was as follows: July, 143; August, 101; and September, 96. In 1929, 205 were found during the month of July. Drainage with resultant lowering of the water table and the effects of the drouth of the summer of 1930 have greatly reduced the number of breeding birds and the habitats suitable for the species. The woodcock migrates early and many of the birds seen during the latter part of the summer are not to be regarded as breeding birds. On twelve occasions more than 100 birds were counted per day during the fall migration.

Wilson's Snipe. *Capella delicata.* (7). Recorded from twelve localities in the eastern and southern parts of the county during the summer season, and sometimes rather common locally though seldom observed. The nests are difficult to locate, only one being found, Pymatuning Bog, May 30, 1931, with four eggs. Adults with young were seen on six occasions: southern Wayne Township, July 6, 1928, June 30, 1929, and June 13, 1932; Plymouth Marshes, May 30, 1930;

Pymatuning Bog, July 2, 1929, and June 14, 1932. The species varies greatly from year to year with fluctuation in the water level and is rapidly disappearing with increased drainage and cultivation or burning of the marshy tracts of cattails and sedges. In 1928 a careful census on several successive evenings indicated that no less than fourteen pairs were breeding in the Ohio portion of the Pymatuning Bog or within three-quarters of a mile of the state line. In 1929 about sixteen pairs bred, in 1930 only six pairs were indicated, in 1931, eleven pairs, and in 1932, eight pairs.

Upland Plover. *Bartramia longicauda.* (6). Rather general but uncommon, local and somewhat variable from year to year. More frequent to the south.

Spotted Sandpiper. *Actitis macularia.* (7). Local and uncommon to the south but common to abundant near the lake shore.

Black Tern. *Chlidonias nigra surinamensis.* (2). Very rare and irregular summer resident. One pair nested at Geneva-on-the-Lake Marsh, July 3, 1928, and another at Ashtabula Harbor pond, June 16, 1932.

Eastern Mourning Dove. *Zenaidura macroura carolinensis.* (164). General and abundant.

Passenger Pigeon. *Ectopistes migratorius.* Formerly irregularly very abundant in the county and nesting in small numbers according to numerous reports of old residents of the county. Pigeons were said to be numerous in the Pymatuning Bog region, the Plymouth Marshes, and in the Orwell Bog, where large roosts existed for several years. The birds apparently became scarce after about 1870 and were not reported at all after 1890.

Yellow-billed Cuckoo. *Coccyzus a. americanus.* (14). General but not common and rather local.

Black-billed Cuckoo. *Coccyzus erythropthalmus.* (28). General though local, ranging from rare to abundant; especially common in the large areas of aspen thickets and bordering the boggy or swampy areas. Probably three or four times as common as the preceding species.

Barn Owl. *Tyto alba pratincola.* (3). Apparently generally distributed but rare, especially in the areas characterized by northern species.

Eastern Screech Owl. *Otus asio naevius.* (7). More common than the preceding but rare compared to its numbers in most other areas of the state.

Great Horned Owl. *Bubo v. virginianus.* (12). General but rather uncommon.

Northern Barred Owl. *Strix v. varia.* (6). Well distributed but uncommon.

Long-eared Owl. *Asio wilsonianus.* (2). Local and rare except in the Pymatuning Bog region. Two nests found with young: Pymatuning Bog, July 8, 1929, and lower Grand River near the Lake County line, June 10, 1931.

Short-eared Owl. *Asio f. flammeus.* (2). Rare and local. Two nests found, both with young: Plymouth Marshes, May 30, 1930, and Pymatuning Bog, May 31, 1931.

Saw-whet Owl. *Cryptoglaux a. acadica.* (2). Rare though probably undetected in many localities. Adults recorded twelve times from seven localities during the summer season. A family group of two adults and four young were observed near Austinburg, July 4, 1928. A nest with three young located in the Pymatuning Bog in a hollow stub in a hemlock grove, was found May 30, 1931.

Eastern Whip-poor-will. *Antrostomus v. vociferus.* (2). Rather rare and local. The two nests found were in the Phelps Creek region.

Eastern Nighthawk. *Chordeiles m. minor.* (7). Not known to nest in natural situations anywhere in the county. Several pairs nest regularly on the roofs of buildings at Ashtabula, Conneaut, and Geneva. Occasionally one or two pairs nest at Andover, Jefferson, and North Kingsville. Not known to occur elsewhere.

Chimney Swift. *Chaetura pelagica.* (28). Abundant, even in most of the rural districts, where it builds numerous easily observed nests in the chimneys of the hundreds of abandoned farm houses.

Ruby-throated Humming Bird. *Archilochus colubris.* (11). Common to abundant. Most of the nests found were on small downward sloping branches of trees arching over small streams. Most of the nests were built in July and three sets of eggs did not hatch until after August 15.

Eastern Belted Kingfisher. *Megaceryle a. alcyon.* (12). Common. More frequent to the north and along the lake shore.

Northern Flicker. *Colaptes auratus luteus.* (58). Abundant.

Northern Pileated Woodpecker. *Ceophloeus pileatus abieticola.* (18). Adults have been recorded in summer from all but one of the twenty-eight townships in the county. The species ranges from rare to very common, being most numerous to the east and south. Forest areas are well distributed and due to the general high humidity of these tracts, injured trees decay rapidly producing an abundance of

large insect-infested stubs. During mating activities, from five to seven adults have been observed at one time on numerous occasions. Several nests were found in the Pymatuning Bog area, Denmark Township, and Wayne Township, where the birds could on occasion be approached closely and observed for hours at a time. The species is everywhere much commoner than the preliminary field investigations would seem to indicate; a thorough knowledge of the locality, the habits of the birds, and the various call notes being necessary to accurately census an area. The number of birds recorded on field trips of the last five years was as follows: 1928, 46; 1929, 37; 1930, 28; 1931, 44; and 1932, 78.

Red-bellied Woodpecker. *Centurus carolinus.* (3). Rare but found occasionally in most localities except those characterized by northern forms.

Red-headed Woodpecker. *Melanerpes erythrocephalus.* (46). General and common to abundant, except in some of the poorly drained or northern areas.

Yellow-bellied Sapsucker. *Sphyrapicus v. varius.* (16). Very local but observed in twelve different localities in summer, mostly in the eastern and southern townships. The species seems to be disappearing rapidly with drainage and continued timbering but is still not uncommon locally in the Pymatuning Bog area and in parts of Wayne and Denmark Townships. Most of the nests were found in yellow birch snags in the wet beech flat tracts or in aspen stubs bordering boggy areas. The adults are observed with difficulty during the nesting season and can easily be missed in a tract having several breeding pairs.

Eastern Hairy Woodpecker. *Dryobates v. villosus.* (21). General and common to abundant.

Northern Downy Woodpecker. *Dryobates pubescens medianus.* (46). General and abundant.

Eastern Kingbird. *Tyrannus tyrannus.* (18). General and common to abundant.

Northern Crested Flycatcher. *Myiarchus crinitus boreus.* (14). General and common.

Eastern Phoebe. *Sayornis phoebe.* (87). General and common to abundant.

Acadian Flycatcher. *Empidonax virescens.* (6). Fairly common but rather local and even absent from some localities.

Alder Flycatcher. *Empidonax t. trailli.* (24). Fairly common but local and absent from some localities.

Least Flycatcher. *Empidonax minimus.* (4). A rather rare summer resident but more frequent than casual observations would indicate. Birds have been recorded in summer from twelve localities, including several in Wayne Township, the Pymatuning Bog area and eastern Monroe Township. Numbers appear to vary greatly from year to year and few have been seen since the 1930 drouth. Nests are placed in alders, willows, yellow birch, and occasionally at considerable height in red maples.

Eastern Wood Pewee. *Myiochanes virens.* (5). Usually a very common summer resident and even abundant in some forest areas, being one of the most characteristic species of large wooded tracts.

Olive-sided Flycatcher. *Nuttallornis mesoleucus.* (1). Very rare. Three summer records from the Pymatuning Bog, one from Wayne Township, and one from eastern Monroe Township. On June 16, 1932, a nest was located adjacent to the Pymatuning Bog. The nest was placed near the tip of one of the uppermost branches of a white pine and was inaccessible. One adult was incubating, returning to the nest three times upon being flushed, and another was observed about a quarter of a mile distant.

Prairie Horned Lark. *Otocoris alpestris praticola.* (1). Very local but sometimes not uncommon summer resident, but entirely absent from many large areas. The species nests very early in the spring, usually before the commencement of most of the field work, so that only one nest was found. By June and July the young fly well and groups of five to fifty are occasionally seen feeding in localities where they are not known to nest.

Tree Swallow. *Iridoprocne bicolor.* (4). Very rare and irregular. In 1929 four pairs nested in hollow snags in the Pymatuning bog but no birds were present during the following years and no evidence of nesting elsewhere in the county was obtained.

Bank Swallow. *Riparia r. riparia.* (410+). Rare or absent except near the lake shore and exceedingly variable in numbers from year to year. Formerly a few pairs nested in banks along the Ashtabula, Conneaut, and Grand Rivers but none have been seen since 1929. Several colonies have been established in the high banks along the lake shore, growing to large size and then being deserted in three or four years. Sometimes a few pairs nest in low sand cuts of the old lake ridges some distance back from the lake. The only nests found in 1932 were a dozen in a small bank at the golf course at Conneaut.

Rough-winged Swallow. *Stelgidopteryx ruficollis serripennis.* (180+). Very local. Absent in much of the southern half of the

county but locally common to abundant near the lake shore, especially along the gorges of the three large rivers.

Barn Swallow. *Hirundo erythrogaster.* (680+). Common to abundant to the south but usually very abundant near the lake shore. Nests are frequently found in numbers about deserted farm buildings.

Northern Cliff Swallow. *Petrochelidon a. albifrons.* (42). Extremely local and variable from year to year but known from seventeen localities in summer, mostly in Monroe, Pierpont, Richmond, and Andover Townships. Not more than six nests have been found in any one locality.

Purple Martin. *Progne s. subis.* (411). Rather general and common to abundant. Rather infrequent in most rural districts, most of the birds nesting in houses erected for them in the villages and cities. Most numerous near the lake shore.

Northern Blue Jay. *Cyanocitta c. cristata.* (10). General and well distributed but ranging from uncommon to abundant. Most numerous in the oak areas.

Eastern Crow. *Corvus b. brachyrhynchos.* (34). General and usually very abundant.

Black-capped Chickadee. *Penthestes a. atricapillus.* (32). General and usually common to very abundant.

Carolina Chickadee. *Penthestes c. carolinensis.* Apparently rather rare but may have been passed by for the preceding species in some localities. The only positive records in summer are several from the Phelps Creek region where many other southern forms occur. No evidence of nesting was obtained but the species certainly does breed. at least in Windsor Township.

Tufted Titmouse. *Baeolophus bicolor.* (11). A fairly common summer resident, most frequent where other southern forms occur and entirely absent from many areas dominated by northern species.

White-breasted Nuthatch. *Sitta c. carolinensis.* (3). General and common.

Red-breasted Nuthatch. Sitta canadensis. (2). Rare and irregular. Adults were recorded from a tract in southern Wayne Township in 1928, 1929, and 1931, including two young just out of nest being fed by adults, July 18, 1929. On June 13, 1931, a nest was found in the Pymatuning Bog in a red maple tree at a height of forty feet. The cavity was surrounded by live wood, the birds entering through a tiny knot hole which had nearly grown over. Though almost unobservable, the nest appeared to be made mostly of grass and contained at least five eggs.

Brown Creeper. *Certhia familiaris americana.* (1). Very rare and local. Adults seen in southern Wayne Township on July 29, 1928, July 17, 1929, and June 10, 1931, and in the Pymatuning Bog on August 3, 1929, May 30, 1930, and June 12, 1931. On the last date three young were observed to leave a nest placed at a height of twenty-two feet in a large split fork of a white elm, but only one of the adults could be located.

Eastern House Wren. *Troglodytes a. aedon.* (207). General and usually very abundant, nesting in great numbers in the wealth of suitable cavities found in the combination second growth cut-over areas. Usually more numerous in the wilder areas away from the haunts of man, where it is not unusual to find ten or twelve occupied nests in a single day.

Bewick's Wren. *Thryomanes b. bewicki.* Very rare and not definitely known to breed. The only summer records are of adults recorded from Phelps Creek, July 18, 1929, and June 22, 1931. Probably a recent invader.

Carolina Wren. *Thryothorus l. ludovicianus.* (2). Very rare. Only two pairs have been located; one nested and was seen with five young along Phelps Creek, June 10, 1930; the other pair was observed along the lower Grand River in Harpersfield Township with five young just out of nest, June 14, 1932.

Prairie Marsh Wren. *Telmatodytes palustris dissaeptus.* (47). A very local and uncommon summer resident except in the Pymatuning Bog region where it is irregularly abundant, nesting in either cattail or sedge clumps.

Short-billed Marsh Wren. *Cistothorus stellaris.* (2). Recorded in summer from six scattered localities in the county but it must be regarded as rare and irregular except in the Pymatuning Bog region where at least seven pairs nested in the Ohio portion in 1931, two nests with five young each being found on June 15, 1931.

Eastern Mockingbird. *Mimus p. polyglottos.* (1). Very rare. Unknown until 1932 when a nest with four young was found in a grove of thornapple trees at Stanhope in southern Williamsfield Township, on June 14.

Catbird. *Dumetella carolinensis.* (48). General and common to very abundant. Most numerous in the wilder boggy areas.

Brown Thrasher. *Toxostoma rufum.* (14). Rather local and ranging from uncommon to common.

Eastern Robin. *Turdus m. migratorius.* (264). General and very abundant, even in most of the wilder areas far from the haunts of man.

Wood Thrush. *Hylocichla mustelina.* (28). A general and common summer resident except in the wilder boggy areas where it is displaced by the Veery and in a few other localities where it appears to be local or entirely absent.

Eastern Hermit Thrush. *Hylocichla guttata faxoni.* (1). Very rare. Known only from the Pymatuning Bog area where adults were observed on July 9, 1928, May 30, 1930, and June 15, 1932. On the latter date a nest was found with four recently hatched young.

Veery. *Hylocichla f. fuscescens.* (24). General and ranging from uncommon to abundant, though absent from some areas. Most numerous in dense moist thickets with a great variety of undergrowth. Sometimes nesting begins as early as May 10, several nests with small young having been found before June 1.

Eastern Bluebird. *Sialia s. sialis.* (38). General and common to very common.

Blue-gray Gnatcatcher. *Polioptila c. caerulea.* (1). Rare but recorded in summer from seven scattered localities. The only nest found was on Phelps Creek, June 10, 1931. Most of the county is apparently too northern in its general aspects to be attractive to this species.

Cedar Waxwing. *Bombycilla cedrorum.* (13). A rather general and very irregular uncommon to abundant summer resident. Most of the nests found were in orchards or in alders in wet areas.

Migrant Shrike. *Lanius ludovicianus migrans.* (8). Rather uncommon and local. Most frequent near the lake shore.

Starling. *Sturnus v. vulgaris.* (68). General and usually abundant but entirely lacking from some localities. Mr. S. V. Wharrum, of Austinburg, reports observing the species every year since 1919, the first record being obtained late in 1918. The first known nestings occurred in 1921 and the species rapidly increased as a summer resident. By 1928 it was established in practically its present numbers, little change in distribution being noted since then except the invasion of several localities and habitat types not occupied in the early years.

Yellow-throated Vireo. *Vireo flavifrons.* (3). A rather general but rare summer resident, though more frequent than casual observations would seem to indicate. It is a bird of the larger forests, the nests found being located near the tops of very tall red maples. curred in 1921 and the species rapidly increased as a summer resi-

dent. Adults were observed in the Morgan Swamp on July 21, 1928; southern Wayne Township on July 6, 1928, and July 8, 1929; Pymatuning Bog, May 30, 1930, and June 12, 1931, when a nest with four eggs was found; eastern Monroe Township, July 11, 1930, nest with three eggs.

Red-eyed Vireo. *Vireo olivaceus.* (226). A general and usually extremely abundant summer resident, the second growth forests attracting larger populations than I have ever seen elsewhere. Frequently parasitized by the Cowbird. Nesting begins in May and June but a large number of occupied nests can be found in July and a few even in mid-August.

Eastern Warbling Vireo. *Vireo g. gilvus.* (3). A fairly common summer resident but usually found nesting only in roadside trees and about towns and cities.

Black and White Warbler. *Mniotilta varia.* (2). Rather general but rare and very local. More frequent to the south and east. A pair with three young were recorded from southern Wayne Township, July 18, 1928, and a nest with four eggs was found in the Pymatuning Bog, June 14, 1931.

Golden-winged Warbler. *Vermivora chrysoptera.* (3). Rather general but very local and decidedly uncommon or rare. Adults have been observed in eight scattered localities. Groups of four and three young just out of nest were observed in southern Wayne Township on July 5, 1928, and another pair was engaged in feeding a single bird in eastern Monroe Township on June 15, 1931.

Blue-winged Warbler. *Vermivora pinus.* (8). Rather local but ranging from rare to abundant. More frequent to the south and east, especially in moist thickets and adjacent to boggy areas.

Brewster's Warbler. *Vermivora leucobronchialis.* (3). This hybrid appears to occur about as commonly as the Golden-winged Warbler, as adults have been recorded fourteen times. No evidence of nesting of this hybrid was obtained, in fact the behavior of individuals suggested in most cases that they were non-breeding birds. On three occasions a male golden-wing and a female blue-wing have been found feeding hybrid young. On May 29, 1930, the writer found a nest with five eggs being incubated by a female blue-wing in southern Wayne Township. The next day, upon returning with Robert H. McCormick and Roscoe W. Franks, it was found that the eggs were hatched, several stills and movie pictures being taken of the hybrid young being fed by both parents at the same time, the female blue-wing and the male a typical Golden-winged Warbler. In 1931, in the

same locality, a male Blue-winged Warbler was seen courting a female Golden-winged Warbler.

Nashville Warbler. *Vermivora r. ruficapilla.* (1). Very rare and local. Adult males observed in eastern Monroe Township on July 1, 1929, and in northern Wayne Township on July 28, 1923. Not positively identified in the Pymatuning Bog area until June 15, 1931, when a male was observed feeding a fledgling just out of the nest.

Northern Parula Warbler. *Compsothlypis americana pusilla.* (1). Very rare. Observed along both the Grand and Ashtabula River gorges in summer but nesting appeared doubtful. A pair was present

Fig. 16. A male Golden-winged Warbler bringing food to five newly hatched hybrid young which are being brooded over by the female Blue-winged Warbler. Enlarged from a movie film taken by Roscoe W. Franks and the author in southern Wayne Township on May 30, 1930.

on Phelps Creek in 1928, 1929, and 1932 but no birds were detected in the other years. Three other summer records of males in unlikely nesting localities, suggested that unmated birds may wander considerably. Two pairs were present in the Pymatuning Bog area in 1929, 1930, and 1931, a nest with three large young being found on June 15, 1931, in a large hemlock.

Eastern Yellow Warbler. *Dendroica a. aestiva.* (32). General and common to abundant.

Magnolia Warbler. *Dendroica magnolia.* (3). A very local rare to uncommon summer resident, being more frequent to the south and

east. A pair of adults was observed feeding three young just out of the nest on July 8, 1928, in northern Wayne Township. Also recorded from Ashtabula River gorge, Phelps Creek, Morgan Swamp, Denmark Township, and eastern Monroe Township. On June 10, 1931, a small fledgling was seen attended by adults in the Pymatuning Bog and on June 14 a nest with four eggs was found in a dense clump of hemlocks south of Conneaut.

Black-throated Blue Warbler. *Dendroica c. caerulescens.* (2). Very rare and local. Recorded from only two localities. A pair was watched feeding three young in southern Wayne Township on July 7, 1928. Adults were seen again on four occasions in July, 1929, but no nests or young were found. Repeated search in the Pymatuning Bog failed to find the species until June 11, 1931, when by the most fortunate of accidents, a nest with four eggs was found at a height of four feet in a forked branch of poison sumach.

Black-throated Green Warbler. *Dendroica v. virens.* (8). Rather general but quite local and uncommon. Usually not found except where hemlock occurs. On seven occasions adults were observed feeding young unable to fly well, but the only nest found was one with four newly hatched young located at a height of eighteen feet in a dense clump of hemlock in northern Kingsville Township.

Cerulean Warbler. *Dendroica cerulea.* (3). Fairly common but rather local, being confined mostly to more upland areas of beech or oak forest.

Blackburnian Warbler. *Dendroica fusca.* (1). Very rare and extremely local. Known from only two localities. An adult male was observed repeatedly in June, 1931, in the Pymatuning Bog and another in an area of hemlock in northern Kingsville Township, but no evidence of nesting could be found. In 1932 a nest with four small young was found at the latter place at a height of twenty-four feet in a clump of hemlocks.

Chestnut-sided Warbler. *Dendroica pensylvanica.* (6). Rather general and very local but sometimes common. Observed in thirty-two localities, most of which are in the eastern half of the county, especially Monroe, Sheffield, and southern Conneaut and Kingsville Townships.

Northern Pine Warbler. *Dendroica p. pinus.* Very rare and local. No nests and only three summer records: northern Kingsville Township, July 8, 1929, northwestern Conneaut Township, July 12, 1930, and Pymatuning Bog, June 12, 1931.

Oven-bird. *Seiurus aurocapillus.* (83). General and usually very abundant, being one of the most characteristic birds of large areas. Nests with either young or eggs are very easy to locate and it is easily possible to find a half dozen in a single day.

Grinnell's Water-Thrush. *Seirus noveboracensis notabilis.* (4). Recorded in summer from eight scattered localities in boggy areas but rare except in the Pymatuning Bog where a survey in June, 1932, indicated that no less than twenty-two pairs were present. After days of search during five seasons, a nest with four hatching eggs was finally discovered on June 15, 1932, marvelously concealed among roots imbedded in a small mound of rotted wood. On several occasions partly grown young were flushed from nests without it being possible to locate the nest itself.

Louisiana Water-Thrush. *Seiurus motacilla.* (1). Rather rare and very local but found in seven scattered localities where swift flowing streams have cut small suitable gorges. Not known in the numerous cuts near the lake.

Northern Yellow-throat. *Geothlypis trichas brachidactyla.* (14). General and common to very abundant.

Yellow-breasted Chat. *Icteria v. virens.* (6). Rather general but local and decidedly uncommon.

Hooded Warbler. *Wilsonia citrina.* (6). Rather general and very local, ranging from rare to uncommon, except along the gorges of the Ashtabula, Conneaut, and Grand Rivers where it is sometimes common.

Canadian Warbler. *Wilsonia canadensis.* (2). A few pairs nest regularly in the Pymatuning Bog, a nest with four eggs being found there on June 13, 1932, and an adult with two fledglings on July 28, 1928. Rare elsewhere in the county, only eight other records from five localities being obtained, all from the eastern half.

American Redstart. *Setophaga ruticilla.* (18). General and somewhat local but ranging from uncommon to abundant. A characteristic species of large areas.

English Sparrow. *Passer d. domesticus.* (165+). General and usually very abundant but absent from the wilder areas.

Bobolink. *Dolichonyx oryzivorus.* (131). General though somewhat local and ranging from uncommon to very abundant. Often nests in colonies, sometimes nearly a dozen nests being revealed during the mowing of one meadow.

Eastern Meadowlark. *Sturnella m. magna.* (24). General and common to very abundant wherever open areas occur.

Eastern Red-wing. *Agelaius p. phoeniceus.* (460+). General and often very abundant, but somewhat local.

Orchard Oriole. *Icterus spurius.* (2). Very rare or absent except near the lake shore where it is not uncommon, though quite local.

Baltimore Oriole. *Icterus galbula.* (21). General and common. Somewhat local.

Bronzed Grackle. *Quiscalus quiscula aeneus.* (64). General and common. Less frequent in the rural districts except in trees about dwellings.

Eastern Cowbird. *Molothrus a. ater.* (171). General and abundant, its eggs being found in 171 nests (of sixteen other species) located. Most of these were in nests of the Red-eyed Vireo, Song Sparrow, Field Sparrow, and Chipping Sparrow.

Scarlet Tanager. *Piranga erythromelas.* (6). General and common.

Eastern Cardinal. *Richmondena c. cardinalis.* (14). General and common, though somewhat local and absent from some of the areas of northern character. Three townships carefully censused in 1928 were again covered in 1932. The results would indicate that the species had in some cases increased in numbers five or six times during the interval.

Rose-breasted Grosbeak. *Hedymeles ludovicianus.* (12). General, ranging from uncommon to very common. Quite local.

Indigo Bunting. *Passerina cyanea.* (8). General and common to abundant.

Dickcissel. *Spiza americana.* Unknown except for a single adult seen near Geneva on July 31, 1929, and another near Saybrook, June 16, 1931.

Eastern Purple Finch. *Carpodacus p. purpureus.* (1). Unknown in the county except in the Pymatuning Bog area where single adults were observed each year from 1928 to 1932. On June 15, 1931, a nest with three large young was found at the height of twenty-six feet in a tamarack.

Northern Pine Siskin. *Spinus p. pinus.* Unknown in the county except in the Pymatuning Bog area where adults were recorded on July 21, 1928, August 1, 1929, and July 10, 1930. Nesting, according to Sutton, probably takes place so early that the season was past before most of the field work began. The species certainly breeds, though perhaps not on the Ohio side of the bog.

Eastern Goldfinch. *Spinus t. tristis.* (21). Common to abundant though somewhat local and variable in numbers.

Red-eyed Towhee. *Pipilo e. erythropthalmus.* (43). Usually common to abundant. A characteristic bird of large areas, sometimes being very abundant and often the most conspicuous species in brushy tracts.

Eastern Savannah Sparrow. *Passerculus sandwichensis savanna.* (6). Rather general, absent from some localities and ranging from rare to abundant in others. Decidedly local and also variable from year to year. More frequent to the south and east, especially in grassy areas of deserted fields in Andover, Richmond, Monroe, and Pierpont Townships.

Eastern Grasshopper Sparrow. *Ammodramus savannarum australis.* (6). General and common to very common in all open areas.

Western Henslow's Sparrow. *Passerherbulus h. henslowi.* (3). Rather general but very local and variable from year to year. In all, eighty-seven colonies of two to fourteen pairs each were located but the greatest number known in any one years was considerably less. Much more frequent in the seven eastern townships.

Eastern Vesper Sparrow. *Pooectes g. gramineus.* (18). General and common to abundant.

Eastern Lark Sparrow. *Chondestes g. grammacus.* Not definitely known to breed and only one summer record, an adult studied June 17, 1932, in a sandy prairie area near Saybrook.

Slate-colored Junco. *Junco h. hyemalis.* (14). Absent except from twelve scattered localities, all in the eastern half of the county. Adults with fledglings and at least one nest were found in both southern Wayne Township and eastern Monroe Township each year from 1928 to 1932. Curiously, only two or three pairs nested in the Ohio portion of the Pymatuning Swamp, while at least fifty pairs nested in eastern Monroe Township until the drouth of 1930.

Eastern Chipping Sparrow. *Spizella p. passerina.* (24). Common everywhere in the cultivated districts but practically absent from the wilder portions.

Eastern Field Sparrow. *Spizella p. pusilla.* (27). General and usually abundant.

White-throated Sparrow. *Zonotrichia albicollis.* (4). Very rare and local, being known from only two localities. Adults were seen with young out of the nest in southern Wayne Township on July 6, 1928, July 16, 1929, and July 14, 1930. On June 14, 1932, a nest with three small young was found in the Pymatuning Bog in a clump of shining club moss and American yew.

Swamp Sparrow. *Melospiza georgiana.* (2). Extremely local and usually rare. About seven pairs nested in the Ohio portion of the Pymatuning Bog in 1932 and two nests, each with four young, were located there on June 17, 1932, by following the adults carrying food. Apparently very variable from year to year. Other localities where the species has been found in summer include Geneva-on-the-Lake Marsh, Ashtabula Harbor pond, a pond near Conneaut, Plymouth Marsh, near Orwell, and a boggy area along the Pymatuning River in southern Wayne Township.

Mississippi Song Sparrow. *Melospiza melodia beata.* (84). General and usually very abundant.

Bibliography

American Ornithologists' Union. 1931. Check-list of North American Birds. Lancaster, Pa. Pp. 1-526.

Cope, E. D. 1872. Zoological Sketch of Ohio. Topographical Atlas.

Dawson, William Leon. 1903. Birds of Ohio. 2 Vol. Wheaton Pub. Co., Columbus.

Hicks, Lawrence E. 1933. The Original Forest Vegetation and the Vascular Flora of Ashtabula County, Ohio. Doctor's Dissertation, Ohio State University, pp. 1-211.

——1933. Brewster's Warbler in Ashtabula County, Ohio. Auk, 50:441.

——1933. Some Breeding Records for Ohio. (Record of the breeding of the Piping Plover, White-throated Sparrow, and Slate-colored Junco in Ashtabula County, Ohio). Auk, 50:448-449.

Jones, Lynds. 1903. Catalog of the Birds of Ohio. Ohio Acad. Sci. Special Paper, No. 6, pp 1-241.

Kirtland, J. P. 1838. Report on the Zoology of Ohio. 2nd Annual Report on the Geol. Surv. of Ohio. Pp. 160-166, 177-187.

Read, M. C. 1853. Catalog of the Birds of Northern Ohio. Proc. Acad. Nat. Sci. Phila. VI. Pp. 395-402.

Saunders, A. A. 1923. The Summer Birds of Allegany State Park, N. Y. State Coll. of For., Roosevelt Wild Life Bull., 1:239-354.

——1926. Additional Notes on the Summer Birds of Allegany State Park, N. Y. State Coll. of For., Roosevelt Wild Life Bull., 3:477-497.

Sutton, George Miksch. 1928. The Birds of Pymatuning Swamp and Conneaut Lake, Crawford County, Pa. Annals of the Carnegie Mus. 18:19-239.

Todd, W. E. Clyde. 1904. The Birds of Erie and Presque Isle, Erie County, Pa. Annals of the Carnegie Mus. 2:481-596.

Warren, B. H. 1890. Report of the Birds of Pennsylvania. 2nd Ed. Harrisburg. Pp. 1-434.

Wharrum, S. V. 1925. List of the Birds of Ashtabula County. (A one-page list recording 228 species and 98 breeding species. Published privately).

Wheaton, J. M. 1861. Catalog of the Birds of Ohio. Ohio Agr. Rept. for 1860. Pp. 359-380.

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THE WILSON BULLETIN

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The present editorial organization is as follows: T. C. Stephens, Editor-in-Chief, Sioux City, Iowa; Myron H. Swenk, University of Nebraska, Lincoln, Nebraska; R. D. Hissong, Sioux City, Iowa.

EDITORIAL

We Would Like to call attention to the very interesting discussion of faunal succession in Dr. Hicks' paper in this number of the Bulletin. Let the reader also pause at the table showing the time afield and the distances covered. To cover 3,144 miles on foot in 2,733 hours is indicative of a fair degree of activity. The 2,733 hours represent about five months of solid time, but distributed throughout different seasons. This paper represents, therefore, intensive work in a very interesting region. Nevertheless, it is a faunal list, and we have a number of others awaiting publication; we may say in explanation that this paper appears at this time because of being subsidized.

The Press carried information in November that Rush Lake in northern South Dakota has become dry. In 1929 we visited this shallow lake and found breeding there a good sized colony of Western Grebes. We also found the nests of the Pied-billed Grebe, the Holboell's Grebe, and the Coot; the Eared Grebe was said to be there, though we did not happen to find a nest. Professor Kubichek was camped there at the same time; in fact, he has made this lake his headquarters during the breeding season for several years. This lake region was a paradise for many species, and Rush Lake seemed to be the favorite spot for many wild fowl. Within a mile or two is located Waubay Lake, where the Double-crested Cormorants breed, as described by Mr. Lundquist in a recent number of the Bulletin. It is most fortunate that Professor Kubichek succeeded in getting some very remarkable motion pictures of the Western Grebe in various activities during the summers of his work at Rush Lake. It will be interesting to learn what becomes of this colony of Western Grebes if this lake does not fill up again before the next breeding season.

Science for October 20, 1933, published an interesting note by Professor Francis Ramaley, of the University of Colorado, on the comparison of botanical papers of two selected decades, the first from 1886 to 1895, the second from 1923 to 1932. All papers were sorted under eleven classifications. Physiology "in all its branches" had 33 papers in the first decade and 176 in the second decade. Systematic botany including "morphology of the lower plants" had 176 papers in the first decade and 82 in the second. These figures show quite a definite trend. Now we hope that some one will make a similar study of some block of zoological literature.

Mr. George Seth Guion (1716 American Bank Building, New Orleans, La.) desires to secure *original* copies of Numbers 1 and 3 of the Wilson Bulletin (1894), and will pay a good price for them.

GENERAL NOTES

Conducted by M. H. Swenk

Second Occurrence of the Western Sandpiper in Iowa.—A female Western Sandpiper (*Ereunetes maurii*) in juvenal plumage was collected by the writer on August 23, 1933. This bird was feeding alone in the shallow water of a cut-off creek bed near the Skunk River, ten miles northwest of Mitchelville, Polk County, Iowa. It was recognized as a Western Sandpiper before collecting it because of its long bill, thicker at the base. It appears to be a bird of the year, the skull being very thin and the plumage entirely unworn. The specimen is preserved in the writer's collection.

The only previous occurrence of this species in Iowa, substantiated by specimens, was on October 15, 1895, when Paul Bartsch secured two males and a female at Burlington, Des Moines County. These are now in the University of Iowa Museum.—Philip A. DuMont, *Des Moines, Iowa.*

Some Unusual Food Habits of the English Sparrow.—While we were living in Richmond, Virginia, I occasionally noticed English Sparrows (*Passer domesticus*), usually females, busily eating the small leaflets of the mimosa tree in our front yard. Since we moved to Wilderness, I have seen two other rather unusual food habits of this bird. First, a short while ago, I saw two females of the species attempt to catch a hornet on the wing, as it was returning to its nest under the gabled roof of the porch. Another time, I saw a male vigorously shake something in his beak. Upon investigation, I found it was a large caterpillar, about three and a half inches long and more than an inch in circumference. It was very flat and contained but a small amount of green, mushy vegetable matter. There was not a break in the tough, leathery skin to account for the lack of body filler.—Gordon W. Jones, *Wilderness, Va.*

The White Pelican on the Tennessee River.—A record of the occurrence of the White Pelican (*Pelecanus erythrorhynchos*) on the Tennessee River in April, 1928, came to my notice several years ago. Some workmen on the highway bridge at Savannah, Tennessee, noticed a large dead bird floating in the river and secured it. A friend who witnessed the finding of the specimen saved a wing and the upper mandible as curios. These were later shown to me in Nashville. The mandible bore the horny elevation and checked with sizes quoted in the manuals.

The date of finding this bird was given as "about a week" after April 19, on which day an accident claimed a number of lives on the bridge. The pelican was said to have been shot, and to have been dead "a long time." Savannah lies about thirty river miles below the state line, above which point the Tennessee flows between the states of Alabama and Mississippi. The actual point of occurrence of this bird may have been in any of these states. Howell (*Birds of Alabama*, p. 39) gives several records for the Tennessee Valley.—Harry C. Monk, *Nashville, Tenn.*

First Record of the Golden-winged Warbler for South Dakota.—On May 10, 1933, while on an early morning walk along the "Dells", about half a mile south of Dell Rapids, some warblers were noted feeding about thirty feet up in some ash and maple trees. After observing them for some time with bird glasses, it became evident they were not any of the migratory warblers that were familiar to me. In order to make their identification certain, I collected one

of the birds and found it to be a male Golden-winged Warbler (*Vermivora chrysoptera*). This is the first record of this bird for South Dakota. There appeared to be four birds of this species in the immediate vicinity, two males and two females. Identification was confirmed by Dr. T. C. Stephens. Mr. William Youngworth made the specimen into a skin, and this was donated to the collection of the State Museum at Vermilion.—Edwin C. Anderson, *Dell Rapids, S. Dak.*

Analysis of Two Hundred Long-eared Owl Pellets.—On February 19, 1933, I flushed three Long-eared Owls (*Asio wilsonianus*) from an evergreen in an old cemetery four miles northeast of Saline, Michigan. From beneath this tree I gathered up just 200 pellets, indicating that the birds had been roosting in this tree during much of the winter. The cemetery was a half mile from the nearest parcel of timber, a swampy piece of woods of some extent. Immediately adjacent to the cemetery on the east and south was plowed land; across the road to the west and north was pasture. I made the analysis of the pellets in the laboratories of the Museum of Zoology, at Ann Arbor, where I had the advice and assistance of Dr. Lee R. Dice and Dr. Josselyn Van Tyne. The results of the work were as follows: 170 *Microtus*, 21 *Peromyscus*, 3 *Synaptomys*, 4 *Blarina* and 1 English Sparrow (*Passer domesticus*). The preponderance of *Microtus* would indicate feeding in the open, although occasional forays into the nearby timber would yield *Peromyscus* in some numbers. *Synaptomys* is rare anywhere in Michigan, and while *Blarina* is not rare, the fact that it lives in burrows would explain its comparative absence from the bill of fare. Could a like number of pellets be obtained from this immediate vicinity in successive years, their examination should give indication of any fluctuation in small mammalian biota from year to year.—Chas. J. Spiker, *New Hampton, Iowa.*

A Loon Found in the Highway.—On the evening of April 14, 1931, while I was away from home, a neighbor, William Gabbard, and his brother-in-law, brought to my place a live Common Loon (*Gavia immer*) which the brother-in-law had discovered on a highway as he was driving along in his car. Later the same evening I saw Mr. Gabbard and he told me that his brother-in-law had taken the bird home with him but was going to bring it back in the morning. Early the next morning I went to see it. Loons must hate dogs for this one flounced towards Mr. Gabbard's dog each time it came near. The bird was chained, else it may have given the dog quite a battle. The extreme tip of its long, sharp, black bill was broken off; some one, teasing it, had allowed it to peck the sole of a shoe. Irregularly it gave vent to a long, drawn-out wail, and when placed in a small vessel of water it splashed and tried to dive, thoroughly enjoying, I would say, the opportunity to spend a few seconds in a bit of its natural element, though closely surrounded by unusual spectators.

I desired the freedom of the handsome bird, and before I left I was promised that it would be taken to some nearby body of water and released, but later I learned that this was not done immediately and it died in captivity a few days after I saw it.—Grant Henderson, *Greensburg, Ind.*

Nesting of the Prairie Horned Lark in Central Virginia.—For the past three or four years the presence of the Prairie Horned Lark (*Otocoris alpestris praticola*) during the summer in the vicinity of Lynchburg has led me to believe that it was nesting here. It is a fairly common winter visitor. On March 27, 1931, I saw a bird make two trips with nesting materials in the bill, and located the site that had apparently been selected for a nest. I did not return

to the spot until April 10, when there were three eggs in the nest. On April 13, two of the eggs had hatched and the young appeared to be about two days old. The third egg never hatched.

On April 19 another visit was made to the nest, when it was found that feathers were rapidly replacing the dirty tan down that covered the nestlings after hatching. This proved to be the last time that we saw the young birds. We took a Graflex to the nest on April 23, feeling sure that the young birds would still be there, but the nest was empty save for the sterile egg. There had been a severe storm on the preceding day, accompanid by unusually high winds, so it is probable that the young birds were destroyed. We took a photograph of the nest containing the single egg. Since this visit I have not even seen the adult birds, though I have visited the locality several times.

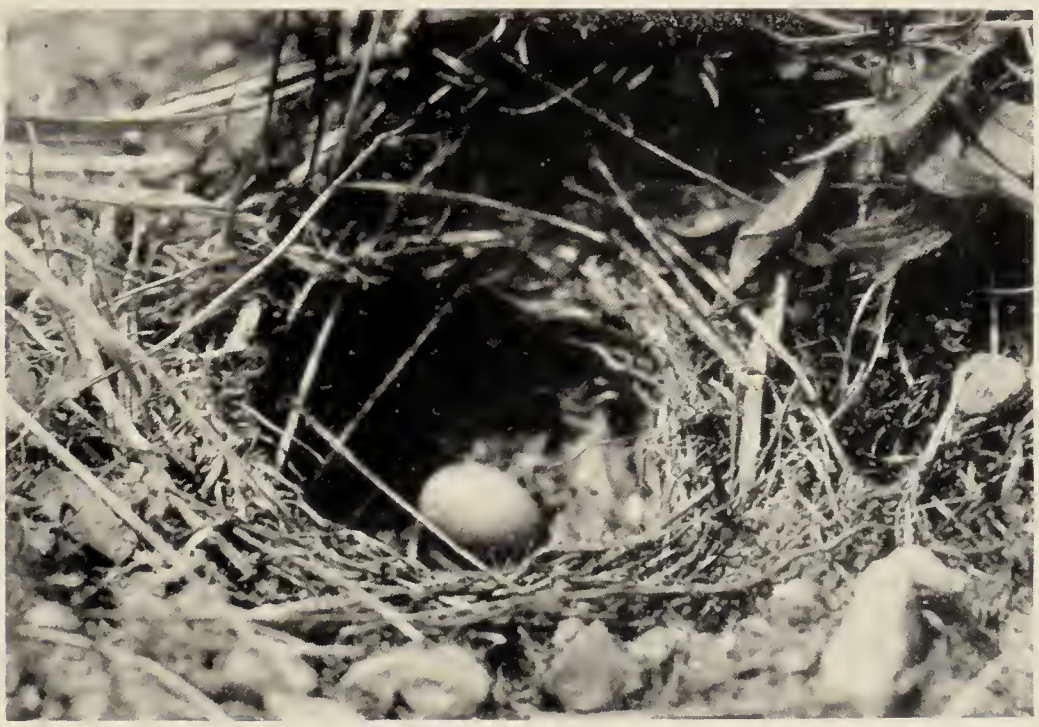

Fig. 17. Nest of the Prairie Horned Lark referred to in Professor Freer's note.

This seems to establish the southernmost record for the breeding of the Prairie Horned Lark on the Atlantic slope. Dr. J. J. Murray of Lexington, Va., says that he thinks the previous southernmost point was Fairfax, Va., about fifteen miles west of Washington, D. C., and about 150 miles northwest of Lynchburg, in a straight line.

Mr. H. H. Bailey, in his book, "Birds of Virginia", published in 1913, does not include the Prairie Horned Lark. He includes only breeding birds. Miss May Thacher Cooke in her paper, "Birds of the Washington, D. C., Region", states that this species is a "very rare summer resident" near Washington. Dr. H. C. Oberholser, in a letter to Dr. J. J. Murray, states that he believes this to be the southernmost record for the nesting of this species.—Ruskin S. Freer, *Lynchburg, Va.*

Upward Currents Not Required for Soaring Flight.—Some recent papers in the Wilson Bulletin have borne on the soaring flight and its mechanics, either advancing the theory that upward currents are necessary, or tacitly agreeing that this is so. I refer particularly to "Soaring of Raptorial Birds", by Palmer (March, 1931, pp. 18-24) and to Taber's "Curvature of Wing and Soaring Flight" (March, 1932, pp. 19-22). The subject is an old one, I know, and without the least desire of becoming controversial, in the interests of accuracy some further comments seem to be indicated.

Not having space for any lengthy discussion of methods, the time, or the place, I will make only one important statement. *My observations show that the Herring Gull (Larus a. smithsonianus) can soar (i. e., fly without flapping its wings) in a level current of air of twenty miles per hour velocity, and (a) remain practically motionless, (b) move forward, (c) move backward, (d) move on an upward incline, or (e) move on a downward incline.* It is fairly obvious that if one species can do this, another of the same relative wing and tail area and contour, and flight control, can do the same. Actually, I have seen the Eastern Red-tailed Hawk (*Buteo b. borealis*), Turkey Vulture (*Cathartes a. septentrionalis*), Southern Bald Eagle (*Haliaeetus l. leucocephalus*), Ring-billed Gull (*Larus delawarensis*), and Bonaparte's Gull (*Larus philadelphia*) in the same level soaring flight, under conditions that seemed to preclude any considerable upward movements of air currents.

The thoughtful paper of Brewster (*Auk*, January, 1912, pp. 85-92) discusses in a non-technical way this flight of the Herring Gull, while both Finley and Dawson, quoted by Bent (*Bull. 113, U. S. Nat. Mus.*, p. 130), have written similarly of the California Gull (*Larus californicus*), and Poole (*Auk*, April, 1925, pp. 209-216) seems to have observed various small birds in rising flight with set wings.

It therefore seems that the explanation of soaring flight must involve level air currents of some velocity, not entirely ascending air currents. That some species may take advantage of rising air streams, does not solve the problem, and only postpones the answer.—Ivan R. Tomkins, *U. S. Dredge Morgan, Savannah, Ga.*

More About the Blue-gray Gnatcatcher in Indiana.—Some time ago an article of mine on the Blue-gray Gnatcatcher near this place was published in the Wilson Bulletin, and there have been several comments about it. In the March, 1933, issue of the Bulletin, Lyndon L. Hargrave of Flagstaff, Arizona, writes about the "Western Gnatcatcher Moves Its Nest". He says that he believes the bird sometimes moves the nest before the eggs are laid. In the case of the birds that we found, I may not have written all of the facts observed, but in this instance we first were attracted to the nest by hearing a commotion in the tree made by the parent birds when they were disturbed by a Hairy Woodpecker that was in the same tree. One parent bird made a terrible fuss as he or she arrived with a flying ant or winged insect in its mouth, so we knew that there were young near. As we watched, the bird went to the nest and fed the young. In that way we located it on the lower section of a forked branch with one fork beneath the other, the upper one being a sort of protection for the nest beneath it.

The next visit to the place showed the young out of the nest and flying about the tree, with the distracted parents following and rounding them up with protests and scoldings. We decided to return later for the nest, which we did,

but it had absolutely disappeared, and was not to be found after a close inspection of the ground beneath. This nest was finished when found, and a brood of three young birds, I think it was, were "finished off" for life and held their "coming out party" there. I add these few notes because Mr. Hargrave may have thought that the nest was not occupied, as in some cases that he had observed. I saw several gnatcatchers in the Mounds State Park that summer, but in 1932 could find no nests any place, although they may have nested there. These nests are not so easy to locate. That was the only one I have ever found. Perhaps the Hairy Woodpecker or ourselves made them move the nest, but if they did, it was after it had housed the family through one brooding season.—Mrs. Horace P. Cook, *Anderson, Ind.*

Nesting of the Northern Raven in Virginia.—The Northern Raven (*Corvus corax principalis*) was once found along all the higher mountain ranges of southwest Virginia, but is now almost a bird of the past with us, and the few that remain are confined to a small section of the Clinch Mountains and the area of the White Top Mountain and adjacent territory. Except in a general way there is not much to be found about the nesting habits of the raven in the various bird books. The best accounts are to be found in *Life Histories of North American Birds*, by Major Bendire (1895), but even those apply mostly to the West. However, most of the data given on the ravens of the West seem to be characteristic of the birds we have here, with a few exceptions. For the past few years I have made a special effort to get some nesting data on the ravens of this part of the state, and have been fortunate in finding a number of nests with both eggs and young. As there does not seem to be a published account of a raven's nest from this state, I will describe one which is typical of the majority that I have examined. Here they do not build on flat rock ledges, such as the Duck Hawk uses, but make the nest back in a pocket of a steep rock cliff, protected above with an over-hang.

On April 11, 1933, while hunting by myself for a nest of the raven on the north side of White Top, I saw a raven fly out from the cliffs, and in rounding a corner of the ledge that I was on, I could see the white-washed rocks and the nest about forty feet above me. I had some rope, but there was no way of reaching the nest from above on account of the wide over-hang, so I cut a spruce pole and climbed up to a crevice and pulled the pole up, finally reaching the nest in this manner. It was situated in a down-slanting pocket, too steep to stand on, and was nicely made of sticks, with a thick, smoothly finished lining composed of about equal parts of sheep's wool and Spanish moss, with a little buffalo hair. The exterior was twenty-four inches wide by eighteen inches deep, and the inside measured ten by five inches.

The four eggs which the nest contained were brought down in my binocular case, and on later examination they all proved to be decomposed, which was accounted for by seeing where some cat hunter had built a fire close to the nesting cliffs. The embryos were well formed in all of the eggs previous to their decomposition, so while no accurate nesting date can be given, the eggs must have been laid about the middle of March. They were smaller than the average eggs for this species, and were rather sharply pointed. They measured as follows: 1.94x1.24, 1.93x1.24, 1.86x1.23, and 1.83x1.23. For the hour that it took me to reach the ground after my examination of the nest none of the ravens were seen or heard, but while putting on my boots one of them alighted in a red spruce

close by, shortly followed by another. They made a considerable racket until I walked on, on a ledge in sight of them, when they both left in a hurry, occasionally diving sideways in the air, all the time voicing their protests. Flying in the direction of Cabin Ridge, they were seen no more.

Like the nests of the Duck Hawk, the rocks all around the ravens' nests are well white-washed, even when they are just building. They are very erratic in their nesting and two nests found while being built last summer were completed this season and occupied. Two nests with young, one found in April and the other in July, indicate irregular nesting dates. Whether all the eggs hatch or not as a usual thing is to be questioned, for three nests with young coming under my notice contained only two each. They are nearly always seen in pairs, except in late summer when the young of that season stay with the two old birds until nesting time the following year. The Crows fight them just the same as they do hawks, but the ravens seem to be able to hold their own very well and usually the Crows are the ones to leave the field of battle, sometimes minus a lot of feathers.—F. M. Jones, *Independence, Va.*

Some Experiences with the Cerulean Warbler.—A number of years ago, I first saw a Cerulean Warbler in May, as it was sitting on a brush pile in a woods pasture. From that time on, for perhaps ten or more years, I did not come across it at all. Then on May 12, 1933, at Mounds State Park, following a flood, I saw a flash of sky blue and the bird disappeared in the direction from which I soon heard a loud, repeated "*ze-ze-ze-ze-ze-ze-zé*". I was beneath the tree at the edge of the flooded area, and the bird was in the top. I tried to see him and finally saw the underparts of the singing bird—white throat, breast, belly, and undertail, with a dark narrow band resembling a string of beads across the breast, and black streaks bordering the sides—and I knew that the flash of blue and the black and white underparts belonged to the same bird. It was the first time I had heard the song. On June 21 following, I was in another woods about a mile to the north, when I heard the same song from two male birds at the same time during the heat of the hottest day of the summer, almost 96 degrees in the shade. At first I thought of the Blue-winged Warbler, but later I saw the birds as before with the white underparts with slightly black markings and the narrow black across the breast or throat. The two birds were answering each other, it seemed, each giving exactly the same song of seven notes and only rarely shortening the song to five or six notes. The Blue-winged Warbler gives but five notes as a rule, but his song sounds to me otherwise very much like that of the Cerulean. But the latter bird sits still very little, moving about the tree in a manner of the Red-eyed Vireo as he sings. Both birds were in the tops of tall trees, gleaning their food from the leaves and branches of the trees. They sang for long periods at a time, then rested awhile between songs.

The Blue-winged Warbler sits still in a low tree for long periods as he sings, and does not seem at all afraid. The Cerulean Warbler was too high to fear anyone. The male is much more beautiful to me than the books picture him. I understand that this bird has been in that woods for five years, but the authority is not an ornithologist and may be mistaken, although my bird experience is that they may return to the same places, as records of other species show. I expect to remember these haunts of this bird, hoping to eventually find his nest and to learn more about him.—Mrs. Horace P. Cook, *Anderson, Ind.*

The American Egret and Other Herons Near Wichita, Kansas.—On September 10, 1933, Dr. Claude C. Tueker observed three American Egrets (*Casmerodius alba egretta*) in the marshy flats of Kingman Lake. He reported also seeing several Sandhill Cranes (*Grus canadensis tabida*). Kingman Lake is situated eight miles west of Kingman, on thte Ne-Ne-Seah River. To the east of the lake is a high grassy hill. From here one can clearly see the entire lake. On September 16, 1933, the Audubon Society of Kansas took a field trip to this lake. From the hill all could clearly see the glistening snow-white egrets, half hidden by the tall marsh grass. During the afternoon they were repeatedly flushed. Their black legs and yellow bills, noted by us, established their identity beyond a doubt. On these same flats three Ward's Herons (*Ardea herodias wardi*) were seen, as well as several Black-crowned Night Herons (*Nycticorax nycticorax hoactli*). The Sandhill Cranes were also seen from the hill and carefully studied throughout the afternoon. Toward sundown, Mr. Charles Ruff and I made our way through the dense growth of weeds to the edge of the marsh. Here we startled four cranes. Their entire plumage was a slate gray, and as they took wing and flew across the mash we clearly noted their outstretched necks and feet.

On September 9, 1933, I visited Santa Fe Lake, sixteen miles east of Wichita. One end of the lake is overgrown with smartweed and is very marshy. While studying an American Bittern at the edge of the swamp, a large slate-blue bird flew up, uttering a familiar heron-like squawk as it took wing. Its head and neek were a dark reddish brown. This, together with its large size and black feet identified it as the Little Blue Heron (*Florida caerulea caerulea*). It settled on the farther side of a small patch of open water. At this plaee there was another Little Blue Heron. How many others, if any, were hidden in the weeds, I eannot say. Its smaller cousin, the Eastern Green Heron (*Butorides virescens virescens*), was also frequently seen.—Wilfred A. Goodman, *Clearwater, Kans.*

The Mockingbird in Northeastern Illinois and Southeastern Michigan.—On May 17, 1933, I was walking in the country just southwest of Chicago when I saw upon a telegraph wire a bird which I at first took for a Brown Thrasher. But careful examination at a distanee of not more than a hundred feet indicated that it was a Mockingbird (*Mimus polyglottos*). I am certain of this identification, since I have seen many of these birds in the South, and I followed this one about, examining it several times. I never saw it again. About July 15, 1933, near Vicksburg, Kalamazoo County, Michigan, I identified another Moekingbird. In fact I examined it carefully on several successive days. It always remained in the same territory. It strikes me as rather an interesting eoincidence that I should twice in the same season have seen a southern species of bird, even though the places in which they were seen were rather widely separated.—Cyril E. Abbott, *Morgan Park, Ill.*

The Black Vulture in Dallas County, Iowa.—An adult male Black Vulture (*Coragyps atratus atratus*) was secured by Mr. Louis S. Trevarthen three miles south of Perry, Iowa, on the Raccoon River, September 17, 1933. There was but the one lone bird, in a dead tree. The specimen was presented to the University of Iowa Museum. This is the first record of this species for Iowa.—Homer R. Dill, *University of Iowa Museum, Iowa City, Iowa.*

ORNITHOLOGICAL LITERATURE

Check-List of the Birds of Missouri. By Rudolf Bennitt. The University of Missouri Studies, VII, Number 3, July 1, 1932, pp. 1-81, one map. (Distributed September, 1933; reviewer's copy received September 18). Price, $1.25.

The reviewer recalls the pleasure with which, more than a quarter of a century ago when state bird lists were all much less ostentatious than many have been in more recent years, he first examined his copy of Mr. Otto Widmann's "A Preliminary Catalogue of the Birds of Missouri", published in the *Transactions of the Academy of Science of St. Louis*, XVII, pp. 1-288, in which the status of the 353 species and subspecies then known or believed to occur in that state was set forth, along with that of thirty additional forms of possible occurrence there, in a much more detailed and complete manner than was indicated by the adjective "preliminary" in the title. Mr. Widmann's excellent effort then seemed so comprehensive that it promised to be an adequate treatment of the subject for many years to come; but during the period intervening between then and now additional bird forms have been reported from Missouri and changes in the recorded status of the previously reported species have become necessary, while there has also been published an extensive revised classification of North American birds (*A. O. U. Check-List*, fourth edition, 1931), so that Mr. Widmann's list of 1907 has come no longer adequately to reflect the existing knowledge of the Missouri avifauna. This deficiency Dr. Bennitt, who is Associate Professor of Zoology in the University of Missouri, aims to supply in his new "Check-List", here under review.

In his "Check-List" Dr. Bennitt lists all of the 396 species and subspecies of birds now attributed to Missouri, and by means of letter symbols endeavors tersely to set forth the "general distribution, relative abundance and seasonal status" of each of these bird forms. He does not give the usual segregated "hypothetical list", but interpolates in brackets, in their proper systematic position in the main list of definitely admitted forms, fifty-seven additional forms "whose presence in the state is probable but not yet certain", with an indication of the basis for such hypothetical inclusion. There is a map (p. 10), a summary (pp. 67-71), a bibliography (pp. 72-75), and a good index (pp. 76-81).

Dr. Bennitt, we infer, does not intend that his "Check-List" shall be regarded as a highly critical review of the status of each form now or previously included in Missouri's bird list; at least it is not such. More it is a useful piece of ornithological record book-keeping. Published records, being such, seem to have been largely quite freely accepted at their face value, except of course in the cases of the more patent or egregious errors, when Dr. Bennitt quite properly disposes of them, usually in footnotes. To do otherwise than this of course involves an enormous amount of painstaking and time-consuming research. Experience in a number of states has indicated that in that final revision of its state list which every state should ultimately have, every individual record of every bird form must be challenged and thoroughly re-examined, and, unless the direct or clear circumstantial evidence reasonably demonstrates its validity and justifies its retention, should be eliminated. From a careful evaluation of the retained residue of records the general statement of the status of each form should be constructed. This is a tremendous task, of course, but some day it must be done for every

state. Meanwhile bird students should be and are grateful for the real help afforded them through the more superficially compiled state lists.

A common problem shared by every author of a state bird list is what to do with the "sight-records" of birds new to the list or so rare that only a few previous records exist. The reviewer does not stand with those who take the rather extreme position that, without exception, only such bird forms as have been collected, preserved, and authoritatively identified may validly be included in a state list, though admittedly this ultra-conservative course is the only wholly safe criterion that can be universally applied. But the reviewer does feel that in admitting such "sight-records" the very utmost of care and good judgment is necessary. As Dr. Bennitt states (p. 7), when "a sight-record is vouched for by an observer of known competence, dealing with a bird whose field marks are distinct and which was seen under favorable conditions, there is no good reason why it should not be accepted at face value." For examples, it is hard to see how there could be any reasonable doubt of the new "sight-records" of the Eastern Brown Pelican and the Man-o'-war Bird, under the circumstances described, to mention only the first two of such cases in Dr. Bennitt's "Check-List". But in a few cases one is compelled to question whether Dr. Bennitt has been quite conservative enough in the application of his rule. This is especially true in the accepted record of "three" American Hawk Owls allegedly seen by a "graduate student" of the University of Missouri in Howard County, northern Missouri, on January 3, 1932. Considering the great rarity of this species in states even farther north than Missouri this record is extremely questionable, and to those well experienced with many of even the most conscientious identifications of less experienced bird observers, the possibility of a misidentification of the Short-eared Owl immediately suggests itself.

In a number of instances a lack of adequate material and field work in parts of Missouri and (or) a lack of sufficiently careful identifications of closely related bird forms seems evident in the conclusions regarding the relative abundance of forms reached by Dr. Bennitt in the new "Check-List". To the present reviewer, familiar for the past thirty or more years with the birds of southeastern Nebraska, just across the Missouri River from northwestern Missouri or only a few miles removed, it is difficult to regard such birds as the Western Sandpiper, Arkansas Kingbird, or Shufeldt's Junco as "casual" in the sister state, or the Stilt Sandpiper, Red-shafted Flicker, Gambel's Sparrow, or Dakota Song Sparrow as "rare" there, or the Eared Grebe and Thick-billed Red-wing as even "uncommon" there, during migrations, to mention just a few of the cases. The lack above mentioned probably causes Dr. Bennitt to record, for example, the Lesser Loon as a "casual" addition to the Missouri list, on the basis of two specimens identified, while all previous records are referred to the Common Loon, which is given as an "uncommon transient visitant throughout the state", interpreting Dr. Bennitt's symbols, thus giving the impression that in Missouri the larger form is much more common than the smaller one, a highly improbable status in view of the determined relative abundance of the two forms in Nebraska (see *Nebraska Bird Review*, I, p. 89). Again, the Bendire's Crossbill, which Dr. Bennitt includes only hypothetically in his list, is the form to which many, probably most, of the red crossbills wintering in southeastern Nebraska, and undoubtedly also northwestern Missouri, belong.

But if Dr. Bennitt did not have adequate material and time to reach conclusions that bid fair to remain reasonably permanent on the status of a number of Missouri birds, he is still to be thanked and congratulated upon the generally excellent results that he obtained with the data and opportunities available to him. The new Missouri "Check-List" is a very helpful piece of work, and should be available to every serious bird student in Missouri and surrounding states. Widmann's basic 1907 list, with the transitional new "Check-List" of Dr. Bennitt's, form a very good basis for the encouragement of such additional accurate field and museum studies on Missouri birds as will pave the way for that more critical, complete, and semi-final exposition of the avifauna of that state which Dr. Bennitt at some later time or some other worker will present to interior ornithology in the future.—M. H. S.

A Revised List of the Birds of Iowa. By Philip A. DuMont. University of Iowa Studies in Natural History, Vol XV, No. 5, pp. 1-171. Iowa City, 1933. Price, $1.00. (Order from the Department of Publications, Iowa City).

This paper is a revised list of the birds of the state. It deals with the status of the birds in as condensed a manner as feasible. Thus, the author has omitted all "popular" matter and illustrations (though a rather inadequate map of Iowa is included). The status of the Chimney Swift is presented in one concise sentence, "A common summer resident, breeds in all parts of the state." But the author enters into detail in order to straighten out more perplexing cases, and in the case of the chickadees he uses two pages. In general the amount of discussion varies inversely as to the rarity or confusion of the forms.

In comparison with the previous list by R. M. Anderson, published in 1907, the DuMont list records 364 forms while Anderson listed 354. The present author deletes a number of Anderson's birds and includes thirty-five not previously included.

The list is a splendid and, in most cases, a careful summation of the birds of Iowa, and the author is to be congratulated upon his results. Mr. DuMont is a capable ornithologist and has critically examined the available material. He has thus revised many of the subspecific standings formerly confused. Our pleasure is marred somewhat when we discover a few subspecific identifications without specimens. The subspecies of ravens and paroquets have been determined through neither has occurred in Iowa in years nor have any specimens been preserved! The author has followed the A. O. U. Check-List, but this is not a proper scientific method. We firmly believe that *no subspecific determination should ever be made except upon critical examination of adequate specimens.*

The author says, "It is a generally accepted rule among ornithologists that no species of bird be admitted to a state list unless a specimen has been captured within the state and preserved or examined by a competent bird student." Using this as a criterion, we find that the following appear to be included in the list without the collecting *and preservation* of a specimen. We believe that they should be considered as hypothetical until such time as evidence fulfilling the author's rule be obtained:

Western Grebe, *Aechmophorus occidentalis.*
Water Turkey, *Anhinga anhinga.*
Snowy Egret, *Egretta thula thula.*
Wood Ibis, *Mycteria americana.*

Cinnamon Teal, *Querquedula cyanoptera.*
American Scoter, *Oidemia americana.*
Harris's Hawk, *Parabuteo unicinctus harrisi.*
Black Rail, *Creciscus jamaicensis stoddardi.*
Hudsonian Curlew, *Phaeopus hudsonicus.*
Black-necked Stilt, *Himantopus mexicanus.*
Louisiana Paroquet, *Conuropsis carolinensis ludovicianus.*
Great Gray Owl, *Scotiaptex nebulosa nebulosa.*
Nuttall's Poor-will, *Phalaenoptilus nuttalli nuttalli.*
Lewis's Woodpecker, *Asyndesmus lewis.*
Arctic Three-toed Woodpecker, *Picoides arcticus.*
Say's Phoebe, *Sayornis saya saya.*
American Raven, *Corvus corax sinuatus.*
Common Rock Wren, *Salpinctus obsoletus obsoletus.*
Eastern Mockingbird, *Mimus polyglottos polyglottos.*
Northern Prairie Warbler, *Dendroica discolor discolor.*
Western Blue Grosbeak, *Guiraca caerulea interfusa.*
Lazuli Bunting, *Passerina amoena.*
Gray-crowned Rosy Finch, *Leucosticte tephrocotis tephrocotis.*
McCown's Longspur, *Rhyncophanes mccowni.*

It would also seem that the Red-throated Loon, *Gavia stellata;* Man-o'-war Bird, *Fregata magnificens;* and the Chestnut-collared Longspur, *Calcarius ornatus,* should be checked up before being definitely given a place in the list.

We hope that pointing out these doubtful birds will stimulate the Iowa bird students to obtain the proper evidence before another season passes. As the state list now stands, 337 species may be definitely assigned to Iowa.—L. W. W.

Editor's Note.—The reader will hardly fail to note the conflicting points of view concerning sight records in the two preceding reviews. There is probably no way of escaping this clash of opinion, not only among reviewers, but among ornithologists in general. On the one hand there is demanded as a basis for belief the capture and preservation (for verification) of a specimen. Verification is one of the corner-stones of science. Too often we are satisfied with merely the report of a captured specimen, and forget to verify the identification. Mr. DuMont's painstaking examination of all known existing specimens of the rarer Iowa species has revealed a number of erroneous identifications with the bird in hand. The truth is not established, therefore, by the mere possession of the specimen. One person's identification of a species in hand may not be as trustworthy as another's identification at a distance of fifty yards. As we have previously claimed, the personal equation is a very strong factor in the problem of credibility. Yet, in all cases science demands the right of verification; and without this a specimen in hand is no better than a sight record. Examples of the failure of the specimen criterion for admissibility will be found in the Appendix of DuMont's list.

On the other hand, let us consider the case of Lewis's Woodpecker in northwestern Iowa during the winter of 1928-29. This single bird was under observation for hours at a time by various observers at different times from November to March. Since there are no complicating subspecies in this case the problem of identification is a simple one. To those who experienced the demonstration

there is no possibility of doubt that this species occurred within the geographical boundaries of Iowa. The only problem is to convince the astute scientist, who is by nature and profession a skeptic. And this will depend upon the credibility of our testimony. Yet, whether the doubter is convinced and believes does not alter the fact. The requirement of a specimen may be safe as a general and arbitrary criterion, but it may fail and fall short of the truth in a great many cases. Much the same discussion might be offered relative to the mockingbird as an inhabitant of Iowa, for it has been repeatedly observed by competent students. The question of subspecies may be raised in this case, however, though *probability* would favor the decision made by the author.

If we are to attempt to generalize on this discussion, it will be to the effect that species can be identified in the field, while subspecies can not be; that sight records on species are admissible in proportion to the credibility of the witness (just as are laboratory determinations, except that verification is possible in the latter), while sight records of subspecies should be wholly inadmissible.—T. C. S.

Autobiography of a Bird-Lover. By Frank M. Chapman. D. Appleton-Century Co., New York. 1933. Pp. 1-420, 87 figures. Price, $3.75.

The reading of this book has been a pleasure. The reading of biography is usually interesting. Biography of ornithologists is especially interesting to us. The present biography is of one of America's foremost contemporary ornithologists, one who is acknowledged as a great leader in popularizing bird study in this country. Dr. Chapman must have been a "born" ornithologist; nevertheless he had a narrow escape from the drudgery of another profession. The book treats quite fully of Chapman's work in tropical America, where he was concerned chiefly with faunal phylogeny. While he has contributed his share to systematic ornithology, yet we gather the impression from his autobiography that he has derived the greatest pleasure from his work as a field ornithologist—distributional studies, etc. On page 209 the following interesting statement is made: ". . . the work of the collector in securing specimens must be supplemented by that of the systematist in identifying them. I have found that in 'working up' a collection representing a fauna with which I am fairly familiar, I average about a species a day." No snap judgment here, evidently! A bibliography of Dr. Chapman's writings and an index conclude the book.—T. C. S.

Traveling with the Birds. A Book on Bird Migration. By Rudyerd Boulton. Illustrations by Walter Alois Weber. M. A. Donohue and Company, Chicago, Ill. 1933. Pp. 1-64. Colored pls. I-XII. Price, $1.50.

Mr. Boulton here presents an excellent discussion of bird migration for younger readers. Any young person who is interested in birds will find pleasure and instruction in the text. And, indeed, the adult reader, if not already acquainted with the facts, will be able to read with interest. Not less important are the twelve colored plates, depicting twenty-four species of typical migrants, by Mr. Weber. A book of this kind will make a splendid gift, and will be valued much beyond the very reasonable cost. We are repeatedly astonished at the volume of choice literature now available to students of nature, and especially relating to birds. This book may be expected to make its contribution to ornithology by informing and inspiring the youth.—T. C. S.

Birds of the Atlanta, Georgia, Area. By Earle R. Greene. Bull. No. 2, Georgia Soc. Naturalists. Pp. 1-46. 1933. Published by the Society. Price, $1.00 (P. W. Fattig, Curator-Librarian, Emory University, Ga.).

This list comprises 208 kinds of birds which have been found by the author within the area treated. No comprehensive report has been issued on the birds of this state; consequently such local lists as this one will be useful, not only to present local students but also, doubtless, at some time when a state-wide report is contemplated. In addition to the author's list an appendix includes annotations on twenty-four other species which have been observed by other students. The proof-reading seems to have been carefully done, and the mechanical work is good. There is no index, but it is not especially needed in this case. A bibliography would have been of service, however.—T. C. S.

History of the Present Status of the Breeding Colonies of the White Pelican in the United States. By Ben H. Thompson. Occasional Paper No. 1, Wild Life Division, U. S. Nat. Park Service (213 Hilgard Hall, Berkeley, Calif.), pp. 1-85.

This excellent summary gives an account of the present known distribution of the White Pelican during the breeding season, based upon a very complete review of recent literature. The question of the relationship between the White Pelican and fish is examined. Several reasons are given why the pelican should not be outlawed because of his fish-eating habits. While a colony of pelicans consumes great quantities of fish, yet it is a fact of observation that under wild conditions the great bulk of such food consists of non-game fish. In only one or two instances are pelican colonies located near enough to artificial fish rearing ponds to be a menace. One of these is probably the famous Yellowstone Park colony, near which man has chosen to locate a fish hatchery. Furthermore, it seems to be evident that pelicans consume only the excess fish population—that nature has adjusted the problem by over-production of fish; that were the pelican check removed the surplus of fish might be self-destructive. The census shows that the White Pelican now breeds in seven important colonies in North America (about twenty-six large and small colonies are listed), with an estimated population of about 30,000 individuals. An excellent bibliography is included.—T.C.S.

The Microscopic Anatomy of the Digestive Tract of Gallus domesticus. By M. Lois Calhoun. Ia. State Coll. Journ. Sci., VII, No. 3, 1933, pp. 261-382, pls. I-XXXIX.

This paper gives a very complete review of the literature of the subject, the great bulk of which seems to be in the German language. The very extensive bibliography together with the review of literature will be a welcome aid to American anatomists. The author examined microscopically all portions of the digestive tract of the domestic chick at various ages after hatching. Descriptions and micro-photographs show the results.—T. C. S.

The Audubon Year Book (Indiana) 1933. Published by the Indiana Audubon Society. Pp. 1-108. Numerous figures. Price, $1.00 (Address Miss Margaret R. Knox, 4030 Park Ave., Indianapolis).

Dr. Earl Brooks gives a history of the numerous names for the Robin, but the article contains a great many typographical errors. Mr. Perkins presents a report on returns of Bronzed Grackles banded in Indiana, showing migratory

movements. Another article by Dr. Test gives results of banding Mourning Doves in Indiana. Still another article on banded Song Sparrows is by S. W. Witmer. W. L. McAtee has a list of Indiana trees and shrubs which bear food for birds. And there are other interesting papers.—T. C. S.

Cave Life of Kentucky, Mainly in the Mammoth Cave Region. By Vernon Bailey. Published by the University Press, Notre Dame, Ind. 1933. Pp. 1-256. Price, $1.25.

This book deals interestingly with the animal life of the Mammoth Cave and vicinity. The mammals, fishes, reptiles, and amphibians are described by Mr. Bailey. The chapter on birds is by Mrs. Florence Merriam Bailey. The invertebrates are treated by Leonard Giovannoli. Since there are no birds which actually inhabit the caves, the birds treated are those which live in the region surrounding the caves. The book is intended to be a help to the tourist who visits this region. Mrs. Bailey has drawn on the current ornithological literature to secure interesting new facts concerning the species of which she writes. Approximately half of the book is devoted to the bird life. Ample descriptions are given of the other vertebrates, but they are less numerous than the birds. The invertebrates are considered, but much less completely. An index and a very full bibliography are furnished. We have noted elsewhere in the reviews reference to a publication entitled "Caverns of Virginia" ($1.00) issued by the Virginia Geological Survey. Another newly described cave is known as Longhorn Cave, located twelve miles south of the town of Burnet, Texas. The region including this cavern has recently been set aside as a state park. The cavern is described geologically and mapped in the April, 1933, number of *Field and Laboratory* (Vol. I, No. 2, Southern Methodist University, Dallas, Texas).—T. C. S.

Suggestions for Pheasant Management in Southern Michigan. By Howard M. Wight. Published by the Department of Conservation, Lansing, Mich. 1933. Pp. 1-25.

Much information about the habits of this bird is presented herein, as well as suggestion on management.—T. C. S.

Bulletin of the Essex County Ornithological Club of Massachusetts. Salem, 1932. Pp. 1-54. Price. 50 cents. (S. Gilbert Emilio, Treasurer, 7 Winter St., Salem, Mass.).

Mr. Griscom presents an interesting comparison of the Western and Yellow-bellied Flycatchers, stimulated by a late fall record of a specimen taken in Massachusetts. Dr. C. W. Townsend records the birds seen on four trans-Atlantic trips. A composite local list for 1933 is reported by S. G. Emilio. There are also other short papers.—T. C. S.

More Game Birds by Controlling Their Natural Enemies. Published by More Game Birds in America, A Foundation, 500 Fifth Ave., New York, N. Y. Pp. 1-62. 1933.

We find here a popular manual on "Vermin". Under this heading are classified seven owls, nine hawks, and five other birds: also about thirteen mammals, various snakes and turtles. Control in various degrees is recommended for these predators, and methods of control are explained. Much information is given, and we have looked carefully for misinformation without positive success. For instance, it is said that the Sparrow Hawk "will take small birds". This is true.

according to most authorities, but whether this hawk will take them in sufficient numbers to justify control by the "gun and pole trap" is another matter. We intend to make no quarrel with these people who wish to control "vermin", for we realize that our viewpoint may be just as prejudiced as we think theirs is. But we think they are actuated by selfish motives in desiring to preserve only game for hunting. However, an argument is useless.—T. C. S.

A List of Vermont Birds. By H. C. Fortner, Wendell P. Smith, and E. J. Dole. Bull. No. 41, State Dept. Agric. (Probably obtainable at the State Capital).

The list includes a statement on the status of each species. A second, shortened, list gives descriptions.—T. C. S.

A Decade of Bird Banding in America. A Review. By Frederick C. Lincoln. Smithsonian Report for 1932, pp. 327-261. Washington, 1933.

As suggested by the title this paper is a review of the scientific results of bird banding during the past ten years. Three maps and seven halftones illustrate phases of the work.—T. C. S.

We have received copies of the *Florida Naturalist* for January and October, 1933. The earlier number contains an article by Mary Frances Baker on "June on the Florida Keys", and one by Lucien Harris, Jr., "A Trip to the Brevard Reserve". Articles in the October number report on the newly organized state conservation department, and on a collecting trip into Florida by biology students from Hanover College.

The National Association of Audubon Societies has issued a leaflet entitled "The Problem of the Vagrant Cat", by T. Gilbert Pearson. (Circular No. 18, pp. 1-4, Nat. Ass'n Aud. Soc., 1775 Broadway, N. Y.). It reprints the cat licensing ordinance proposed by the International Cat Society, and also offers a control method free from the license idea. Our readers are familiar with the license plan, which is practically the same as for dogs. The new plan recommended, and for which a model ordinance is presented, provides that no cat be allowed to run at large unless it bears an identifying tag, tags to be furnished at cost (about five cents) by the town clerk. Cats found at large without identifying tags may be impounded for forty-eight hours, and if not claimed are to be humanely killed. Many people, the vast majority, little realize what a nuisance the domestic cat has become in this country. The new plan seems to be workable, and is free from certain objections to the license plan.

Crevecoeur's Notes on Birds in Pottawatami County, Kansas, by Arthur L. Goodrich, in Trans. Kans. Acad. Sci., XXXV, 1932, pp. 85-92, in one table shows the earliest and latest arrival dates for many common birds. A second table shows the time in minutes before and after sunrise when birds begin to sing, and figures are given for nearly fifty species.

The Proceedings of the South Dakota Academy of Science (Vol. XIII, 1929-1930) contains a brief sketch by W. H. Over of Gabriel Smith Agersborg, together with a re-publication of Agersborg's list of "The Birds of Southeastern Dakota", which was originally published in the *Auk*, Vol. II, 1885.

The Journal of the Tennessee Academy of Science (Vol. VII, No. 4, October, 1932) contains a list of "The Water Birds of Radnor Lake" (which is close to Nashville) by Harry C. Monk.

News from the Bird Banders for August (VIII. No. 3, August, 1933) contains a leading article on "Cooperative Ornithology" which is a summarized review of the major coöperative undertakings in the development of ornithological knowledge. Like a previous one on "Territory" this one is a valuable review of recent work and literature.

Inland Bird Banding News for March (V, No. 1) contains a report by Dr. Louis A. and Frederick H. Test on recent banding work in Indiana, giving the special problems worked on by the banders in that state. Miss Arch Cochran discusses (V, No. 2, June) the construction and use of nets in trapping birds. Mr. M. J. Magee gives an interesting account of the White-throated Sparrow. In the September number (V, No. 3) Mr. W. I. Lyon makes a full report of his annual banding trip to the islands in Lake Michigan, showing a total of 4,644 banded birds and something over 3,000 miles travelled by automobile and boat. Full directions are given for building the circular water trap.

The following mimeographed publications have been received in recent months:

The *Raven*, Bulletin of the Virginia Society of Ornithology, is edited and published at Lynchburg, Virginia, by Dr. J. J. Murray.

The *Saint Louis Bird Club Bulletin* is published monthly (except in July, August, September) at $1.00 per year. Address Mrs. Elizabeth Allen Satterthwait, 118 Waverly Place, Webster Groves, Mo.

The *Chickadee* is published by the Forbush Bird Club, 12 State St., Worcester, Mass. The September number gives a list of wild fruits and artificial foods and the birds known to feed on each kind.

The *Snowy Egret*, which we have not seen for some time, comes now as the Summer Number (Vol. VIII, No. 1). It is published by H. A. Olsen and R. E. Olsen, 172 Manchester St., Battle Creek, Michigan, and is issued irregularly.

The *Flicker* is published quarterly by the Minnesota Bird Club, at $1.00 per year, and may be ordered through the Secretary-Treasurer, Marius Morse, 4031 Fortieth Ave., Robbinsdale, Minn. The number for October, 1933, contains a beautiful tribute to a deceased member, Donald Fischer. A list of breeding birds in Minnesota during the season of 1933 includes 133 species, with the nests observed for 120 species. The mimeograph work is worthy of note—the type is large and the printing is clear.

The *Cornell Rural School Leaflet* is a quarterly magazine dealing with the facts of natural history, and perhaps occasionally with general seience. It presents the material in a form intended to be especially helpful to teachers in the schools below the college. Heretofore this publication has not been available to teachers in the city schools of New York, nor to any outside of that state. Now, anyone in the United States may subscribe beginning with Volume XXVII (September, 1933) at fifty cents for the four annual numbers. The number of pages in each number is variable, but the smallest number in the last year or two has been 32, while the maximum number has been 124. The material in this series will be very helpful to nature study teachers, and, doubtless, many will be glad to learn that it is to be made available to everyone.

INDEX FOR VOLUME XLV, 1933

Compiled by Leonard W. Wing

TO OUR CONTRIBUTORS

Our members are urged to submit articles for publication in the BULLETIN. Short items are desired for the department of General Notes, as well as longer contributions, especially pertaining to life-history, migration, ecology, behavior, song, economic ornithology, field equipment, and methods, etc. Local faunal lists are also desired, but they should be annotated, at least briefly, and should be based upon sufficient study to be reasonably complete. Authors are asked to include the common name, the scientific name (from the A. O. U. Check-List), and annotations, and they should be arranged in this order. The annotations should include explicit data concerning unusual species. Omit serial numbering.

THE MANUSCRIPT. The manuscript, or copy, should be prepared with due regard for literary style, correct spelling and punctuation. Use sheets of paper of good quality and of letter size (8½x11 inches); write on one side only, and leave wide margins, using double spacing and a reasonably fresh, black ribbon.

The title should be carefully constructed so as to indicate most clearly the nature of the subject matter of the contribution. Where the paper deals with a single species it is desirable to include in the title both the common and the scientific names, or, to include the scientific name in the introductory paragraph. Contributors are requested to mark at the top of the first page of the manuscript the number of words contained. This will save the editor's time and will be appreciated.

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You are earnestly requested to remit at your earliest convenience, thus saving postage to the Club, and much time and effort to the Treasurer. A receipt will be returned only if requested.

Life Members	**$100.00**
Sustaining Members	**$5.00 Annually**
Active Members	**2.50 Annually**
Associate Members	**1.50 Annually**

The Club values the continued support of every member, and every resignation is received with regret.

The reports of the officers will be published as usual in the March number, but there will not be the usual "Proceedings". We are closing the year with a sufficient balance to cover the cost of printing the December issue of the BULLETIN, the preceding four issues having been paid for out of the income of the 1933 fiscal year. The coming year will still be an uncertain one financially, and if we know early in the year what our income is to be we may be able to enlarge the BULLETIN accordingly. Therefore, we hope that those who can will remit dues promptly.

In behalf of the Officers of the Club the WILSON BULLETIN extends the greetings of the season to all of its readers, and wishes for everyone a realization of promised prosperity.

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