DUES FOR 1931

ANNUAL DUES FOR 1931 ARE NOW PAYABLE

This is the Treasurer's first notice to all members that dues for 1931 are now due and payable to the Treasurer

Mr. W. M. Rosene,
City State Bank,
Ogden, Iowa

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.

<table>
<thead>
<tr>
<th>Membership Type</th>
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<tr>
<td>Life Members</td>
<td>$100.00</td>
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<td>Sustaining Members</td>
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<td>Active Members</td>
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<td>Associate Members</td>
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The Club values the continued support of every member, and every resignation is received with regret. Considerable financial loss is suffered by the organization in sending the March issue of the Wilson Bulletin to members who are slow in paying dues. While many of these delinquent members pay, a still larger number drop out without a resignation; the Club would probably save money by rigidly removing all delinquent members from the mailing list. Is this desirable?

THE WILSON BULLETIN again extends the season's greetings to its readers. The past year has been a good one for us. Through the efforts of Secretary Shaver and his committee more than two hundred new members have been added to the roll. We have published three issues of the Bulletin of eighty pages each, and one usual issue of sixty-four pages. The last annual meeting, held in Des Moines, was our largest, and we are looking forward to a splendid meeting at Cleveland. We ask for the continued support of all our members, and their aid in securing new members.
THE WILSON BULLETIN
A Quarterly Magazine Devoted to the Study of Birds in the Field and the Official Organ of the WILSON ORNITHOLOGICAL CLUB

Edited by
T. C. Stephens, Editor-in-Chief
Myron H. Swenk      Albert F. Ganier
Alfred M. Bailey    R. D. Hissong

Volume XLIII
1931

Published Quarterly by the WILSON ORNITHOLOGICAL CLUB at Sioux City, Iowa
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THE WILSON BULLETIN

Published quarterly, in March, June, September, and December, as the official organ of the Wilson Ornithological Club, at Sioux City, Iowa.
The current issue of the Wilson Bulletin is printed by the Verstegen Printing Company, Sioux City, Iowa.
All articles and communications for publication, books and publications for notice, and exchanges, should be addressed to the Editor. New subscriptions, changes of address, and applications for membership should be addressed to the Secretary. Personal items, news of events in the scientific world, and other notices suitable for our "Notes Here and There" department may also be addressed to the Secretary. 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. W. Stack, M. S. C., East Lansing, Mich.
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Editor—T. C. Stephens, Sioux City, Iowa.
The membership dues are—Sustaining membership, $5.00; active membership, $2.50; associate membership, $1.50 per year.
The following societies are affiliated organizations:
The Nebraska Ornithologists' Union.
The Iowa Ornithologists' Union.
The Kentucky Ornithological Society.
The Tennessee Ornithological Society.
NESTING OF THE DUCK HAWK IN TENNESSEE

BY ALBERT F. GANIER

If one were asked to name the most spectacular and romantic of our native birds he might readily defend the choice of the Duck Hawk, our counterpart of the Peregrine Falcon, that most favored bird among the falconers of mediaeval Europe. At one time widely distributed throughout the United States, this bird, chiefly through boldness in defense of its nest, has become nearly exterminated in all that area which lies between New England and the Rockies. A bold brigand, a courageous parent, a paragon in the art of flight, trim and handsome, he is a proud untamed aborigine making his last stand in the very few rugged unsettled places that remain in our land.

On April 7, 1929, I discovered a nest of the Peregrine Falcon (Falco peregrinus anatum) in a cliff on the slope of Mt. LeConte, in the Great Smoky Mountains near Gatlinburg, Tennessee. The nest contained three eggs which I succeeded in collecting with the aid of a rope ladder and the assistance of Mr. Brockway Crouch of Knoxville, who accompanied me. In preparing the eggs I found that incubation was advanced, varying from 14 to 17 days; therefore, the bird had evidently begun to set about March 20 with the laying of the first egg.

The site was in the Devil's Backbone cliff, a promontory or comb with a sheer drop of 150 feet on one side, nearly vertical on the other and having practically no width at its apex. This site had been in use for years with no doubt and was first found by me on May 31, 1925, at which time there were unmistakable evidences of occupation. A shelf about twelve feet long and fifteen feet below the top, on the vertical side, was chosen. It was triangle shaped, about five feet wide at the center, at which point there was a little cave-like pocket, while at the ends it feathered out to nothing and so was inaccessible to prowling animals. A few small bushes grew at either end of the shelf and also some rank grass, now prostrate and dry. The surface was covered by fine shale and in a depression in this material, near the center and a foot from the wall, the three eggs were found. There were bits of
down from the bird's body as well as numerous feathers of such small
birds as robins, thrushes, jays, and juncos, scattered about the shelf.
By the eggs were two pellets composed of hair and feathers and meas-
uring $3/4 \times 2 1/4$ inches. There were four or five deposits of white excreta
near the nest and also on nearby sheltered ledges, where the birds
were in the habit of perching or roosting. On the top of the rocky
backbone of the cliff there was no growth except occasional clumps
of sand myrtle and here also were found pellets, excreta, and feathers.
The vertebra of a small snake was on the nesting ledge.

The conduct of the falcons about the nest was similar to that de-
scribed by other observers. Our first view of them was from the forest
600 feet below, when the two were seen flying about the cliff. One of
the birds finally began to fly in closely, with rapid beating wings, and
a moment later I saw her alight on the nesting shelf. An hour's
climbing through the jungle of laurel and rhododendron brought us
out on top of the backbone which we followed in approaching the
nesting site, keeping a close lookout the while for the departure of the
sitting bird. The male had in the meantime disappeared. I stationed
myself sixty feet from the shelf while my companion advanced to a
point immediately above the brooding female. He struck the cliff face
with a rock but the bird, hidden from sight, did not leave. He then
pushed off a lump of loose shale with his foot and as it fell on the
ledge, the sitting bird launched herself into space with rapid wing
beats. She immediately began her cackling alarm notes and was joined,
in less than a minute, by the male, a smaller bird. He remained high
and did not join in the demonstration, leaving the scene in about five
minutes. A short while later he returned for a few moments and then
did not re-appear during the hour we were about the nest.

We tied the rope ladder to rhododendron bushes and went "over
the top," seating ourselves a few feet from the eggs. All this time
the female, which had been keeping up her demonstrations, now be-
came more violent. She would approach from above with half folded
wings, darting straight toward us but swerving suddenly upward or
sideways when from forty to eighty feet away. The swish of her wings
could be heard plainly as she turned, and her flight at this time was
inconceivably rapid, making an audible roar. With a Leitz Leica
camera, f. 3.5 lens and shutter set at 1/500 second, we made a number
of pictures of the bird in flight. With different adjustments I photo-
graphed the nest with eggs and later photographed the cliff from
different points. The falcon's contrasting head markings, the black tail,
the slaty back and the black and white breast bars, were plainly visible.
Nesting of the Duck Hawk in Tennessee

Fig. 1. Nesting crag of the Duck Hawk in the Great Smoky Mountains. a, Profile of cliff. b, Broadside of cliff from 500 feet below. c, d, and e, Duck Hawk in flight, at about 50 feet.
After half an hour the female sought rest on the top of a dead spruce across the canyon, 1,000 feet away, and during the last fifteen minutes of our stay she remained on this perch.

The most easily discernable field marks of the bird in flight were noted to be the pointed wings bent at the elbows, the rather long tail with rounded tips and the large club feet drawn up close under the tail. The eggs, which I collected, are considerably longer than the average. They measure in inches, 2.32x1.61, 2.26x1.67, and 2.21x1.66, averaging 2.26x1.65. Bendire gives the average of sixty-one specimens as 2.06x1.61. Darker markings of rufous overlie a lighter brick red under color but this does not entirely cover the creamy ground and therefore makes this set unusually handsome.

On May 24, 1923, a friend noted these birds noisily circling about the site and got the impression that there were three of them. Two weeks later I visited the site and observed two of the falcons going through their splendid aerial evolutions. For lack of time I did not try to locate the nest on that visit and it is probable that the young had already taken flight.

On the morning of March 30, 1930, I found myself on an escarpment of the Cumberland Mountains looking down some 800 feet, into the wooded gorge of two tumbling mountain streams which a little further down emptied their waters into the Collins River. This was in Grundy County, Tennessee, some 125 miles west of the Smoky Mountains site. The sandstone cliff on which I stood, “The Point”, was that in which I had located an eyrie of the Duck Hawk on May 29, 1922, a description of which will be found in Wilson Bulletin for March, 1923, page 26.

The birds were not at home, so our party, consisting of Messrs. Mayfield, Monk, Sharp, my son, and myself, began a systematic search of the cliffs which stretched in an unbroken line as far as we could see, keeping a lookout into the half mile wide canyon for falcons on the wing. At one o’clock we decided to lunch at a spring and while my companions were preparing the “grub” I pushed on a quarter mile farther and had the good fortune to flush a male Duck Hawk from a dead limb overhanging the cliff. After a circuitous five minute flight he resumed his perch while I rejoined the party to break the good news.

On our return a short while later the male was still at his post and a few moments after the female flew from her nest, when we had taken a position where we could look across at her from a point about 150 feet away. This nest was unusual, in that the eggs were laid in an old nest of the Red-tailed Hawk built in a recess in the cliff some
Fig. 2. Nesting cliff of Duck Hawks in the Cumberland Mountains of Tennessee. a, Cliff from the west. b, Cliff from east. c, "Valley of the Peregrines".
ninety feet from the bottom and twenty feet from the top. The brow of the cliff projected about ten feet beyond the nesting ledge and so, even with our rope ladder, we were unable to reach the eyrie. The nesting site is shown in the accompanying illustration. These birds were not nearly so bold as the pair previously described and while both birds remained nearby, in the air, at no time did they dart closer than 150 feet from us. They maintained their cackling notes more or less continuously. On revisiting the nest a week later it was observed to contain three downy white young nearly a week old. From this it would appear that incubation of the eggs began about March 10. The parent birds were no more bold on this trip than before. From a squirrel hunter, who frequented this cove and who had known of the birds for years, I learned that this pair had nested at the present site for six years, having moved from “The Point” eyrie, a mile away, in 1924. He stated that the latter eyrie had been used prior to 1924 for five or six years to his knowledge. He had never shot at the birds and promised he would endeavor to protect them. Their isolation, some three miles from a good road and two miles from a habitation, will assist in their preservation. He did not know of another pair in the vicinity.

The ledges about both of these eyries, as well as the one in The Smokies, were well marked by white excreta and this serves as an apparently unfailing method of locating a nesting site, at least, one that has been in use for some time.

The pair of Red-tailed Hawks which furnished the nest have definitely formed the cliff nesting habit. In May, 1922. I found their nest with small young a half mile west of “The Point”, while in 1930 their nest was found a quarter mile north of it, both being on inaccessible ledges of the cliff.

A nest of the Duck Hawk was found April 4, 1893, by William Wack, three miles below Knoxville in a cliff, the base of which is washed by the waters of the Tennessee River. This nest contained three eggs with incubation well advanced and with measurements averaging 2.15x1.73. (See Museum, Vol. 1, No. 3). I am unable to find published records of any other nests having been found in the southern states, although it has been observed at breeding season in a number of places in the Appalachian Mountains. I have searched diligently in many likely localities, but have been unable to locate other breeding pairs than those I have mentioned.

NASHVILLE, TENN.
A PRELIMINARY REPORT ON THE INFLUENCE OF LIGHT INTENSITY UPON THE TIME OF ENDING OF THE EVENING SONG OF THE ROBIN AND MOCKINGBIRD

BY JESSE M. SHAVER AND MISS RUBY WALKER

The very great importance of transition areas has long been recognized in animal ecology, but relatively little attention has been paid to transition intervals of time such as those between night and day.

The very great need of exact studies of the transition interval between day and night is well indicated by Elton (1927, page 89). He says that "A careful study of the changes in external conditions during the day and night with reference to corresponding changes in the activities of animals is very badly wanted, for our ignorance of the matter is profound. It is remarkable to reflect that no one really knows why rabbits come out to feed only at certain times, and at different times on different days . . . and yet rabbits are common animals and of great practical importance, and millions of people have watched their habits. We do not know whether light, temperature, humidity, or something else determines the appearance and retirement of animals at certain times."

All that Elton says about rabbits is equally true of birds. Some birds, as owls, come out only at night and retire early in the morning while most birds are active during the daytime and retire at nightfall. This last is true of most of our song birds. In studying this interval when day passes into night, bird activities are most useful and especially bird song since it may be recorded even when it is too dark to see the bird. Furthermore the song sung near sunset—called in this paper the evening song—has been shown by Shaver and Miss Gladys Walker (1930) to be highly correlated with sunset time in the case of the Mockingbird and to have a sharp end point. This makes this particular song well-fitted for study.

Many possible weather factors are changing rather rapidly during the twilight period and conceivably might be causally related to the time of ending of the evening song of diurnal species. The scanty literature on this subject indicates that light is one of the most important of these factors.

In 1916 and again in 1924, Haecker reported on studies of the relation between light and the time of beginning song in the morning and the time of song ending in the evening. In his first study (1916).

3Read by the senior author before the Ecological Society of America at the Des Moines meeting, December 30, 1929.
sunlight intensity was investigated both subjectively and objectively. In collecting his objective data on light, he used a crude apparatus consisting of a bar with a piece of spectacle glass at one end for an eye-piece and a sliding plate containing letters of a certain height at the other end. He moved this plate back and forth using the distance at which he could read the letters as the relative measure of the light intensity at the time that a bird began singing. His conclusions were that there is a definite and high correlation between the time of beginning song and the light intensity.

Later Haecker (1924) made observations on the evening song of birds. Light summation of the hours of sunshine per day was made and used as well as the data on light intensity. The light was measured photometrically. This work confirmed his earlier results on the very great importance of light in determining the time that birds quit singing in the evening. However, he found that the evening song began in much stronger light than the morning song but it also ended when more light existed than at the beginning of the morning song.

Schwan, according to Walker (1928) used more accurate methods of measuring light but secured quite similar results in the case of the awakening song.

Dorno (1924) repeated a part of Haecker’s work and came to the conclusion that light was significant, but that the variation in the time between the beginning of the morning song and sunrise was due to differences in dispersal of light rays rather than the actual intensity of the light present. He is of the opinion that this dispersal is due to the latitude of the region and season of the year.

Walker (1928) in Tennessee made a study of the relation of light intensity to the awakening song of birds. The study was at first subjective, in that the weather was estimated as clear, cloudy, foggy, or smoky and later objective in that the Macbeth illuminometer was used for measuring light intensity in foot-candles.

Her findings seem to indicate that the length of time before sunrise at which a bird begins singing is probably dependent on the total amount of light present when measured in foot-candles but to a very great extent on other weather factors also.

Knowledge of the above results caused light intensity to be selected for this investigation. It seemed best not only to study one single factor, such as light, at a time, but to limit the first studies to a single species or, at most, to a very few species in order to simplify analysis. A permanent resident, the Mockingbird, and a summer resident, the Robin, were selected. Thus the problem involved the rela-
tion between the time of ending of the evening song of the Robin and of the Mockingbird, and light intensity.

Observations were made beginning February 1, 1929, and extending through May 7, 1929; a total of 53 evenings being spent in this way, distributed rather uniformly over each month as follows: 12 in February, 16 in March, 19 in April, and 6 in May.

![Graph](https://via.placeholder.com/150)

Fig. 3. A Comparison of the Time of Ending of the Evening Song of the Robin with Sunset and with Light Intensity. The numbered curves represent: 1, actual time of the ending of the evening song; 2, smoothed time of ending of the evening song; 3, time of sunset; 4, smoothed light intensity at the time of ending of the evening song; 5, smoothed light intensity at sunset; 6, actual light intensity at the time of ending of the evening song. It should be noted that curve 4 (smoothed light intensity at the time of ending of the evening song) is given on a greatly enlarged scale as regards the ordinate axis in order to emphasize its form. For this curve, each unit of the ordinate equals .05 foot candles.

The type of data gathered may first be displayed in graphs so as to show the seasonal changes in bird song activity and in light as compared to sunset. Figure 3 is for the Robin. It is noticed at once, in
spite of the saw-toothed curve of the song, that, in general, the time of ending of the Robin's song parallels sunset time. The light intensity at the time of the song ending varied from .1 to 10.0 foot-candles with the exception of one high day of 101.6 foot-candles. This exceptional day, February 13, 1929, was the second day of the year for the Robins to sing their evening song at this spot and was separated from the first day that they sang by two bright days when they did not sing. It is regarded as very significant that on 47 out of 48 singing days, the Robin stopped its evening song within a range of light intensity of 10 foot-candles. Median light intensity for all days was 6.2 foot-candles at the time of the song ending.

The variability of the evening song ending appears, as respects light intensity, to be related in part to other physiological activities of the Robin, being most variable during the period of the establishment of territory, and during the time of feeding the young, in which the male helps.

The light intensity at sunset was exceedingly variable, ranging from 2 to 115 foot-candles.

The graph (Fig. 4) of the time of ending of the Mockingbird's evening song, like that of the Robin, parallels, in a general way, the time of sunset. Light intensity at the time of ending of the Mockingbird's song is quite variable, ranging from .1 to 175.8 foot-candles, with a median of 19.35.

In data like this, it is desirable to get the average change as well as the actual change. This may be done by smoothing the curve by use of a formula selected by trial and error. The method of smoothing used here may be illustrated by Figure 5 where both the smoothed and unsmoothed curves for light intensity at sunset on the days the Robin sang are given. The unsmoothed values are given above the curves under the letters: a, b, c, d, . . . t, u, v. At the top of the figure is given the general formula used for smoothing and just below it the method of using the formula for determining smoothed values for February 8, 13, 11, 15, and 18, respectively. The letters as used in the formula stand for the light intensity values indicated above the graphs.

The smoothed curve of time of ending of the Robin's song (Fig. 3) diverges more and more from the sunset curve until April 6. This means that the Robin sings later and later after sunset on the average until April 6. Then the curves converge until April 13 when they proceed approximately parallel to the end of the period of observation. Apparently this period of convergence corresponds closely with the
period of the feeding of the newly hatched young. It indicates clearly that any study of this kind must consider the physiological activities associated with nesting.

The smoothed light intensity at the time of the ending of the Robin's song (Fig. 3) was such that the Robin stopped singing, when

![Graph](image)

**Fig. 4.** A Comparison of the Time of Ending of the Evening Song of the Mockingbird with Sunset and with Light Intensity. The numbered curves represent: 1, actual time of ending of the evening song; 2, smoothed time of ending of the evening song; 3, time of sunset; 4, smoothed light intensity at the time of ending of the evening song; 5, actual light intensity at the time of ending of the evening song.

there was less and less light on successive days, until April 1, when it stopped singing with a greater and greater light intensity on successive evenings until April 20. From April 20 to May 7, the Robin stopped his evening song with the light intensity getting less and less. Thus, as far as these data go, there appears a periodic rhythm in this song activity as related to light. This rhythm seems to the authors to be related to the rhythm of physiological activities associated with the nesting cycle.
It should be noted that the actual light intensity at sunset is exceedingly variable, ranging from 2 to 115 foot-candles with a median of 43.5.

The smoothed curve of the time of ending of the Mockingbird's song (Fig. 4) shows similar rhythms to that of the Robin's song with the major depression occurring about April 15. In addition, there are two minor depressions about March 5 and 28. All of these depressions are like the single large depression in the case of the Robin in that the Mockingbird quits singing when the light intensity is higher than usual. It is thought that these rhythms in reaction to light are associated with the nesting cycle. However these rhythms might be associated with unmeasured environmental factors other than light since Shaver and Gladys Walker (1930) have found that the time of ending of the evening song of the Mockingbird is significantly related to temperature.

The data may be further analyzed by the product-moment correlation method of Pearson. This method of analysis gives a single number—the coefficient of correlation—to indicate the correlation between two curves. When the coefficient of correlation is 1.00, there is perfect positive correlation between the two curves; when this coefficient equals 0, there is no correlation; and when it is —1.0 it indicates perfect negative correlation. The method used in calculating this coefficient has been given in detail elsewhere (Shaver and Gladys Walker, 1930) and need not be repeated here.

Table I shows quite clearly the very high positive correlations existing between the time of sunset and the time of ending of the evening song of the Robin and the Mockingbird. This indicates, as has been previously pointed out, that the causative factors of these song endings are related to sunset. Light appears to be the most important of these.

The correlations between the time of ending of both the Robin’s and Mockingbird’s evening song and light intensity are negative. This apparently means that when these birds stop singing later in the evening than usual, they stop when the light intensity is less than when they stop singing earlier in the evening.

There are several elements which tend to increase the negative values of some of the coefficients. In the second correlation in the table, the increase in the length of the day as spring comes on, increases numerically the values for the time for ending of the evening song. Evening begins no longer at 5:21 but at 6:38. The error due to increase in length of day has been eliminated in correlations 3 by hav-
ing all time calculated from sunset (central standard time, Weather Bureau sunset data). It should be noted in the table that this gives lower coefficients of correlation, as was expected.

Correlations number 3, 5, and 6 are influenced by the increase in the length of twilight after sunset as spring advances because this increases the length of time after sunset to a light of a definite intensity.

TABLE I

<table>
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<th>Correlation Coefficients</th>
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<td>The Mock'bird</td>
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<td>1</td>
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<td>Time of sunset............</td>
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<td></td>
<td>Time of ending of the evening song</td>
<td>Light intensity at the time of ending of the evening song .........</td>
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<tr>
<td>2</td>
<td>Deviation of the time of ending of the evening song from sunset time</td>
<td>Light intensity at the time of ending of the evening song ........</td>
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<tr>
<td>3</td>
<td>Deviation of the time of ending of the evening song from sunset time</td>
<td>Deviation of light intensity at the time of ending of the evening song from its smoothed value</td>
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<td>4</td>
<td>Deviation of the time of ending of the evening song from its smoothed value</td>
<td>Deviation of light intensity at sunset from its smoothed value</td>
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<tr>
<td>5</td>
<td>Deviation of the time of ending of the evening song from sunset time</td>
<td>Smoothed light intensity at the time of ending of the evening song</td>
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</table>

Finally, as brought out earlier in this paper, the physiological state of the bird, as respects its nesting cycle, apparently influences its song reaction to light.

When all of these things were taken into account, the correlations between the Robin’s song ending and light intensity were regarded as expressing the real conditions very unsatisfactorily. In the field work when the days were bright and clear, our notes said that both the Robin and Mockingbird sang later than on cloudy days. The coefficients of correlation already given on light do not indicate this relation.

For a long time the reason for this failure was not apparent. Then it finally came to us that in calculating our coefficients of correlation, no measure of whether the day was cloudy or sunny had been used. We had merely gotten a numerical expression of the relation
between the time of song ending and the light intensity at that time. Just as should have been expected, it was found that when the birds sang later after sunset, they stopped singing at a lower light intensity than when they stopped singing earlier.

Now the light intensity at sunset would give a numerical measure of whether the day was sunny or cloudy and would in addition link light intensity with sunset just as has been done with the time of the song ending. Accordingly, coefficients of correlation between light intensity at sunset and the length of time after sunset to the song ending of both the Robin and Mockingbird were calculated. These coefficients were \(0.54 \pm 0.07\) for the Robin and \(0.58 \pm 0.07\) for the Mockingbird. These coefficients are high enough to be regarded as significant. They indicate that light intensity is a very important factor in causing the ending of the evening song. Still they are low enough to show that light is not the only factor affecting the time of ending of the evening song of these birds.

By correlating smoothed light intensity at sunset and smoothed time of song ending after sunset, similarity of trends can be discovered. The coefficients of correlation for these smoothed curves are \(0.91 \pm 0.02\) for the Robin and \(0.81 \pm 0.04\) for the Mockingbird. These coefficients are high and to the authors indicate that light is the main factor causing the ending of the evening song. Other factors may cause the song to end a few minutes earlier than usual or a few minutes later, but light intensity appears the most significant factor.

**Conclusions**

1. The time of ending of the evening song of the Robin and of the Mockingbird is highly correlated with sunset time, the coefficients of correlation being \(0.92 \pm 0.02\) for the Robin and \(0.94 \pm 0.01\) for the Mockingbird.

2. On 47 out of 48 days when the Robin sang the evening song, it finished its song within a light range from .1 to 10 foot-candles. This is regarded as a very significant light relation.

3. The light intensity at the time of ending of the evening song of the Mockingbird was quite variable ranging from .1 to 175.8 foot-candles with a mean of 19.3488 and a standard deviation of 36.2167. This gives no indication of the absolute light intensity being significant in the case of the Mockingbird.

4. There is some evidence, in the case of both of these birds, of a variation in the song ending with respect to light intensity according to the physiological relation of the bird as respects the nesting cycle.
5. There is a general tendency for both the Robin and the Mockingbird to stop their evening song at a low light intensity when they sing late after sunset. This is especially marked with the Mockingbird as indicated by the high negative correlations (No. 2, 3, and 4 in Table I).

6. Both the Robin and the Mockingbird sing later after sunset on bright days than on cloudy ones. That this is not the whole story is indicated by the smallness of the coefficients of correlation when the time of song ending from sunset is compared with light intensity at sunset. These coefficients were .54±.08 for the Robin and .58±.07 for the Mockingbird.

7. Trends, as indicated by correlating smoothed curves, show that light intensity at sunset is very significant in relation to the time after

Fig. 5. The Method of Smoothing Curves.
sunset that the Robin and the Mockingbird sing, the coefficients being \(0.91\pm0.02\) and \(0.81\pm0.04\), respectively. It seems highly probable that light intensity is the main cause of the song ending but that other factors cause it to vary somewhat, causing the song to end earlier than usual on some days and later on others.

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George Peabody College for Teachers.

Nashville, Tennessee.

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**THE SOARING OF RAPTORIAL BIRDS**

**BY R. H. PALMER**

Perhaps the most spectacular of the many accomplishments of birds is that strange modification of their flight called soaring. An old red-tail, floating high in the air, moving in more or less irregular circles, banking in the sharp turns or against sudden gusts until he is a mere speck against the sky, “oozing around,” as Riley says, and with scarcely a beat of the wing, does not fail to register on the mind of even a casual observer. A buzzard appearing as a mere dot in the distance and slowly moving towards a decaying carcass, bent on the

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*This paper was transmitted to the present Editor in 1925 by his predecessor; the delay in publication has been due to the misplacement of the figures.—Editor.
twofold mission of banqueteer and scavenger with the same ease is an object of wonderment even to the more thoughtful observer. A Sparrow Hawk, poised immovably in the air, scanning the field below for a mousy diet seems to be a living, concrete instance of one valid exception to the law of gravitation. How do they do it? is a question often asked and many more times wondered.

It is the purpose of this paper to record a few observations and to suggest what is hoped may be a possible explanation, or at least to throw some light on this common though none the less rather curious and interesting phenomenon. It is not the intention to have included in any deductions or inferences any but the raptorial birds as this is the only order on which any observations, more or less extended, have been made.

I have very often noted that hawks and buzzards seemed more energetic, and used their wings in the commonly accepted manner, in the early morning or in cloudy weather or when there was little or no wind; stated conversely, they resorted to soaring only when the sun was shining or when the wind was blowing; and that the Sparrow Hawk never hovered without beating its wings except in a wind. I have further noticed that they are much more prone to soaring in hilly or mountainous country than where the topography is uniform, as in the broad Mississippi Valley. The connection, I take it, is this: the physical phenomena I have mentioned cause currents in the air that these birds take advantage of. Let me explain. The sun shining on the earth heats the ground which in turn heats the overlying air. This expands and rises or sets up convection currents. The large many domed cloud banks with the horizontal bases resembling aggregates of giant milk-weed down floating in the air, cumulus clouds, are formed by just these currents so the meteorologists say. If one takes the time to watch the evolving round masses that are continually unfolding or blossoming out in a cumulus cloud, he is seeing the process actually in operation. What is taking place is this: the currents of warm air rise and are cooled to the point where the water vapor condenses and a cloud results. Above this they are visible and the unfolding is seen. Obviously these can be formed only while the sun is shining. Now a hawk or buzzard can by means of his rudder-like tail poise over the most advantageous points of this potential cloud and by circling keep over these points. At the same time, by circling, he moves up a spiral incline. If he remained over one fixed point, it would require a rather strong, though not unusual, current to overcome the
pull of gravity and carry him upward or to prevent his falling. What really takes place, as will be explained later, is that he is gliding down an incline. It is possible that the spiral motion of the rising air may in some manner bear a casual relation to the circling direction taken by the bird.

The wind and topography factors need a word of explanation. Air moving against a rise of land follows along the topography and up the hill or mountain side causing by its upward movement a bulge or arch in the layers of air above the crest of the hill or ridge. This roughly parallels the ground below. It is on this bulge that the Sparrow Hawk is able to poise with absolutely no movement of his wings, balancing himself by steady, sure movements of his broad fan-like tail. Where there is a ridge as along a range of hills or along a well defined bank bordering the floodplain of a fair sized river it is no uncommon sight to see red-tails and buzzards soaring along, apparently for the pure sport afforded, or to see a Sparrow Hawk hovering.

A few examples may serve to make my point clear. Several years ago in southeastern Idaho I was up in the hills and observed an eagle floating in broad irregular circles a thousand feet or so in the air. It was a bright sunny day and he was taking full advantage of it all. Apparently he had nothing else particularly in view for he was in sight something better than an hour. Idaho weather is like the time-tables of the railroad—subject to change without notice. Several small and then larger and larger clouds rapidly hove in sight so that much less than a half of an hour the sun appeared between the cloud masses very much less than half of the time. Along with this sudden change the eagle began to manipulate his wings and shortly flew off (not by soaring) and disappeared.

Another day I was walking along the crest of a rather steep ridge broadside of which a thirty-mile, steady wind was blowing. A flock of nine buzzards were sailing up and down along the crest a hundred feet or so in the air "without an apparent movement of their wings," as I wrote in my notebook: and further, "a little Sparrow Hawk was

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*The efficacy of these rising currents to carry a bird upward might be questioned. It needs but to be called to mind that hail is caused by drops of water being carried upward where they receive a coating of snow. Hailstones often bear evidence of having been carried upward and dropped at least three successive times. Personal communications from aviators record the fact that when these currents are encountered the planes are shot upward by their force. In a recent parachute drop from an airplane at an elevation of 6,000 feet in Seattle, it was observed that the parachute was carried upward several hundred feet by these rising currents.
hunting in his usual way hovering over likely places. Several times he remained absolutely stationary in the air facing the wind without a movement of his wings, his little tail moving up and down in a steadying motion.” On another day in the same locality I saw a hawk remain absolutely stationary in the air except for the slight steadying motion of his tail for forty seconds by actual measurement.

In the summer of 1920 I had a fine opportunity to observe the flying and soaring of buzzards. For a month or so I was camped in a small canon in the Simi Hills down in southern California. A half mile or so down the canon was a large hog ranch into which cholera was making costly inroads. This, of course, called in Nature’s scavengers in great numbers. It was no uncommon sight to see 150 of these spectral fellows variously distributed in the air, on posts, in trees, or gorging themselves on this filthy diet. Light morning fogs were the usual thing and as long as these were on these birds never soared without losing elevation. However, when there was a wind they would soar around in true buzzard form. As soon as the sun appeared over the hills and dispelled the fog the same change in their system of aerial navigation followed.

The question may arise as to how soaring birds progress through the air. The answer is this. They simply coast down hill with reference to the medium they are in and this medium rising keeps them at the same elevation above the earth. For example, if a cardboard is allowed to fall its course is not straight down but rather zigzag due to the resistance of the air. If this zigzag course is prevented by proper balancing so that one end is somewhat lower than the other it will sail down an incline. Now if there is an upward current of air sufficiently strong to keep the cardboard at a given elevation it will move forward in a horizontal line. The accompanying figures illustrate the principles of physics involved. Let W-P (Fig. 1) represent a cross-section of the cardboard in question and x the angle it makes with the horizontal or, in the case of the soaring of the bird, the wing pitch. a-g the resistance of the air or its upward push and a-b the force of gravity. Now if there were no pitch to the cardboard or wings, i. e., if W-P were horizontal the resistance of the air would act in a direction exactly opposite to the pull of gravity and the cardboard or bird would fall in a given time a distance that would be the resultant of these two forces, say to the point g'. But the pitch of the cardboard or the wing pitch of the bird (and this is exactly analogous of the trim of a sail) alters these simple conditions.
If wings have no pitch the bird falls from a to g' in given time.
If wings have pitch (W-P) the bird sails in direction of arrow to a'.

If upward force of wind (a-g) is equal to pull of gravity (a-b), the bird sails horizontally in direction of arrow to a'.

Diagramatic view showing course of Albatross over a wave. Arrows (c) represent direction of wind. a-b is the vertical distance the bird is lifted by the air currents.

Fig. 6. Diagrams for the article on soaring flight.
Soaring of Raptorial Birds

The wing pitch resolves the resistance of the air into two components: one acting parallel to the wing (a-w) and hence having no effect and one acting at right angles to the surface (a-d). We now have the two forces acting on the bird; a-d due to air resistance, and a-b the gravity pull. The resultant a-a' leaves at bird at a''.

In the third case, illustrated in Fig. 2, there is an upward current of air a-g acting against the bird equal to the force of gravity a-b (and in the case of soaring the wing pitch is exactly adjusted to this end). We now have the two components a-d and a-b with the resultant a-a'', i. e., the resultant is the only force effective to move the bird with the result that it moves in a horizontal direction to the position a''.

A moment's reflection will show that any increase or decrease in the force of the upward current can be met by changing the pitch of the wing so that the only effect, within ordinary limits, will be an increase or a decrease in the horizontal velocity of the bird.

As stated, this discussion refers to raptores only. However, I cannot refrain from mentioning some observations made on the Black-footed Albatross (Diomedea nigripes), or the goony, as he is known to the sailors. In September, 1920, I had an opportunity to keep several of these birds under observation off and on for several days. These long, narrow-winged fellows are past masters in the art of soaring. They usually keep within less than a foot of the water and there is seldom a movement except to veer sideways or up or down to avoid a passing wave or swell. They have no difficulty whatever in following a steamer by resorting to soaring only. So close do they hug the water that they occasionally cut its surface with the tips of their pinions. However, it was noticeable that they rose a considerable distance in the air as the crest of a wave passed under them, i. e., the wind, moving faster than the wave, moved upward as it passed up to and over the crest; and as the bird appeared over the crest it likewise was carried upward a few inches. This allowed him enough elevation to supply velocity sufficient, while going down into the trough to carry him to the crest of the succeeding wave. The slight acceleration to his rising course a-b (Fig. 3) was very often noticeable. In other words, the goony, on a very small scale, was doing exactly what the nine buzzards were doing on a much larger scale, with the difference that the crest was continually changing. This latter, however, introduces no new factors. I regret to add that during the entire time the albatrosses were under observation there was a high wind and a heavy sea; so there was no opportunity to secure any data on their flying when there was no possible assistance from this source.
Gulls following a boat soar in certain definite areas with respect to the boat. It seems probable that some of the air eddies, that are caused by the boat's motion through the air and the accompanying wind together with the heated air that escapes from the engine room and funnels and streams backward and upward, may result in small areas where there are upward currents that are sufficiently strong and persistent to support birds for a longer or shorter distance.

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QUARTERING FLIGHT IN MIGRATION

BY E. C. HOFFMAN

By quartering flight is meant flight not directly against the wind, but rather at a substantial angle with the wind, perhaps fifteen to forty degrees. That such flight exists in nature is shown by the observations of Lynds Jones (1) on Hummingbirds flying from Pelee Island to Middle Bass Island in Lake Erie. It is also shown by William Beebes' notes on the Albatross (2). A. H. Clark (3) mentions the direction of the migration of the Golden Plover as being not in a direct line to the destination but across prevailing southwesterly winds along the northern part of their journey. However this last observation may be due to the fact that many birds tend to begin their migration during a period of high barometer (4). The direction of the winds in such an area of high air pressure being clockwise the migration routes in the area covered by the average northeasterly moving "high" would tend toward the eastward in the fall and toward the westward in the spring (5), (6). One of the most complete accounts of the flight of flying fishes is that by Holland (7) who states that the flight is at an angle with the wind.

Somewhat analogous is the tacking of a sailboat advancing against the wind by using the force of the same wind acting against the resistance of the boat to the water. See Headley (10), page 8. Perhaps in the case of the bird the resistance is furnished by pulsating air currents. Pulsating air currents are discussed by Wolfgang Klemperer (8), who in a letter to the writer dated December 20, 1929, mentions the Knoller-Betz theory of pulsating air currents. (9), (11), (12). Variations in wind velocity are also discussed by Otto Lilienthal (13); by Huffaker (14); by Hankin (15) who mentions "a form of air motion that blows a feather to leeward at one speed and blows the
complete bird to windward at another and greater speed"; by Maxim (16); by Dreisch (17); and by Langley (18).

It appears that birds wishing to take advantage of quartering flight fly at low elevations, particularly over the water, where air pulsations are caused by wave motion of the water. As shown by airplane experience, the air becomes quieter with increasing elevation. Over the cloud level few if any "bumps" are encountered and the air is usually quiet except when air strata moving in different directions meet, though the velocity relative to the earth increases with altitude. Probably therefore quartering flight is not common at the higher elevations and birds as well as airplanes travel in the upper air currents for the advantage of the increased velocity resulting from a favorable tail wind.

Wing areas apparently determine the character of flight, the Hummingbird depending mostly on wing motion while the Albatross, with its great wing spread, finds soaring flight most efficient. Soaring flight caused by air pulsations appears to be distinct from soaring flight resulting from rising air currents. Soaring flight in a rising air current is circular, except where the rising current is caused by a cliff or other obstruction. In fact a circular soaring flight may be taken as an indication of an ascending air current.
One of the unexplained features in the study of marked birds has been the small percentage of recaptures or returns in subsequent years of the smaller Canadian birds banded during migration at northern stations (19), (20), (21), (28). Apparently these birds, though they are reported as returning in subsequent years to their winter homes—for instance, White-throated Sparrows (Zonotrichia albicollis) at Thomasville, Georgia—must usually arrive in the south by different routes each year (22), (23). That a quartering flight offers a favorable air movement condition is noted by Wetmore (22, page 55). In a letter to the writer dated October 28, 1927, Lynds Jones says, "I have noticed quartering flight a good many times where there was a stream of flying birds, such as the migration flights of Crows, Bluebirds, Killdeers, blackbirds, ducks, and particularly of Lapland Longspurs in central Iowa, when I lived at Grinnell prior to 1890." If this quartering flight is customary it is evident that the only chance of recapturing banded birds at the same place will come with similar winds in following years.

If the flight of the Lapland Longspur (Calcarius lapponicus) is quartering, then a flock of these birds approaching a winter storm would tend to turn to the right. As shown on the chart (Fig. 7) the constantly shifting winds, moving counter-clockwise, would tend to keep the flock in the storm area.

That disasters have occurred to large flocks of Lapland Longspurs is shown by the accounts of Roberts (24), who estimated the mortality on part of the area at 750,000; of Saunders (25); and of Swenk (26).

Storms of the winter type, according to Ward (27) move eastward with increasing intensity in the regions, the north central states, where these disasters to bird life have been observed. Under these conditions a heavy fall of wet, clinging snow would force larger birds to the ground and completely destroy most of the smaller birds.

The writer suggests experiments with homing pigeons and also with gliding and sailing airplanes as a means of increasing our knowledge of pulsating air currents and quartering flight. Such experiments may also increase the efficiency of the planes.

References

*Special acknowledgment is made to S. Prentiss Baldwin for data on White-throated Sparrows, and to Rev. John A. Brady for data covering the period from 1924 to 1926. No recaptures in subsequent years are shown by these records.

Lakewood, Ohio.
CONTROL OF INSECTS BY BIRDS

BY W. L. MCATEE

While the article by C. N. Ainslie on "The Economic Importance of Birds as Insect Predators" in the September, 1930, issue of the Wilson Bulletin is written in the best of spirit, I believe that its effect on the general reader will be an unwarranted one. The impression probably will be that birds are of little, parasites of great, value in controlling insect pests, while the fact is that if we consider the degree of control necessary to commercial success of a crop it is rarely attained as a result of the work of natural enemies of whatever kind. The latter owe their existence to the fact that there is a proportion of the individuals of their prey that can be consumed without any permanent decrease in the numbers of these species as a whole. It is this surplus that is the perennial support of natural enemies and it is seldom that they consume more. In other words, they live upon the interest and leave the capital intact.

Natural enemies, however, are only a part of the entire complex of natural control, and leading entomological authorities seem to agree that they are not a very large part. B. P. Uvarov\(^1\) has pointed out that recent researches "throw some doubt on the commonly accepted idea that the chief controlling factor is the parasites, since a number of cases have become known in which the factors normally keeping an insect species down are alwost entirely of meteorological order. This has been admitted for the cotton boll weevil in America (Hunter and Pierce, 1912), for the corn-borer in Europe (Thompson and Parker, 1923), for the almond sawfly in Palestine (Bodenheimer, 1928), for the cotton seed bug in Egypt (Kirkpatrick, 1923), for plague fleas in India (Hirst, Rogers), for vine-moths in Europe (Stellwaag, 1925), and for some other notorious pests."

Again F. S. Bodenheimer\(^2\) in answering the question "Welche Faktoren regulieren die Individuenzahl einer Insektenart in der Natur?" states that parasites, predators, and scarcity of food, are rarely or only secondarily of regulatory significance, but that climatic factors are the real controlling influences.

The late F. H. Chittenden\(^3\) in discussing insects and the weather further states, "It also appears to me what has been observed by Mr. Marlatt in the case of scale insects . . . is true in general, viz., that

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\(^1\)Conference of British Empire Meteorologists, 1929, Agricultural Section, \n\(^2\)Biol., Zentralbl., 48, 1928, pp. 714-739.
favorable or unfavorable climatic conditions are of greater importance in determining the abundance or scarcity of insects as a whole than are other natural checks such as parasitic and other enemies, or even fungous or bacterial diseases.”

There is hardly anything more characteristic of publications on economic entomology than the remark, after detailing the activities of predators, parasites, and diseases, that none of these can be depended upon for controlling the pests. Mr. Ainslie’s remark therefore “that useful as birds are in their way, they can seldom be depended upon unaided to rid us of our insect enemies” is just as true in general of parasitic insects and other natural enemies as it is of birds. What needs to be kept in mind at all times is that in assigning economic values to natural enemies, it is best to speak in terms of tendencies rather than of achievements. Good economic tendencies are as satisfactory as any grounds for advocating the protection of natural enemies.

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MIGRATION OF CANADA GEESE FROM THE JACK MINER SANCTUARY AND BANDING OPERATIONS
BY MANLY F. MINER

Much ink has been used by various writers and authors describing the origin and history of the Jack Miner Bird Sanctuary, but to me the big achievement there has been scarcely mentioned, namely, the catching and tagging of the Canada Goose to study its route of migration in both spring and fall, and to find where it nests and raises its young during the summer months.

It was in 1902 and 1903 that Jack Miner conceived the idea of establishing a bird sanctuary, the first of its kind in Canada, if not on the continent. But not until 1904 was work on the sanctuary actually started, that is, excavations made for ponds, several wing-tipped live decoy geese placed on same, and corn spread plentifully around the banks. Ducks and geese, in a short time, found this to be a place of safety. Both the conservationists and shooters were back of the Jack Miner scheme, because the Sanctuary, taking nothing from the shooters, constantly builds up the hunters’ chances a mile away, the bird haven attracting many birds to the community. At the same time the birds became wise enough, when shot at from the property where they were unprotected, to fly back to their safety zone and haven of rest.
Eventually the birds commenced to congregate on the Sanctuary in large numbers. Jack Miner had no desire to shoot, but was anxious to study and find out where these feathered creatures spent each season of the year. On August 5, 1909, he caught a duck and wrapped around its leg a piece of aluminum, on which was stamped his post office address. This was the first time Jack Miner had done such a thing and, incidentally, this record is probably the first of the kind on the continent. Thus not only is Jack Miner's Sanctuary the first of its kind in North America, but he is the pioneer in tagging ducks.

A few months later—January 14, 1910—the duck which had the honor of bearing the first tag was killed by W. E. Bray of Anderson, S. C.

Naturally, great enthusiasm was caused and the problem then confronting the owner of the Sanctuary was how to build nets and other contrivances to catch the ducks without injuring them, in order that they might be tagged. He had no books or plans to which he could refer, for there was nothing of the kind in existence. So, after attracting the birds to the Sanctuary, it fell to the lot of Jack Miner to invent a contrivance for catching the ducks. This he accomplished after many months of work, the result being that today there are hundreds and hundreds of ducks flying to and fro across the continent wearing his tags. Nearly every mail brings reports to the Sanctuary from hunters of North America of the killing of tagged birds.

By 1914 Jack Miner had learned where ducks, Mourning Doves, Robins, etc., spend each season of the year. His next ambition was to catch and tag Canada Geese, the wildest of wild birds and practically the largest migratory waterfowl on the continent. He soon found that catching Canada Geese was a very different undertaking compared with catching ducks. Although the geese, at this time, were coming to his Sanctuary by the hundreds for food and protection—where neither rich nor poor could enter with a gun; but to catch one of these birds for tagging purposes was another thing. They would not go near the network he had arranged for catching ducks. So, after a year's constant study, he contrived a method of having two ponds with a canal connecting them covered with network and a trapdoor at both ends. It was in 1915 that he caught his first wild Canada Goose and placed an aluminum tag on its leg, giving the post office address of the owner of the Sanctuary.

Jack Miner is by no means a religious fanatic, but he believes in the simple teachings of Christ and, being anxious to make his tagging system complete and fascinating, a short verse of scripture, such as
Fig. 8. Canada Geese on the Jack Miner Sanctuary.

Fig. 9. Canada Geese rising from the Jack Miner Sanctuary.
“Have faith in God,” “God is able,” and so forth, is stamped on one side of his tag. In this way every person who gets one of his tagged birds gets a verse of scripture, which has more than doubled the interest of his tagging system.

In the spring of 1915 and just before the geese migrated for parts unknown in the North, he caught and tagged his first Canada Goose, and liberated it again with the big flock from which it had been taken. Interest was aroused in the community as to who would kill it, and where. No one had ever caught one before for tagging purposes, no one knew where they nested. All that was known was that they went north and the settler in the most northern point in Canada always reported that “they went still farther north.”

However, weeks and months rolled by and, to the surprise of everyone, early in October of the same year, Jack Miner received a letter from the Hudson Bay Company at Moose Factory, dated August 19, 1915, containing this tag. The goose had been killed by an Indian in unsurveyed territory in the Hudson Bay District.

This, naturally, interested the whole country, and, with real enthusiasm, Jack Miner began to work on the improvement of his goose trap in order to catch geese by the hundreds. The next year it proved to be a decided success. Many more geese were tagged and, later on in the season, word was received from different points along the east side of Hudson Bay and James Bay, and as far as Baffin Land of tagged geese being shot.

On one occasion the Reverend W. G. Walton, an Anglican missionary, who had spent between twenty and thirty years among the Indians and Eskimos and had never been out to civilization, came by canoe from Hudson Bay to Cochrane. Taking the train there, he in due course arrived at Kingsville and the Sanctuary. With him he brought a pocketful of tags, each of which bore a passage of scripture and Jack Miner’s post office address. He had collected these from the Indians and Eskimos all the way from the factory, at James Bay, along the east coast of Hudson Bay and as far north as Baffin Land. The natives had brought them to him for interpretation of the verse of scripture.

Through these tags, this devoted Christian missionary, together with the Hudson Bay fur dealers and the agents of Revillion Fur Company, who have also cooperated to a great extent in collecting them from the natives, a lot of valuable information as to why these birds nest around the shores and islands of Hudson Bay and Baffin Land, instead of along the rivers and streams, has been revealed to the world.
Fig. 10. Wild Swans and other fowl on the Jack Miner Sanctuary.

Fig. 11. Jack Miner and his home.
The geese arrive in that vicinity around the latter part of April and the first part of May. The rivers and all fresh water are all frozen over at that season of the year, but the Hudson Bay is opened up by the incoming ocean current and the geese prefer to nest where there is open water.

The tagging system has also revealed where they spend their winters. Each tag bears a date and it has been proven that very few geese which visit the Sanctuary in the fall visit the following spring, as practically all geese bearing fall tags are killed in the middle states, along the east of the Mississippi River and towards the Gulf of Mexico, while geese which are tagged in the spring winter along the Atlantic coast, mostly around Carrituck Sound. The geese which spend the winter along the Atlantic seaboard nest in the extreme northerly portion of Hudson Bay and Baffin Land. When the fall comes and it turns cold, instead of migrating inland, they follow the ocean around by the way of Labrador, Newfoundland, and the New England coast, southward to Carrituck Sound. But when March and early April come, it is too warm in North Carolina for them. The Labrador coast and their summer quarters, however, are still frozen over with zero temperatures. The geese, therefore, migrate north from the southern states to the Great Lakes region, where they congregate at this Sanctuary during the months of March and April.

There have been tagged nearly 6,000 geese since 1915 and year after year those that are not killed return to this protected property, wearing their bright aluminum bands around their legs. This fall 100 geese out of 500 which stood on one of our ponds wore tags. The pond is only one acre in size and as I look at the map of North America in my old school geography, there are no words or anything small enough to represent one acre on it. Even the dot of a pencil would represent several square miles. Yet the most remarkable thing about the migration of these birds is that year after year, as regularly as the sun rises, those that are not killed find their way back to the Jack Miner Sanctuary at Kingsville, Ontario, Canada.

Kingsville, Ontario.
THE RIDGWAY MEMORIAL COMPLETED

BY HARRY C. OBERHOLSER

Readers of the Wilson Bulletin will be pleased to learn that the fund to maintain Bird Haven as a memorial to Mr. Robert Ridgway, the ornithologist, has at last been provided. Bird Haven, it will be recalled, is a tract of some eighteen acres, mostly second growth forest, situated near Olney, Illinois. It had been developed by Mr. Ridgway over a period of years, and its association with him and the possibilities there for the preservation of birds and plants made it an admirable kind of memorial to the memory of this great naturalist. On the tract there are more than fifty species of native trees in addition to many shrubs and flowers. It was offered by Mr. Ridgway as a permanent sanctuary if a sufficient fund could be raised for its maintenance.

At the meeting of the American Ornithologists' Union in New York in 1925, the project of a memorial to Mr. Ridgway was introduced, and a committee authorized for the purpose of raising the fund to preserve Bird Haven for this purpose. The Wilson Ornithological Club and the Cooper Ornithological Club were each invited later to appoint a representative to act with the representative from the American Ornithologists' Union as a national committee for the purpose of raising the memorial fund. By the appointment of Dr. Harry C. Oberholser, of Washington, D. C., for the American Ornithologists' Union, Mr. Percival B. Coffin, of Chicago, for the Wilson Ornithological Club, and Mr. Harry Harris, of Eagle Rock, California, for the Cooper Ornithological Club, this committee was organized. Subsequently, Mrs. Gertrude Cox, of Chicago, was added as a special representative for Illinois. The further organization for the purpose of the campaign for raising the fund consisted of committees in practically all of the States of the Union and in Canada. The Ridgway Bird Haven Association was formed and incorporated under the laws of Illinois in 1927 for the purpose of administering the fund and caring for Bird Haven when provision should be made for its maintenance.

Through efforts of these committees approximately $27,000 was raised, and in the summer of 1929 Mrs. Frances K. Hutchinson, of Chicago, offered to assume the responsibility of increasing the fund to $50,000 and thus provide for the future of Bird Haven. Mrs. Hutchinson also purchased and added to Bird Haven the adjoining
farm of about 100 acres, which will greatly improve the area as a sanctuary.

A new organization called the Bird Haven Memorial Association was incorporated in 1929 to take the place of the original Ridgway Bird Haven Association, and this new organization will assume responsibility for the property and all the funds raised for its maintenance.

Mention should here be made of all those who have aided in the establishment of the Ridgway Memorial. We regret that it is not possible here to give the names of all of these, but the chairman of the national committee wishes to express his sincere appreciation of all this cordial cooperation, without which the success of the movement would have been impossible. A list of the special committees and of the chairmen of the state committees is given below:

GENERAL COMMITTEES AND STATE CHAIRMEN OF THE RIDGWAY MEMORIAL

NATIONAL COMMITTEE. Dr. Harry C. Oberholser, Chairman; Mr. Harry Harris, Mr. Percival Brooks Coffin, Mrs. Gertrude Cox.

ILLINOIS SPECIAL COMMITTEE. Mr. Percival Brooks Coffin, Chairman; Mrs. Gertrude Cox, Mr. O. M. Schantz, Mrs. A. B. Crosby.

NEW ENGLAND SPECIAL COMMITTEE. Mr. Charles F. Batchelder, Chairman; Mr. Laurence B. Fletcher, Mr. Charles B. Floyd, Mr. Lovell Thompson.

ALABAMA, Prof. J. M. Robinson. ARIZONA, Dr. W. P. Taylor. ARKANSAS, Mrs. W. T. Kelton. CALIFORNIA, Mr. Harry Harris. CANADA, Prof. William Rowan. COLORADO, Mr. E. R. Warren. CONNECTICUT, Mrs. Lucy Stock Chapin. DISTRICT OF COLUMBIA, Dr. A. K. Fisher. FLORIDA, Mr. R. J. Longstreet. GEORGIA, Mr. Thomas D. Burleigh. IDAHO, Mrs. S. E. Hyde. ILLINOIS, Mr. Percival B. Coffin. INDIANA, Mr. S. E. Perkins, H. I. IOWA, Mrs. F. May Tuttle. KANSAS, Mr. Dix Teachener. KENTUCKY, Dr. L. O. Pindar. MAINE, Dr. Alfred O. Gross. MARYLAND, Mr. Talbott Denmad. MASSACHUSETTS, Mr. Charles F. Batchelder. MICHIGAN, Mr. M. J. Magee. MINNESOTA, Dr. T. S. Roberts. MISSISSIPPI, Miss Fanny A. Cook. MISSOURI (eastern), Dr. Herman von Schrenk. MISSOURI (western), Mr. Dix Teachener. MONTANA, Dr. M. J. Elrod. NEBRASKA, Dr. Robert H. Wolcott. NEW HAMPSHIRE, Mr. George S. Foster. NEW JERSEY, Mr. J. Fletcher Street. NEW MEXICO, Mr. J. S. Ligon. NEW YORK, Dr. Frank M. Chapman. NORTH CAROLINA, Dr. Z. P. Metcalf. NORTH DAKOTA, Prof. O. A. Stevens. OHIO, Dr. Lynds Jones. OKLAHOMA, Mrs. Margaret M. Nice. OREGON, Mr. Stanley G. Jewett. PENNSYLVANIA (eastern), Mr. J. Fletcher Street. PENNSYLVANIA (western), Mr. Bayard H. Christy. RHODE ISLAND, Mr. Henry E. Childs. SOUTH CAROLINA, Miss Laura M. Bragg. SOUTH DAKOTA, Mr. William H. Over. TENNESSEE, Prof. George R. Mayfield. TEXAS, Dr. A. R. Shearer. UTAH, Mr. Claude T. Barnes. VERMONT, Mr. Wendell P. Smith. VIRGINIA, Prof. Thomas Smyth. WASHINGTON, Mr. Harry Harris. WEST VIRGINIA, Mr. A. B. Brooks. WISCONSIN, Dr. Warner Taylor, Dr. Leon J. Cole.

U. S. BIOLOGICAL SURVEY. WASHINGTON, D. C.
NOTES ON THE BREEDING BIRDS OF STATE COLLEGE, CENTER COUNTY, PENNSYLVANIA

BY THOS. D. BURLEIGH

These notes supplement an article which was published in the Wilson Bulletin (June and September, 1924, Vol. XXXVI, No. 2 and 3) dealing with migration records from Center County, Pennsylvania. They cover the same period, from September, 1914, through May, 1917, and the spring of 1919, as well also as the summer of 1920. While the larger number of my breeding records were taken in Center County, some of the rarer species, such as the Northern Pileated Woodpecker, could be found only well back in the mountains and a number of my best records were the result of week ends spent at Charter Oak, approximately ten miles south of State College, and in Huntingdon County. All other localities mentioned refer to Center County. No migration records are here included, nor is there need to touch on the topography of this region again. For the sake of uniformity the same nomenclature is used as in the previous article, accepted changes in scientific names being disregarded at this time until the new Check-List appears.

Pied-billed Grebe. Podilymbus podiceps. There being no previous published record of this species breeding in the state I was rather interested to find a pair nesting on the pond at Scotia in 1917. The nest, when found on May 14, held six slightly incubated eggs, and was a floating mass of decaying vegetation attached to a bush at one end of the pond where the water was two feet deep. The eggs were in a slight but well defined hollow in the top, and were covered entirely from sight by a layer of wet half-decomposed grasses and reeds. Both birds were heard, but were not seen.

Great Blue Heron. Ardea herodias herodias. A few of these birds probably breed well back in the mountains for they have been seen there late in the spring, but at present I know of no definite breeding record for this species here.

Green Heron. Butorides virescens virescens. This species is rather scarce here as a breeding bird, and I never actually found a nest, although an occasional bird seen during the spring months left no question in my mind as to its nesting in rather limited numbers.

Virginia Rail. Rallus virginianus. This species is a plentiful summer resident here, being especially abundant in the large Center Furnace Swamp and in a smaller swamp at Oak Hall. My earliest breeding record is a nest found May 12, 1919, with eleven fresh eggs,
but full sets of fresh eggs, varying in number from seven to eleven, can always be found by the middle of the month. The nests are usually well concealed in the thick marsh grass, and are slightly cupped substantial beds of pieces of reeds and cat-tails and, rarely, the marsh grass.

Sora Rail. *Porzana carolina*. This species is even more plentiful than the preceding, and is so similar in so far as its breeding habits are concerned that nests can be recognized with certainty only by the appearance of the eggs. As with the Virginia Rail my earliest breeding record is a nest found May 12, 1919, with ten slightly incubated eggs, while full sets of fresh eggs, varying in number from eight to twelve, can always be found by the middle of the month.

Woodcock. *Philohela minor*. This species breeds only well back in the mountains, but is fairly plentiful in the wet meadows about Charter Oak. My first nest found there April 15, 1917, held four fresh eggs, and was a slight depression lined with dead leaves between two blue beech saplings at the edge of a marshy field and a short distance out from some underbrush. Another nest found April 6, 1919, held four incubated eggs, and was at the foot of a small white pine in the middle of a marshy field overgrown with underbrush. It was merely a hollow in the deep marsh grass lined with dry pine needles and a few grasses.

Upland Plover. *Bartramia longicauda*. One or two pairs of these fine birds could be found each spring in the large open fields about the town, but I was never fortunate enough to find a nest. They are undoubtedly on the verge of extinction here, and it will be only a few years before they are gone.

Spotted Sandpiper. *Actitis macularia*. This species breeds sparingly about the few streams in the open valley, and is far less common than one would expect to find it here.

Killdeer. *Oxyechus vociferus*. This species is a rather plentiful breeding bird here, occurring in many of the open fields about the town. My first nest, found April 26, 1916, held four incubated eggs, and was merely a slight hollow in the middle of a gravel bar at the side of a small stream in an open field. Another nest found April 30, 1919, held four well incubated eggs, was at the upper end of a large open field and on a slight slope, and was a slight depression in the ground lined with crushed fragments of weed stems.

Ruffed Grouse. *Bonasa umbellus umbellus*. This species breeds only on the mountain ridges, and is of but casual occurrence in the open valleys. In 1917 two nests were found about Charter Oak, one
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on the 6th of May with eleven slightly incubated eggs, and one on the 11th of May with twelve somewhat incubated eggs. Both were in fairly open woods, and were mere hollows in the dead leaves at the base of one of the larger trees. These birds drum here as early as the first of March, and on warm days can be heard as late as the first of October.

Wild Turkey. Meleagris gallopavo silvestris. This fine game bird still survives in fair numbers in the mountains of central Pennsylvania, and I was favored with frequent glimpses of single birds or small flocks, although I never did succeed in finding a nest. My largest flock was that of twelve birds seen October 5, 1916, feeding at the side of a trail well up a mountainside. At dusk on the 5th of April, 1919, two were watched going to roost in the top of a large white pine in a secluded ravine, flying with considerable noise into the upper branches where they were at once well concealed.

Mourning Dove. Zenaidura macroura carolinensis. This species is quite plentiful here during the summer months, being found in many of the orchards and scattered short stretches of woods. My earliest breeding record is that of a nest found April 12, 1917, with two slightly incubated eggs, while other nests have been noted at frequent intervals between that date and the last of May. Each invariably held two eggs, and varied in height from four to fifteen feet from the ground, the usual situation being a crotch of a limb of an apple tree, or of a black willow or a haw (Crataegus) at the edge of a field.

Turkey Vulture. Cathartes aura septentrionalis. These birds are fairly plentiful here during the summer months, and unquestionably rear their young on the rugged mountain sides that offer many suitable nesting sites, but I have never been fortunate enough to stumble on a nest, although at intervals I have searched carefully for one.

Marsh Hawk. Circus hudsonius. This species is a rather uncommon and irregular breeding bird here, and although seen throughout the year I never succeeded in finding a nest.

Cooper's Hawk. Accipiter cooperi. This species is one of the commonest of the birds of prey that breed here, nesting both in the open valleys and well back in the mountains. A nest found at Charter Oak on May 4, 1919, held five fresh eggs and was forty-five feet from the ground in the top of a white pine on a ridge covered with fairly open second growth timber. Another found close by on May 11 held five somewhat incubated eggs, and was fifty feet from the ground in a large white pine in a thickly wooded ravine. Both were large and
substantially built of small sticks and twigs, the slight hollow in the top being well lined with flakes of bark.

**Sharp-shinned Hawk.** *Accipiter velox.* This species breeds rather sparingly here, an occasional pair being found in wooded ravines well back in the mountains where hemlocks predominate. Only once have I noted them nesting in a stretch of pine woods in the open valley, and hardwoods are apparently shunned entirely.

**Broad-winged Hawk.** *Buteo platypterus.* This species is rarely if ever seen in the open valleys, but is a fairly plentiful breeding bird on the mountain sides and in the wooded ravines. On May 11, 1917, two nests were found about Charter Oak, one with three slightly incubated eggs and the other with two fresh eggs. The latter was up thirty feet from the ground in the top of a pitch pine, and was rather loose and delapidated, evidently a few sticks having been merely added to an ancient Crows' nest and lined with small flakes of bark. Another nest found at Charter Oak on May 18, 1919, held two slightly incubated eggs and was thirty-five feet from the ground in a crotch of a sugar maple at the side of a stream in a ravine. It was well built of sticks, with a lining of flakes of bark and a few sprays of hemlock.

**Sparrow Hawk.** *Cerchneis sparveria sparveria.* Unlike the other breeding hawks this species shows no liking for the mountain sides, and is found entirely in the scattered short stretches of woods in the open valleys. Here, however, it is quite plentiful, there being few stretches of woods without one pair at least. I have found numerous nests, and have noted with interest the uniformity with which these birds breed. All have held full sets of fresh eggs, five, with the exception of one that had but four, between the 7th and the 10th of May, and all but one have been in natural cavities in the larger trees standing in an open field or at the edge of a short stretch of woods, varying in height from twenty to thirty-five feet from the ground. One pair had chosen an old Flickers' hole in the top of an old decayed stub standing well out in an open field, but a natural cavity is almost invariably given preference over any other situation. The depth of the cavity will vary from a few inches to at times fully two feet, the eggs lying on fragments of rotted wood.

**Screech Owl.** *Otus asio asio.* This species is a fairly common breeding bird here, nesting both in the scattered short stretches of woods and in the numerous old apple orchards. Two nests were found April 10, 1919, in both four somewhat incubated eggs, and both in cavities of apple trees at the edge of small orchards. One was an old
Flicker's hole but five feet from the ground, while the other was a natural cavity fifteen feet from the ground, large but very shallow.

**Great Horned Owl.** *Bubo virginianus virginianus.* This species breeds in many of the wooded ravines well back in the mountains, but natural cavities in the larger trees are seemingly preferred to old hawks' nests, and I never had sufficient luck to find an occupied nest.

**Yellow-billed Cuckoo.** *Coccyzus americanus americanus.* This species is fairly plentiful here in the open valleys. A nest found June 5, 1916, held three slightly incubated eggs, and was three feet from the ground in a small wild crabapple tree in a thicket at the edge of a short stretch of woods. It was loosely built of twigs, lined with fragments of dead leaves.

**Black-billed Cuckoo.** *Coccyzus erythrophthalmus.* This species is possibly as common as the preceding, and like it is seen very largely in the open valleys. A nest found May 27, 1916, held three slightly incubated eggs, and was six feet from the ground in a small red hawk in a thicket at the edge of an open field. Another found a week or so later, on the 6th of June, held three small young in various stages of growth and one well incubated egg, and was five feet from the ground in a bush in a stretch of thick underbrush.

**Belted Kingfisher.** *Ceryle alcyon alcyon.* This species is plentiful here, and seen during the summer months about many of the numerous small streams in the open valley. A nest found May 10, 1916, held seven slightly incubated eggs, and was at the end of a four foot hole in a low bank facing a creek, a foot down from the top of the ground and four feet up from the water. Usually no nesting material is in evidence, but in this case the eggs were lying on a bed of fragments of the hard outer shells of crawfish.

**Hairy Woodpecker.** *Dryobates villosus villosus.* This species is a common breeding bird here, nesting both in the open valleys and well back in the mountains. Old orchards are favored spots during the spring months. The two nests that were found being both in apple trees in orchards, and within ten feet of the ground. One, on April 30, 1917, held four well incubated eggs, while the other, on May 6, 1919, held four fresh eggs. In each case the female was incubating and refused to flush, being finally removed from the nest by hand.

**Downy Woodpecker.** *Dryobates pubescens medianus.* This species is fairly common here, and like the preceding shows a marked preference for old orchards not only during the spring months but during the larger part of the year. A nest found May 14, 1919, held
six well incubated eggs, and was fifteen feet from the ground in a dead limb of a large apple tree. The male was incubating, and as is characteristic with this sex flushed even before the tree was reached.

**Northern Pileated Woodpecker.** *Phoeotomus pileatus abieticola.* It was on the 19th of October, 1915, that I saw one of these birds for the first time, although gradually I found they were fairly plentiful in the thicker stretches of woods on the mountain sides. My first nest was found at Charter Oak on the 11th of May, 1917, held on that date four slightly incubated eggs, and was forty feet from the ground in the trunk of a living white oak in open second growth timber part way up the side of a ravine. That they at times nested earlier than this was shown several years later when, on the 11th of May, 1919, a nest was found that held two newly hatched young, one hatching egg, and one egg that was infertile. It was twenty-five feet from the ground in the top of an old rotten pitch pine stub at the top of a ridge in fairly open second growth timber, with a cavity in spite of, or possibly because of, the rotten wood but ten inches deep. Another nest that on the 18th of May, 1919, held four practically fresh eggs was thirty feet from the ground in the trunk of a large living chestnut oak part way up a mountain side, and was unusually large, with a cavity fully two feet deep. In each case the female flushed readily when the tree was rapped, but usually remained close by protesting at my intrusion.

**Red-headed Woodpecker.** *Melanerpes erythrocephalus.* This species is quite plentiful here in the scattered short stretches of woods in the open valley about the town, but entirely wanting in the mountains. A nest found May 30, 1916, held four fresh eggs, and was thirty feet from the ground in a dead limb of a large black oak at the edge of a short stretch of woods. Another that on June 9, 1916, held four slightly incubated eggs was fifteen feet from the ground in a dead limb of an apple tree in an orchard.

**Northern Flicker.** *Colaptes auratus luteus.* This species is quite plentiful here, and found practically everywhere except in the thickest stretches of woods. The majority of the birds are incubating full sets of seven or eight eggs by the latter part of May, my earliest breeding record being that of a nest that on the 13th of May, 1917, held eight fresh eggs, and was six feet from the ground in the trunk of an apple tree at the edge of an open field.

**Whip-poor-will.** *Antrostomus vociferus vociferus.* This species occurs rather sparingly in the open valleys, but is plentiful in the
mountains where at dusk late in May it can frequently be heard "singing" on all sides.

NIGHTHAWK. *Chordeiles virginianus virginianus*. This species is one of the scarcest of the breeding birds here, and although a few were seen during the summer months I never succeeded in finding a spot where they were nesting.

CHIMNEY SWIFT. *Chaetura pelagica*. This species is a plentiful breeding bird here, especially about the town where the larger chimneys offer many suitable nesting sites. During the latter part of September thousands appear late each afternoon to roost in a chimney of one of the college buildings.

RUBY-THROATED HUMMINGBIRD. *Archilochus colubris*. This species is fairly plentiful here during the summer months, although seen more frequently about the town than in the mountains.

KINGBIRD. *Tyrannus tyrannus*. This species is a plentiful breeding bird here, few of the numerous orchards being without at least one pair. A nest found June 6, 1916, held four fresh eggs, and was twenty feet from the ground at the outer end of a limb of an apple tree at the edge of an orchard. That two broods are at times raised is evidenced by another nest found in much the same situation on July 4 of the same year that held two slightly incubated eggs.

CRESTED FLYCATCHER. *Myiarchus crinitus*. This species is less plentiful than the preceding but like it is found largely about the orchards where numerous cavities offer suitable nesting sites. Only rarely is it seen in the scattered short stretches of woods or on the mountain sides.

PHOEBE. *Sayornis phoebe*. This species is a plentiful breeding bird here, occurring practically everywhere there is a suitable nesting site. A favorite spot is a beam under a bridge crossing a stream, although old sheds, ledges of low cliffs and caves of unoccupied buildings are frequently chosen. Two and frequently three broods are reared each year, my extreme dates being a nest found April 21, 1915, with five fresh eggs, and one that on June 4, 1916, held five slightly incubated eggs. The nests vary little in construction, being compactly built of green moss, a few grasses, wool when available, and mud lined with fine grasses and horse hair.

WOOD PEWEE. *Myiochanes virens*. This species is also a plentiful breeding bird here, occurring in many of the scattered short stretches of woods about the town. A nest found June 9, 1916, held
three slightly incubated eggs, and was thirty feet from the ground at the outer end of a limb of a large white oak at the edge of a short stretch of woods.

**Least Flycatcher.** *Empidonax minimus*. This species is a rather scarce breeding bird here, and rarely seen during the summer months.

**Prairie Horned Lark.** *Otocoris alpestris praticola*. During the winter months this species occurs here in small restless flocks feeding in the open fields or on the roads, but early in March these flocks begin to break up, and by the middle of the month scattered pairs can be found in many of the open fields and pastures. I have seen singing males soaring overhead as early as the 11th of March, and it is no uncommon occurrence to find well incubated eggs with the ground white with snow. A nest found March 26, 1919, held five slightly incubated eggs, and was sunken level with the ground at the edge of a large field. It was compactly built of rootlets, weed stems and grasses, well lined with chicken feathers. Another found the same day held young fully a week old, and was far less substantially built of crushed fragments of weed stems and a little wool, although as before sunken flush with the ground in an open field.

**Blue Jay.** *Cyanocitta cristata cristata*. This species is rarely seen in the scattered stretches of woods about the town, but is fairly plentiful well back in the mountains. A nest found at Charter Oak on May 6, 1917, held six fresh eggs, and was twenty-five feet from the ground at the outer end of a limb of a large white pine at the edge of a clearing in the woods. It was compactly built of twigs, weed stems and grasses, lined with fine black rootlets.

**Northern Raven.** *Corvus corax principalis*. This species, one of the remnants of a vanished wilderness, still manages to survive in the less accessible mountain valleys, and while not increasing in numbers should be safe from actual extermination for a number of years yet. My first nest was found near Charter Oak, March 11, 1917, when there was still a foot of snow on the ground, and held on that date five fresh eggs. It was sixty-five feet from the ground near the top of a large white pine deep in the woods, and was compactly built of sticks, twigs and strips of bark, lined with soft inner shreds of bark and wool. The incubating bird apparently flushed before I reached the tree, but both soon appeared and showed considerable resentment at my intrusion, circling low overhead and croaking almost continuously. Another nest found March 22, 1919, held three incubated eggs, and was built on a
ledge of a cliff in a rugged gap in the mountains but three miles south-west of the town of State College. This nest had been used in previous years so was rather large, but otherwise, except for deer hair in the lining, was in construction much like the first.

Crow. Corvus brachyrhynchos brachyrhynchos. This species is an abundant breeding bird here, being found during the spring months in practically all the short stretches of woods in the open valley, and in many of the wooded ravines well back in the mountains. Possibly two broods are at times reared each year, for while full sets, varying in number from four to six eggs, can always be found the latter part of March and the first of April it is not uncommon to find fresh eggs late in May. My extreme breeding records are a nest that on March 29, 1917, held six slightly incubated eggs, and a nest that on May 20, 1919, held four fresh eggs. Nests varied in height from fifteen feet to at times fully sixty feet from the ground, the average, however, being between twenty-five and forty feet, and were in almost any hardwood or conifer that offered sufficient protection and concealment. Two situations chosen that were somewhat out of the ordinary were a large black willow standing alone at the edge of a pond, and a small wild crabapple tree in a thicket well out in an open field.

Starling. Sturnus vulgaris. This species first appeared in Center County on the 29th of February, 1916, four birds being seen that day feeding at the edge of an open field. It was the following year, however, before the first pair nested here, although they were almost at once fairly plentiful, and are now one of the commonest breeding birds in and about the town. My first nest, found May 1, 1917, held five slightly incubated eggs, and was twenty feet from the ground in a cavity of a tree standing in the middle of an open field. Like others seen later it was rather bulkily built of coarse grasses and feathers. In 1919 these birds nested much earlier for a nest found on the 29th of April held four well incubated eggs, while in another, on the 6th of May, there were six half grown young.

Bobolink. Dolichonyx oryzivorus. This species is a fairly plentiful breeding bird here, nesting late in May in the open fields about the town.

Cowbird. Molothrus ater ater. This species is by no means plentiful here during the summer months, and only at infrequent intervals have I found its eggs in nests of the smaller birds. My earliest breeding record is that of a single fresh egg found in a Phoebe's nest on May 3, 1917, that also held three fresh eggs of the rightful owner.
Red-winged Blackbird. Agelaius phoeniceus phoeniceus. This species is a very plentiful breeding bird here, small colonies nesting in many of the scattered swamps and marshy meadows about the town. Domestic duties are well under way by the middle of May, and it is possible then, and until the first of June, to find eight or ten nests with eggs, in marshes of more or less limited area. My earliest breeding record is a nest that held four fresh eggs on May 12, 1919, although I have never failed to find full sets of four, or rarely three, fresh eggs by the 16th of that month. Nests vary but little in situation, being either in the cat-tails or in the thick marsh grass, and are built of reeds, pieces of cat-tails and the marsh grass, with a lining of fine grasses and, at times, a little horse hair.

Meadowlark. Sturnella magna magna. This species is plentiful here during the summer months, breeding in many of the open fields about the town. A nest found May 19, 1919, held six fresh eggs, and was sunken a little in the ground in a clump of green grass near the middle of a large field of winter wheat.

Orchard Oriole. Icterus spurius. This species is a fairly plentiful breeding bird here, occurring during the summer months in many of the scattered apple orchards. A nest found June 6, 1916, held four slightly incubated eggs, and was twenty feet from the ground at the outer end of a limb of an apple tree near the edge of an orchard.

Baltimore Oriole. Icterus galbula. This species is more plentiful than the preceding, and while fairly common about the town shows a like preference for old apple orchards. A nest found June 5, 1916, held five fresh eggs, and was but six feet from the ground at the extreme end of a limb of an apple tree in an orchard.

Purple Grackle. Quiscalus quiscula quiscula.

Bronzed Grackle. Quiscalus quiscula aeneus. Both these species are equally plentiful here, and as they nest together, and even at times interbreed, it is only by actually collecting the incubating bird that a nest could be satisfactorily identified. Old apple orchards are favored spots during the spring months, although scattered pairs can be found throughout the town, nesting in the upper branches of such trees as Norway spruces and cottonwoods. Only once have I noted them colonizing, fifteen pairs being found on May 7, 1919, nesting in the upper branches of a large white pine standing at the edge of an open field. The nests varied from twenty-five feet to fully fifty feet from the ground, and were invariably at the outer ends of the larger limbs. A
few held young several days old, while in the others there were eggs either fresh or in various stages of incubation. But one brood is reared each year, my extreme breeding records being a nest that on April 29, 1919, held six slightly incubated eggs, and one that on May 12, 1919, held five fresh eggs.

**Goldfinch. Astragalinus tristis tristis.** As it is the latter part of July before this species breeds here my experience with it was rather limited, but I found it quite plentiful during my one summer, 1920, at State College. My first nest, found August 1, held on that date five fresh eggs, while in the following three weeks seven other nests with eggs were, with little effort, located in and about the town, the latest, on August 19, holding six slightly incubated eggs. They varied in height from six to forty feet from the ground, the average being between fifteen and twenty feet, and there was apparently little preference for any certain tree, other than that conifers were consistently avoided. All were compactly built of gray plant fibres, shreds of bark, fine weed stems and plant down, well lined with thistle down and, in one case, horse hair.

**English Sparrow. Passer domesticus.** This undesirable but persistent species is plentiful in and about the town, and nests everywhere and in quite varied situations. Apple orchards are favored spots, and unless well out in the open country such species as Bluebirds and Crested Flycatchers are soon driven away. Natural cavities are usually selected, although where these are scarce large unsightly nests are built in the upper branches. My extreme breeding records are a nest that on April 15, 1916, held five fresh eggs, and one that on August 13, 1920 held four half grown young. This latter nest was somewhat out of the ordinary, an old Robins' nest on a beam against the side of a building having been merely well lined with large chicken feathers, and no attempt made to arch over the top with grasses and weed stems.

**Vesper Sparrow. Poecetes gramineus gramineus.** This species is plentiful during the summer months in the open fields about the town. My earliest breeding record is a nest found April 30, 1919, that held four fresh eggs, and was in a depression in the ground in a thick clump of grass at the edge of a large open field. Other years it has been the first week in May before full sets of fresh eggs were found, and in 1916 I found my first nest with four slightly incubated eggs as late as the 16th of May. Nests are rather unsubstantially built of weed stems, rootlets and grasses, with a lining of finer grasses and horse hair.
Savannah Sparrow. *Passerculus sandwichensis* savanna. This species breeds very sparingly in a few of the larger open fields about the town, but I personally was never fortunate enough to find or actually see a nest.

Grasshopper Sparrow. *Ammodramus savannarum australis*. This inconspicuous little sparrow is plentiful during the summer months in the open fields and pastures about the town. A rather late breeding record is that of a nest found July 28, 1920, that held three fresh eggs, and was sunken in the ground, and very well concealed, in the middle of a large open field.

Henslow's Sparrow. *Passerherbulus hensloni hensloni*. At present this species is known to breed at only one spot here, a marshy meadow in the open valley near Charter Oak. I have noted it there each year the latter part of April or the first of May, but while several nests have been found I was never fortunate enough to actually see one.

Chipping Sparrow. *Spizella passerina passerina*. This species is a plentiful summer resident here, both about the town and in the open valleys. Such conifers as the red cedar are given preference as a nesting site, but apple orchards are seldom without at least one pair, and bushes at the edges of thickets are chosen at times. The nests are never over ten feet from the ground, and often up but a foot or two. Fresh eggs can always be found by the middle of May, my earliest breeding record being a nest that on May 11, 1916, held four fresh eggs.

Field Sparrow. *Spizella pusilla pusilla*. This species is an equally plentiful summer resident here, with a preference for fields and pastures overgrown more or less with scrubby underbrush. Old apple orchards, however, are likewise much favored. The nests found were usually on the ground, fairly well concealed in thick clumps of grass or weeds, an exception being one that was five feet up in a small bushy red cedar at the edge of an open field. My earliest breeding record is a nest that on May 13, 1916, held four fresh eggs, the others noted being between that date and the first of June.

Song Sparrow. *Melospiza melodia melodia*. This species is quite plentiful here during the summer months about thickets and underbrush bordering open fields. Two and possibly three broods are reared each year, and it is interesting to note that the first nests are invariably on the ground, well concealed in thick grass or weeds, while in
late spring and early summer the nests are built in bushes or vines often as much as six feet from the ground. My extreme breeding records are a nest that on May 4, 1916, held five slightly incubated eggs, and one that on August 8, 1920, held three fresh eggs.

**Towhee. Pipilo erythróphthalmus erythróphthalmus.** The distribution of this species here proved somewhat of a surprise to me for it consistently avoids, during the summer months, thickets and underbrush in the open valleys and breeds only on the more open mountain sides. A nest found May 28, 1916, held five incubated eggs, and was on the ground at the foot of a small laurel bush in scruffy underbrush at the top of a ridge.

**Cardinal. Cardinalis cardinalis cardinalis.** This species is fairly plentiful in the ravines well back in the mountains where the dense rhododendron thickets afford suitable conditions, but like the preceding is never seen in the more open valleys.

**Indigo Bunting. Passerina cyanea.** This species is a plentiful summer resident in the more open valleys, occurring about thickets and underbrush in the scattered short stretches of woods. It breeds rather late, my earliest record being a nest that held three fresh eggs on June 9, 1916.

**Scarlet Tanager. Piranga erythromelas.** This species is fairly plentiful during the summer months on the mountain sides but is never seen then in the stretches of woods in the open valleys.

**Cliff Swallow. Petrochelidon lunifrons lunifrons.** This species is rather scarce here as a breeding bird for I know of but two small colonies, one at Oak Hall and the other near Charter Oak, that return each year to the same barns. At the latter spot four nests were noted on June 4, 1916, three practically built and the other with three fresh eggs.

**Barn Swallow. Hirundo erythrogastra.** This species is a plentiful summer resident in the open valleys, there being few barns on the scattered farms in which at least one pair cannot be found nesting then. Fresh eggs can usually be found shortly after the middle of May, my earliest breeding record being a nest that on May 18, 1916, held five slightly incubated eggs.

**Tree Swallow. Iridoprocne bicolor.** I know of but one spot where this species breeds here, the small pond at Scotia affording suit-
able nesting sites in several old stubs standing well out from the shore. I unfortunately was not aware at the time that two pairs were nesting here each year, so have no definite data now to this effect.

**Rough-winged Swallow. Stelgidopteryx serripennis.** This species is fairly plentiful during the summer months in the open valleys, scattered pairs breeding in the low banks bordering the numerous small streams. A nest found May 30, 1916, held six slightly incubated eggs, and was at the end of a one foot hole in such a bank facing a shallow creek flowing through a pasture.

**Cedar Waxwing. Bombycilla cedrorum.** This species is fairly plentiful here as a breeding bird but as it nests rather late in the spring my records are rather meager. A nest found July 4, 1916, held five somewhat incubated eggs, and was twenty feet from the ground in a crotch of one of the limbs of a tree on the college campus. It was rather shabbily built of twigs and catkins, with a lining of fine grasses.

**Red-eyed Vireo. Vireosylva olivacea.** This species is fairly plentiful during the summer months both in the scattered stretches of woods in the open valleys and on the mountain sides.

**Warbling Vireo. Vireosylva gilva gilva.** This species is likewise plentiful during the summer months in the open valleys where it shows a decided preference for the larger willows fringing the streams. My one breeding record is that of a nest found May 31, 1916, that held four slightly incubated eggs, and was ten feet from the ground at the outer end of a limb of a large apple tree at the side of a road. It was compactly built of grasses, plant fibres, feathers and bits of wool, lined with fine grasses.

**Yellow-throated Vireo. Lanivireo flavifrons.** Scattered pairs of these birds can be found during the summer months in the short stretches of woods in the open valleys where they nest in the upper branches of the larger trees.

**Blue-headed Vireo. Lanivireo solitarius solitarius.** This species breeds very sparingly in the secluded ravines well back in the mountains and only about Charter Oak have I seen it during the summer months.

**Black and White Warbler. Mniotilta varia.** This species is fairly plentiful during the summer months on the mountain sides but rarely ventures then into the open valleys.
Worm-eating Warbler. *Helmitheros vermivorus*. I was rather interested to find this Carolinian bird far from scarce about Charter Oak, scattered pairs nesting in many of the wooded ravines.

Golden-winged Warbler. *Vermivora chrysoptera*. This species nests in overgrown clearings or pastures on the mountain sides, and is somewhat scarce as a breeding bird.

Northern Parula Warbler. *Compsoschlypis americana pusilla*. I have seen this species during the summer months only about Charter Oak where a pair or two nest in the larger hemlocks bordering the streams.

Yellow Warbler. *Dendroica aestiva aestiva*. This species is a common summer resident in the open valleys, frequenting apple orchards and underbrush fringing the larger streams. My earliest breeding record is a nest that held five slightly incubated eggs on May 27, 1916, and was eight feet from the ground in a small apple tree at the edge of an orchard.

Black-throated Blue Warbler. *Dendroica caerulescens caerulescens*. This species can be found rather sparingly during the summer months in rhododendron thickets in ravines in the mountains.

Chestnut-sided Warbler. *Dendroica pensylvanica*. This species is fairly plentiful during the summer months in clearings on the mountain sides that are partially overgrown with scrubby underbrush.

Blackburnian Warbler. *Dendroica fusca*. This species breeds rather sparingly in the ravines in the mountains, scattered pairs being found during the summer months in the larger hemlocks and white pines bordering the streams.

Black-throated Green Warbler. *Dendroica virens*. This species occurs in much the same situations as the preceding, but is far more plentiful and is frequently found well up the mountain sides.

Pine Warbler. *Dendroica vigorsii*. This species can be found during the summer months on the open south slopes of the mountain ridges where it nests in limited numbers in the larger pitch pines that are scattered here and there.

Oven-bird. *Seiurus aurocapillus*. This species is a plentiful summer resident on the mountain sides, but only during migrations ventures into the scattered stretches of woods in the open valleys.

Louisiana Water-Thrush. *Seiurus motacilla*. This species is a plentiful summer resident in the mountains, there being few streams
without at least one pair. A nest found May 16, 1919, in Laurel Run held five well incubated eggs, and was well concealed under a projecting root on a low bank at the side of a stream flowing through dense rhododendron thickets. It was rather bulkily built of dead leaves and grasses, lined with fine grasses.

MARYLAND YELLOW-THROAT. *Geothlypis trichas trichas*. This species is plentiful during the summer months in the open valleys, frequenting thickets and underbrush bordering the numerous streams.

YELLOW-BREASTED CHAT. *Icteria virens virens*. This species is plentiful during the summer months both in thickets and underbrush in the open valleys and in overgrown clearings on the mountain sides. My earliest breeding record is a nest found May 31, 1915, that held three fresh eggs, and was in a thicket at the edge of a short stretch of woods.

HOODED WARBLER. *Wilsonia citrina*. This handsome warbler is plentiful during the summer months in thickets of rhododendron and laurel on the mountain sides. Two nests that were found were both a few feet from the ground in small rhododendrons near streams. One held four fresh eggs on June 3, 1915, and the other four fresh eggs also on June 8, 1916.

CANADA WARBLER. *Wilsonia canadensis*. This species is a fairly plentiful summer resident here, and occurs in much the same situations as the preceding. A nest found June 3, 1915, held four slightly incubated eggs, and was very well concealed in a mass of dead leaves that had lodged in a few small shoots at the foot of a large tree growing at the side of a stream in a tangled rhododendron thicket.

REDSSTART. *Setophaga ruticilla*. This species proved unexpectedly scarce as a breeding bird, but a very few being noted during the summer months in ravines in the mountains.

CATBIRD. *Dumetella carolinensis*. This species is a plentiful summer resident here, occurring in thickets and underbrush at the edges of the scattered short stretches of woods or bordering open fields. A characteristic breeding record, both as to date and situation, is a nest found May 29, 1915, that held five slightly incubated eggs, and was two feet from the ground in a small haw bush at the edge of a thicket.

BROWN THRASHER. *Toxostoma rufum*. This species is equally plentiful and occurs in much the same situations as the preceding. My earliest breeding record is a nest found May 7, 1915, that held four
slightly incubated eggs, and was five feet from the ground in a small wild crabapple tree in a thicket at the edge of a short stretch of woods. Only rarely is a nest placed on the ground, my one instance of such an occurrence being a nest that when found June 2, 1915, held four half grown young and was well concealed in a stretch of tall weeds in rather open woods.

**Bewick’s Wren.** *Thryomanes bewicki bewicki.* This species breeds rather sparingly here, scattered pairs being found during the summer months about the old sheds or unoccupied houses where the nest is invariably built. A nest found May 18, 1919, at Charter Oak held seven slightly incubated eggs, and was under the eaves of a cabin at the side of a road near the foot of the mountain. It was compactly built of twigs, weed stems, pieces of rotten wood, and dead leaves, lined with bits of wool, chicken feathers, a few horse hairs, and fragments of a cast off snake skin.

**House Wren.** *Trogodytes aedon aedon.* This species is a plentiful summer resident here, occurring both in and about the town as well as in the numerous orchards in the open valleys. A characteristic breeding record, both as to date and situation, is a nest found May 31, 1916, that held six slightly incubated eggs, and was five feet from the ground in a cavity in the trunk of a large apple tree in an orchard.

**White-breasted Nuthatch.** *Sitta carolinensis carolinensis.* This species is one of the most characteristic birds of the scattered short stretches of woods in the open valleys, one pair at least, frequently two, being found in each one. Nesting is well under way by the middle of April, and by the latter part of that month or the first of May these birds are incubating full sets of from seven to nine eggs, the last being actually the commoner number. The nests are invariably in knot holes in the trunks of the larger trees, varying in height from fifteen to fifty feet from the ground, the cavity itself being six to eight inches in depth, and usually six inches from the entrance. The nests are substantial matted beds of soft shreds of inner bark and rabbits’ fur, with rarely a little wool, cow hair, and chicken feathers. But one brood is reared each year. My earliest breeding record is that of a nest found April 27, 1917, that held eight slightly incubated eggs.

**Tufted Titmouse.** *Baeolophus bicolor.* I found this species decidedly scarce here, but apparently slowly increasing in numbers, so it is possible that in time it may be fairly plentiful as a breeding bird.
Chickadee. *Penthestes atricapillus atricapillus.* This species is plentiful throughout the year on the mountain sides but, especially during the summer months, rarely ventures into the short stretches of woods in the open valleys. A nest found May 14, 1916, held seven fresh eggs, and was three feet from the ground in an old rotten poplar stub at the side of a road in a wooded ravine. Another, found May 18, 1919, at Charter Oak, held six slightly incubated eggs, and was four feet from the ground in a fence post at the edge of a clearing.

Wood Thrush. *Hylocichla mustelina.* This is another species that strangely enough shuns the scattered stretches of woods in the open valleys where conditions would seem entirely suitable for it to breed, and can be found during the summer months only in secluded ravines on the mountain sides. Here, however, it is fairly plentiful. Three nests noted June 3, 1915, held each four incubated eggs, and were five feet from the ground in rhododendrons near small streams.

Robin. *Planesticus migratorius migratorius.* This familiar bird is very plentiful here during the summer months, occurring everywhere there is any open country and avoiding only the deeper stretches of woods on the mountain sides. Two and possibly three broods are reared each year. My extreme breeding records being a nest with three slightly incubated eggs found April 16, 1919, and one that on July 4, 1916, held four fresh eggs. Full sets of three or four eggs, either number being equally common, can, however, be found at almost any time between these two dates. The nests are placed in almost any situation that affords sufficient concealment and protection, having been noted on the cross arms of telephone poles, on beams in sheds and barns, under bridges crossing small streams, on rain spouts under the eaves of buildings, as well as in practically any tree or bush, the height from the ground varying here from five to thirty feet.

Bluebird. *Sialia sialis sialis.* This species is plentiful during the summer months both in the open valleys and about the farms well back in the mountains. Old apple orchards are favored spots in which to breed, while the scattered short stretches of woods usually offer sufficient inducements for at least one pair. Two and possibly three broods are reared each year. My extreme breeding records being a nest found April 16, 1915, that held five fresh eggs, and one that on August 1, 1920, held three somewhat incubated eggs.

U. S. Biological Survey.

Asheville, North Carolina.
EDITORIAL

The Following Figures for the last five meetings show interesting comparisons. The most gratifying figures are those showing the out-of-town attendance at the annual meetings. Naturally, our attendance at the Cleveland meeting included good representations from Ohio, Pennsylvania, Michigan, and the Virginias; we were glad to have so good a showing from the Atlantic states and the District of Columbia. Mrs. H. J. Taylor, who came all the way from Berkeley, California, probably made the best record for distance.

In looking over the register of attendance, the writer was chagrined to find the names of many persons of whom he has known or with whom he has had correspondence, and of whose presence at this meeting he was not aware at the time. One of the greatest privileges in attending these meetings is the opportunity of making new acquaintances. We are not quite ready to go to a three-day program; and we will be reluctant to curtail the number of papers on the program. Therefore, we recommend to our officers that in planning future meetings a good deal of thought be given to ways and means of getting acquainted—in the midst of so much activity.

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<th>1926 Out-of-town attendance</th>
<th>1926 Total attendance</th>
<th>1926 Dinner attendance</th>
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<th>1926 Life members</th>
<th>1926 Sustaining members</th>
<th>1926 Active members</th>
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New Orleans has been selected as the meeting place for this year. The dates will probably be Monday and Tuesday, December 28 and 29. Many of our members will undoubtedly wish to take this occasion to visit this historic old city. Reduced railroad fare (one fare and a half) will be available as usual for this trip. Announcements concerning special attractions will be made in succeeding issues.
The January (1931) issue of the Auk contains a Platform of the A. O. U. Committee on Bird Protection. This platform consists of six articles embodying what are regarded by the Committee as the most fundamental principles in bird conservation. The six general principles are: 1) education, 2) prevention of extermination, 3) opposition to bounties and organized shooting campaigns, especially on birds of prey, 4) opposition to the introduction of exotic species, 5) control of destructive agencies arising with the progress of civilization, 6) legislative regulation. The platform has not, apparently, been as yet adopted by the American Ornithologists’ Union, though little doubt can be entertained that it will be adopted. The only division likely to arise will be when the general principles are applied to some concrete proposal. The Committee consists of: Dr. H. C. Bryant, chairman, A. C. Bent, Florence Merriam Bailey, Bayard H. Christy, Stanley G. Jewett, Hoyes Lloyd, Edward A. Preble. And we know enough of the personnel of this committee to have complete confidence in their zeal for honest conservation and sane protection.

Not long ago the Wilson Bulletin (XLII, September, 1929, page 189) made a plea for just such a statement of principles by ornithological societies, and the American Ornithologists’ Union has demonstrated its leadership. Now, it seems to us that it would be appropriate for the Wilson Ornithological Club, or any other society interested in bird protection, either to ratify and adopt this same platform, or to put in motion the machinery necessary to formulate one of its own.

We Are very much interested in a bit of publicity in behalf of the birds of prey which has been undertaken by the Brodie Bird Club, of Toronto. This organization has been furnishing a short daily article on “Our Birds of Prey” to the Toronto Globe. These articles average about two hundred words in length, and have a double-column display heading. Apparently all phases of the ecological relations of the birds of prey are to be discussed in this series. It is indeed a splendid educational program. The Toronto Globe and the Brodie Bird Club are to be congratulated for carrying out such a concrete effort in defense of the wild life of the continent. It is altruistic and economic.

What a fine thing it would be if each local bird club in America should engage its members to prepare twenty-five to fifty brief and incisive articles on the birds of prey, and then arrange with the local newspaper of largest circulation to run the series daily as a special feature. We have no doubt that many papers would be glad to cooperate—to the enjoyment of the readers and great benefit to wild life.

In 1930 the Wilson Bulletin received for publication a letter of complaint against the Fish and Game Department of the State of Arkansas for encouraging the destruction of various birds of prey in that state. It was our intention to publish the letter, but before we got to it we received, about four months later, another letter from the same writer stating that the Fish and Game Department had been converted to a less drastic policy, and requesting the withdrawal of the first letter. Thus, a great deal can be done for the native wild life of the country if those who are interested and informed will take the trouble to disseminate the interest and information.
We Are Pleased to publish in this issue a paper by Mr. Manly F. Miner. It deals with the history of Jack Miner’s work in banding wild geese, in which he has had remarkable success. This account places Jack Miner as one of the pioneers in the systematic trapping and banding of birds—in fact he may be the pioneer. At any rate no one else has caught and banded so many wild geese, to say nothing of ducks and song birds. No doubt this work has added much to our knowledge of the migration of the Canada Goose. There may be some question as to what extent these birds are drawn out of their normal route of migration by the regular food supply in the Jack Miner Sanctuary; but the terminals are at least established.

It was our privilege last December to hear Jack Miner lecture on himself and his work with the birds. Jack Miner is a dynamic personality, and his story is a fascinating one. He held his audience of seven or eight hundred people for two hours and ten minutes, and apparently they would have remained longer to listen to him. His talk is interspersed with humor, facts, a good deal of feeling, a little prejudice, and a whole lot of the homely philosophy of life which makes Jack Miner who he is and what he is. He is dead set against the Crow and hawks in general—several Canadians seem to get this slant on the matter. But we have decided that Jack Miner is a remarkable man, and that he has a message of general interest to the bird lovers, to sportsmen, to outdoor enthusiasts, to indoor habitues, and to most people. His lecture in Sioux City seemed to please the sportsmen as much as the bird lovers, and the latter as much as the former—which leads us to think that perhaps there is not so much of a gulf between the two groups as we are sometimes told there is. If these two forces would ever harness up together in the interest of real conservation, wouldn’t it be great for the wild life of America!

The Death Knell of conservation organizations is rung when they begin to employ salaried executives. If not death, at least look for gangrene. And what does the surgeon advise in this case?

We Have advance information of the forthcoming publication by the Museum of Comparative Zoology of a “Check-list of the Birds of the World,” by James Lee Peters. The completed work will consist of about ten volumes, and will be sold for about five dollars per volume. The first volume, soon to be ready, will contain about three hundred genera with seventeen hundred species and subspecies. This will be an up-to-date work similar to Sharpe’s Hand-list published in 1899.

We Wish to call attention to our small, but growing, endowment fund, which is shown in the report of the Treasurer. One more life membership will bring the fund up to the minimum required for deposit with the trust company with which we have a contract.
GENERAL NOTES
Conducted by M. H. Swenk

The Golden Eagle in Southeastern Iowa.—On October 20, 1930, a Golden Eagle (Aquila chrysaetos) was brought in to Iowa Wesleyan College, having recently been killed about five miles east of Mt. Pleasant by a sixteen-year-old boy, while it was apparently attempting to feed on duck decoys. The bird seemed to be a young one of about medium size, having a wing length of twenty-four and three-fourths inches.—H. E. Jaques, Iowa Wesleyan College, Mt. Pleasant, Iowa.

The Carolina Wren in Northwestern Iowa.—While I was in Onawa, Iowa, forty miles south of Sioux City, on August 28, 1930, I heard the song of the Carolina Wren (Thryothorus ludovicianus). On the next two days I heard the song many times, and also had several good looks at the bird. As far as I can determine, the Carolina Wren has been reported previously in this region only twice, and not in recent years.—Wm. Youngworth, Sioux City, Iowa.

Unusual Food of the Baltimore Oriole.—While looking from a window on July 23, 1930, the writer saw three immature Baltimore Orioles (Icterus galbula) clinging to the tall hollyhock stocks that were growing along the side of the house. Close watching showed that these birds were pecking into the newly formed pericarps of the hollyhocks and were greedily eating the soft, tender seeds. One of the birds after a time left the above food and started to eat the centers out of the blooming flowers. Probably insects in the flowers caused this last action, but the eating of the soft seeds of the hollyhock was a new oriole food to the writer.—William Youngworth, Sioux City, Iowa.

The Pugnacity of a Nighthawk.—One early June morning in 1929, I observed two Nighthawks (Chordeiles virginianus) flying in wide circles and quietly catching insects. As they flew over the wires of a highline, a common Kingbird (Tyrannus tyrannus) flew up from his perch and attacked the closest Nighthawk. The second Nighthawk came at once to the rescue and darted savagely at the Kingbird, driving it down to the wires. This action was repeated several times, whenever the Nighthawks flew near the Kingbird. In each case the Kingbird would attack the first Nighthawk and the second one would immediately dash down and drive the Kingbird back to his perch. The Nighthawk will at times defend its nest by dashing at the intruder, but this was the first time I had ever noticed one attacking another bird.—William Youngworth, Sioux City, Iowa.

An Early Hour’s Bird List.—I would like to place on record a list of birds heard between 6:30 and 7:30 o’clock on the morning of May 12, 1929, while I was still in bed. I would like to hear from places where a similar or larger list can be made. The weather was mild, with a gentle rain falling. Here it is: A cock Pheasant crowing, Flicker, Red-headed Woodpecker, Blue Jay, Bronzed Grackle, Baltimore Oriole, White-throated Sparrow, Purple Martin, Brown Thrasher, Tufted Titmouse, House Wren, Olive-backed Thrush, and Robin. After getting up, the Goldfinch and Chimney Swift were added immediately. When I am away from home, say in Texas or in northern Wisconsin, it is always a source of enjoyment to make mental note of the bird voices heard early in the morning, before getting up, and then jotting them down in the book. One gets some peculiar, even startling, combinations, depending on the place and time of year.—C. W. G. Eifrig, River Forest, III.
Traill's Flycatcher Nesting at Sioux City, Iowa.—While the migration of the small flycatchers is usually quite noticeable in this region, the presence of nesting small flycatchers is rather uncommon. During June and July, 1930, the writer found at least three pairs of Traill's Flycatchers (Empidonax traillii) within the city limits. The identification of the birds was kindly verified by Dr. T. C. Stephens. On August 4, young birds just out of the nest were seen as they were being fed by the parents. This species will be watched with interest to see whether it is a regular summer resident, or is an irregular summer visitor.

—Wm. Youngworth, Sioux City, Iowa.

An Oddly Colored Harris's Sparrow.—While making a field trip in a favorable locality near Sigourney, Iowa, on October 19, 1930, I saw considerable numbers of Tree Sparrows, Slate-colored Juncos, Song Sparrows, White-throated Sparrows and Harris's Sparrows, merged to some extent in one general flock. There were present also a few Cardinals, Chickadees, and Tufted Titmice to add color and animation to the scene.

But what particularly attracted my attention was the very peculiar color of one of the Harris's Sparrows (Zonotrichia querula). There were eight or ten of these birds in the flock. The juveniles could easily be distinguished by the absence of black in their plumage. All but one of the adults showed the usual black crown and black throat patches. However, this odd bird's entire head and neck were black. Approximately the same area of this bird's plumage that is red in the adult Red-headed Woodpecker was solid black. It would be interesting to know if any of the other readers of the Wilson Bulletin have ever noticed this peculiar coloration in a Harris's Sparrow.—E. D. Nauman, Sigourney, Iowa.

Cavity-Nesting Robins.—On May 19, 1929, while in a sparsely tree-covered pasture, seated near a tree which annually harbors a nesting pair of Red-headed Woodpeckers, a bird, presumably a Starling (as viewed from a distance), was seen to enter a woodpecker nesting cavity. With a desire to obtain an unquestionable identification, the tree was approached and vigorously rapped—but in vain. It was not until the ascent was well in progress that a boisterous Robin (Phoenicurus migratorius migratorius) emerged from the cavity, which was located some twenty feet from the ground. Upon examination, amidst protests from the parent birds, the cavity (which had been enlarged by decomposition) was found to contain a typical mud structure and two naked young Robins. A second hole had been provided by decay, which served as an exit. A second instance of a similar placing of the nest by a Robin has since been brought to my attention. In this case one room of a four-compartment Purple Martin house had been utilized by the birds as a place to bring forth their offspring.

Lack of suitable natural nesting places, coupled with the idiosyncrasies of birds, should account for such peculiar selections.—Paul A. Stewart, Leetonia, Ohio.

Nesting of the Starling in the Chicago Region.—On April 16, 1929, while out with a class of boys, the writer saw three Starlings (Sturnus vulgaris) in Thatcher's woods in River Forest, a western suburb of the great metropolis. Not seeing them again on subsequent visits, nothing was thought of the occurrence. On May 21, however, we again saw a Starling, this time on the opposite side of the Des Plaines River, in a tree at the water's edge. The bird flew over to our
side of the river, carrying something in its bill. I marked the spot, and after about a half hour came back to it. To my surprise there was a young Starling, almost fully grown, looking out of an old woodpecker hole about twenty-five feet up in a dead tree, which was broken a few feet above the hole and had no branches whatever. Soon the adult male Starling came and fed the youngster. One or two more seemed to be inside, because they could be seen making ineffectual attempts to get their head out of the hole. So far as the writer is aware this is the first authentic instance of the nestling of the Starling in the immediate vicinity of Chicago.

In 1928, Mr. C. A. Eickemeyer, a teacher near Crete, Illinois, thirty miles south of Chicago, described to the writer some birds new to him that had nested in his orchard. From the description it was at once apparent that the birds had been a pair of Starlings, the gentleman in question being also perfectly familiar with our native birds. This year (1929) he again notified me that they had arrived and were starting nesting operations. I have heard of similar instances in 1928 from near Waukegan. This, therefore, registers another gain of breeding territory in the westward march of this species.—C. W. G. Eifrig, River Forest, Illinois.

Winter-Killing of Barn Owls in Wisconsin.—A Barn Owl (*Tyto alba pratincola*) was picked up dead in what is known as the Shorewood Quarry, west of Madison, Wisconsin, on February 10, 1930. Four days later another owl of the same species was found within sixty yards of the one first mentioned. Both owls had the appearance of having been dead for a week or more. They were lying on the ground at the base of the quarry face, in the crevices of which face they had been accustomed to roost. A careful post-mortem disclosed that these birds had not met death from shooting or from direct mechanical injury of any sort. Though lean, they were not eneuated. Their alimentary tracts were quite empty, except for a small amount of fecal material in the intestine of one of them.

Barn Owls are rare in Wisconsin, but the presence of these two in the quarry had been known for some months, and their pellet accumulations had been gathered from time to time for food habits study. It had been noted, as the winter had progressed, that the pellets had been becoming smaller, due presumably to the protection afforded mice and shrews by the snow. Many of the pellets last deposited contained remains of but a single meadow mouse (*Microtus*), instead of the three to six small mammals making up a full size pellet. The owls were apparently unable to take advantage of the winter population of small birds; at least, they had not done so.

Madison and environs had experienced the coldest weather of the season during the last half of January, the temperature having dropped as low as 24 degrees below zero. The inference is that a scarcity of food, coincident with the cold weather, proved too much for these individual owls.—Paul L. Ekrington, Madison, Wisconsin.

A Hint on the Character of Catbirds.—While banding in the spring of 1929 I had the unusual experience of catching the same Catbird (*Dumetella carolinensis*) three times in one day in the same trap. The trap was located in our back lot in a clump of elderberry bushes, where later in the year Catbirds could always be seen devouring the juicy berries. It was an ordinary pull-string drop-trap, equipped with a broken stick as support. As bait a mixture of bread
crumbs, canary seed, and sunflower seed was spread under it. The Catbirds seemed to prefer the bread crumbs.

The bird was first caught on the morning of May 17. His mate (?) was attempting to employ my pull-string to use in her nest, which was being constructed near by, and so jerked the trap down when Mr. Cathbird was feeding. He was released, seemingly unperturbed, with band No. A136809. The same bird entered the trap twice later in the day and both times was captured. The bird at all times seemed very nonchalant and when released immediately made off. The next day he was caught again, together with another Cathbird, presumably his mate, and the one who was responsible for his capture the day before. She was given band No. A136811. Bird A136809 made his last appearance on May 20 when his mate (?) was again responsible for his capture in the same way as when first caught. Bird A136811 put in an appearance at the same trap a day later and was very frightened upon release. Perhaps a reason for the frequent captures of A136809 and a few other Catbirds at other times was the fact that immediately upon capturing a heavy robe was spread over the trap, shutting out all light and thus keeping the birds from excitement and fluttering. The fact that this was not possible when A136811 was caught the second time may have accounted for her fear. The question is, are Catbirds more than other species apt to be less excitable and consequently more likely to reappear at the trap?—Ben K. Polk, Des Moines, Iowa.

An Interesting Green Heron Colony.—On June 9, 1929, Mr. E. L. Jacobs and I visited a small pond about seven miles southeast of Vicksburg, Michigan. This pond, with an area of about a half acre, is nearly surrounded by two high hills and at that time contained about eighteen inches of water. The north half has grown up to a thick mass of button bush eight to ten feet high. As we approached the pond two Green Herons (Butorides virgates virgates) flew from the bushes. Having our boots we waded through this thick mass of tangled brush, and to our surprise found twelve nests of this heron, containing altogether thirty-two eggs and thirteen young. I banded one young, the others being too small.

We decided to visit this place again in two weeks, and on June 23 we did so, and banded twenty-one young which included all the young birds that were hatched, but there were more nests with eggs in them. Two weeks later, on July 7, we again visited the pond and banded fifteen more young and still found more nests with eggs. On July 21, I visited the place alone, as Mr. Jacobs was unable to accompany me. On this trip I banded nineteen young and there were three more nests containing a total of eleven eggs. Much to our regret neither of us was able to visit the place again before the young left.

We banded a total of fifty-six young, and on my visit of July 21 the bushes were alive with young banded birds. This was the largest and most interesting colony of Green Herons it has ever been my privilege to observe. We never saw more than five adult birds near this pond at any one time, so no doubt each pair raised two or more broods in a season.

We also found several nests of the Mourning Dove, Red-winged Blackbird, Bronzed Grackle, and one place where a Sora had nested, a single infertile egg still remaining in the nest.—F. W. Rapp, Vicksburg, Michigan.
An Unusual Nest of the Ruddy Duck in Montana.—On July 2, 1930, while checking up on the condition of about thirty nests previously found at Barnaby Lake, near Fortine, Montana, my brother and I were surprised to find nineteen eggs of the Ruddy Duck (*Erismatura jamaicensis*) in a nest described in my notes under date of June 15 as a newly-constructed, empty Coot nest. Held in place by a heavy growth of reeds in three feet of water, and built of reed stalks, the nest was very similar in shape, size, and construction to twenty-one Coot nests on the lake, and differed markedly from a nearby Ruddy Duck nest, in which ten eggs composed a complement. As only eighteen days, including both days of our visit, had elapsed since the nest had been empty, evidently more than one Ruddy Duck had contributed to this set of nineteen eggs in a nest presumably built by Coots.

The cup of the nest was seven inches in diameter at the rim, allowing room for a top layer of only ten of the typically large Ruddy Duck eggs. Eight eggs beneath these, where the diameter of the cavity was much less, formed, roughly, two more layers. Below these, one egg, pressed deep into the wet base of the nest, was half submerged in the warm water. Only by removing every one from the nest could the exact number of eggs be ascertained. After raising the bottom of the nest above water level by adding pieces of reeds, we replaced the eggs in the necessary three layers. But we agreed that it would be impossible for a duck to turn more than the top ten or twelve eggs without rolling some of them over the rim of the nest into the lake; and that the lowermost eggs would surely not hatch.

While at the lake on August 24, however, I saw nineteen young Ruddy Ducks, of uniform size, appearing to be about one-third grown, swimming in a group with one adult female. Because of the lowered level of the water, I was unable with a raft to reach the nest that had contained nineteen eggs, and could not be positive that it had produced the young ducks now seen swimming. But as the other four broods of young of this species observed at the lake during the season were all on the water before July 2, it seems quite certain that the deep-piled nineteen eggs laid by at least two Ruddy Ducks in a Coot nest were successfully hatched.—WINTON WEYDEMeyer, Fortine, Montana.

Some 1929 Bird Notes from the Chicago Region.—The artificial lake in the Mt. Forest preserve near Willow Springs is becoming a regularly established stopping place for waterfowl. On April 27, 1929, a flock of about thirty Double-crested Cormorants were on the lake, and were seen on several previous and subsequent visits. Other birds seen were loons, gulls, mergansers, and ducks of several species. Even an Osprey was seen on one visit. Until the making of this lake, cormorants were few and far between in the Chicago region.

An amusing instance of the fearlessness toward man on the part of some birds came to the writer's observation this year. On the morning of April 28 a Flicker was seen to chisel away vigorously at a small, three-foot-high poplar stump. The stump is only about ten feet away from the steps to the rear porch of the writer's home. For the next three or four days the bird made the chips fly in a most energetic manner, until the cavity in the stump seemed to reach down almost to the level of the ground. Later the young could be heard producing their characteristic noise, like a swarm of bees, particularly when one tapped on the rim at the entrance of the cavity. On May 28 they left the nest. No time lost there!
Of late years, the writer has repeatedly seen Pine Siskins in May. This year a flock of about fifteen were seen on the 8th near his home in River Forest. This may indicate a nesting place nearer to Chicago than has hitherto seemed possible. Thus, George Miksch Sutton, state ornithologist of Pennsylvania, has found a large nesting colony in an extensive piece of swampy woods in his state, after he had for years discounted such a possibility when he saw the Siskins there.

For the first time in twenty years' residence near Chicago, on May 14, the writer saw a Clay-colored Sparrow. As this species breeds commonly in northern Wisconsin, it should be a more or less regular migrant near Chicago. The chances are that it is of more frequent occurrence than is generally believed. It is a small, secretive, inconspicuous bird, of much the same size and appearance as the Chipping Sparrow but can, by the aid of a good glass, be told from the latter species by the triangular brown spot on the cheek. Another one was seen by Mr. S. Gregory, in his yard in Winnetka. This may merely be an unusual occurrence, or it may indicate a partial shifting of migration route, as seems to be true of Harris's Sparrow.

On May 18, the writer saw a Mockingbird at Mud Lake, near Lyons, where one was seen several times in successive years. I suspect that there is a pair resident in this very suitable spot.

On November 14, a Snowy Owl was shot some distance within the city limits of Chicago.—C. W. G. Kifher, River Forest, Illinois.

An Ohio Record for the European Teal.—Among the numerous duck skins in the bird collection of the late W. F. Henninger, which was recently acquired by the Ohio State Museum, is a male European Teal (Nettion crecca) collected by Mr. Henninger on March 18, 1910, at New Bremen, Ohio. The specimen is labeled "Nettion carolinensis, Green-winged Teal." This is apparently the bird referred to by Henninger in the Wilson Bulletin, Vol. XXIII, p. 61, 1911, the incorrect identification arising from the close resemblance of the European and American species. The "make" of the skin is like that of other small ducks in the same collection and is quite typical of Henninger's work. Upon comparison with European specimens of N. crecca this bird is seen to be unquestionably of that species, lacking the white crescent before the wing and having the long scapulars largely white, not vermiculated as in N. carolinensis. No other instance of the occurrence of this teal in Ohio is known to the writer and a cursory search reveals but one additional record for the interior of the United States, that given by Eaton on p. 191 of the "Birds of New York," for Cayuga Lake. As has been suggested by Mr. Forbush in "The Birds of Massachusetts and Other New England States," the apparent degree of rarity of this bird in America may be due in part to its similarity to the common Green-winged Teal.—Charles F. Walker, Ohio State Museum, Columbus, Ohio.

Some Warbler Records at Sioux City, Iowa.—The spring migration flights of the numerous small warblers may vary a few days, from one year to the next, but as a rule the birds can be looked for on or about the same time every year. The spring of 1930 seemed to be an exception, however, and showed what a real early spring will do in changing migration dates of many of our birds. Some species arrived four or five days ahead of their regular arrival dates, and some
even ten days earlier than usual. This spring marked the early coming of some of the swallows, vireos, and several species of warblers. Another thing particularly noticed was the fact that certain other species did not come on this early wave and came instead on about their usual arrival dates. The Black and White Warbler, the two water-thrushes, and others come under this latter group.

The Blackburnian Warbler and the Chestnut-sided Warbler were not in evidence the last two years, but to offset this we can add the Blue-winged Warbler, Cape May Warbler, and Prothonotary Warbler as rare migrants. The species listed in this report are records from Sioux City and the immediate vicinity, including Union County, South Dakota, and Dakota County, Nebraska.

Black and White Warbler (*Mniotilta varia*). A common migrant during the past five seasons. On August 11, 1930, the writer saw three young Black and White Warblers which were probably reared near Sioux City.

Prothonotary Warbler (*Protonotaria citrea*). One of our rarest migrating warblers. One record on May 11, 1929, at Mud Lake, Union County, South Dakota. This singing male bird was watched by many members of the Iowa Ornithologists’ Union and the Nebraska Ornithologists’ Union, who were having a joint field trip on this date.

Blue-winged Warbler (*Vermivora pinus*). A very uncommon migrant. On April 30, 1930, I heard a warbler song unfamiliar to me and following it up found a Blue-winged Warbler. The bird allowed fairly close approach and was watched with 10x glasses for nearly thirty minutes.

Nashville Warbler (*Vermivora ruficapilla ruficapilla*). This little warbler is a regular migrant, but can hardly be considered a common one.

Orange-crowned Warbler (*Vermivora celata*). A very common migrant in both spring and fall. The first bird was seen on April 30, 1930, and is usually with us until about May 20. Found in the fall as late as October 16.

Tennessee Warbler (*Vermivora peregrina*). This common migrant arrived on May 5, 1930, and appeared to be even more common than during the four preceding seasons. From the date of arrival this year, until past mid-May, an observer in the field would often see and hear fifty to seventy-five of these warblers in a short walk.

Cape May Warbler (*Dendroica tigrina*). I have only found this bird on one day, May 9, 1930. On this day two Cape May Warblers were seen in Floyd Cemetery and a lone bird was noticed in the Toothaker Orchards.

Yellow Warbler (*Dendroica aestiva aestiva*). An abundant summer resident. It usually departs early, but it is often found here in the fall, viz., September 16, 1929.

Myrtle Warbler (*Dendroica coronata*). This common migrant arrives ahead of all the other warblers and lingers the latest in the fall. The earliest spring arrival is April 14, 1927, and the last fall record is October 30, 1929.

Magnolia Warbler (*Dendroica magnolia*). Not a very plentiful migrant, but is observed most years.

Chestnut-sided Warbler (*Dendroica pensylvanica*). Evidently an erratic bird of passage through this territory. The writer’s only record is May 15, 1928, when several of these trim little warblers were found near Half Moon Lake, Sioux City.
Black-poll Warbler (*Dendroica striata*). The thin wiry song of the Black-poll Warbler is a common sound in our woods during the latter part of May. The ordinary date of arrival is about the middle of the month, but this year the first birds came on May 5.

Blackburnian Warbler (*Dendroica fusca*). This beautifully colored warbler is also in the class with the Chestnut-sided Warbler. Two male birds were watched with some interest on May 16, 1928.

Palm Warbler (*Dendroica palmarum*). An interesting species, which is not an especially common or regular migrant. Several singing birds were heard and seen during the second week of May, 1930. Occasionally found passing through in October.

Ovenbird (*Seiurus aurocapillus*). A common migrant, with the earliest spring arrival on May 1, 1928. In June, 1930, and again in July, the writer observed Ovenbirds in a certain wooded ravine east of Sioux City, and from their actions it was concluded that the birds were probably breeding here.

Grinnell's Water-thrush (*Seiurus noveboracensis notabilis*). Found as a very regular migrant in the spring, but is not seen as often in the fall. Once in a while the hiker will be treated to the fine clear song of this bird, singing from the underbrush near the water’s edge.

Louisiana Water-thrush (*Seiurus motacilla*). This water-thrush is also a regular migrant every spring. I think that a season or two of intensive collecting is necessary, however, to determine which species is really the common migrant through this region.

Mourning Warbler (*Oporornis philadelphia*). A late-comer among the throng of warbler visitors, which is also at times found in song. On May 20, 1930, I found one lone bird of this species. Two days later the woods seemed full of Mourning Warblers, several of which were singing, and I counted no less than forty-five in a walk of two or three miles.

Maryland Yellow-throat (*Geothlypis trichas trichas*). This familiar ground-loving warbler is heard on all sides during the summer time. The yellowthroat is another of the warblers which has a habit of staying late in the fall; viz., October 10, 1930.

Yellow-breasted Chat (*Icteria virens virens*). Not found as a common summer resident. Two chats were heard by Dr. T. C. Stephens and the writer on May 13, 1928, near Homer, Dakota County, Nebraska. Mr. Walter W. Bennett found several nests of the chat near McCook Lake, Union County, South Dakota, during the summer of 1929.

Wilson’s Warbler (*Wilsonia pusilla pusilla*). A regular spring migrant, also found sometimes in the fall. Wilson’s Warblers were apparently more common in 1929, when upwards of twenty-five birds were seen on a field trip. While in 1930 the largest number seen was four birds, on May 13, on this last date two of the warblers were heard singing.

American Redstart (*Setophaga ruticilla*). A regular migrant and not uncommon summer resident. On August 12, 1929, and on August 11, 1930, the writer saw young birds with adults on the Iowa bank of the Big Sioux River.—William Youngworth, Sioux City, Iowa.
The Seventeenth Annual Meeting of the Wilson Ornithological Club was held at Cleveland, Ohio, on December 29 and 30, 1930, in connection with the general sessions of the American Association for the Advancement of Science. The Cleveland Bird Club acted as host to the Wilson Club on this occasion and helped to make the meeting a success by their splendid hospitality. The W.O.C. had the pleasure of having many of the members of the Inland Bird Banding Association present at its meetings. The Tuesday afternoon (December 30) session was held in cooperation with the Cleveland Bird Club and the Inland Bird Banding Association. The headquarters of the Wilson Club was at the Hollenden Hotel, while the business and program sessions were held in room 32, Clark Hall, College for Women, Western Reserve University. The Annual Dinner was held on Tuesday evening, December 30, at the Hollenden Hotel.

Business Sessions

The business sessions were held on Monday and Tuesday mornings from 9:00 to 10:00 a.m. and at 5:00 p.m. on Tuesday.

The Monday morning business meeting was of the usual type. The minutes of the previous meeting were approved without being read since they had previously been published in the Wilson Bulletin (Vol. 42, No. 1, pages 68-73). The Editor reported briefly on the Wilson Bulletin of the past year and on prospects for 1931. The Secretary's report indicated a flourishing condition of the Club with a total of 775 paid up members and 54 members delinquent for 1930 dues. These last will be dropped from the rolls unless their dues are paid shortly. All of the new members secured during the year and temporarily elected by the Electoral Board were approved. The Treasurer's report was read by the Secretary, in the absence of the Treasurer, and referred to the Auditing Committee for consideration. The temporary committees appointed at this time were: the Committee on Nominations, the Committee on Resolutions, and the Auditing Committee.

At the Tuesday morning meeting, all committees except the Committee on Nominations reported.

The Auditing Committee was composed of A. F. Ganier and Josselyn Van Tyne. The chairman, A. F. Ganier, reported that the Treasurer's records were found to be correct. They were then approved.

The Committee on Endowment was continued for another year with A. F. Ganier as chairman.

The Committee on Resolutions composed of Myron H. Swenk, Chairman, Mrs. H. J. Taylor, Charles J. Spiker, and T. C. Stephens presented an imposing array of resolutions approving such significant conservation problems as the establishment of a national park in the Everglades of Florida, the establishment of a national park in the American Samoan Islands, and the passage of the McNary-Haagen bill regulating the bag limit on game birds by Federal statute, and disapproving the bill now before Congress authorizing large appropriations to the Biological Survey for a ten year exterminative poisonous program against wild animals regarded as inimical to livestock. These measures are of such great importance to the conservation of our native birds and mammals as to arouse every
nature lover. Read the resolutions through carefully, and then write the Senators and Congressmen from your state at once.

The resolutions as passed are given below:

Whereas, The Wilson Ornithological Club, now in Seventeenth Annual Meeting assembled at Cleveland, Ohio, December 29 and 30, 1930, is a national organization of several hundred ornithologists and bird lovers who are deeply interested in the proper protection, preservation, and conservation of native wild life everywhere, and especially in the United States and its possessions, and

Whereas, There is now before the Congress of the United States legislation proposing the establishment in the Everglades of Florida of a national reservation to be known as the Tropic Everglades National Park, for the permanent preservation of the wild character of this region, and its fauna and flora which are in many ways unique; therefore be it

Resolved, That we favor the acquiring by the United States of sufficient suitable lands in the Florida Everglades to enable the establishment of a National Park, to be administered by the Federal Government in such a manner as to make certain the full preservation of the primitive character of the area and to afford permanently complete protection to its indigenous bird and other animal life, and to its plant life.

Whereas, The Government of the United States has recently formally accepted a group of the Samoan Islands which have long been governed by the United States Navy, and is now studying the problem of the future administration of these islands, and

Whereas, Any commercial exploitation of these islands would likely be ruinous to their native fauna and flora, including the native Samoan race, and such exploitation is always a possibility unless provided against, therefore be it

Resolved, That we hereby endorse the proposal to make the American Samoan Islands a National Park, to be administered by the Park Service of the United States.

Whereas, There is now before the Congress of the United States a bill (S. 3483; H. R. 9599) authorizing large appropriations to the Biological Survey of the United States Department of Agriculture for the purpose of carrying out on a large scale a ten-year exterminative poisoning program directed against native wild mammals regarded as inimical to the livestock interests, and

Whereas, Such extended and extensive poisoning campaigns involving the persistent and widespread distribution of poisons are very destructive to valuable wild life, especially the smaller native carnivores and fur-bearers, as has otherwise been fully presented to the members of Congress; therefore be it

Resolved, That we express our opposition to this program and respectfully urge our representatives in Congress to likewise oppose this measure.

Whereas, We believe in the principles of shorter open seasons, closed seasons, reduction of bag limits, sanctuaries and refuges for the conservation of game birds, though recognizing that no one of these is a panacea, and

Whereas, We believe that regulation of the bag limit by Federal Statute is a more effective safeguard for the birds than are annual regulations at the discretion of the Department of Agriculture; therefore be it

Resolved, That we favor the passage of the McNary-Haugen bill (S. 2015; H. R. 5278) which provides for the reduction of the bag limit by Federal statute.
The new constitution was taken from the table and read by Myron H. Swenk who pointed out some errors in the mimeographed copy sent to the members October 28 by the Secretary. The new constitution was considered at the last annual meeting at Des Moines and tabled according to the method prescribed by the old constitution. After the reading, the new constitution was unanimously adopted. The new constitution as adopted is printed beyond.

The Secretary was instructed to send the greetings of the W. O. C. to three of the honorary members of the club who were unable to be present, viz., to Miss Althea R. Sherman, Mr. Otto Widman, and Dr. L. Otley Pindar.

The report of the Library Committee was presented by T. C. Stephens, and included the agreement which had been negotiated with the Museum of Zoology of the University of Michigan. This agreement was ratified and adopted, and our officers were authorized to sign it. The vacancy in this Committee caused by the resignation of Mr. Pellett was not filled at this time. (The report of the Committee and the agreement are printed farther along in the proceedings).

On motion of T. C. Stephens, the Secretary was authorized to draw on the Treasurer for an amount not to exceed one hundred dollars for stenographic assistance in the membership campaign during the next year.

At the Tuesday afternoon business meeting, Lynds Jones reported for the Committee on Nominations. This committee was composed of Lynds Jones, Chairman, William I. Lyon, and J. Paul Visscher. The report of this committee was adopted and the following officers were unanimously elected:

Vice-President: George M. Sutton, Bethany, West Virginia.
Secretary: Jesse M. Shaver, George Peabody College for Teachers, Nashville, Tennessee.
Treasurer: W. M. Rosene, Ogden, Iowa.
Councillors:
Lynds Jones, Oberlin College, Oberlin, Ohio.
A. F. Ganier, Nashville, Tennessee.
Mrs. Margaret M. Niee, Columbus, Ohio.
Myron H. Swenk, University of Nebraska, Lincoln, Nebraska.
Clarence Bretsch, Gary, Indiana.

Officers and Councillors were nominated and elected under the old constitution under the assumption that the new constitution would not go into effect until after this annual meeting, since this meeting began under the old constitution.

Social Features

The social features of the Cleveland meeting were unusually pleasant and enjoyable. The annual banquet was held at the Hollenden Hotel, Tuesday evening, with the Inland Bird Banding Association. Our host, the Cleveland Bird Club, had planned an unusually attractive menu and program for this occasion. This part of the meeting was probably one of the most satisfactory that the Club has ever had. C. M. Finfrock was toastmaster. President Stack spoke briefly as also did Mr. Lyon. Then the speaker of the evening, Dr. H. C. Oberholser, of the United States Biological Survey, addressed the group on "The Present Status of American Waterfowl."
For the unusual success of the banquet, the Wilson Ornithological Club is deeply indebted to Mr. Herbert W. Brandt, Mr. S. Prentiss Baldwin, and their able assistants. Ninety-eight people were counted at the dinner.

Monday evening the Club was hospitably entertained at the beautiful home of Mr. and Mrs. Herbert W. Brandt. The occasion was very delightful and much enjoyed by the large group present. Mr. Brandt’s fine library and his large collection of eggs were exhibited to the guests. The size of this collection, practically all personally taken, and the excellent technique used in preparation excited general admiration.

At noon on both Monday and Tuesday, the members had the pleasure of lunching together in Haydn Hall; thus renewing friendships and making new acquaintances.

**Exhibits**

A recent portrait of Professor Francis Hobart Herrick, painted by William Edmondson of Cleveland, was exhibited on Monday afternoon in the “Browsing Room” of Clark Hall.

One of the most interesting features of the meeting was a display of bird paintings by Mr. Walter A. Weber, of the Field Museum of Natural History, Chicago. Seventeen of these paintings are to illustrate the report on the Crane Pacific Expedition, as follows: Cocos Island Cuckoo, Graceful Trogan (Panama), Galapagos Penguins, Solomon Island Red Lory, New Hebrides Wood Rail, Blue-winged Fruit Pigeon, Racquet-tailed Kingfisher, Kingbird of Paradise, Cassowary (a head study), Celebes Wood Kingfisher, Celebes Hornbill, New Guinea Cuscus (a mammal), Giant Skink (a lizard from Solomon Islands), Striped Trigger Fish, Blue-spotted Puffer, Golden Butterfly Fish, Achilles Surgeon Fish. Eighteen of the plates designed to illustrate Dr. Roberts’ forthcoming work on the birds of Minnesota were also shown, as follows: Snow Buntings and Longspurs, Baltimore and Orchard Orioles, Spizella group (Field, Tree, and Clay-colored Sparrows), Purple Finch, Pine Grosbeak, and Redpolls, Fox Sparrow, Towhees, and Swamp Sparrows, Juncos and English Sparrows, Cross-bills and Evening Grosbeak. Red-tailed Hawk, American Bittern, Prairie Falcon, Swainson’s Hawk, Ring-necked Pheasant, Alpine Bluejay, European Starling, Young Duck Hawk, Snowy Owl. Short-eared Owl, Sharp-tailed Grouse. Mr. Weber’s work was a surprise to many of the people present, but all conceded that he is a rising artist of the first rank.

The Cleveland Museum of Natural History opened its study collection of birds to the Wilson Ornithological Club on Wednesday, December 31.

A very profitable demonstration of the scientific apparatus used by the Baldwin Bird Research Laboratory at Gates Mills was arranged by Mr. S. Prentiss Baldwin in room 207 of the Medical School Building on Monday, Tuesday, and Wednesday. These instruments were demonstrated:

*The Itograph*. This is an instrument devised by Mr. Baldwin, which records each visit of a bird to the perch of the nest box to which it is attached, and even indicates whether the bird went in and touched the inner perch and when it came out. One form of the itograph was run by a clock and thus was portable. Another form was not portable because the recording mechanism was run by a motor connected with commercial current. This latter had seven different pens recording on the same paper at the same time. Each pen was connected by electric current to some nest.
Fig. 12. W. O. C. group at Cleveland, 1930.
The Potentiometer. This hand-operated instrument has been used with a thermo-couple for measuring temperature. The instrument now in use is accurate to one-twentieth degree, Fahrenheit.

The Recording Potentiometer. This is a Leeds and Northrup instrument of the usual type here adapted for recording temperatures with thermo-couples. Wires are run out to any nearby nest. If there happens to be eggs, a thermo-couple wire is run from one side of the box through the nest just above the eggs and out the other side. The mother bird enters the box and settles down on the eggs, thus warming them up. Every time the mother sits in such a nest, she changes the temperature of the thermo-couple and therefore the record made by the potentiometer. In this way a continuous day and night record may be secured.

Apparatus for Recording the Heart Beat of a Bird. This consists of a box containing a perch connected with a microphone of piezo-electric crystals of Rochelle salts. The heart beat of the bird is transmitted through its slender legs to the perch. A loud speaker amplifies the beat to any desired strength. This crystal perch may also be used without the box. It may be placed near the bird's nest and a record secured of the heart beat as the bird alights after flight or emerges from the nest rested.

The Micro-movie. The micro-movie built by Dr. Bradley Patton of the School of Medicine of Western Reserve University in cooperation with Mr. Baldwin was demonstrated.

Register of Attendance at the Cleveland Meeting


Boston; Leonard G. Worley, Cambridge. From MICHIGAN: Ephraim B. Boldyreff, Sanitarium, Battle Creek; Mary Ella Bennett, Ann Arbor; Edward M. Brigham, Jr., Museum of Natural History, Battle Creek. R. O. Gosden, Ypsilanti; Theodosia Hadley, Kalamazoo; T. L. Hankinson, Ypsilanti; Harry W. Hann, Ann Arbor; Peter Okkelburg, Ann Arbor; M. D. Pirnie, State Department of Conservation, East Lansing; W. M. Raglin, Ypsilanti; H. D. Ruhl, East Lansing; Katherine Sprague, Farmington; J. W. Stack, East Lansing: W. Bryant Tyrrell, Birmingham: Josselyn Van Tyne, Museum of Zoology, Ann Arbor; Mrs. Etta S. Wilson, Detroit. From MINNESOTA: Almeda Anderson and Leslie Bevoven, of the University of Minnesota, Minneapolis. From MISSOURI: Dorothy S. Bayer, H. G. Da Costa, Mr. and Mrs. A. F. Satterthwait, all of Webster Groves; C. D. Day, Westminster College, Fulton. From NEBRASKA: Myron H. Swenk, University of Nebraska. From NEW YORK: Carol Cady and Jean Cady, New York City; P. J. Chapman, Agricultural Experimental Station, Geneva; E. H. Eaton, Geneva; R. N. Johnson, Normal School, Oneonta; C. V. Knipper, Medina. Marjorie Ruth Ross, Ithaca; James Savage, Buffalo; Albert H. Shadle, Buffalo. From CLEVELAND, Ohio: John W. Aldrich, Mrs. Hella M. Antisdelar, S. Prentiss Baldwin, Mrs. T. P. Bateman, Mrs. H. S. Benedict, Mrs. A. R. Boethelt, Herbert W. Brandt, Chester K. Brooks, Mabel E. Chapman, Mrs. M. E. Crane, R. M. Deering, Jessie Duff, George H. Dury, C. M. Finfrock, Mr. and Mrs. Arthur B. Fuller, Mrs. N. L. Hakbell, Frances Herrick, Ruth A. Hubbard, Russel A. Joly, H. S. Jones, Mr. and Mrs. S. Charles Kendeigh, M. McNab, Mrs. A. B. Marshall, Louise Klein Miller, Margaret E. Morse, Mrs. James H. Murphy, N. A. Neal, Miss A. Parker, Mrs. Harry D. Potter, Mildred E. Reeve, F. A. Simpson, J. Stevenson, S. H. Taylor, Dorothy A. Trent, William G. Vinal, J. Paul Visscher, Grace Y. Visscher, Marideen Visscher, I. R. Watt. From OHIO outside of CLEVELAND: Ethel Atkinson, Toledo: Robert L. Baird, Oberlin; Mr. and Mrs. B. J. Blincoe, Dayton; Florence E. Clippayes, Dayton; Leila A. Compton, Wooster; G. M. Cook, Youngstown; Mr. and Mrs. W. M. Dawley, Lakewood: Emma R. Ehilar, Bay Village; Betty Francis, Kent; R. M. Geist, Columbus: Mrs. W. W. Godard, Lakewood: W. B. Goddard, Canton; Ethel Gunns, Kent: Lawrence E. Hicks, Division of Conservation, Columbus; E. C. Hoffman, Lakewood; H. C. Jones, Oberlin; Dr. and Mrs. Lynds Jones, Oberlin; Emerson Kemises, Lakewood; Gerald L. Koffel, Louisville; Margaret McCloud, Columbus; E. O. Mellinger, North Lima; Lyle Miller, Shariine; E. L. Moseley, Ohio State College, Bowling Green; Dr. and Mrs. L. B. Nice, Columbus; F. M. Phelps, Elyria; Vilma Rottenstein, Toledo; M. T. Royer, Beren. James Stevenson, Gates Mill; Paul A. Stewart, Leetonia; Tony B. Strabala, Leetonia; Arthur Stuyska, Columbus; Reta Swain, Dayton. From OKLAHOMA: R. D. Bird, University of Oklahoma, Norman. From PENNSYLVANIA: Norman W. McClintock, Pittsburgh; George J. Free, State College; George R. Green, State College; Helen F. Hill, Uniontown; Charles E. Mohr and John S. Mohr, both of Bucknell University, Lewisburg; W. E. Clyde Todd, Carnegie Museum, Pittsburgh. From TENNESSEE: G. M. Bentely, T. G. Hopkins, and Edwin B. Powers, all from the University of Tennessee, Knoxville: John T. McGill and George R. Mayfield from Vanderbilt University, Nashville: A. F. Ganier, Nashville; Jesse M. Shaver, George Peabody College for Teachers, Nashville. From VIRGINIA: Ruskin S. Freer, Lynchburg; Florence Hague, Sweet Briar; Lena B. Henderson, Lynchburg. From VERMONT: Paul A. Moody, Burlington. From WEST VIRGINIA: Maurice Brooks, French Creek; A. B. Brooks, Wheeling. From WISCONSIN: L. J. Cole,
University of Wisconsin, Madison; Margarette E. Morse, Viroqua; Louise Pollitz, Oshkosh.

SUMMARY OF ATTENDANCE: California, 1; Connecticut, 1; Delaware, 1; District of Columbia, 5; Illinois, 10; Indiana, 2; Iowa, 6; Kansas, 1; Massachusetts, 2; Minnesota, 2; Missouri, 5; Nebraska, 1; New York, 9; Oklahoma, 1; Pennsylvania, 7; Tennessee, 7; Virginia, 3; Vermont, 1; West Virginia, 2; Wisconsin, 3; Ohio (outside of Cleveland), 36; Cleveland, 41. Total attendance, 163. Total outside of Cleveland, 122. Number at Dinner, 98.

REPORT OF THE SECRETARY FOR 1930*

Nashville, Tennessee, December 29, 1930.

To the Officers and Members of the Wilson Ornithological Club:

During the past year, a very intensive campaign for new members has been conducted by the Secretary. In this campaign, he was ably assisted by a local membership committee composed of Vera Kearby, Compton Crook, and H. C. Monk. The membership as a whole rendered valiant service in sending in nominations. The Club is especially indebted to W. B. Taber, Jr. and to Miss Marjorie Ruth Ross for their activity in this and other respects.

This campaign was reasonably successful, a total of 241 new members being added to our rolls as follows: sustaining, 9; active, 35; associate, 197. These new members are distributed through 37 states and 7 foreign countries: Alabama, 1; Arkansas, 1; California, 14; Colorado, 3; Connecticut, 2; Delaware, 1; Florida, 2; Georgia, 4; Illinois, 15; Indiana, 6; Iowa, 27; Kansas, 6; Kentucky, 3; Louisiana, 1; Maine, 1; Massachusetts, 8; Michigan, 14; Minnesota, 3; Mississippi, 2; Montana, 1; Missouri, 9; Nebraska, 9; New Jersey, 3; New York, 22; North Carolina, 7; North Dakota, 4; Ohio, 14; Oklahoma, 1; Oregon, 2; Pennsylvania, 13; South Carolina, 1; South Dakota, 3; Tennessee, 15; Texas, 4; Virginia, 6; Wisconsin, 3; Wyoming, 1; Canada, 6; Australia, 2; Denmark, 1; Germany, 1; Holland, 1; Ireland, 1; Mexico, 1. The results of the campaign for new members showed itself in increasing the number of subscribers as well as members as was shown in the Editor's report.

In spite of the large number of new members obtained this year, the Wilson Ornithological Club has only a few more total members this year than last due to an unusually large number of resignations and delinquencies and the further fact that some members were listed on the Secretary's roll that had paid no dues since 1927. These last have all been discovered this year through a careful system of checking by the Treasurer, Editor, and Secretary so that the present roll includes only actually paid members. The total number of members lost by the causes mentioned above during the year of 1930 were: sustaining, 2; active, 26; associate, 60; total, 88. In addition, 9 members were lost by death as follows: honorary, 1; sustaining, 1; active, 5; associate, 2. Thus there has been a total loss of 97 members.

This leaves the present membership of the Club at 775, distributed as follows: honorary, 7; life, 5; sustaining, 58; active, 227. associate, 479.

Respectfully yours,

JESSE M. SHaver, Secretary.

*Corrected to the end of December, 1930.
REPORT OF THE TREASURER FOR 1930
December 30, 1929 to December 19, 1930

Ogden, Iowa, December 19, 1930.

Receipts for 1930

Cash from former Treasurer, J. W. Stack .................................................. $ 530.30

1 Associate member for 1929 ................................................................. $ 1.50
424 Associate members for 1930 ............................................................. 636.00
52 Associate members for 1931 ............................................................... 78.00
3 Active members for 1929 ................................................................. 7.50
224 Active members for 1930 ............................................................... 560.00
11 Active members for 1931 ................................................................. 27.50
1 Active member for 1932 ................................................................. 2.50
59 Sustaining members for 1930 ............................................................. 295.00
1 Sustaining member for 1931 ............................................................... 5.00

Total receipts ................................................................. $ 1,613.00

90 Subscribers for 1930 ........................................................................ $ 135.00
20 Subscribers for 1931 ......................................................................... 30.00
2 Subscribers for 1932 ........................................................................ 3.00
1 Subscriber for 1933 ........................................................................ 1.50
2 Active subscribers for 1930 ............................................................... 5.00
Total short-time subscriptions ................................................................. 7.85
Total foreign subscriptions ..................................................................... 8.25

From advertising ................................................................................ $ 10.00
Contributions to color plate fund .......................................................... 7.00
For publication fund from Miss Sherman ............................................. 35.00
For publication fund from Mr. Fargo .................................................... 30.00
Various small gifts ............................................................................... 1.55
Sale of Bulletins .................................................................................. 34.35

Total ............................................................................................... $ 2,451.80
**Disbursements for 1930**

<table>
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<tr>
<th>Description</th>
<th>Amount</th>
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<tr>
<td>Printing four issues, Wilson Bulletin</td>
<td>$1,150.40</td>
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<tr>
<td>Share of cost of color plate, June Bulletin</td>
<td>93.00</td>
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<tr>
<td>Halftones and zines</td>
<td>128.77</td>
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<tr>
<td>Addressing envelopes for Bulletin</td>
<td>16.13</td>
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<tr>
<td>Mailing expense for 1929</td>
<td>41.12</td>
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<tr>
<td>Mailing envelopes, and miscellaneous</td>
<td>30.35</td>
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<tr>
<td>Cost of publication</td>
<td>$1,459.77</td>
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<td>Expense in Secretary’s office</td>
<td>237.14</td>
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<tr>
<td>Expense in Treasurer’s office</td>
<td>38.50</td>
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<tr>
<td>Expense in President’s office</td>
<td>5.13</td>
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<tr>
<td>Printing, telegrams, express, etc.</td>
<td>27.21</td>
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<tr>
<td>Refunds</td>
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<tr>
<td><strong>Total expense</strong></td>
<td>$1,776.65</td>
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<td><strong>Balance on hand December 19, 1930</strong></td>
<td>675.15</td>
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<tr>
<td><strong>Total</strong></td>
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**Endowment Fund**

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<tr>
<td>From former Treasurer, January 4, 1930</td>
<td>$732.32</td>
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<tr>
<td>Life membership of Wm. I. Lyon</td>
<td>100.00</td>
</tr>
<tr>
<td>To complete life membership of Dr. A. C. Taylor</td>
<td>25.00</td>
</tr>
<tr>
<td>Interest at 4 per cent</td>
<td>31.03</td>
</tr>
<tr>
<td><strong>Total on December 19, 1930</strong></td>
<td>$888.35</td>
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Respectfully submitted,

W. M. Rosene, Treasurer.
REPORT OF THE LIBRARY COMMITTEE

The project of a library for the Wilson Ornithological Club was first suggested by Mr. Frank C. Pellett. The proposal was made for Mr. Pellett at the Ann Arbor Meeting in 1928, and at that time the undersigned Committee was appointed to pursue the matter. After two years of study and negotiations the Committee presents the following definite program of action for consideration at the Cleveland Meeting, 1930. (The Agreement, which was signed by the University of Michigan authorities prior to our Cleveland Meeting, and by the officers of the Wilson Ornithological Club after authorization at the Cleveland Meeting, is printed below as a part of this report.)

As the library grows by accretion it will increase in usefulness and importance. It will serve the members of the organization who do not have access to an adequate local library, and it will undoubtedly eventually be of service in the research work of the University. The original plan includes the establishment of one or two additional libraries of a similar, though possibly less technical, nature: one to be located somewhere in the south, and another, perhaps, west of the Mississippi River. Preliminary steps have been taken toward these additional libraries, but it was the Committee's policy to secure a culmination of the first one before taking active steps toward others.

The Ann Arbor library may now be looked upon as permanently established and ready for contributions. No purchases are contemplated. The library is to be built up by gifts and bequests of the members—either of books or of cash.

When one has spent many years of thoughtful effort in the selection and collection of a library in a special field, the time must come when the question of the disposition of such a collection takes hold of the mind. One is usually loath to think of the books being scattered. If they could only be held permanently intact, the efforts of the original owner would be thus, in a measure, perpetuated.

The Wilson Ornithological Club now solicits bequests of entire libraries of ornithological works; gifts of single, bound volumes: unbound volumes, reprints and separates in any way related to ornithology, ecology, exploration, or travel. Maps, both old and new, are likewise desired. Journals of explorers, such as Jonathan Carver, Lewis and Clark, Audubon, Henry, and all others, are of enormous value in a research library such as we are attempting to build. Biographies and bibliographies, both printed and manuscript, are wanted. The older volumes of various state geological and natural history surveys are wanted. All of the publications of the various state scientific societies and academies are wanted. We also solicit manuscript note-books, migration lists, and bibliographies of local, state, and continental scope. It is also part of the plan to establish a collection of photographs, including personal portraits (autographed, if possible), of ecological environments, birds, nests, eggs, habitats, etc. Negatives may also be desirable.

Every member of the Club may help make a nice beginning by contributing a full set of reprints of his publications to date. All such contributions may be addressed to the Library of the Wilson Ornithological Club, Museum of Zoology, University of Michigan, Ann Arbor, Michigan.

Respectfully,
T. C. STEPHENS,
FRANK C. PELLETT,
MYRON H. SWENK.
AGREEMENT BETWEEN THE WILSON ORNITHOLOGICAL CLUB AND THE MUSEUM OF ZOOLOGY OF THE UNIVERSITY OF MICHIGAN IN THE MATTER OF ESTABLISHING AN ORNITHOLOGICAL LIBRARY

This Agreement, made this 30th day of December, A. D. 1930, between the Wilson Ornithological Club, an Illinois Corporation, party of the first part, and the Museum of Zoology of the University of Michigan, party of the second part.

Witnesseth, as follows:

Whereas, the said parties are mutually desirous of creating a library, which shall be known and referred to as the “Research Library” of the Wilson Ornithological Club at Ann Arbor, Michigan, and;

Whereas, the parties hereto have agreed upon the method of creating, maintaining, and continuing such library:

Now Therefore, in consideration of the premises and of the mutual undertakings of the parties hereto, it is expressly understood and agreed:

1. At the present time this library shall be known and referred to as the “Research Library” of the Wilson Ornithological Club at Ann Arbor. But it shall be understood and agreed that the Wilson Ornithological Club may at any subsequent time alter and change the name, the present designation being considered as temporary.

2. In order to provide proper administration it is agreed that ownership of the Library shall be vested in the University of Michigan.

3. It is agreed that said Library shall remain as a distinct entity among the book collections and libraries of the University of Michigan, and shall be kept as such and housed in the Museum of Zoology unless otherwise agreed to by the high officers of the two institutions.

4. It is agreed that when a permanent name has been selected, an appropriate book plate will be furnished by the Wilson Ornithological Club; and in the meantime, a temporary book plate for identifying each item shall be devised and furnished by the same organization.

5. It is agreed that the said Library shall be available to the Staff of the Museum of Zoology and to the members of the Wilson Ornithological Club under certain proper rules and restrictions common to libraries and suited to the peculiar requirements of this case. It is further agreed that certain rare, costly, or bulky works may be withheld from circulation at the option of the Librarian in charge.

6. It is agreed that when items are loaned to non-resident members the Museum of Zoology will pay the transportation costs one way, the return charges to be borne by the borrower.

7. Since duplicate books are bound to accumulate over a period of years, it is agreed that the Museum Librarian will notify periodically, at least as often as once a year, the designated officials or representatives of the Wilson Ornithological Club, such as the Library Committee, of such duplicate material as may have accumulated, and the latter will be charged with the proper distribution or disposal of the same.
8. It is agreed that authors' separates and reprints shall be carefully filed as they are received, and as soon as practicable a system of cataloging will be devised and operated.

9. It is agreed that all books and items properly belonging in this Library shall be accessioned and catalogued promptly upon their receipt, and that as soon as practicable a catalogue (or list) of the items in the library shall be prepared by the Museum and published by the Wilson Ornithological Club for the information of its members.

10. It is agreed that the Wilson Ornithological Club will maintain a standing Committee on Library, or will from time to time appoint a special Committee on Library, whose duty shall be to cooperate and advise in the administration of the Library in such ways as may be permissible and needful.

11. It is agreed that the Museum will receive and store said stock of old Bulletins, cost of packing and transportation to Ann Arbor to be borne by the Wilson Ornithological Club. And further, that the Librarian of the Museum shall mail out copies from this reserve stock upon order from the authorized officer of the Wilson Ornithological Club, envelopes and postage to be furnished by the Wilson Ornithological Club.

12. This Agreement is subject to the approval of the Regents of the University of Michigan.

In Witness Whereof, the said parties have hereunto set their hands and seals the day and year first above written.

In the Presence of:

Dorothy M. Anderson.
T. C. Stephens.
Ruth A. Rouse.
Edith J. Smith.

Wilson Ornithological Club,
By J. W. Stack, President. (L.S.)
By Jesse M. Shaver, Secretary. (L.S.)

Museum of Zoology of the University of Michigan,
By Alexander G. Ruthven, Director. (L.S.)
By Frederick M. Gaige, Director, Museum of Zoology. (L.S.)
CONSTITUTION AND BY-LAWS OF THE WILSON ORNITHOLOGICAL CLUB
AS ADOPTED DECEMBER 29, 1930

CONSTITUTION

ARTICLE I

Name and Object

Section 1. This organization shall be known as the Wilson Ornithological Club.

Section 2. The object of this Club shall be to promote the study and advance the science of ornithology, and particularly of field ornithology, especially as related to the birds of the interior of North America, and to secure cooperation in measures tending to that end by uniting into a group such persons as are interested therein, by facilitating personal intercourse among them and by providing for the publication of information secured.

ARTICLE II

Membership

Section 1. The membership of this Club shall consist of six classes: associate members, active members, sustaining members, life members, patrons, and honorary members.

Section 2. Any person of good moral character in sympathy with the object of this Club may be nominated for membership. Nominations for membership must be made through the Secretary. Applications for membership must be endorsed by at least one member. Members are elected at the annual meeting by a majority of the voting members present. Nominations presented in the interim between annual meetings are elected by the Electoral Board subject to ratification at the next annual meeting.

Section 3. The annual dues of associate members shall be one dollar and fifty cents ($1.50). The annual dues of active members shall be two dollars and fifty cents ($2.50). Any member may become a sustaining member by making an annual payment of five dollars ($5.00). Any member may become a life member exempt from further dues by making a payment into the Endowment Fund of the Club of one hundred dollars ($100.00). Any person may become a patron exempt from further dues by making a payment into the Endowment Fund of the Club of one thousand dollars ($1,000.00) or more. Honorary membership may be conferred by the Club by a three-fourths vote at any annual meeting upon the unanimous recommendation of the Executive Council.

Section 4. All except associate members shall be entitled to hold office and to vote.

Section 5. All annual dues for the ensuing year shall be due on January 1. Any member in arrears for dues for one year shall be dropped from the roll of members, provided that two notices of delinquency, with an interval of two months between them, shall have been sent to such member.

ARTICLE III

Officers

Section 1. The officers of this Club shall be a President, two Vice-Presidents, a Secretary, a Treasurer, and an Editor. The duties of these officers shall be those usually pertaining to their respective offices.

Section 2. Officers shall be elected by ballot at the annual meeting by the voting members.
Section 3. Officers shall hold office for one year, or until their successors are elected, and shall be eligible for re-election. Their terms of office shall begin at the close of the meeting at which they are elected.

Section 4. The officers of the Club and three additional members, who shall be elected from its voting members by the Club, shall constitute an Executive Council. The business of the Club not otherwise provided for shall be in the hands of the Executive Council, which shall pass on any urgent matters that cannot be deferred until the next annual meeting. Five members of the Council shall constitute a quorum.

Section 5. The Electoral Board shall consist of the President, Secretary, Treasurer, and Editor.

Section 6. Vacancies in the staff of officers, occurring by death, resignation, or otherwise, may be filled by appointment of the Executive Council, but the person so appointed shall hold office only until the close of the next annual meeting of the club.

ARTICLE IV
Meetings

Section 1. An annual meeting shall be held at a time and place to be determined by the Executive Council. When the American Association for the Advancement of Science holds its annual meeting in the Mississippi Valley the annual meeting of the Club should preferably be held in conjunction with that meeting. Special meetings may be called by order of the Executive Council on a thirty-day previous notice, mailed to each member.

Section 2. Ten voting members shall constitute a quorum for the transaction of business.

ARTICLE V
Accounts

Section 1. A committee of two shall be appointed by the presiding officer at the beginning of each annual meeting, whose duty it shall be to audit the accounts of the Treasurer for the closing fiscal year.

ARTICLE VI
Amendments

Section 1. This constitution may be amended at any annual meeting by a two-thirds vote of the voting members present, provided the amendment has been proposed at the preceding annual meeting or has been recommended by a two-thirds vote of the Executive Council, and a copy has been sent to every voting member of the Club at least one month prior to the date of action.

ARTICLE VII
By-Laws

Section 1. By-laws may be adopted or repealed at any annual meeting by a majority vote of the voting members present.

BY-LAWS

1. Notice of all meetings of the Club shall be sent to all of the members at least one month in advance of the date of the meeting.

2. The time and place of the business meeting shall be published prior to the opening session of the annual meeting.
3. A program committee, of which the Secretary shall be chairman, and a local committee on arrangements for the annual meeting, shall be appointed by the President at least ninety days in advance of the date of the meeting.

4. Election of officers, except the Editor, shall be by ballot, but, by the unanimous consent of the members, the Secretary may cast one ballot, representing the unanimous vote of the members present. A nominating committee shall be appointed by the presiding officer at the first session of the new business meeting, which shall bring forward nominations of officers to serve the Club during the ensuing year. Nominations may, also, be made by any member in good standing from the floor.

5. A committee of three on resolutions shall be appointed by the President at the beginning of the annual meeting.

6. The accumulation and proper care of an Endowment Fund shall be provided for. An Endowment Fund Committee shall consist of three members appointed by the President, one member for one year, one for two years, and one for three years and at the expiration of each respective term aforesaid, a member shall be appointed for three years or until his successor shall be appointed; any vacancy in the Committee shall be filled likewise for the unexpired term of the member who has vacated. The President shall annually inform the Illinois Merchants Trust Company, as Trustee of the Endowment Fund, as to the personnel of the Committee.

7. The accumulation and proper care of one or more Wilson Ornithological Club Libraries shall be provided for. A Library Committee of three shall be elected in a manner similar to that in which the Endowment Committee is appointed, vacancies to have the unexpired term of the member filled by appointment by the President.

8. The Executive Council shall constitute a committee which shall have power to expel any person found unworthy of membership.

9. The Editor for the official organ shall be appointed by the Executive Council.

10. The official organ of the Club shall be the Wilson Bulletin.

11. Any member three months in arrears for dues shall be ineligible to vote or to hold an elective office in the Club, and the Wilson Bulletin shall not be sent such members until dues in arrears shall be paid.

12. The fiscal year of this Club shall be the calendar year.

13. The order of business at regular meetings shall be as follows:
   1. Calling the meeting to order by the President.
   2. Reading of the minutes of the previous meeting.
   3. Reports of officers.
   4. Appointment of temporary committees.
   5. Election of members.
   7. Reports of committees.
   8. Election of officers.

The program may be interpolated in the order of business according to convenience.

14. The rules contained in Robert's Rules of Order shall govern the Club in all cases to which they are applicable and in which they are not inconsistent with the Constitution and By-laws of this Club.
The Program

The program is given below just as it was carried out, which varies slightly from the order in which it was announced in the program printed for the meeting.

Monday Morning, December 29, 1930

Dr. Francis H. Herrick, of Western Reserve University, gave the address of welcome on behalf of the Cleveland Bird Club. In a few well-chosen words Dr. Herrick made everyone feel at home. He called our attention to the work of Mr. Baldwin’s laboratory near Gates Mill, to the early work of the teacher, horticulturist, and naturalist, Gerald Potter Kirkland at Cleveland, and his influence in helping to found the Cleveland Academy of Science which later became the Cleveland Society of Natural History, and to Mr. Brandt's oological collection. On behalf of the Wilson Ornithological Club, President Stack responded briefly.

1. What was the Original Distribution of the Lesser Prairie Chicken? (10 min.)
   Myron H. Swenk, University of Nebraska, Lincoln, Nebraska.

   The statements on the limits of distribution of the Lesser Prairie Chicken in the literature are very general and indefinite. Even the A. O. U. Check-Lists (both the second and the last) give an unsatisfactory distribution statement. There is also a paucity of specimens in museums. Many of these museum specimens were obtained in the markets of New York City and bear unsatisfactory locality data. From all data available, the author concludes that the original distribution was from west-central Nebraska to northwestern Texas, west to southeastern Colorado and the eastern edge of New Mexico, east (at least in winter) to eastern parts of Nebraska, Kansas, and Oklahoma, extreme southwestern Missouri and north-central Texas.

2. Survival and Reproduction in a Song Sparrow Population During One Season. (30 min.) (Lantern slides). Mrs. Margaret M. Nice, Columbus, Ohio.

   The Song Sparrows were trapped on their own territories and banded with aluminum and celluloid bands. One-fourth of the adults of thirty pairs disappeared before July, while seven new individuals came into the area. Twelve pairs made three attempts at nesting, four pairs made four attempts. Fifteen pairs raised sixty-four young, the totals of each ranging from zero to ten. Sixty-one nests were found, in twenty-nine of which young were raised. Twenty Cowbird eggs were laid in fifteen of the nests; in five cases a single Cowbird was raised with from two to five Song Sparrows in the same nest.


   The completion of Radnor Lake in 1914 opened up a new sanctuary for migrating water fowl in this region of no lakes. In ever increasing numbers and species, migrants have learned to take advantage of this body of water. The results of the work of four observers were presented.


   This report summarizes the observations of five years made mostly in New York and Iowa but partly in nine other states. Twelve thousand miles were covered on a bicycle with further mileage by car, which was not metered. The number and kinds of birds killed were related to the types of roads. A total of sixty species had been killed and nine hundred and one individuals. English Sparrows and Red-headed Woodpeckers were most frequently killed.

5. Additions to the Birds of Ohio. (20 min.) Emerson Kemsies, Oberlin, Ohio.

   Mr. Kemsies has been assisting Dr. Jones in revising his catalog of Ohio birds. This paper is a result of this work and includes only species that
have undergone a change since the publication of Jones’ catalog. There were twenty-one new species, mainly of accidental or casual species, added to the state list since 1903.


This study was based on the examination of the crops of one hundred and thirty-four Bob-whites and four Scaled Quail. The data showed that during the winter season, quail in Oklahoma feed mainly on weed seed and waste grain, the grain being either wheat or corn, depending on the section of the state from which the birds were collected. A method of using gelatin capsules to keep the crop contents separate was described.

Monday Afternoon, December 29, 1930

7. Some Facts Revealed from Thirty-four Years’ Migration Records. (20 min.) Lynds Jones, Oberlin College, Oberlin, Ohio.

Migration records for the thirty-five years, 1896 to 1930, inclusive, at Oberlin, Ohio, give an average range of dates of first arrival for 162 species of 30 days. The graph as well as the curve of arrival dates shows that an “average” or “medium” date of arrival for any species is misleading because neither graph nor curve give any focus, but the thirty-five records of the arrival of each species are well scattered over the thirty-five years. Nor are there groups of species that always migrate together year after year. The frequency of such groups is less than 10 per cent.

8. The Physiology of Bird Temperatures. (20 min.) (Lantern slides). S. Charles Kendeigh, Baldwin Bird Research Laboratory and Western Reserve University, Cleveland, Ohio.

This paper presents a review of work done on bird temperatures through the use of thermo-couples and potentiometers. The data show that the body temperatures of adult birds are very variable, ranging normally between 104 degrees and 112 degrees F. This variability is dependent upon muscular activity, air temperature, food, and excitement. There is a marked daily rhythm in body temperature with the highest temperatures in early morning and the lowest during the first half of the night. Nestling House Wrens are cold-blooded until the development of temperature control after nine days. The nest temperature of a wren egg during incubation regularly fluctuates as much as 10 degrees, depending on whether the adult is on the nest.


This report indicates the progress made in banding swifts during the past season at Chattanooga where Dr. Green and his friends band them by the thousand.


This is an account of the ornithological work of the Kelley-Roosevelt Expedition to northwestern Indo-China in 1929 for the Field Museum of Chicago. Dr. Van Tyne takes us with him on pony-back, on rafts, and native boats through the interior of French Indo-China. We are fascinated by the interesting method used by the natives to catch pheasants and by many of their other habits.
11. Shore Birds Attracted to a Small Stream Carrying Sewage. (10 min.) E. L. Moseley, Ohio State College, Bowling Green, Ohio.

A ditch carrying all the sewage from Bowling Green, Ohio, enters a small tributary of the Portage River three miles east of the city. About eighty rods below this point the stream is shallow in mid-summer, with partly emerged stones, mud flats, and bars. Here have been seen many Yellow-legs, Pectoral and other sandpipers, whose species were identified, also many Killdeers and smaller numbers of other water birds.


Mr. Todd gave a brief account of his last trip up the eastern shore of Hudson Bay, and told of some of the birds observed.


Several instances of the occurrence of bilateral ovaries in raptorial birds were described. There was also brief comment on the variation of kidney structure in different species. A more detailed account was published in the Anat. Rec., Vol. 46, No. 4, Sept., 1930.


Systematic observation of waterfowl on the Detroit River has brought much information. It has been possible to identify the following species and form some idea as to their relative abundance: Redhead, Lesser Scaup, Golden-eye, Black Duck, Barrow's Golden-eye, American Merganser, Red-breasted Merganser, Hooded Merganser, Mallard, Shoveller, Gadwall, Canvas-back, Wigeon, Baldpate, Blue-winged Teal, Pintail, Wood Duck, Greater Scaup, Bufflehead, Old Squaw, Black Scoter, Ruddy, Lesser Snow Goose, Blue Goose, Canada Goose, Eider, Whistling Swan, and American Coot. The Lesser Scaup was found to be the most abundant, closely followed by the Canvas-back and Black Duck tied for second place.


A compilation of data supplied by correspondents as to the relation between the arrival of Hummingbirds in the spring and the blooming of flowers.

Tuesday Morning, December 30, 1930

16. Some Fluctuations in Central West Virginia Bird Life. (10 min.) Maurice Brooks, French Creek, West Virginia.

First appearance, increase to abundance, and gradual disappearance of Lark Sparrow and Bachman's Sparrow in this region are discussed without reaching any conclusion as to the causes underlying these phenomena.

17. Pioneers in Economic Ornithology. (25 min.) Mrs. H. J. Taylor, Berkeley, California.

The names of Glover, Aughey, Beal, King, and Forbes stand out as pioneers in the serious study of economic ornithology. Glover came to America from England in 1836. The United States Department of Agriculture with a sub-department of Entomology was established in 1862. Townsend Glover was the first United States entomologist—being appointed to this office in 1863.

Samuel Aughey, Professor of Natural Sciences in the University of Nebraska in 1871, made an extensive and valuable study of the grasshopper plagues in this region during the period of thirteen years.

The respective fields of King, Beal, and Forbes were Wisconsin, Iowa, and Illinois. These men put the economic study of birds on a scientific basis.

The red color phase Bob-whites used in this experiment were furnished by Mr. Hobart Ames. The red which occurs in the normal plumage suffuses the whole body largely obliterating the black markings. On the head there appears to be a tendency for the white to be replaced by black and the black areas by red. The difference in color is apparent in the newly hatched chick, the down color of the red birds being more decidedly reddish than that of the normals.

Preliminary breeding tests made in 1930 indicated that the red phase is a dominant sex-linked allelomorph of the normal. The critical test was the mating of a normal male to a red female, which gave typical criss-cross results, though the numbers are not large. This mating gave 4 red males and 7 normal female chicks. In addition there were 1 red and 2 normal chicks on which sex could not be determined.


Mr. Ganier gave here a brief review of all of the known remaining nesting sites of the Bald Eagle in Tennessee. These included the three eyries in the Reelfoot Lake Region and four discovered last spring near Memphis.

20. The Food Habits of the Ring-necked Pheasants in Nebraska. (10 min.) Myron H. Swenk, University of Nebraska, Lincoln, Nebraska.

Complaints from farmers of damage to crops in central Nebraska led to an investigation of the food of the Ring-necked Pheasant, based on the crop and gizzard contents of 100 birds. This investigation showed that nine-tenths of the year's food of this bird was vegetable matter and most of this corn. The corn was, however, mostly gleaned during the winter. The relatively small amount of insects eaten included some very injurious pests. The conclusion is drawn that where numerous, as in central Nebraska, this pheasant may be injurious, but that, where the numbers are kept down, it will on most farms probably render a sufficient service by destroying injurious insects as on the whole to about balance the harm done to crops.


A review of variations existing between the sexes in House Wrens as exemplified by measurements of various external parts, such as length of body, length of tail, length of wing, length of primaries, wing spread, etc.

22. Summer Birds in the Big Horn Mountain Region of Wyoming. (20 min.) John W. Aldrich, The Cleveland Museum of Natural History, Cleveland, Ohio.

A discussion of the author's experiences with the bird life of this most interesting section of Wyoming, touching briefly on habits and distribution.


An account of nesting colonies of Great Blue and Black Crowned Night Herons in southern Michigan was given with especial attention to a colony of night herons nesting in dead trees of a flooded woodland located in an artificial lake in the course of the Huron River near Ypsilanti, Michigan.
24. The Young of the Ross Goose (Chen rossi). (30 min.) (16 mm. film). Chester K. Brooks, Cleveland, Ohio.

A captive adult Ross Snow Goose laid three eggs, only one of which proved fertile. From the fertile egg was hatched, by a Bantam hen, a young goose which was successfully reared—probably the first time that the young of this goose has ever been reared in America. The nesting region of the Ross Snow Goose has not yet been discovered by white man.


These motion pictures contain views of male Prairie Chickens dancing during the spring courtship, and an excellent account of the incubation and hatching of the Upland Plover.


An account was given of one of the few areas still remaining in the Dakotas where water birds are breeding in great variety. Varying water level in a chain of lakes has had considerable effect upon the nesting of numerous species.

27. Nesting Habits of the Bald Eagle. (60 min.) (Standard motion pictures). Francis H. Herrick, Western Reserve University, Cleveland, Ohio.

These splendid pictures of the changing habits of the young eagles with age are always interesting. At each season advances, Dr. Herrick adds some new facts discovered by careful and prolonged observation from the steel tower. Thus these motion pictures are always new since they are constantly being revised to include the new data.


Mainly views of the magnificent scenery in this region of the Dakotas.

Papers Read by Title

29. Recent Interesting Birds Found in the Sioux City Region. Mrs. Mary L. Bailey, Sioux City, Iowa.


31. Studies from a Bird Laboratory. (15 min.) (Lantern slides). S. Prentiss Baldwin, Western Reserve University, Cleveland, Ohio.

32. Wild Wings. (20 min.) (Standard motion pictures). Two reels loaned by Mr. Edward A. Hyer of the Department of Conservation of Michigan.

33. The Early Bird. The First Two Days of Embryo. (30 min.) (Motion pictures). S. Prentiss Baldwin, Western Reserve University, Cleveland, Ohio.
ITEMS FROM THE CLEVELAND MEETING

BY ROBT. L. BAIRD

Some of us went to the banquet Tuesday evening half wishing we were triplets, at least, so that we might attend two or three other good meetings at the same time. Perhaps we dreamed that we would leave early and go to one of them anyway. But not on your life, once there we stayed there all evening. The Cleveland Bird Club and the local committee did themselves brown in entertainment that night. Not only was there a banquet, in every course of which we were reminded that we were bird lovers, for birds were pictured, carved, and modeled, to say nothing of the splendid ones broiled; but the entertainment afterward capped the climax of the whole meeting. C. M. Finfrock of the Cleveland Bird Club, was the magician toastmaster who presided. Dr. H. C. Oberholser of the Biological Survey, Washington, gave a brief address. The audience was then requested to about face toward the stage from the depths of which the toastmaster summoned forth the Herr Doctor Ein Z. Dreistein who explained and demonstrated his new baliscope. After straining the machine to the utmost it finally brought forth Wilson, the central figure on the first epoch away back in 1800-1825 among the hills of Pennsylvania. He was collecting birds in characteristic fashion with apparently the selfsame rifle which produced a terrific kick when it snapped. Very modern field glasses though brought the birds close to hand. In the second epoch Audubon was painting pictures from life down in the Tennessee woods, with the help of an enormous jug. No, the jug did not contain his paint but other incentives for cool morning work. Altogether he produced a wonderful turkey (we heard its realistic gobble) and an admirable lyrebird (I am not sure how the first part of that was spelled).

Baird was shown standardizing subspecific characters from 1850-1875 and then Coues was skinning birds in airy fashion at the Smithsonian. Delicate instruments like corn cutters and hand saws made the feathers of a midnight snipe fluff about like the light of day. The moving spirit of the fifth epoch was Herrick after a very movable white eagle which he tried to photograph with a moving camera which moved the crowd to a showdown.

We’ve just started the last epoch and Baldwin is its central figure. Listening to the intimacies of the heart life of the House Wrens, he has determined that the great question to be solved for them is the problem of birth control. As 1950 dawns he shouts, “Eureka” and slashes the pestiferous egg in two.

The good Herr Doctor* interpreted the whole show in a most delightful German-American-English brogue with the most brilliant scientific hits which kept the audience convulsed. We’ll say he was a master showman and his machine—well, the audience demanded to see the wonderful baliscope, and carefully it was opened up, disclosing a food grinder and a string of baloney.

*Since the meeting there has been some dispute as to the identity of Herr Doctor Einstein, but the consensus of opinion favors Mr. Brandt. The visitors were under deep obligation to Mr. Brandt and his assistants for so pleasant and novel an entertainment.—EDITOR.
The characters in the pantomimes were:

Wilson..................................................Dr. Vinal, of Western Reserve University
Audubon..................................................Frary, of the Cleveland Art School
Baird.......................................................Phelps, of Elyria
Cones........................................................Fuller, of the Cleveland Natural History Museum
Herrick......Shipman, of Willoughby, photographer for Prof. Herrick
in his Eagle work
Baldwin..............Williams, of the Cleveland Natural History Museum
Kendeigh, Baldwin's associate..................................................Brandt, Jr.

A Symposium Suggested as a Part of Each Annual Meeting.—There was such a fine get-together spirit among the members of the Wilson Ornithological Club at the Cleveland meeting and a number of ways were suggested by which we might further cooperate to make our work more valuable. Cooperation is necessary these days in every big project. It was illustrated in many ways in various sections of the science meetings. The A. A. A. S. prize of $1,000 was awarded this year for the work of three men together. Some of the groups have the whole annual program a symposium of the work of many during the whole year. One suggestion deserves some consideration from members of this Club. We had three sessions this meeting with papers presented in serial order and one session devoted to movies almost entirely. Why not have one session devoted to a symposium on which the members of the Club have worked in common during the year?

It has been suggested that at each meeting the President appoint a committee to choose a subject for special field study during the coming year. Some subject should be chosen not requiring too technical work but one that would have wide spread interest and on which information is needed from all parts of the country. In the fall all members who had worked up anything along that line could announce their titles to the Secretary who would then build the symposium into the program in such a way as seemed proper.

Perhaps at once or early in the year there would be some members who would want to head up certain phases of the investigation and that might be announced in the Bulletin. All observations and notes might be sent at once direct to the interested parties. Sometimes we are not inclined to make use of our own separate observations as being of enough value for publication. Here they might be the very thing to round out valuable researches.

Possibly another object of such work would be the development of more of a community of feeling and acquaintance among the Club members. For many of us we meet once a year and that ends it. It would be rather enjoyable to hunt over our own territory in the common cause. Maybe we would be surprised and happily, too.

Some of us thought Prairie Chickens had all but gone the way of the Passenger Pigeon. But here we saw they had posed as actors for the movies within fifteen miles of Chicago. But a step more and we are almost persuaded that we may believe Henri Fabre's love stories of the insects. Too bad he didn't have a movie camera too. And then discussion brought out the fact that Prairie Chickens are becoming quite abundant again in some parts of Michigan.
But if Grant has peeked at the birds at their courting antics, Baldwin is boldly entering into their holy of holies. He is listening to their heart beats under all kinds of thrills. He gave a wonderful exhibition of his work and let us listen to a Canary's heart beating. As we stood before the amplifier it sounded like a roll of thunder all of a sudden. Some one had opened the door of the dark room where the bird was resting and it registered excitement immediately. Baldwin says a bird's heart goes more than pit-i-pat sometimes. It may beat from 200 to 800 times a minute. It makes the amplifier sound like a loud speaker with lots of static when the bird is roused.

If you get tired of your dog but still want something to tag you around, raise a Ross Goose. Chester K. Brooks, of Cleveland, raised one of these rare birds and it was unutterably distressed when shut up alone. It simply had to have a companion of some kind other than adults of its own species—a dog, a bantam hen, the children, or Mr. Brooks himself. A beautiful little goose, almost pure white, and no one knows where the wild ones nest as yet. But it is up near the north pole somewhere.

They reported progress in banding Chimney Swifts in Chattanooga. Some people never do things in a small way. They have banded 30,000 already. Most people would call that an achievement now.

The fine oil painting just presented to Western Reserve University of Dr. Herrick, who has made the finest study of the Bald Eagle, was on exhibition at the first day's sessions.

It was a happy planning of the program to have side trips out of the central states region. Dr. Van Tyne took us on his expedition to French Indo-China and Mr. Todd took us on a trip up the east coast of Hudson Bay.

Several expressed the hope that Mrs. Taylor's paper on "Pioneers in Economic Ornithology" would be published. She gave much interesting information that is not readily available, some of it gathered at first hand. She came from Berkeley, California, to give the paper.
A WORD OF APPRECIATION FROM OUR TREASURER

Ever since the latter part of December I have been receiving from our members letters enclosing checks and drafts to cover the dues for 1931. They have come from nearly every state in the Union, from Canada, from various foreign countries, and even from one of Uncle Sam's battleships. First I want to thank all of these members for their promptness, thus saving me considerable labor in sending out notices.

However, the thing that has most impressed me is the fact that so many of you have included a letter telling of your appreciation of the Wilson Bulletin, or reporting some activity in your pursuit of bird lore, or relating some bird banding experience, or other interesting news.

It is impossible for me to acknowledge personally all of these letters, since the Club is unable to provide stenographic help. But I wish in this way to express my thanks, and to assure you that it does my heart good to know that you appreciate the work your officers are doing.

There are many, of course, who have so far overlooked the matter of the 1931 dues. In order to save time and postage, and in order to keep the Club's finances in good condition I hope that all who have postponed sending dues up to now will immediately remit. The March issue of the Bulletin has been sent to all members, whether delinquent or not; the June issue can not be sent, however, to unpaid members unless an arrangement is made.

Looking forward to another pleasant official year, I am,

Cordially,

W. M. ROSENE, Treasurer,
<table>
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<td>Chicago</td>
<td>February 5</td>
<td>Chicago Academy of Sciences</td>
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<td>1914</td>
<td>Chicago</td>
<td>December 29-30</td>
<td>New Morrison Hotel</td>
<td>T. C. Stephens</td>
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<td>Columbus</td>
<td>December 28-29</td>
<td>With the A. A. A. S.</td>
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<td>1922</td>
<td>Chicago</td>
<td>October 26</td>
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<td>Nov. 31-Dec. 1, 1928</td>
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<td>1930</td>
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<td>December 29-30</td>
<td>With the A. A. A. S.</td>
<td>J. W. Stack</td>
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THE WILSON BULLETIN

Published quarterly, in March, June, September, and December, as the official organ of the Wilson Ornithological Club, at Sioux City, Iowa.

The current issue of the Wilson Bulletin is printed by the Verstegen Printing Company, Sioux City, Iowa.


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

New subscriptions, changes of address, and applications for membership should be addressed to the Secretary. Personal items, news of events in the scientific world, and other notes suitable for our “Notes Here and There” department may also be addressed to the Secretary.

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. W. Stack, M. S. C., East Lansing, Mich.

Vice-President—Mr. George Miksch Sutton, Bethany, W. Va.

Treasurer—Mr. W. M. Rosene, Ogden, Iowa.

Secretary—Prof. Jesse M. Shaver, Peabody College, Nashville, Tenn.

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

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

The following societies are affiliated organizations:

The Nebraska Ornithologists’ Union.

The Iowa Ornithologists’ Union.

The Kentucky Ornithological Society.

The Tennessee Ornithological Society.
SURVIVAL AND REPRODUCTION IN A SONG SPARROW POPULATION DURING ONE SEASON*

BY MARGARET MORSE NICE

The Song Sparrow (Melospiza melodia melodia) is the dominant avian species in the pioneer weed association on the east bank of the Olentangy River between the Doddridge Street and Lane Avenue bridges in Columbus, Ohio; sixty-four pairs lived on approximately fifty acres in April, 1930. Near the river and on the bluff to the east are cottonwoods, sycamores, buckeys, elms, silver maples, and hackberries. Shrubs are almost wanting except for large patches of elder. The chief weeds are sweet clover, cow parsnip, teasel, dandelion, burdock, golden rod, Canada thistle, and giant ragweed.

In 1930 I made a study of the Song Sparrow population most conveniently situated from our house, obtaining data on the success of the first brood in the case of forty pairs, of the first and second broods with thirty pairs, and a complete record of sixteen pairs. As the season progresses, the difficulties of keeping track of a large number of birds increases, due to the rankness of the vegetation and the subdued activity of the birds themselves. Twenty-seven of the males and twenty of the females were marked with aluminum and celluloid bands, in most cases the birds having been trapped on their respective territories. Some males that were not banded were distinguishable by their songs, while other birds were known by position. For each pair for the most part stays closely throughout the season within the two-thirds of an acre or so which it calls home.

The accompanying map shows the territories of forty pairs on approximately thirty acres as affairs stood the last of May. Each pair is designated by a field number which has no connection with the band number; the field number followed by m refers to the male. Each female is named by the number of her first mate followed by f.

*Read before the Seventeenth Annual Meeting of the Wilson Ornithological Club at Cleveland, Ohio, December 29, 1930.

and the year—as 4/29: if there were more than one mate in a season a letter is added as 18/30a, 18/30b. The details of this scheme of nomenclature as well as my technique in finding nests has been discussed elsewhere. The boundaries of the territories were not rigidly fixed, each pair trespassing on the land of its neighbors’ and many disputes being staged, but in general they stay about the same throughout the season.

Survival

In the fall and winter the Song Sparrow is admirably protected by his coloration and his habit of diving into cover upon suspicion of danger, in this locality being noticeably more cautious than the Juneo or Tree Sparrow. But from February or March through June, the male, busied with affairs of his territory, comes boldly into the open to sing or quarrel, while both parents expose themselves recklessly when concerned over the safety of half grown young. An unexpectedly large mortality of nesting adults was found.

On April 15 there were thirty pairs on the twenty acres nearest us—all the birds on the map north of and including 12, 30, 2, and 7, but not 44. But by early July there were only twenty-five pairs and (one-sixth)—one-fourth of the whole number. Five new females and two new males had come in. Three pairs were lost outright—7, 16, and 46. There were two re-matings of neighboring widows and widowers—26m and 27f, 30m and 13f. 20m lost his mate in late May and never procured another, although he stayed on his territory to the end of June and was again singing there from September 28 to October 14. 29m came May 21, carved out a new territory and was soon joined by a female. 47m appeared in mid-June, but remained a bachelor. 4m, on the other hand, had three different mates in 1930. Where both birds survive, Song Sparrows normally keep the same mates throughout the season: primarily, I believe, because so preeminently rooted to the soil, secondarily, because of their habit of often starting another brood as soon as the first is out of the nest.

Reproduction

Nest Statistics. Sixty-one nests were located while occupied and three others later in the season. A second nest was never placed in close proximity to the first, the distance between succeeding nests two lone males. Ten females had been lost (one-third), and five males ranging from 32 to 190 feet, the average of twenty-four cases being

\[3\text{Bird-Banding, 1930, Vol. 1, No. 4, pp. 177-181.}\]
\[4\text{46 was present, but 29 was not; the former’s territory lay between 26 and 27 and was appropriated by 26 after the disappearance of 46 and his mate.}\]
Fig. 13. Map of the Song Sparrow territories. The letters A, B, C, represent the first, second, and third nestings.
The sixty-four nests are classified in Table I as to height from the ground and excellence of concealment, while data on the number of eggs is given in the case of thirty-seven nests. All nests of the first attempt were placed on the ground, half of the second attempt and a third of the third attempt being in the same position; the average height of all the nests of each attempt incased with the advance of the season.

**Table I**

**Song Sparrow Nests in 1930.**

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<tr>
<th>Height</th>
<th>Concealment</th>
<th>Size of Sets</th>
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<tr>
<td>Per cent Height of others in inches</td>
<td>Numbers of Nests</td>
<td>No. of Nests Containing 5 eggs 4 eggs 3 eggs Avg.</td>
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<tr>
<td>Average Height of all</td>
<td>Excel, Good, Fair, Poor</td>
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<tr>
<td>First Attempt ..........100</td>
<td>17 3 2</td>
<td>7 7 0 4.5</td>
</tr>
<tr>
<td>Second Attempt .......... 50</td>
<td>17 1 8 1</td>
<td>7 7 2 4.3</td>
</tr>
<tr>
<td>Third Attempt .......... 33</td>
<td>7 3 1 1</td>
<td>0 3 3 3.5</td>
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<tr>
<td>Fourth Attempt .......... 0 6-10</td>
<td>2 1</td>
<td>0 1 0 4.0</td>
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<tr>
<td>Total</td>
<td>41 7 11 5</td>
<td>14 18 5 4.2</td>
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</tbody>
</table>

Although these birds began to nest in mid-April when the vegetation had hardly started, the earliest nests appeared to be better hidden than the later ones. Concealment according to my point of view being excellent in 77 per cent of the first attempt, 63 per cent of the second, and 58 per cent of the third. The favorite situation was under prone weed stalks. Taking the nests throughout the season, fourteen were found in this position; the other most usual sites were, under Canada thistle, seven cases; in miscellaneous weeds, seven; in weeds and stalks, six; in weeds and grass, five; in blue grass, five.

There was some correlation between excellence of concealment and success of the nest, since 56 per cent of this class raised young, while this was true of but 35, 36, and 40 per cent of those rated good, fair, and poor respectively. However, there was not necessarily any consistency in the same bird, for the first nest was sometimes well hidden and the second conspicuous, or the reverse might be true. Of the twenty females of which two to three nests were found, none built nests that were consistently poor or mediocre in concealment. One built two which I considered fair and good respectively; another built three nests which were rated good. Eighteen scored excellent in from one to three cases, but eight of them had one nest apiece which rated fair, and three of them had nests which rated poor.

As to the numbers of eggs, only those nests are included in the table where the set was known to be complete and that contained no Cowbird eggs. In eighteen cases four eggs were laid, in fourteen
cases five, and in five cases three. The first two attempts average much the same in size, but in the third there was a decrease.

Success and Failure of Nests. Of the first attempts of forty pairs of Song Sparrows, the young of fifteen nests left in safety, while all the others came to premature ends, giving 37.5 per cent of success. The fate of seventy-nine nests of the thirty pairs is shown in Table II.

Table II
Success and Failure of the 79 Nests of the 30 Pairs.

<table>
<thead>
<tr>
<th>Numbers</th>
<th>Success</th>
<th>Failure</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>10</td>
<td>20</td>
<td>33.3</td>
</tr>
<tr>
<td>2nd</td>
<td>12</td>
<td>15</td>
<td>44.4</td>
</tr>
<tr>
<td>3rd</td>
<td>7</td>
<td>10</td>
<td>41.2</td>
</tr>
<tr>
<td>4th</td>
<td>3</td>
<td>2</td>
<td>60.0</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>47</td>
<td>40.5</td>
</tr>
</tbody>
</table>

The data are complete for the first two broods, but not for the last two; there were three attempts whose outcomes were unknown and a possibility of five other attempts, none of which could have succeeded. Here, as with the data on the forty pairs, there is some evidence of a greater mortality among early nests than later ones, the percentage of success in the first attempt being only 33.3, but for the whole season 40.5.

Table III gives the complete record of sixteen pairs that survived the season.

Table III
Complete Record of 16 Pairs that Survived the Season.

<table>
<thead>
<tr>
<th>Numbers of Pairs</th>
<th>Number of Successes</th>
<th>Number of Failures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>22</td>
<td>29</td>
</tr>
</tbody>
</table>

The most common experience—shared by six pairs—was one success and two failures, two successes and one failure being the lot of five pairs. One pair had four failures and no success; one had no failure and three successes. (In 1929 one of the two pairs I studied experienced two failures followed by two successes, the other one failure and then three successes; the first raising five young, the second nine). Four pairs made four attempts and twelve pairs three attempts. The percentage of success was 42.3. Each pair averaged 1.4 successful attempts; 1.3 unsuccessful attempts.
The actual numbers of young raised (i.e. that left the nest in safety) by fifteen pairs* that survived the season were as follows: 0, 2, 2, 3, 3, 4, 4, 4, 5, 6, 7, 7, 10—a total of 64, an average of 4.3 a pair. The last four figures represent two broods each, hence eighteen broods were raised, averaging 3.6 young to a brood. Mr. E. M. Nicholson reports that on forty acres in England 169 adults of eight species raised 299 young, giving an average of 3.6 young per pair.

Of the 61 nests that were located, 17 came to their ends while containing eggs, and 15 while containing young. At least 240 eggs were laid in the 61 nests (although the number should have been about 255): 151 young were hatched in 44 nests; 102 young were fledged in 29 nests. Thus in 72.1 per cent of the nests young were hatched, in 47.5 per cent they left in safety. Of the eggs, 63.0 per cent hatched, and 42.5 per cent were fledged. (It is interesting to compare these figures with those given by Nicholson for a 20 acre tract: 687 were eggs laid in 156 nests; 420 hatched—61.1 per cent: 300 fledged—43.7 per cent). The average number of eggs in the nests was 3.9, the average number of young raised in the 29 successful nests 3.5.

In order to trace this shrinkage between the number of eggs laid and the number of young raised per successful nest, let us examine the matter of full and partial successes. In 24 successful nests in which I am sure of the quota of eggs, 99 eggs were laid and 88 young raised—an average of 4.1 eggs and 3.7 young per nest. In 15 of these nests 63 eggs were laid and 63 young fledged—an average of 4.2 eggs and young each; but in 9 nests 36 eggs were laid and 25 young fledged—an average of 4 eggs and 2.8 young each. The loss in these 9 nests was 30.6 per cent, in the whole 24 it was 11.1 per cent.

This loss is largely due, not to outside factors (except for one young bird crushed by a Cowbird nest mate), but to imperfect functioning of parental behavior. Four eggs failed to hatch, one because infertile, the other three being addled. In two cases this latter condition was the fault of the nest; in the first an egg had slipped into a depression, in the other the nest had been pressed out of shape by the growth of the thistle in which it was placed.

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*Nine of these two sets—the 16 pairs and the 15 pairs—were the same, the others different, for in some cases the total number of young was not known, as a nest had not been found, although parents were observed feeding young out of the nest; and in the other cases I have full data as to the successes, but am not sure how many failures occurred.

Two young in one nest apparently perished while hatching. One six-day nestling was found dead outside the nest, presumably pulled out by a parent. Two in a nest died of starvation, apparently as a result of poor care by the parents; (the male was a young bird and the female probably was also; this was their only success this season). The last nestling was deserted by its parents and allowed to perish after the other young had left. I had banded this brood in the morning at the age of nine and ten days amid great parental excitement; three dispersed and were cared for by the adults some twenty yards to the east during the next two days, but one remained in the nest. By afternoon it was calling loudly and the next morning was dead. It may have been that the parents were so conditioned by their fright at the nest, that they would not return to it despite the pitiful cries of the offspring.6.

The Young After Leaving the Nest. Mortality during the fourteen to eighteen days of parental care after the young have left the nest is a hard matter to keep track of, since the fledglings are adepts at hiding in the weeds. In only a few cases did I use colored bands on the nestlings, so that even when I saw grown young being fed, it was not often possible to discover whether or not all of the brood had survived. I know that three broods were wiped out a few days after leaving the nest, but some at least of nineteen broods were reared to independence. In three cases I know they all survived, and in two cases at least six out of nine birds. On eight broods I have no data.

Causes of Mortality

Under possible causes of mortality let us consider the weather; parental efficiency; man; introduced enemies; and natural enemies.

The Weather. Three ways in which weather might influence the nesting Song Sparrows are: the destruction of eggs and young

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6For instances of young perishing through misadventure in hatching see Nelson (Bird-Banding, 1930, Vol. 1, pp. 1-12); and Harding (Bull. North-eastern Bird-Banding Assn., 1929, Vol. 5, pp. 77-80). Stephens describes how a Red-eyed Vireo, trying to jerk a worm out of the mouth of one of its young, pulled the latter out of the nest (Bull. Lab. Nat. Hist., Univ. Iowa, 1919, Vol. 7, No. 3, pp. 25-38). As to fright at the nest preventing a parent returning to care for young, see Bigglestone (Wilson Bulletin, 1913, Vol. 25, pp. 49-67) for this behavior in a male Yellow Warbler after a snake had taken one of his young. Two somewhat similar instances have come to my notice: a black snake was killed by us after it had eaten two of a brood of Robins, but neither parent came back to the remaining young. Song Sparrow 27m was so disturbed by my placing a drop trap over his nest containing seven-day young that he deserted and never returned, leaving his mate to struggle alone with the rearing of two Cowbirds.
through storms; possible lessening or change in food supply; effect on length of the breeding season.

The exceptionally dry season of 1930 was favorable to nesting, so that not a single nest nor young bird under observation came to its end through cold rains. It seems probable that a larger proportion than usual of fledglings survived after leaving the nest.

As to the food supply, two entomologists tell me that while the numbers of some insects were decreased in this region by the drought, others were increased; they believe that the insect supply was as ample as usual. Seeds of early maturing weeds were always available. The July broods of the Song Sparrows were brought off in full numbers at the normal age of nine and ten days.

The nesting season of 1930 began about ten days later than that of the previous year. In 1929 I found the first egg April 10 (laid by 1/29); in 1930 no egg was found before April 20 on which date three birds (one of them 1/29) began to lay. Although in two other nests the first eggs must have been deposited April 18 or 19.

Molting began earlier in 1930 than in 1929. In the former year adults were in the midst of the molt the first half of September, eight such birds—two without tails—being noted in a willow stub by the Olentangy September 8. 4m was in full molt September 8 and 15, but had nearly completed it September 19; he did not begin to sing freely until September 24.

In 1930 several nesting birds had started molting by July 12. On September 7 two of the banded females were entirely through the process and two days later another female and 4m were practically through. The only unbanded molting adults noted after our return to Columbus, September 7, were single birds seen September 12 and 14. 4m began to sing in earnest September 10. As to 1m, he had hardly sung at all during the fall of 1929, but in 1930 he sang quite regularly in the early morning—sometimes as many as sixty-three to eighty-four songs an hour—from September 17 to October 11. In 1929 he was last seen October 14, in 1930 October 15, the other summer resident males7 leaving at about the same time, so migration does not seem to have been hastened by the earlier molt.

According to the United States Weather Bureau the five months of 1929 influencing the nesting season were characterized as follows (the deviation from the mean of the last 47 years at Columbus being given first): March, +8.3°, persistent and summer-like warmth from

7Of my 27 banded males, 12 are (or were) residents throughout the year, 13 are summer residents.
the 12th on; April, +3.2°, great temperature changes; May, −2.6°, persistently cool; abundant precipitation; June, −2.2°, much cool weather with frequent storms; July, −0.7°, changeable temperature, precipitation above average.

In 1930 the weather was markedly different: March, −0.5°, changeable, precipitation below normal; April, +3°, changeable, dry; May, +2.1°, warm, abnormally dry; June, +1.1°, one of two dryest Junes in 47 years: July, +2.1°, hot, especially in last half, dryest July in 77 years.

In 1929 the abnormally warm weather during the last two-thirds of March appears to have hastened the beginning of the breeding season. During the excessively dry and comparatively hot summer of 1930 the molt started about two weeks earlier than the preceding year. (Whether this was due to a change in diet, to a more direct debilitating effect of the continued heat and drought, or to some other factor, I will not venture an opinion). Thus the season of 1930 was shorter at both ends than that of 1929, and the numbers of attempts at nesting must have been reduced in consequence. The majority of the thirty pairs were through nesting by mid-July, and three or more as early as the end of June; none had young in the nest later than July 27. In a more normal season more pairs might have made fourth attempts.

**Efficiency of Parents.** So far as nest building goes, the female Song Sparrow constructs a stable, adequate structure that in the majority of cases is well concealed. Only two of the nests found were placed on insecure foundations. While feeding young, the parents are adept at keeping the whereabouts of the nest a secret. The loss of ten eggs and young in the twenty-nine successful nests may fairly be laid to the charge of parental mistakes—i.e., 8.8 per cent of the 113 eggs laid. This is substantially less than that found by us with Mourning Doves in central Oklahoma; from 261 eggs in 130 successful nests 213 young were raised, a loss of 18.4 per cent, due largely to frailty of the nest.

**Man.** The influence of man has many ramifications—the clearing of the land, primarily beneficial to the species, now detrimental; the activities of his young; the introduction of new enemies; and finally, for this study, myself.

There are evidently many more Song Sparrows nesting on this flood plain at present than there could have been when it was covered with primeval forest. The northern half of the area, unprotected by dikes, is flooded nearly every year and consequently is almost use-
less for purposes of cultivation. To the south, however, people plowed up territories with entire disregard for Melospizan property rights, causing several pairs to retire to the edges of their land, and dispossessing one pair entirely with the result that the neighboring population was thrown into an uproar through the home seeking endeavors of the refugees. Some of the unmated birds that replace losses may have lost mates or territories due to human activities. In late June there were two visiting males on my twenty acres, each remaining about a week; on June 28 I banded an adult on 30's territory that I never saw again, and the same thing happened July 14 on 29's territory. The Song Sparrow is a remarkably adaptable bird and will cherish as his home places on the bluff in the southern end of this area that are nothing but masses of tin cans and weeds.

Boys are responsible for the loss of some of the adults, shooting the singing males and both parents when disturbed over young. They carried off two nests with eggs.

As for myself, I tried not to interfere with the course of events, not removing Cowbird eggs nor killing natural enemies. I did warn a man with a mowing machine away from a nest, I did bolster two insecure nests and replace three infants scattered a few inches from the rim; perhaps these good deeds counterbalanced the enemies I might have led to the nests. One set might have been deserted because of my visits, although on the whole the birds were remarkably tolerant of my interest in their doings. The nests found by me suffered fewer disasters than those that remained undiscovered; for of the fifty-seven nests of the thirty pairs that I found twenty-six, or 46 per cent. succeeded; but of the twenty-two I did not find, only six, or 27 per cent, succeeded.

**INTRODUCED ENEMIES.** A number of self-hunting dogs infest the area and may break up nests. Cats undoubtedly destroy both the adults and young. Rats are probably a serious factor. The contents of five nests disappeared gradually. Song Sparrow eggs being preferred to those of the Cowbird, for none of the five latter were eaten until after they hatched. Here it is probable that rats were the guilty parties. A Ring-necked Pheasant was surprised just after she had emptied a nest of two-day old infants; I suspect it was she that threw the three four-day-old nestlings out of their nest.

**NATURAL ENEMIES.** Crows, Blue Jays, and grackles I have never seen hunting in the low situations favored by Song Sparrows, and the same is true of the few gray squirrels present. Two pairs of Sparrow Hawks nest by the Olentangy, one fifty feet north of 41's territory
and the other opposite 32's territory, but they do not hunt on this area during the nesting season. Opossums, weasels, and snakes are rather common and doubtless take their toll.

The Cowbird summers here in goodly numbers, depending on the Song Sparrow as its chief host early in the season, but later favoring the Maryland Yellow-throat also with its attentions. Twenty eggs of *Molothrus ater ater* were found in fifteen of the 61 nests; in five cases there were two eggs. Twenty-eight per cent of the first and second attempts were parasitized. 18 per cent of the third attempt; 24.6 per cent of all. Fourteen of the thirty pairs were victimized, one pair twice.

Seven Cowbird young were raised in six nests—35 per cent of success. In one nest two Cowbirds and no Song Sparrows were raised, in the others a single Cowbird with two Song Sparrows in one nest, with three Song Sparrows in each of three nests, and with five Song Sparrows in still another nest. Three Cowbird young brought death to three young Song Sparrows, in one instance crushing one of four nest mates, in the other the two Cowbirds crowding out two Song Sparrows. The quota of Song Sparrow eggs was full in three cases, was six eggs short in four cases, while as to the five other nests I do not know. Two nests were found with two Song Sparrows and one and two Cowbird nestlings respectively; here there should have been three or four more of the former species. In the twenty-nine successful nests, three to seven more Song Sparrows should have been raised without Molothrine interference, and four Song Sparrows in the nest that produced only two Cowbirds; hence without this parasite seven to eleven more Melospizan young would presumably have left the nest in safety. This season about a 9 per cent loss from otherwise successful nests is attributable to the Cowbird.

**Conclusions**

If we calculate on the basis of the 255 eggs that should have been laid in the sixty-one nests, we find that 38 per cent of eggs or young were eaten by enemies, 3.5 per cent carried off by boys; 5 per cent lost through Cowbirds; another 5 per cent through parental inefficiency; while 8.6 per cent (six nests) were deserted. Four or five of these last disasters were due to the death of the incubating bird. The worst enemies of the adults I believe are boys and cats; of the young, rats and cats.

The high mortality of the adults during the breeding season was unexpected, and the number of failures was often disheartening. But the period between leaving the nest and attaining independence showed
a marked degree of success. Another season might show more attempts at nesting, but greater mortality.

COLUMBUS, OHIO.

NOTES ON THE SONG AND TERRITORIAL HABITS OF BULLOCK'S ORIOLE

BY ALDEN H. MILLER

Possibly there are many students of birds who have noted the song of the female Bullock's Oriole, but it would appear from a perusal of the general accounts of the natural history of this species as set forth in the better known manuals of American ornithology that the female Icterus bullocki is not given proper credit as a singer. Primarily to correct this impression regarding song a short and unfortunately fragmentary observational record of two pairs of Bullock's Orioles is presented here. The songs of female orioles of other species, as for example, I. galbula, in some cases are well known.

In the vicinity of Pinole, Contra Costa County, California, in the winter and spring of 1930, several California Loggerhead Shrikes were under my observation for a period of six months. Incidental to this study of the shrikes other bird species came to my notice, among them several pairs of orioles. The region studied consisted of an open pasture with a number of steep-banked ravines cutting through it (see figure 14). Willows were the principal trees although a few cottonwoods, live oaks, valley oaks, and buckeye trees were present. The grass in the pasture did not attain a height of more than fifteen inches during the 1930 season. A few low tangles of rose bushes were present in the bottoms of the ravines.

Male orioles had arrived in the region under consideration on March 27, 1930, and were in full territorial song. These birds were not present on a previous visit on March 24. Songs of two males were recorded on this date at 7:15 in the morning, the method used being that employed by A. A. Saunders (New York State Museum Handbook 7, 1929, p. 140), except that absolute pitch was not recorded. The two songs were identical and could not be distinguished from songs, probably of the same males, that were uttered a month later on the same territories. On March 27 one male occupied the line of willows, territory B, to the west of the bridge shown in figures 14 and 15, while the other male occupied the two clumps of willows east of the bridge, territory A. These males were not followed closely by me at this time but each appeared to have established possession of
a territory as indicated. The male of territory B sang most frequently from the tree in which later the nest was located (nest site marked by B in figure 15). The male of territory A sang either from the trees marked 1 or at the point A where the nest of this bird later was built.

On April 16 female orioles were noted but it is believed that they were present several days earlier. Notable actions of the females were not observed until the morning of April 25 when both males A and B were paired and the pair A appeared to be attempting an invasion of the territory of pair B. Although the possibility of confusing female and first-year male Bullock's Orioles is great, the obviously mated condition of these pairs of birds made it certain that the two dull-colored individuals were females. The two males were in full adult plumage. Members of a pair were almost constantly in close company, often being within two feet of one another.

At 9 A.M. on April 25 my attention first was drawn to pair A which, the female leading in flight by a few feet, attempted to alight in the tree marked 2 which was next to the singing post of male B. The males hovered and screeched near one another and the pair A

Fig. 14. View looking north across the territories occupied by two pairs of Icterus bullocki near Pinole, Contra Costa County, California. Photo-taken April 30, 1930.
then left the tree and came to rest on the east railing of the bridge. Once having alighted here, female A began to beg of male A and pursue him along the railing of the bridge, fluttering her wings, posturing occasionally, and uttering a low *clu-r-r* of unusually clear quality for this species. The male was pursued in this manner for a few feet when female B came to the railing and darting at female A drove her from the bridge and thereafter pursued and begged of male A in identically the same fashion as had female A. In the meantime male B was singing at short intervals from the top of the tree at 2. When female B had pursued male A to the end of the bridge, male A flew to the grassy slope of the ravine and there was joined by female A. Female B returned to a perch in the trees near male B.

While pair A was on the ground on the ravine slope, female A stood erect and sang the song (♀A) recorded in figure 16. This song was repeated at least six times before the pair flew to the tree at A. In the trees the male sang the song (♂A) represented in the figure. the female roughly alternating with her somewhat different song.

For a period of one hour repeated attempts at invasion of territory B by pair A were witnessed. At least ten such attempts were seen. The behavior of the birds was in general the same each time although with a few significant differences. Female A usually flew in advance of male A as this pair attempted to invade the tree at 2. On two occasions the repulsion of pair A involved all four birds, the two males fighting one another and the two females fighting one another in the short grass at the south end of the bridge. Female B repeatedly was excited by the begging of female A and by the presence of male A and was successful in driving away female A and in begging from male A herself. Female B courted male A only when male A was near the bridge; she did not follow him into his territory east of the bridge. Female B several times begged from male B in the tree at 2 but details of her actions were obscured by the foliage. In several instances females A and B simultaneously pursued and courted male A. Only once was female A able to withstand the attack of female B and continue to pursue male A along the bridge railing unmolested. During my observations on this day I was located at the point marked X.

The songs of the two females were not identical as may be seen in figure 16, yet they both were easily distinguishable from the songs of the males. The songs of the two males always were extremely similar one to the other. The females sang repeatedly from the ground
Fig. 15. Sketch map of territories of *Icterus bullocki* shown in figure 14. Shaded areas indicate ravines.
whereas the males with one or two exceptions sang only while in the trees. The females sang in the trees near their respective males. In pair A it was estimated that during the hour from 9 to 10 A.M. the female sang five times as often as did the male. In pair B the female sang slightly less frequently than did the male.

On May 27 the two nests of these pairs were located. The nest of pair A was situated on the north side of the willows at A, eight feet above the ground and contained young estimated to be about three days old. The pair B had built a nest twenty-five feet above the ground in the crown of the tree at B. This nest contained four young between ten and twelve days of age. The nest of pair B was larger and more neatly fashioned at the top than was the nest of pair A. From the findings on this day it may be supposed that on April 25 the orioles were beginning or contemplating nest construction. Pair B was about one week more advanced than pair A.

No singing was noted on May 27 although both members of each pair appeared at their respective nests and scolded as I inspected their young. Pair A in their foraging did not attempt to pass west of the bridge and invade the territory of pair B. Apparently pair B had been successful ultimately in defending the area west of the bridge. On this day a third pair and nest was found at the point C.

Concluding and summarizing from these observations, the male Bullock’s Oriole arrives on the breeding ground before the female and establishes a singing post, perhaps the entire territory. The females arrive one to two weeks later and come to occupy a territory jointly with a male. The female shares in the defence of territory and perhaps, as seen in pair A, may be responsible for attempted, and doubtless sometimes successful, alterations in the outlines of the territory. In the case of territory A it appears to me that there were relatively few trees present in which to forage and that this circumstance may have led to the impulse to annex the trees at 2. The male and female of a pair do not cooperate completely in the defence of territory at least at a time before the nest is built. That is, a female during this period possesses an urge to defend a territory to the exclusion of other females, the male to the exclusion of other males. Other males during or preceding nest building are not repulsed from the territory by the female but instead may be acceptable to the female and may be courted. The converse doubtless is true of the male at other periods in the breeding season. Certainly the male before nest construction is tolerant of two females within his territory. At the beginning of nest construction the females pursue and beg from
the males, posturing, fluttering the wings, and singing. At this time the males appear to be passive, and consistently move away from the advances of the females. Nevertheless, in flight the males may follow after the females. The difference in the aggressiveness of the two females A and B on April 25 may have been due to a more ad-

![Graphical representations of songs of Icterus bullocki recorded on territories A and B near Pinole, Contra Costa County, California, between 9 and 10 a.m. on April 25, 1930. Numbers on vertical axis indicate whole tones of pitch (absolute pitch not recorded); numbers on horizontal axis indicate seconds of time.](image-url)
vanced sexual and territorial cycle of behavior in female B as evidenced by the greater age of her young on May 27.

The utterances of female Bullock’s Orioles while in defence of territory and in association with males in every way are comparable to the songs of males and may be considered as true territorial songs. The song of the female is similar to that of the male in rhythm, pitch, and quality except as regards the concluding notes of the song which in the female are slightly harsher in quality, range over lesser intervals of pitch and show important modifications of the rhythm as compared with those of the male. Before or during nest building the songs of females on occasion may be even more abundant than the songs of the males.

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THE STATUS OF THE GOSHAWK IN PENNSYLVANIA

BY GEORGE MIKSCH SUTTON

Ornithologists have for years regarded the American Goshawk (Astur a. atricapillus) as a rare and irregular visitor during the winter months in Pennsylvania. Occasional remarkable invasions have been noted, of course, such as those which occurred during 1905 and 1907, and from November, 1926, to March, 1927, when the species was very abundant (Cardinal, Vol. II, No. 2, July, 1927, 35). It appears from recent investigations, however, that the Goshawk is at least locally a fairly common and regular late fall migrant or winter visitor in this Commonwealth.

Prior to personal observation and study of the remarkable hawk migration which takes place each fall at Blue Mountain, near Drehersville, Schuylkill County, it was noted that Goshawks were always mentioned among the birds of prey regularly observed in this region. It was believed at the time that those who made this report did not know the Goshawk, since the average hunter does not, as a rule, accurately distinguish the several members of the hawk tribe. On October 19, 1927, however, four Goshawks were killed at Blue Mountain. On October 22, sixteen more were killed, of the fifty or more that were seen; and these birds were not, apparently, part of an unusual invasion such as had occurred during the preceding fall. The hunters of the region recognized the birds as Goshawks at once, and were surprised to learn that their regular occurrence there was considered unusual. They sometimes called the birds “Gray Hawks,” because the finely
barred underparts present, at a distance, a gray appearance. A little inquiry brought to light the fact that sixty-seven Goshawks had been killed at this mountain on one afternoon in mid-November, 1926, by one hunter. This, of course, happened during the height of an unusual invasion. The hawk-shooters near Drehersville state that Goshawks have been noted every late fall and winter for the past forty years, and that while they are not, as a rule, common in the region, they are not distinctly rare as are the Rough-legged and Duck Hawks, which sometimes occur.

Goshawks are not usually seen at Drehersville before November and sometimes not until late in the month. They do not linger in the region but continue flying on to the southward. It is remarkable that they have not been noted elsewhere, since they must winter somewhere in the region south of Schuylkill County. Apparently they arrive at Drehersville more or less in a body and then separate as they move on to the south and west. There probably is much variation from year to year in the number of birds which pass along Blue Mountain.

Knowledge of the status of this species in Schuylkill County, together with continued reports from many parts of the Commonwealth concerning the depredations of Goshawks to game and poultry during the winter of 1927-28, incited interest in a special investigation similar to that made during the preceding winter, and Goshawks were again found to be present in considerable numbers throughout Pennsylvania.
It is not probable that many of the 1927-28 birds were the same individuals which visited the State in 1926-27, though there is a possibility that birds which found abundant food during the former year returned, bringing with them their hungry fellows.

On the accompanying maps are plotted the Goshawk records for the winter of 1926-27 and of 1927-28. Examination of these brings to light some interesting facts: first, that the total number of records for 1927-28 is not much smaller than that for 1926-27, yet no special invasion is thought to have occurred during the more recent year. It may be that the great interest of taxidermists, sportsmen, and game protectors has something to do with the number of records accumulated during 1927-28, since much discussion was aroused by the abundance of the birds during the preceding year; second, that certain counties in eastern Pennsylvania have numerous records during both years, and that many counties, such as Fayette, Crawford, and Tioga, have very few records for either year. While this absence of records may be due partly to actual scarcity of birds, it is also partly due to the unpopularity or inaccessibility of certain sections as gunning grounds, though not, necessarily, to the scarcity of game, since small game, such as is killed by the Goshawk, is well distributed throughout the Commonwealth.

In a general way the 1927-28 invasion, if we may so refer to it, was much more extensive than that of the preceding year. Comparatively more birds were found in the central and western counties, notably so in Huntingdon, Somerset, and Forest Counties. The two maps clearly show, it appears to me, that the birds regularly come into Pennsylvania at about the northeastern corner. Evidently they follow a fairly well defined course southward, probably along one of the ridges of the Alleghanies. Upon reaching the latitude of Blue Mountain, Schuylkill County, most of them do not continue to fly directly southward but veer off to the west as far as northern Dauphin County, and then continue south and west. This procedure is more evident in the 1927-28 map than in that for the former winter.

It is reasonable to assume that the abundance of Goshawks in Pennsylvania during 1927-28 indicates a continued shortage of food supply in the North Country, though it may be that the migratory habit is more quickly revived or developed than we have supposed and that birds which move southward during one winter repeat their migration merely through the more or less involuntary following of a racial tendency to move southward toward an ancestral home with the advent of cold weather.
During the 1926-27 season, 424 of the six hundred or more Goshawk records were established as reasonably authentic; during the following year 349 records were gathered. Most of these records are of birds which were shot. A few sight records were considered authentic, and several birds were trapped. The precursors of the 1927-28 migration appeared in September and October. Three September records are all from northern counties so there is a possibility that these birds were locally nesting individuals: on September 15, Mr. Edward Shaw took a female in central Forest County; on September 18, Mrs. P. Banner caught a male in a steel trap, near Rowland, Pike County; and on September 25, Mr. John H. Lohmann, Jr., saw one in Dark Swamp, Pike County.

The October records indicate that no Goshawks had yet reached the southern tier of counties; by the middle of the month they had come to Schuylkill County, however, and they continued to arrive in great numbers. October records are scattered through Luzerne, Forest, Sullivan, Lehigh, Schuylkill, Northumberland, Lackawanna, Huntingdon, Indiana, and Dauphin Counties, indicating that by this date the birds had scattered considerably to the westward—or, perhaps, that some of them had come directly south or southwest across New York.

By early November the southernmost counties were reached, birds being recorded as follows: Chambersburg, Franklin County, November 1; western York County, November 5; Parker Ford, Chester County, November 7; York Springs, Adams County, November 11; and Benton, Lancaster County, November 17. No Goshawks were taken in
Somerset County before January, 1928, suggesting that the migration westward was gradual. Lack of records from Bedford County has not been satisfactorily explained.

By far the greatest number of records were made during November, 1927, while the hunting season was on. Goshawks were taken during this month in almost every county where any records were made, thirteen birds having been taken in eleven different counties on November 1.

Twenty-three birds were taken in December, and thirty-one in January, 1928. Twenty-seven were taken in February from all parts of the State, these records not indicating any withdrawal of the hawks to the northward. The eleven March records are chiefly from central or northern counties, it is true, but this does not necessarily indicate a northward movement.

The 1927-28 invasion extended into the spring much later than did that of the preceding year, when only five records were made during February, the latest being February 23, 1927, Osceola Mills, Clearfield County. This lingering of the birds was perhaps due to the protraction of cold weather during the spring of 1928, and doubtless also to the continued abundance of food supply.

All of the specimens secured during the winter of 1927-28 were in adult plumage save one, an immature female with red eyes. taken November 17, 1927, at Emporium, Cameron County, by Mr. Arthur G. Logue. Among the specimens whose sex was determined it was found that males and females occurred in about equal numbers.

Of the 349 records which we believe to be authentic, twenty-eight were ocular records. The stomachs of fifty-six specimens taken were not examined by the taxidermists who skinned them. Of the 266 stomachs examined, sixty-one were empty. In the 205 stomachs and crops which contained food, some of them holding the remains of two or more creatures, were found flesh, feathers, fur, or bones of the following: 31 Ruffed Grouse (Bonasa umbellus); 55 cottontail rabbits (Sylvilagus floridanus). 29 domestic chickens, including several White Leghorns, a Rhode Island Red hen, and a Barred Plymouth Rock rooster; 16 Bob-Whites (Colinus virginianus); 13 Ring-necked Pheasants (Phasianus colchicus); 10 gray squirrels (Sciurus carolinensis), one of the black phase; 3 red squirrels (Sciurus hudsonicus); 2 chipmunks (Tamias striatus); 2 white-footed mice (Peromyscus sp.); 1 domestic pigeon; 1 Meadowlark (Sturnella magna); 1 Cardinal (Richmondena cardinalis); 1 Song Sparrow (Melospiza melodia); and 8
small birds the species of which were not determined. Three contained unidentifiable flesh and fur. Three stomachs each held the remains of two Ruffed Grouse; one, a Bob-White and a cottontail; one, a chicken and a cottontail, and so on. Six birds which were killed while attacking poultry, or pursuing prey, had much food in their stomachs. Eight birds were killed while chasing or killing poultry, two while killing grouse, and two while chasing squirrels. Three birds were killed while carrying prey a few feet above the ground: one, a female, was carrying a large Rhode Island Red hen; one, a full grown cottontail; one, a young cottontail; one, a grouse. Many of the birds which had eaten grouse and Bob-whites had swallowed the feet entire, and mandibles were also found in almost every case. Not many feathers were found in the stomachs—evidence that Goshawks pluck their prey rather carefully before eating it. The crop alone of one individual held over twelve ounces of grouse flesh. One male, shot by Mr. Charles Mack, on February 14, 1928, at Slatington, Lehigh County, is thought to have killed twelve hens before it was captured.

During the winter of 1928-1929, very few Goshawks were noted anywhere in Pennsylvania. According to the records of the Game Commission at Harrisburg, only seven sight records of the species were made, and no specimens were taken. During the following winter, however, the species was noticeably commoner. Seventy-six specimens were received for bounty payment at the Game Commission office in Harrisburg, and twelve sight records were found to be authentic. During the recent winter (1930-1931), twenty-eight specimens were received for bounty payment at Harrisburg, and three sight records were authenticated.

Summing up our knowledge of this species in Pennsylvania, we may regard it as a rare summer resident of the more northern, mountainous counties, individuals which nest doubtless remaining throughout the year in one locality so long as food is available; as a regular late fall migrant in the region of Blue Mountain, Schuylkill County, and perhaps elsewhere; and as an irregular winter resident, sometimes abundant, and apparently becoming somewhat more regular of late years.

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BIRDS OF SOUTHERN LOUISIANA

BY ALFRED M. BAILEY AND EARL G. WRIGHT

Photographs by Alfred M. Bailey.

The coastal marshes of Louisiana are well known for their abundant bird life; thousands of waterfowl migrate down the Mississippi Valley each fall and spend the winter on the wide-stretching savannahs, and, then, when they have departed in the spring for their northern breeding grounds, their places are taken by species which wintered in Central and South America. There are many resident forms also, so all in all, the lowlands bordering the Gulf of Mexico are ideal for bird study.

The region under consideration in this paper includes the off-shore sand and shell islands and the great stretch of territory bordering the gulf from the Texas border to the state of Mississippi; for convenience we may use the Southern Pacific Railway, which extends westward across the state of Louisiana from New Orleans, as our northern boundary line. In this vast area we have marsh land with occasional high knolls (known as "islands") and extensive flat regions bordering the marsh, which in dry seasons would be known as "prairie." The region is diversified, and conditions are suitable for many different species of birds; we have offshore islands for terns and gulls, typical marsh country for wintering or breeding waterfowl; miles of swamps for woodland species; and lastly, high wooded knolls. As would naturally be expected, it is an interesting field for the naturalist, but owing to the fact that transportation presents a serious problem, the average student can not expect to cover the entire region except in the course of many years' work.

Louisiana is fortunate in possessing three great areas which have been set aside as sanctuaries for bird life. Mr. E. A. McIlhenny, of Avery Island, has been the leader in this work, and was instrumental in having the land deeded to the state. The three reserves have a total acreage of 174,664 acres. and are known as the Louisiana Wild Life Sanctuary, Marsh Island Refuge, and the Rockefeller Foundation Wild Life Refuge. In addition to these lands, there is the Paul Rainey Reserve, under charge of the National Audubon Society, in Vermilion Parish, a region of 150,000 or more acres, which is privately owned. Another area of marsh land, in Cameron Parish, owned and protected by Mr. H. J. Lutcher Stark, is one of the most important wintering grounds in Louisiana, and while it is in safe hands in Mr. Stark’s care, it should be purchased and set aside for all time under the protection of the state or national government. Then, Louisiana would have a
network of reserves extending from the Texas border, over half way toward the Mississippi River.

The majority of the islands used by sea birds for rearing their young, extend from the mouth of the Mississippi northward toward the Mississippi state line. There are many of these little shell keys, the most important being grouped together in a series known as the Chandelier Islands. At the south end of this chain we find Breton Island, some five miles in length, and at the other end, as might be expected, is North Island. In between, we find Grand Gosier, Tern, and Errol Islands, as well as many others, on which are found sea birds of several species. Royal and Cabot Terns, Laughing Gulls, skimmers, and Brown Pelicans are the most numerous, while Caspian, Forster's, and Least Terns nest in smaller numbers. The mud lumps at the mouth of the Mississippi River are also well known as the breeding grounds of thousands of pelicans.

The region about the mouth of the Mississippi is ideal for the study of water birds, and one of the stations covered in this article is the north side of Main Pass. Through the courtesy of Messrs. Joseph Leiter and Eugene R. Pike, two weeks were spent in October, 1928, with headquarters at "Chateau Canard" and photographs made of the ducks and thousands of geese which were arriving from their breeding grounds.

Centrally located in the state, along the Gulf of Mexico, are the State Wild Life, Marsh Island, and Paul Rainey Reserves, while bordering the gulf is a wonderful strip of live-oak woods extending for about five miles, which is known as Chenier au Tigre (oak ridge of the tiger). The winter bird life of the Chenier has been covered in the Auk (Volume XLV, July, 1923), and the reader is referred to that paper for a more extensive description of the area. North of this section, across Vermilion Bay, is a series of high knolls rising 100 to 150 feet above the sea, which are known as islands. The most important of these is Avery Island, one of the finest places in the south to observe bird life. This is the home of Mr. E. A. McIlhenny, and it is unique—there is no better example of what can be accomplished in matters of conservation. Mr. McIlhenny has written an interesting paper, "How I Made a Bird City," which was published in Country Life in America, and which gives in detail what we have summarized briefly below.

There are several ponds on the island, and one of them, Willow Pond, was made in 1894 by damming a small creek which meandered among the hills. At this time, many species of our beautiful birds
were threatened with extermination, due to the demand for their feathers and plumes for millinery trade. The Snowy Egret was one of the most persecuted, and Mr. McIlhenny thought it might be possible to attract birds of this species to his pond where they would be safe to breed. Eight young were taken from their nests in the nearby marsh, kept in captivity along Willow Pond, and handled every day, so they became very tame. Then in the fall the birds were liberated. They remained about for a few days, then joined the other migrating birds and left, presumably, for South America. On the 18th of March following, four birds returned to the pond, and two days later two more arrived. One disappeared after a few days, so five birds remained and two pairs nested. Eight young were hatched, and all survived to go south with the five adults—"all left on the same night, the 17th of November". The birds returned year after year, other species joined the Snowy Egrets, so we now find Louisiana, Little Blue, Green, and Snowy Herons crowding the bushes: Anhingas build their heavy nests in the cypresses and willows, and gallinules, among the low growing plants.

Avery Island is not a remote place, far off from civilization; on the contrary, it is one of the show places of southern Louisiana. about ten miles below New Iberia, and connected with the Southern Pacific by the Salt Mine Railway, and also by an excellent shell road. The trains run within thirty feet of the heronry, and the birds pay no attention to the passing traffic. The same birds, however, will not allow one to approach within a hundred yards of them, out in the open marsh, and when they fly from their breeding ponds for their feeding grounds, they trek high in the air. It is a wonderful sight just at dusk, when the incoming birds are returning to their nests; they fly high—a continuous chain of birds coming from the grayness—until they are over the pond; then they tumble on set and whistling wings, performing gymnastics which make one dizzy to watch. Avery Island has many other advantages for the bird student, however, for there are high hills, cultivated fields, extensive marshes, and nearby swamps with heavy growths of cypress, tupelo, and gum, so all in all, it is an attractive region for study.

Cameron Parish, in the southwest corner of the state, is another important place from the point of view of the naturalist. Through the courtesy of Captain William E. Lea and Mr. H. J. Lutcher Stark, we have made many trips to the region. It is totally different from Avery Island, but just as interesting in other ways, for we find forms in the west which are lacking in the latter place. This is the last
Fig. 19. Along Black Bayou, Cameron Parish.

Fig. 20. Live Oaks and Palmettos.
bird, and after the breeding season, one will often find the solemn
stronghold of the Roseate Spoonbill; the American Egret is a common
faced Wood Ibis lining the shores of lagoons. There are two distinct
areas; just below the intercoastal canal is an expanse of prairie which,
in normal years, is comparatively dry, while to the south, and extend-
ing to the gulf is typical marsh land. The usual ridges are found
along the gulf, so conditions are favorable for both land and water
birds. The marsh is one of the finest wintering grounds for wild
fowl in the south, for there seems to be an abundant food supply, as
well as wide-stretching, impassable areas which offer places of refuge.

This paper covers intermittent observations over the past fifteen
years; it is not intended as a list of the birds of the region, but rather
of those actually observed by the writers. We have made no effort to
compile life history notes, but we have tried to give specific dates for
the occurrence of species which are not so common as to make such
records superfluous. The majority of the field notes are from the
various trips made by the senior author in the interests of the Louisiana
State Museum in 1916-19; November and December, 1925, for the
Colorado Museum of Natural History; and, October, 1928, for the
Chicago Academy of Sciences. Another trip was made for the Chicago
Academy of Sciences in 1930, with Earl G. Wright, Francis R. Dickin-
son, and E. V. Komarek as other members of the party. Headquarters
were made at Avery Island in May, and the many places of interest—
Chenier au Tigre, Marsh Island, and Mr. Stark’s estate in Cameron
Parish were visited; and then, the second week in June, work was car-
rried on among the bird islands off the east coast, with visits made at
the “mud lumps,” Breton, Tern, Brush, and North Islands, as well as
less well-marked places.

Messrs. Francis R. Dickinson and A. M. Bailey spent an additional
two weeks in March, 1931, making observations on Marsh Island,
Chenier au Tigre, and in Cameron Parish. This is the “betwixt and
between” season, when the majority of the wintering birds are still
found in numbers, and some of the migrants are arriving from South
and Central America.

The recent trips were made to secure motion films of Louisiana
wild life for the film library of the Academy, and we are greatly in-
debted to many individuals for their coöperation—not only during
these expeditions, but in others of past years. We wish to acknowl-
dge our indebtedness to Mr. Robert Maestri, Commissioner of Con-
servation, and Mr. Armand P. Daspit, in charge of the Wild Life Divi-
sion of the Department, for their coöperation; the resources of the
Department of Conservation, their boats and personnel, were placed at our disposal, and made possible much more extensive work than otherwise would have been practical. As was mentioned before, Mr. E. A. Mcllhenny, Mr. Lutcher Stark, and Capt. William E. Lea aided in every way, furnished quarters and boats, built blinds, and gave us the services of their men. We also wish to acknowledge the kindness of Dr. Robert Glenk, who has always cooperated in our field work, and the members of the staff of the Department of Conservation of the present and the past administrations, Mr. Stanley C. Arthur, Mr. Percy Viosca, and Mr. E. S. Hopkins, and Mr. and Mrs. Simms Sagrera, our hosts on many trips to Chenier au Tigre.

Owing to the fact that the majority of the field trips were made to secure exhibit material for museums, the small, inconspicuous birds were neglected, and many opportunities to make valuable observations were lost. Mr. H. H. Kopman has made more extensive observations on the perching birds, and the reader is referred to his article which was published in the Auk, as listed below.

We have regretted the preparing of this paper before the new check-list has made its appearance, but for convenience, we have followed the order of the third edition. It has been impossible for the writers to keep informed on the latest scientific names; probably this paper should have been submitted to an authority for his suggestions, but we realized that other names would be changed before the article could be published. We feel apologetic that with the opportunities we have had, we have failed to observe and record many species, especially the smaller forms, which are probably abundant at various seasons, and we believe that any observer will be able to make many additions to our list.

HORNED GREBE. Colymbus auritus. The Horned Grebe is not common. It occurs in small flocks during the winter months, on the larger lagoons and lakes near the Gulf Coast. A few were observed daily on Vermilion Bay, the middle of November, 1917, and all were in the gray-and-white winter dress. One specimen was collected.

PIED-BILLED GREBE. Podilymbus podiceps. A common species on fresh water or slightly brackish lagoons during the fall and winter months. Its distribution is general along the coast at this season of the year. It was especially common in the marshes along Main Pass, at the mouth of the Mississippi River during the latter part of October, 1928, and was observed in Cameron Parish, in the western part, during November of the same year. This species is recorded as a resident, but we have failed to find it at other seasons.
Loon. *Gavia immer.* Occurs during the winter, but never observed abundantly. One was collected on Vermilion Bay in winter plumage, November 19, 1916, and a few others noted: from one to a dozen were seen on each trip along the coastal marshes. They were fairly common in the Mississippi Sound in March, 1918, when many high-plumaged birds were seen.

**Herring Gull.** *Larus argentatus smithsonianus.* Many of these large gulls are found along the Mississippi River and the Gulf Coast during the winter months. They are irregular in their habits, for sometimes they are very numerous, and at other times there are few to be seen, probably due to the food supply. As in other parts of the country, the Herring Gull will be found about the water fronts of the cities where they feed upon refuse. They are present from the latter part of October until the first part of April. Several were collected at Chenier au Tigre, March 6, 1918.

**Ring-billed Gull.** *Larus delawarensis.* This is the most common of the gulls found along the coast during the winter, and it was observed on every trip. Flocks of them worked along the beaches and the lagoons at Chenier au Tigre during the early part of March, 1918, and they were common during January, 1919. On December 12, 1925, a flock of 200 was observed cruising against the wind.

**Laughing Gull.** *Larus atricilla.* These gulls are found at all seasons of the year, but they are often scarce during the cold days of winter. They are the only gulls which nest along the Gulf Coast, and they are extremely common during the nesting season. The Laughing Gulls prefer to hide their nests upon the ground among the coarse grasses, wax myrtles, and water oaks of the offshore islands, and while they are community dwellers, their well constructed nests are usually some distance apart. They have from three to four greenish eggs which are spotted with black. The downy chicks are brownish in color, and when an intruder appears they quickly leave the nest and hide in the dense vegetation. Several hundred birds will often nest upon the same little island, and when disturbed they rise out of the grass and hover overhead, all of them calling and shrieking their displeasure. As is the case with most gulls, they are more or less predatory, and seize every opportunity to plunder the nests of other birds. They are fast fliers, light of wing and keen of eye, and as they scan the waves, they inspect every little object: it is a common sight to see hundreds sailing along after a fishing boat, waiting for refuse to be thrown overboard.
Fig. 21. Royal and Cabot’s Terns, at Chandeleur Islands.

Fig. 22. Cabot’s Terns and young.
Franklin's Gull. *Larus franklini*. Several bands of gulls were noted flying from the north, the first week in November, 1917, at Avery Island. They flew in rather compact flocks, as though in migration, and Mr. E. A. McIlhenny identified them as this species. He stated that he had had considerable experience with this form. No specimens were taken, and we do not know of a Louisiana record, although we may have seen many and mistaken them for the preceding form.

Gull-billed Tern. *Gelochelidon nilotica*. These terns were encountered on but three occasions, in spite of many trips along the coast at all seasons of the year. Four birds were observed at Chenier au Tigre March 6, 1918, and one collected; another was taken at the same place, January 21, 1919, and several were observed October 22, 1928, at Main Pass, at the mouth of the Mississippi River.

Caspian Tern. *Sterna caspia*. This tern is a resident, and is common among the low islands along the eastern coast. It nests on the ground in company with the Royal and Cabot's Terns, but it is not so numerous. The two large eggs are laid in a depression in the ground shell. They were nesting on Timbalier Island, June 14, 1918, and many were seen on Lost Island, December 8, 1918. Thirty-five nests were counted on one of the "mud lumps" at the mouth of the Mississippi River. June 1, 1917, and a week later, fifty pairs were found nesting on Free Mason Keys. They were observed June 7 to 13, 1930, on the mud lumps, and on Tern Island. The Caspian Terns refused to return to their eggs at the mud lumps when we attempted to photograph them. We saw turnstones breaking the tern eggs and eating them.

Royal Tern. *Sterna maxima*. This is the most common of terns, and while it is found at all seasons of the year, the majority migrate southward during the winter. They are well named, for they are large, strong-winged birds with dark, keen eyes, and heavy, capable build, and they strut about their nesting island with crests erect, in a fearless manner. They nest on many of the "outside" islands along the east coast, although the colonies are changed from year to year. Errol, Grand Gosier, Breton, Hog, Battledore, and Brush Islands are a few of the places where we have found large colonies in years past. This past season we did not find them nesting on Breton or Grand Gosier, but on Tern Island, a low lying spit, there were fully 7500 pairs of Royal and Cabot's Terns nesting in the two colonies. What a sight for the bird photographer! From the distance they looked like shimmering snow fields. A great flock of Man-o'-war-birds circled over-
head, and bands of shrieking terns rose from their eggs and flew to meet us. The two colonies of terns were about half a mile apart, and while Bailey made motion films of the larger flock, Wright and Komarek counted the eggs in the smaller. There were 2400 Royal and Cabots' Tern eggs, the Royal being more abundant than the Cabot's. The terns usually lay but one egg each along the Louisiana Gulf Coast, although many sets of two were observed. The eggs are deposited in shallow depressions in the sand or shell, and both adults share the task of incubation. They are variously mottled and of many sizes, and the young are just as varied in their coloration. Some are pure white, others are brown, with all degrees of shades between the two extremes. Many of the young have orange legs and feet, while others are brownish black. All the young terns, Royal, Cabot's, and Caspian, have similar habits, and it is usual to see whole rafts of these little birds swimming parallel to their island, and they often swim far to sea. We were greatly mystified to hear a clear, whistlelike note, on one occasion, and we tried to locate the source of the sound; it came clear and resonant, but seemed to come from no particular direction. We finally discovered it was made by a young Caspian Tern far out in the gulf—the call to its parents. It is interesting to see the old birds guide the young back to shore after they feel the danger is over. They circle overhead, scold and scream, and then fly toward land, circling back repeatedly as they coax the youngsters along.

Cabot's Tern. Sterna sandvicensis acuflavida. These terns are smaller than the Royal Terns, and nest with them in perfect harmony—if the constant bedlam for which these colonies are noted, can be called harmony. They are beautiful little fellows, silver pearl of wing, and white with rose-washed underparts. Their eyes are dark, and they have black crests which they erect when excited; they are more fearless than the Royal Terns, and seem to take better care of their young. Although they nest in the same colonies with the Royal Tern, they are not so numerous. On Tern Island, there were two nests of the Royal Tern for each one of the Cabot's Tern, and the percentage seems to hold in other colonies. The nesting season varies from the first of June until well into July. We have found the terns with downy young the first week in June, one season, while another year there were no young until July. Many times the entire colony is wiped out by high water, and it is no unusual sight to see eggs washed in windrows. This past season was a late one, for young terns were found on Brush Island only, during the first two weeks of June. On some islands the terns
had not started to nest, while on others we found fresh eggs only. On
Brush, however, the downy chicks of Cabot's and Royal Terns were
making their appearances, and at one edge of the main colony, along
the beach where the waves had piled the shell, was a little group of
Cabot's. When we approached too closely, they stretched their necks
to full length, with crests erect, and protested at the top of their voices.
and then, when a step nearer, they raised and drifted gracefully away,
and then circled in against the wind and fluttered down to protect their
youngsters from the hot sun. One adult tried to coax her little one
over the rim of the beach to the water's edge. She would go ahead a
few steps, teasing and scolding, and then go back, as though out of
patience with the wayward child. This species has been listed as a
resident, but Bailey has failed to record it on his numerous coastal
trips during the winter months.

Forster's Tern. Sterna forsteri. These terns are common sum-
mer residents, and they nest abundantly along the coastal marshes and
islands east of the Mississippi River. They nest upon drift which has
been stranded by the high tides, and make a rather bulky nest of grass
in which are deposited the three greenish or brownish eggs. They are
characteristic birds of the marshes, and we have never found them
nesting upon the gravel, or associated with other species of terns.
While a few of this species winter along the Gulf Coast, by far the
majority migrate southward. They were common at the mouth of the
Mississippi, October 25, 1928. Among the small terns which are seen
over the sheltered bays during winter months, some are undoubtedly
Common Terns, but we have no definite record of their occurrence.

Least Tern. Sterna antillarum. This small tern is becoming
abundant among the shell islands off the east coast where it nests in
colonies. It was practically exterminated in this region, along with
other terns, when feather hunting was at its height, but due to protec-
tion, the birds are once more returning to their old haunts. They nest
on many of the offshore islands, and we have found them on Breton
Island, Free Mason, and Mitchell Keys, where their two protectively
colored eggs are laid in depressions in the shell. They are aggressive
little fellows and make ideal photographic subjects, having a pleas-
ing way of alighting near their nests, and approaching with wings
raised. The young are hard to find, for they crouch motionless when
alarmed, but once the photographer is concealed, they tumble about
the uneven terrain, reminding one of thistle down blown by the wind.
They nest early in June, and all nests observed June 7, 1930, contained
fresh eggs.
Fig. 23. Royal and Cabot's Terns, Chandeleur Islands.

Fig. 24. Royal Terns and young.
Black Tern. *Clidonias nigr[a* surinamensis. While these birds are common along the Gulf Coast during all seasons of the year, they have not been recorded nesting. They were abundant among the off-shore islands and over the coastal marshes during May and June, 1930. We observed them from the western part of the state to the Mississippi border. In Cameron Parish we noted them by the thousands over the lagoons, where they seemed to be feeding upon insects which were destroying the water plants.

Black Skimmer. *Rynchops nigra*. These are common birds of the coast at all seasons of the year. They were numerous at Lost Island, December 8, 1918. Bailey records: "Skimmers are on the islands by thousands—great waves of them. They seem to be more or less nocturnal in their habits; during the day they sit on the mud bars or stalk about, talking with curious, raucous voices, but as soon as twilight comes around, they start flying close over the surface of the water, bands of fifteen to twenty-five working together." They nest abundantly on the islands east of the Mississippi, and colonies will be found upon the ridges of shell thrown up by the waves. The four speckled eggs are deposited in pits which the birds have fashioned with their feet and breasts. The downy youngsters are interesting in that their mandibles are nearly of an equal length, while the lower one of the adult is much longer than the upper. The skimmers were later nesting than the terns during 1930, for we found very few eggs, although the bands of adults were congregated at the chosen nesting sites, and the pits were prepared.

Blue-faced Booby. *Sula cyanops*. A specimen was secured alive in August, 1915, at Avery Island by E. A. McIlhenny; the bird had been blown inland by a gulf storm. Mr. E. S. Hopkins informs me he found a specimen dead on Coral Island, Chandeleur Group, in July, 1929. It was not preserved. Beyer, Allison, and Kopman record several specimens, but it must be considered a rare straggler in the state.

Booby. *Sula leucogaster*. This species is also an accidental visitor. It has been recorded previously, but the only definite record of which we know is an adult in the State Museum at New Orleans, which was collected in April, 1929, on Grand Isle, by E. S. Hopkins.

Anhinga. *Anhinga anhinga*. This is one of the most interesting of the water birds. It is often seen along cypress-lined bayous, and because of its long, reptile appearing neck, it is often called the "snake bird". It nests in cypress trees in company with the herons, and we had many opportunities to study and photograph nesting birds. A dozen pairs had their nests among the low cypresses on Avery
Island, and large young were observed the last week in May. These tawny, downy fellows with long, snake-like necks, are fed by regurgitation, and they thrust their slender heads into the parent’s throat in exactly the same manner as do the young pelicans and cormorants. Both sexes incubate the eggs and feed the young. Twenty or more pairs were nesting on Bird Island in Cameron Parish, in the same colony with American Egrets, Florida and Mexican Cormorants, and Wards’ Herons. A characteristic posture for an adult to assume is to stand with wings and tail half-spread, and the long, slender neck outthrust. While this species has been recorded as a resident, we have no definite winter records.

**Double-crested Cormorant.** *Phalacrocorax auritus auritus.* An extremely common bird along the coast during the winter. On Lost Island, December 10, 1918, Bailey recorded thus: “The ‘nigger geese’ were seen by hundreds. We went ashore on one sandspit after dark, with a flashlight, and the birds allowed us within ten feet of them. Their eyes gleamed in the light, and there was a constant shuffling of feet in the hard sand as the big flock moved in front of us. The nearest birds floundered out of the way, but they did not seem greatly alarmed.” Cormorants were seen by thousands at Grand Isle, March 15, 1919.

**Florida Cormorant.** *Phalacrocorax auritus floridanus.* We have not compared breeding birds from Louisiana with specimens from the north; this is the form which has been given as the breeding bird by Beyer, Allison, and Kopman, and by Arthur, but we have not made comparisons to check their identifications. We found a dozen pairs or more nesting on “Bird Island” in Cameron Parish, the nests being rather bulky structures in high cypress trees. Young were well grown at the time of our visit, June 1.

**Mexican Cormorant.** *Phalacrocorax viga mexicanus.* This is not a common bird; a few pairs were observed on the big lake at Avery Island during the breeding seasons of 1916, 1917, 1918, and 1930, but no nests were observed. In Cameron Parish, however, it was recorded at Bird Island during the different nesting seasons. This past season there were perhaps twenty nests with half-grown young. Adults were seen sitting about on topmost branches with half open wings, taking sun baths, a habit similar to that of the anhinga.

**White Pelican.** *Pelecanus erythrorhynchos.* This species is a resident along the coast, but has not been recorded breeding. A flock of twenty-four was observed at Timbalier Island, June 14, 1918, and another of forty, December 10 of the same year, on Lost Island. A
few birds were seen at Grand Isle, March 15, 1919. Many were seen from time to time over the lakes inland from Chenier au Tigre. The pelicans are good natured fellows, and make fine pets. One of the Conservation Department boats picked up a wing-tipped bird and kept it for several weeks. At first he refused to eat, but finally, when he decided to accept the gifts offered, he took fourteen catfish in succession.

**Brown Pelican. Pelecanus occidentalis.** The Brown Pelican nests on the different islands along the Louisiana Gulf Coast, but the largest colony is found on the “mud lumps” at the mouth of the Mississippi River. These lumps were thrown up by pressure from below, and those most thickly inhabited by pelicans are found off the mouth of Pass a Loutre, where thousands of birds come each year to raise their young. The first eggs are laid about the middle of April, the outermost islands being occupied first, and as the birds increase in numbers and overpopulate the islands, the islands toward shore are gradually used until all have their families of downy white youngsters and awkward parents. The nesting season extends over several months, there being fresh eggs on the innermost lump during the middle of June, while the young first hatched were shifting for themselves. We spent several days in June on this reservation and hardly expected to find young birds, for we had just visited several colonies near the Mississippi coast and found none, all the eggs being fresh. There is a difference of more than six weeks in the nesting time of the different colonies.

The old birds lay three chalk-white eggs in bulky nests on the ground, or among the bushes a few feet from the ground. On Errol Island and on some of the mud lumps which were devoid of vegetation, the nests were merely piles of sticks clumsily heaped together, while on North Island they were well made structures in the “mangroves”. The young, when first hatched, resemble little India-rubber balls more than anything else; naked, black little fellows that are extremely sensitive to the sun, and so are constantly sheltered by their parents. In a few days the white down appears, and the rookery is white as a cotton field. As soon as the youngster is able to paddle about, he keeps his parents fishing in order to satisfy his enormous appetite, and there is a continuous arrival of old birds from afar—a long string of birds flying with methodically timed strokes—a few strong beats and then a coast, each bird following the wing strokes of the leader, and all scaling so close to the surface that it seems they must strike the water at every beat. And what excitement there is when the old ones arrive!
Fig. 25. Windrow of terns' eggs, washed up by the waves at Chandeleur Islands.

Fig. 26. Forster's Tern on the nest.
The downy fellows follow after the old ones with anxious, begging cries; the parents open wide their beaks and disgorge the fish, while the youngsters anticipate its arrival by thrusting their heads down the parent's throat. It is amusing to see heavy youngsters, weighing more than the adults, feeding in this manner, and the more they receive, the more they beg. They flop their wobbly wings and jerk their heads back and forth, blinking their eyes and staggering about. Often they receive so many fish that the tails of the last ones remain in sight, and when extra large fish are taken, their course can be followed down the skinny necks. Often the babies become so gorged that they sprawl on their breasts, or flop over on their backs with feet extended in the air. At first, when we walked around the rookery, we thought these stuffed fellows were dying, but when they were straightened out, they immediately disgorged and started paddling away. The young large enough to travel take to the water immediately when one comes near their home, and they gather in large flocks as they drift idly in the quiet water and wait until their rookery is undisturbed.

The pelican secures his food by diving, but only fish living near the surface are caught. Of the many we examined, not one game fish was found. Menhaden, a bony sardine, and a few mullet make up the bulk of their food supply during the breeding season.

Bailey records that at Grand Gosier in June, 1913, "we counted over 1200 newly made pelican nests with fresh eggs in each. We visited this island six weeks later, and expected to find it overrun with fuzzy youngsters, but to our surprise, there were fewer than 200 nests, and only one or two young in each nest. We thought at first that the abnormally high tides had drowned them, but we discovered four nests of sea turtles which had been robbed, and there were many tracks of raccoons. Undoubtedly, these animals cause immense damage among the nesting sea birds."

**Man-o'-war-bird,** *Fregata aquila.* This species, which is known as the "storm bird" by the people of the coast region, is a summer visitor. We have never seen it during the winter. They are abundant about the pelican colonies on Errol and North Islands where they secure an easy living stealing from the nesting birds. It is a common sight to see thousands of these long-winged marauders sitting about the bushes; as one approaches the colony the Man-o'-war-birds take wing and sail directly overhead, often poising on outstretched wing as they eye the intruder inquisitively; often they will circle high in the air until they appear as small dots in the sky. A few definite records of their occurrence may be given; namely, several hundred were seen
at Isle of Pitre, June 7, 1918, and others on the same date at North Island. They were only about one hundred at Errol Island, June 5, 1919, while on June 10, 1930, several thousand were noted in one flock at North Island. Beyer, Allison, and Kopman give the species as a resident and breeding commonly, but on our many trips to the bird islands we have no evidence to support this.

**Red-breasted Merganser.** *Mergus serrator.* This is a common bird of the coast during the winter months. The local name, "bec-scie de mer" (saw bill of the sea) is an appropriate one, for they are found along the passes and in the gulf. They were seen on practically every trip during the fall and winter months, and Bailey’s notes record that specimens were taken in Vermilion Bay, November 20, 1916, at Grand Island, March 15, 1919, and that there were many at the mouth of the Mississippi River off Main Pass, October 25, 1928. He failed to identify *Mergus americanus*, although it undoubtedly occurs along the coast in winter.

**Hooded Merganser.** *Lophodytes cucullatus.* These handsome birds were seen in small flocks in the tidal streams and bays along the coast during the winter. In November, 1918, many were observed in the small bayous adjacent to Vermilion Bay, and a few specimens collected. Several flocks were noted at Chenier au Tigre, March 10, 1918, and one bird in the same locality, December 8, 1925. While this species is generally distributed, it is never seen commonly when compared in numbers with other species of ducks.

**Mallard.** *Anas platyrhynchos.* This is the common duck of Louisiana. They begin to arrive the latter part of October, and many remain until the latter part of April. They were observed in pairs in the western part of the state, in April, just before they started their northward migration. Their distribution is general, and their abundance in a given region from year to year, depends upon the food supply. In November, 1916, they were particularly numerous near Chenier au Tigre. A trapper told us that in a single run of ninety muskrat traps, he had caught seventeen Mallards. Under date of November 17, Bailey’s notes read: “I never can hope to see more Mallards than I saw when I cut across from the ridge, for they rose in clouds from almost under foot, only to settle down a little way ahead. In places, they would rise from the cane, and would get tangled so that one could easily catch them.”

**Black Duck.** *Anas rubripes.* This species is generally distributed along the coast, and a few were seen on practically every trip during the winter months. They were noted as common on just one occasion,
near the Pass a Loutre, at the mouth of the Mississippi River, early in November, 1918, and even then they were few in comparison with the number of Mallards.

**Mottled Duck.** *Anas fulvigula maculosa.* We have eight specimens of the "summer Mallard", including five from the eastern part of the state, two from the western, and a breeding female from the central part. (Chenier au Tigre). They vary considerably in the markings and the head, the breeding bird being especially lightly streaked. This specimen, which was taken with a set of eggs, May 27, 1930, appears faded, and the dark mottlings of the breast feathers are distinctly brownish in contrast with the black markings of the other seven birds which were collected in November. The mottled duck is a common resident of the salt marshes, and they nest abundantly during April and May. The bird upon the nest will often allow one within a few feet before flushing from the eggs, and when young are near, it will flop upon the marsh grass in an attempt to decoy the intruder away. The nests are concealed in grass, and are lined with down plucked from the breast. Bailey encountered an old bird with a brood of young at Chenier au Tigre, May 5, 1917, another one May 12, 1918, and found a nest containing twelve eggs, April 6, 1919. Three sets were found March 9-13, 1931, which varied from eight to eleven eggs. Owing to the fact that the nests are built on the ground, many are flooded when the gulf is forced back into the marshes.

**Gadwall.** *Chaulelasmus streperus.* This is a common form in Louisiana during the winter months. They begin to arrive early in the fall; they were common at the mouth of Main Pass by October 24. (1928), and were extremely abundant in western Louisiana on November 1. These birds were not regarded highly by the market shooters, as they spoil quickly. We have not encountered the species during the summer months.

**Baldpate.** *Mareca americana.* This beautiful duck is also a common form during winter, and occurs in mixed flocks with the preceding species. They arrive early in October and many linger until early in the spring. We have no records of their occurrence during the summer months.

**Green-winged Teal.** *Nettion carolinense.* A common species during the winter months. They arrive early in the fall with many other forms, and on October 24, 1928, they were abundant in the marshes adjacent to Main Pass at the mouth of the Mississippi River. They are generally distributed throughout the marsh country, and often are found in large flocks.
Fig. 27. Nest and eggs of the Least Tern, on the shell beach.

Fig. 28. Coots, at Chenier au Tigre.
Blue-winged Teal. Querquedula discors. The blue-wings arrive early in the fall, and many of them migrate to northern South America. They are common throughout the lowlands during winter, and are the last of the ducks to leave for the north in the spring, many of them lingering along the gulf until the first part of May. We have no records of the species breeding in the state. They are tame, and are often found in large flocks feeding about the borders of lagoons. On October 24, 1928, Bailey recorded them as common at the mouth of Main Pass, and on one occasion, observed a flock feeding in company with Coots and Shoveller ducks, while along the mud flats were several beautiful American Egrets.

Shoveller. Spatula clypeata. The Shovellers are common in lower Louisiana from the latter part of October until April, and a few linger in the marshes even during the summer months. They were especially abundant in Cameron Parish, November 1, 1928. A pair was observed May 27, 1930, at Chenier au Tigre.

Pintail. Dafila acuta tzitzihua. Pintails are common winter residents, the first arriving in late October, and the last stragglers returning to their northern breeding grounds in April. Often, several hundred males will be seen in a single flock; they are favorites of the sportsmen, and thousands are killed during the hunting season.

Wood Duck. Aix sponsa. This species inhabits wooded regions and is an uncommon one along the coastal marshes. The only record from the salt marshes which we have is one, a female, at Chenier au Tigre, December 15, 1925. They are not uncommon, however, along the wooded bayous near Avery Island, and a few pairs nest on the large lake in the center of the Island. We saw a small flock among the reeds May 18, 1930, and on the same date, encountered a female with a band of five half grown youngsters. Mr. McIlhenny reported them as fairly numerous along the wooded bayous.

Redhead. Murila americana. The only definite records we have of this species are a few specimens taken at Belle Isle Lake, Vermilion Parish, in December, 1925. They prefer the waters along the coast and large open bays, and Mr. McIlhenny reports them as numerous at certain times.

Canvas-back. Murila valisineria. This species is found along the coast or upon large lakes, as are the Redheads, but is more abundant. Bailey found it common at the mouth of the Mississippi River early in November, 1918, and a few were seen in the vicinity of West Chenier Lakes, Chenier au Tigre, in November, 1916, March 6, 1918, and in December, 1925.
Lesser Scaup Duck. *Marila affinis.* These birds are very common in the larger lakes and estuaries, sometimes occurring in great numbers; they begin to arrive early in October, and many linger until the middle of April. In fact, Wright collected a specimen on Avery Island, May 17, 1930, which had been banded by Mr. McIlhenny at the same locality, February 12, 1930. The scaups are typical bay ducks, and are found most abundantly where the bays are affected by the tide. Although many scaup ducks have been examined, we have failed to find a single one which could be referred to *Marila marila.* The latter undoubtedly occurs, however; Beyer, Allison, and Kopman state it is a bird of the open gulf.

Old-squaw. *Clangula hyemalis.* This rare straggler has been recorded a few times from Louisiana, and Mr. E. S. Hopkins has given us data for three other specimens. He killed a female at Grand Isle, April 4, 1921, and another in Cameron Parish, January 22, 1929, and saw a male which was shot by a sportsman, at the Delta Duck Club, in December, 1928.

White-winged Scoter. *Melanitta deglandi.* This species is listed by Beyer, Allison, and Kopman, and by Arthur, but the only definite record we know of is a young male taken in Cameron Parish by Elmer Bowman, the latter part of December, 1924. This specimen is now in the office of Mr. Lutcher Stark, at Orange, Texas, and it was recorded in the *Auk* July, 1925.

Ruddy Duck. *Erismatura jamaicensis.* A very common winter resident, but we have not recorded it in large numbers, in any one locality. They are found in the lakes of the marshes, and when alarmed, often seek to escape by diving rather than by taking wing. They are generally distributed over the low country. A few were observed October 24, 1928, at Main Pass, and others were seen in Cameron Parish, November 1. They are not held in high esteem as game birds, as one of their local names “god-dam”, will bear witness. This expletive is used when the hunter attempts to pick his duck, for they are very tough skinned.

Snow Goose. *Chen hyperboreus hyperboreus.* This species winters along the entire coast of Louisiana, but they are found most abundantly in the western part of the state. They arrive the latter part of October, and leave for the north in April; their range is restricted to within a few miles of the coast. There is a great tract of land in Cameron Parish along the Sabine River and bordering the gulf, the property of Mr. Lutcher Stark, where Snow Geese were extremely
abundant during November, 1928. The territory is a natural wintering ground, and I am told that the birds occur abundantly each season. The great flocks were feeding on the tender shoots of grass, and at times, it appeared there were acres of snow white birds. The dark colored young were numerous, (in fact, the big flocks appeared to be formed of family groups), but they were so protectively colored that they were not conspicuous, as were the adults. Among these flocks were a few Blue Geese—possibly one Blue Goose to twenty Snow Geese. In the eastern part of the state, the ratio is reversed; the Blue Goose is the common bird, and the white one the interloper. Of many Snow Geese examined during several seasons, not one approached the size given for the Greater Snow Goose.

**Blue Goose.** *Chen caerulescens.* This is one of the most interesting of the game birds found in Louisiana. It is extremely abundant locally along the coast, from the mouth of the Mississippi to the central part of the state, in the vicinity of Chenier au Tigre. Farther west the species is found associated with the large flocks of Snow Geese. They arrive on their wintering grounds early in October, and remain until April. The main migration occurred, in the fall of 1928, on October 25, and Bailey records their arrival at Main Pass, at the mouth of the Mississippi River—"we went down Piling Bayou and into our blind along the gulf about nine o'clock. The noise of the boat flushed about 2,000 Blue Geese from the marsh, which we were sure were new arrivals. We soon realized that the main migration of the Blue Geese was on, for flock after flock and calling horde after horde came in from the west. They were flying high and each flock was apparently following in calling distance of the one before. The flight continued all the time we were in the blind, from 9:00 in the morning until 4:30 in the afternoon, with a flock of from fifty to two hundred birds in sight at all times, and often there were several flocks. We heard the birds coming in all night. A strong northwest wind had been blowing, which shifted to the northeast."

Chenier au Tigre is another ideal place to study the Blue Geese. They feed and spend the night in a great flat area known locally as the "pasture". Every morning the geese rise from their resting place and wing across the marshes, often stopping to feed at the Paul Rainey Reserve, or continuing on to the gravel banks of Hell Hole Beach. It is a wonderful sight to see the geese returning in the evening. On March 10, 1918, Bailey's field notes read, in part, "we saw the Blue Geese coming into the pasture, and it took them a full thirty minutes to pass—just a continuous stream. They seemed to fly in several dis-
Fig. 29. Young pelicans, on mud lumps, Chandeleur Islands.

Fig. 30. Pelicans, on mud lumps, Chandeleur Islands.
tinct groups, with about seventy large flocks to the group. There were
five of these hosts of geese in all, and the regular V-shaped formations
were often so interlaced that intricate networks were traced in the sky."

The plumage of the Blue Goose is varied, the belly often being
nearly white, and we have specimens with white in the wings and back.
Hybridism between this species and the Snow Goose is probable, for
the forms are closely associated, and oftentimes an adult Blue and an
adult Snow Goose will be seen with a small group of young birds,
which would appear to be a family group. Bailey has observed such
groups, and on October 25, 1928, one such family, if a family it was,
passed his blind three times. This little band of five birds passed
directly overhead, a fine Snow Goose leading, three gray immature
birds following, and an adult Blue Goose with dark belly bringing
up the rear. The guide called his attention to this one band, particu-
larly. A half hour later they were seen again, in the same order, as
they "bucked the current of the migration", winging northwest. They
flew out of sight, and then, a few moments later, they were again seen
drifting back with new arrivals. They were flying in the same group
formation, with the Snow Goose leading.

There are approximately thirty Snow and Blue Geese in Lincoln
Park, in Chicago, and we have watched them in the spring with in-
terest. They pair off indiscriminately, and it is more unusual for a
Blue Goose to have a similarly colored mate than it is for it to be
paired with a Snow Goose.

White-fronted Goose. *Anser albifrons albifrons*. This small
race is the common one—if there are two forms in North America.
It is found most commonly in the western part of the state where it
feeds on the drier portion of the marsh. They were abundant in Cam-
eron Parish early in November, 1917, and were observed again in
November, 1928. Two were collected at Chenier au Tigre, April 6,
1919. They are rare along that part of the coast.

Tule Goose. *Anser albifrons gambelli*. During the fall of 1923,
three specimens were secured, two at Pilot Town at the mouth of the
Mississippi River, and the other in Cameron Parish in western Louisi-
ana, which approach the size given for the Tule Goose. In some
measurements they greatly exceed the minimum for that form, and in
others they are slightly under. In other words, they are "betwixt and
between" specimens. We are slightly skeptical about the advisability
of two races for this species, when there is no geographic ground as
a basis. When Messrs. Swarth and Bryant published the results of
their study (1917), the difference given for *gambelli* included (1)
greater size. (2) difference in color of eyelid, (3) difference in number of tail feathers, and (4) difference in general coloration. It has been shown that the color of the eyelids and the number of tail feathers can not be used as diagnostic characters, and we doubt that the coloration of the back is any better. If the underparts of the White-fronted Goose are variable and become darker with age, then the upper parts are just as likely to be subject to change. The main difference between the two races, then, is one of size, and there seems to be a continuous gradation from the smallest to the largest. If the breeding grounds of the large bird could be found, and a geographic range established, we should feel that there is a more legitimate reason for dividing the White-fronted Geese into two races. The measurements for our three Louisiana birds, which are intermediate, but nearer those given for gambelli than albibrons, are: (C. A. of S. No. 2007) male, culmen. 55 mm.; wing, 430 mm.; tarsus, 72 mm. (C. A. of S. No. 2001) female, culmen, 57 mm.; wing, 415 mm.; tarsus, 70 mm. (C. A. of S. No. 1977) immature, culmen, 50 mm.; tarsus, 71 mm.; wing, 405 mm. Numbers 2007 and 1977 were taken at Pilot Town, Louisiana, and the immature specimen was a soft-bodied bird. It weighed 51½ pounds. The adult female, Number 2001, a very dark-bellied bird, was taken in Cameron Parish.

Canada Goose. Branta canadensis canadensis. This species is fairly common locally in Louisiana during the winter months. It has become scarcer of late years, however. It arrives early in October, the first birds making their appearance at the mouth of the Mississippi in 1928, before the middle of the month. About one hundred birds were seen feeding in the marsh in company with an equal number of White-fronted Geese. This species was recorded from Chenier au Tigre but once in the many visits to that place, a half dozen birds on April 6, 1919. A fine flock of 150 birds was observed on the State Wild Life Preserve in November, 1916. The warden, Wilfred Trahan, said the flock had grown from 15 birds to 150 during the three years he had protected them. Cameron Parish is an ideal location to study these birds, for they still occur in numbers in certain places. They were common in the rice fields during February, 1919.

Branta canadensis subsp. Two small geese were collected by Bailey at Cameron Farm, Cameron Parish, February 27, 1919, the only ones observed in three years of field work. We never satisfactorily identified the birds, for some of their measurements placed them as minima, while others approached those given for hutchinsi. The Hutchins’s Goose has been recorded as common in winter, and it may
have been in years past. It certainly is far from being numerous at the present time.

**Fulvous Tree Duck.** *Dendrocygna bicolor.* The first of this species was observed at Chenier au Tigre, May 6, 1917, a flock of twenty-five over the marsh. Five specimens were taken. A few small bands were seen during the following week. The birds have a characteristic flight, their long necks and dangling legs, and their methodical wing strokes giving them the appearance of ibises. A few were seen the following spring, but during the winter of 1925 the “Mexican squealer”, as he is commonly known, was abundant in the vicinity of the Chenier. The marsh men told Bailey that about two thousand had ranged near the entire fall. There were about five hundred birds during his visit in December.

**Roseate Spoonbill.** *Ajaia ajaja.* This is an uncommon species, its distribution being limited to the western part of the state, for the most part. A few were seen occasionally at Avery Island during the summer months; two were observed on April 27, 1917. A nesting colony was formerly located in the cypresses of Black Bayou, near the Sabine River. Fourteen birds were observed June 16, 1919, but they were not nesting. The Black Bayou colony was broken up because of the discovery of oil; greasy derricks and rattling machinery now are found where the roseates once held forth. The only nesting colony in Cameron Parish, so far as we know, is in a little cluster of cypresses known as Bird Island. The roseates are irregular in their nesting habits, however, and do not return to the Island every year. During the summer of 1930, we did not see a single roseate in the bird colony. The people living near by reported a few in flight the week previous to our visit, and we saw five birds over the marsh on the Cameron Land Company holdings. A small band was observed November 1, 1928, in the general locality.

**White Ibis.** *Guara alba.* This form has been given as a fairly numerous one, but our experience does not justify this view. A few were seen at Avery Island, April 27, 1917, and one was collected, and a few were observed in Cameron Parish, June 16, 1919. Bailey and S. C. Arthur wore out a great deal of shoe leather in various marshes, endeavoring to find nesting places, where the birds were said to be “by thousands”. Small herons were seen, but not a White Ibis. They undoubtedly nest in limited numbers, however, but they are far from abundant.
Fig. 31. Snowy Egret on nest, Avery Island.

Fig. 32. Little Blue Heron on nest, Avery Island.
Glossy Ibis. *Plegadis autumnalis.* The only records we have are from the mouth of the Mississippi River. There are four specimens in the Chicago Academy collections, secured through the kindness of Messrs. E. R. Pike and Joseph Leiter, which are of this species. Bailey saw several flocks in the same locality, October 22, 1928, and they were probably this species, but no specimens were taken.

White-faced Ibis. *Plegadis guarauna.* Ibises are usually common in the marshes of Vermilion Parish during the winter months, and flocks of hundreds of individuals are not unusual. All the specimens collected proved to be this form, although it is probable that some of the birds observed were of the preceding species. A few specific occurrences are as follows: ten were observed in the State Wild Life Sanctuary, November 20, 1916; several hundred at Chenier au Tigre four days later; common in large flocks, May 5, 1917, and again January 15 to 21, 1919. On January 15 Mrs. Bailey recorded in her notes, "the ibis has a swift, erratic flight when cruising over the lowlands; it swirls about in the air with wavelike motion so characteristic of skimmers, swooping this way and that, its wings making a loud, swishing noise in turning—a noise which is audible for several hundred yards. Each bird flies with no particular position in the flock, seemingly, but the flock rises and falls together with a rapidity which is surprising. When alarmed, however, they have a direct flight, the whole flock stringing out in file, each bird holding its relative position. They are curious, and occasionally the flocks will circle overhead, sailing slowly along and peering down with little calls of alarm. When the ibises alight and are feeding, they talk to each other contentedly, a noise which resembles the voices of a crowd of people talking at a distance; they feed in the long marsh grass where they catch crabs and crayfish."

Wood Ibis. *Mycteria americana.* This species makes an irregular appearance in the lowlands; it will be seen commonly during the summer months in a given region, and few will be seen the following season. It was common in the marshes along the Sabine River, where it fed in company with the Roseate Spoonbills, in June, 1919, but during 1930, we did not see a single bird. Several large flocks were observed November 1, 1928, near the Gulf Coast, in Cameron Parish. It nests, as formerly, within the state: small colonies are reported from Tammany and Madison Parishes. by Beyer, Allison, and Kopman.

[To be continued]
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; Albert F. Gunicr, Nashville, Tennessee; Alfred M. Bailey, Chicago Academy of Sciences, Chicago, Illinois; 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 $2.00 a year, and 60 cents a number. Subscriptions and orders for single copies should be addressed to the Secretary, Dr. Jesse M. Shaver, Peabody College, Nashville, Tennessee, U. S. A.

EDITORIAL

As we prepare this issue of the BULLETIN we learn that the St. Louis Bird Club is planning to celebrate the ninetieth birthday of Mr. Otto Widmann, which occurs on June 15th. Many of our readers may recall the delightfully written autobiography of Mr. Widmann which was published in the Wilson BULLETIN for September, 1927. In behalf of the Wilson Ornithological Club we offer our congratulations to Mr. Widmann.

Professor Gordon Wilson, a former secretary of our organization, has published a synopsis of his doctor's thesis, which has Alexander Wilson for the subject. Professor Wilson displays a sympathetic appreciation of Wilson's many-sided nature, and the brief abstract indicates a thorough study of the life of his subject. While Alexander Wilson is given full credit for his scientific work, he is regarded "primarily as a poet, essayist, and letter-writer, and as such, he is one of the greatest interpreters of America." Perhaps a literary student would be prone to magnify the literary qualities of the man, just as the scientist will understand and appreciate best his scientific work. And the artist may emphasize his artistic power. We hope to be able to present in the BULLETIN some contribution by Professor Wilson on Alexander Wilson.

Investigation of the "duck sickness" in Utah and elsewhere is still in progress. Formerly this malady of ducks was supposed to be due to excessive alkali in the water, resulting, perhaps, from drainage, dry seasons, and evaporation. More recently Kalmbach (Science, LXXII, Dec. 26, 1930) reports experiments which indicate that the symptoms of the duck sickness may be produced in healthy birds by feeding to them the tissues of the sick birds; and the disease may be passed on to a second, or third, bird by the same method. The feeding of natural and synthetic alkalis has not produced comparable results. Later, Gillmer and Couch (op. cit., p. 660) isolated and identified Clostridium botulinum, type C, (same as Bacillus botulinus) from the mud in an infected area in Tule Lake, California. This is the bacillus which causes the disease known as Botulism. A recent editorial in the Journal of the American Medical Association (March 14, 1931, p. 864) gives a critical review of the facts and concludes that "it must be shown that the preformed toxin and not merely the bacillus was present in the suspected food or the tissues of the diseased animals."
Science, for May 22, 1931, (Vol. 73, No. 1899, p. 12) gives a very brief report of the recent meeting of the American Society of Mammalogists. It appears that the poisoning campaign of the U. S. Biological Survey was again strongly condemned, charges being made that the Survey is playing into the hands of the livestock industry and that it has distributed poison to livestock men. It was also reported that the Survey men defended themselves by asserting that the quantity of poison used has been reduced from 13,000 ounces in 1930, to 10,000 ounces in 1931, with a proposed reduction to 8,000 ounces in 1932, a total of 31,000 ounces of poison used in three years on the wild life of the country. Who will say that this is not wholesale destruction? Folks are beginning to wonder if the Survey does not need re-christening, and certainly a reorganization would be welcome.

During the spring of 1931 a printed circular entitled “Facts About Hawks” was distributed by Jack Miner. It would be too difficult to abstract this circular with full justice to the author; suffice it to say that Mr. Miner is not only opposed to the protection of hawks, but he favors the destruction of most kinds of hawks. At the close of the circular the author gives a report of the stomach analyses of about sixty-five birds of prey.

A month later, April 7, 1931, there was issued from Toronto a four-page leaflet entitled “The Brodie Club Examines Jack Miner’s ‘Facts About Hawks’.” This is a careful analysis of the arguments and logic of Mr. Miner’s circular, and, though judicial, is much more favorable to the hawks. It seems to us that all such controversial matter should be signed by the author or authors. This letter is quite proper and wholesome, and does not deserve the stigma of anonymity.

It is beyond our scope ordinarily to comment on the major ornithological journals. However, the last issue of the Ibis for 1930 merits special mention. In addition to the regular full sized number for October there appeared two supplementary numbers entitled a “Review of the Genus Cisticola”, by Rear-Admiral H. Lynes. The text covers 673 pages, while the twenty colored plates are bound together to form another supplement. Such a voluminous monograph is seldom published by a periodical, but in this case was furnished to subscribers and members gratis. This publication formed a fitting finale to the editorial regime of Mr. William Lutley Sclater.
GENERAL NOTES

Conducted by M. H. Swenk

Nesting of Bachman's Sparrow in Butler County, Ohio.—On a field trip taken on August 6, 1929, a small bird was flushed from a hillside covered with blackberry bushes and short grasses. On investigating, I found a nest of Bachman's Sparrow (Passer aestivalis bachmani). The nest was partially sunk in the hillside. The bottom of the nest was almost bare, but the sides and top were very compact and well built, with a slight arch over the entrance. The nest was composed of grass and small weed stems. The nest contained four eggs, pure white in color, with incubation well advanced. From all reports available, this is the only record of the nesting of this species in this county.—C. K. Lloyd, Oxford, Ohio.

Bald Eagle Captured in a Trap Set for a Hawk.—About the middle of December, 1930, a farmer living near Wheeling, West Virginia, set a steel trap by a partly-eaten chicken which he supposed had been killed by a hawk. On the following day he found a Bald Eagle (Haliaeetus leucocephalus leucocephalus) in the trap. Thinking the bird would make an interesting pet he confined it for a couple of weeks in a latticed-in enclosure under a porch. After the eagle had worn out the feathers of its wings and tail by beating against the walls of its prison, the farmer reported his catch to Oglebay Park. An effort was made to save the eagle’s life, but it died soon after being released.—A. B. Brooks, Wheeling, W. Va.

Aggressive Behavior of Screech Owls.—In July, 1927, my attention was called to the behavior of a Screech Owl (Otus asio asio) that had nested in a bird box placed in the garden of a suburban home near by. The small daughter had gone into the garden on an errand about dark. The Screech Owl flew at her, flapping its wings and cracking its bill. Hearing the commotion an older child went to the rescue, when the attack was transferred to the newcomer. These attacks were kept up as long as any one entered the garden about dusk, but no one was molested during the day. I believe that these attacks were made in defense of the young.

A farmer reports that on going to and from his work, he had to pass through a strip of woods at dusk. A Screech Owl would fly at him, cracking its bill. This took place nearly every evening. It did not show its displeasure in any other way.—Katie M. Roads, Hillsboro, Ohio.

Trematodes Infesting the Neck of a Great Blue Heron.—In September, 1930, a Great Blue Heron (Ardea herodias herodias) that had been shot was brought to me for mounting. While skinning the bird I found six live parasites on the flesh of the neck under the skin, about three inches below the head. I removed the flukes and preserved them. They were later identified by Dr. Bennitt of the University of Missouri and Dr. H. W. Stunkard of the University of New York as Clinostomum attenuatum.—Cora E. Shoop, Mascoutah, Illinois.

Little Blue Herons and Egrets Near Toledo, Ohio.—Prior to the year 1930, the only record of white herons in Lucas County was a group of eight immature Little Blue Herons (Florida caerulea caerulea) observed by Mr. Louis Klewer in September, 1925, in the Maumee River Rapids south of Waterville,
Ohio. On April 19, 1930, I found an adult Little Blue Heron in the marshes near Bono, Ohio. Then came the historic drought driving the wandering herons far from their usual haunts. The first Egret (Casmerodius albus egretta) was seen on July 20 near Bono accompanied by fifteen Little Blue Herons in the immature plumage. Day by day their numbers were increased, and on the week end of August 9 and 10 an attempt was made to count all of the white herons in Lucas County. On August 9, Professor E. L. Moseley and the writer visited the rapids of the Maumee River between Maumee and Grand Rapids, Ohio. The following morning, August 10, the writer alone covered the marshes around Bono, Ohio. The final count was: Little Blue Herons, August 9 (60); August 10 (25), all in white plumage; total 85. Egrets, August 9 (21); August 10 (25); total 46. From this date their numbers became smaller. My last record for the Little Blue Herons was four on August 24; for the Egrets, four on September 20.—Louis W. Campbell. Toledo, Ohio.

May the Color Pattern of the Mockingbird's Wings Aid in Finding Insect Food?—I have often admired the pretty way in which the Mockingbirds (Mimus polyglottos polyglottos) raise and extend their wings at intervals while tripping along the grassy sward of lawns or pastures, but had always considered this as merely a display of vanity. However while watching a pair of Mockingbirds at Pensacola, Florida, in the spring of 1928, I was shown that this display may have a very practical use. These birds had a nest of young in a honeysuckle vine on a gate post and they frequently carried on the search for insects in a nearby field. As I watched I was impressed with the frequency with which the wings were opened and closed. Also, I noted that while the dull gray Mockingbird blended well with the background of earth and grass, yet when the wings were extended he became very conspicuous. The idea occurred to me that to an insect on the ground this sudden spreading of the contrasting colored wings must be actually startling. With this in mind I watched with greater care and on several occasions noted that grasshoppers or similar insects flew from the grass as the bird made this display and that it quickly pursued them. After considerable observation I was convinced that in this instance, at least, the Mockingbird's striking wing pattern was of real assistance to it in finding insect food.—Frank F. Gander. Natural History Museum, San Diego, Cal.

Food Regurgitation by Young Kingbirds.—In the summer of 1928 I found a nest of the Kingbird (Tyrannus tyrannus) on some timbers hanging from some roof-trusses on which the wood sheathing had not yet been placed. I could watch the nest from a point above and fifteen or twenty feet distant. I noted some very interesting things in regard to the family life of the Kingbird, but the most interesting was the fact that the young, after being fed, would often, but not always, regurgitate a pellet of undigested matter and that the parent bird would watch carefully for this pellet and when it appeared would take and swallow it.

An ornithologist to whom I mentioned this said that perhaps I had seen the adult bird take and swallow a parcel of excrement, as is often done. However, I am sure that this was not the case as the pellet was always taken from the young bird's mouth. I saw it very distinctly a number of times and I was in an unusually advantageous position to make the observation.
I have not been able to find any reference to this habit in bird literature, but Thomas Nuttall, on page 267 in Vol. 1 of his “Manual of the Ornithology of the United States and Canada” (1832) states that the adult Kingbird regurgitates the indigestible portions of the insects it has eaten. I would like to know if others have observed regurgitation by young Kingbirds and the swallowing of the pellets by the parents.—C. S. BAUMAN, St. Louis, Mo.

Erratic Movements of the Red-headed Woodpecker.—The Red-headed Woodpecker (Melanerpes erythrocephalus) is a fairly common bird, in the summer time, in and about Sigourney and Keokuk County, Iowa, where it may usually be seen most anywhere—by the roadside, on telephone poles, on fences, or in the deep forests—but is rare in the winter time. It is as a rule most common and conspicuous during September, October, and November. However, in September of 1929 it completely disappeared from this vicinity. A trip of about sixty miles to Iowa City and back, during the latter part of the month, revealed only a single individual, which was clinging to a telephone pole as we passed.

Although I traveled considerably on the public roads and in the woods and fields, and was always on the alert looking for birds of any species, I did not see a Red-head until April 30, 1930, when I saw one. This was late for the spring arrival of the species, as the migrants usually begin to appear during the latter part of March or the first part of April. In a few days, however, they were here again in their normal numbers. Mr. J. B. Slate informed me that two of these birds had passed the winter in an oak grove near South English. These were the only ones I learned of as being in this county during a period of about eight months.

During the fall of 1930 they remained here, in their usual numbers, and during the winter of 1930-31 they are present in more than their normal numbers. Aside from the fact that this winter, up to the latter part of January, has not been so cold as winters here usually are, the weather and food supply, for the period of time covered by this report, have been, as far as I am aware, about normal.—E. D. NAUMAN, Sigourney, Iowa.

Pugnacious Dispositions of Blue Jays in the Defense of Their Young.—As bird lovers know, the Blue Jay (Cyanocitta cristata cristata) ordinarily is shy in the presence of man; but this summer (1930) I observed a very pugnacious disposition on their part when defending their young.

On July 20, while going through a pasture adjoining our farm, I noticed two objects clinging to the base of the trunk of a large beech, and, as I had not noticed such objects on this tree before, I investigated and found that they were young Blue Jays that had but recently left the nest, since they could not fly very well. They did not move until I picked them up, when they began to call for help as loudly as they could. Until then there had been no adult jays in sight, but the minute the young started calling, both parents were in the trees above my head, screaming with all their might and flying about from tree to tree. The young then stopped their calling and sat on my fingers, as tame as a couple of little chicks.

But the adult jays became furious, and came darting at my head from the nearby trees, finally actually striking me on the top of the head. They took turns flying at me and striking me, and continued this for some time, screaming all the while. Then one young bird jumped from my fingers to the ground, and
wrestled by the wings and fluttered along. One of the adults flew to its side and fluttered about, then flew back at my head, while the other adult continued to dart at me. The other young bird then flew away also. I caught both of the young and placed them on a branch of a beech. But as I walked away the adult birds still waged war upon me.—Raymond O. Marshall, Leetonia, Ohio.

Some Accommodating Bird Tenants.—The elements of weather had hollowed out the center of an old fence post. This opening afforded a Bluebird the desired protection for a home in which to rear her family. Early in May she located this spot, and had built a nest at the bottom of a vertical hole that descended for about a dozen inches. There she brooded over her complement of four pale, greenish-blue eggs. The eggs hatched and the youngsters developed rapidly, as the mother did more than her share in bringing food for her babies. This continued for a couple of weeks, then one morning the home was deserted.

Scarcely a fortnight after the Bluebird family had departed, a pair of wrens decided that the same fence post would suit them for a summer home. It was necessary to make a few improvements, so the pair brought in quantities of sticks and twigs and soon the bottom of the hollow cavity was filled with sparse material. The door that had been cut in the side of the post by the writer admitted too much light, and this was closed with a bunch of sticks. Some soft material lined the interior of the nest and there a Bluebird’s feather, left by the previous tenant, could be seen. While watching the scene of this happy home one afternoon, the last of the family clambered to the top of the post. There he sat for a time but a passing wagon frightened him and he dropped into the tall grass. In a few minutes he escaped from view and the home in the old post was again vacant.

A few years later another pair of wrens chose a more conspicuous place in which to build. They gathered sticks and a small amount of feathers and down, which they fashioned into a nest of the usual type placing it in the transom of a doorway in a busy section of a little town; a rather unusual place for wrens to start housekeeping. They reared their family and seemed little concerned about their proximity to man’s dwelling. Their nervous chattering, during the brief time they occupied the transom home, lent a pleasing note to the long day. They slipped away one day before we hardly knew they were gone. Later during the same summer a Robin saddled her nest upon the top of the wren’s nest, probably thinking that it was no more than a convenient foundation for her home. After a period of careful attention, during which the mother braved her conspicuous position above the door, the young developed until the nest was running over with flesh and feathers. The nest was no longer large enough to hold them and they were forced to leave their home.

While Robins, Bluebirds, and wrens often return to their former nesting places, we wonder whether such tenants would accommodate each other again as they had done in “The Old Post Home” and in “The Transom Home.”—S. W. Frost, Arendtsville, Pa.

A Land Migration of Coots.—One of the most interesting sights in bird migration which I have ever seen, occurred in the Warner Valley region of Lake County, Oregon, in May of 1929. This area is an immense marsh and lake region, some thirty-six miles long and from five to seven miles wide. Large and
small lakes, ponds, and water almost everywhere, and large areas of tules and flags, with wild grass lands.

I was located at the southern end of the valley, and on my arrival was informed that thousands of large black-colored birds were passing through the marshes northward. So on the next morning, May 9, I went to the location mentioned, which was about two miles out in the marsh and there in full view some 300 yards distant were the Coots (*Fulica americana*) marching northward like an immense army, from six to twenty-five of them abreast. They followed the course of dry land wherever possible, and did not enter the water to swim across ponds and lakes, but followed the shore lines, in constant motion. They did not seem to be feeding. They would not rise to wing unless approached too close, and then would fly only a short distance, and continue their northward course.

The season of 1929 was a very late one. Generally at this time nests with full complements of eggs could be found. But in 1929 at this time they had just arrived from the south. The open ground where these birds could be seen extended about one-half of a mile in length, and the birds covered the entire length. I judge that not less than 5,000 birds passed this point the first morning of my visit.

Again the next morning I visited the place, and the procession was still in progress, with 3000 birds in sight. Again on the third morning of my visit the Coots were still walking northward, but in very much reduced numbers, now scattered in flocks of fifty to one hundred birds. The fourth morning the migration had been completed at this point. My estimate of 10,000 birds seen during the four-day observation I believe is far below the actual number.

Visiting the northern part of the marshes a few days later, I found the birds scattered in all directions, looking for their summer nesting locations. Not until about June 1 were any nests found, with eggs, and these with incomplete sets. The marshes and tules, however, were filled with new nests, and Coots were everywhere.

How many of these Coots remained for the season in Warner Valley, I am unable to say, but there was an abundance of room and food. In talking with the older resident of the valley, and some who live out on islands in the marshes, I found no one who had ever seen this before. My record set of Coot’s eggs is seventeen, taken in 1925.—Dr. A. G. Prill, Scio, Ore.

**Five Little Migrant Shrikes.—**On May 25, 1927, five lluffy Migrant Shrike babies, with tails about an inch long, were sitting in two elm trees beside Snail Brook, west of Norman, Oklahoma. They were vociferous, and demonstrative with their wings, whenever their parents came to them, but quiet in between meals. The begging note was a harsh *ker ker ker ker*. Once when a parent left, the young said *too too*; when I came near, they remarked *krou krou krou*; sometimes they grunted as they sat waiting. They also preened themselves and pecked at leaves.

Interestingly enough, mother *Lanius ludovicianus migrans* went to an old nest forty feet up in a nearby elm, and from there flew with a twig to a new nest about a hundred feet to the north. This new nest was thirty feet from the ground, in an elm, and was composed of twigs and a small amount of cotton. She then returned to what had probably been her first home, tugged at a piece of grape vine and carried it also to her new dwelling, where she drove off two
English Sparrows that were in her way. She made one more visit to the new nest during the hour I watched.

Both parents gave battle to a passing Blue Jay, but a Nighthawk winged its way unheeded.

At one time all five babies were on the same branch, but they changed their positions frequently, sometimes flying to the place where a parent had mounted guard, sometimes hurrying over to beg frantically beside a lucky brother that had just received an insect. Between 6:00 and 7:00 A. M. the young were fed twenty-three times by both parents, one of whom worked much harder than the other.

Four days later I visited the same spot about 5:30 in the morning and found that the tails of the young shrikes were nearly as long as those of the parents. Mother was getting cotton and twine from the old nest for the new one. As she flew past she was fervently appealed to by a baby, but her mind was on other matters. One youngster begged from another, but, on seeing his mistake, tried to peek his brother. Two Mourning Doves were courting on the ground; a little shrike flew to them and they separated; he darted at one who retreated and then at the other. He hurried after a grasshopper but in vain.

A Mockingbird was driven by the parent shrikes from the elm in which their young had been perched on May 25, although none were there at this time.

Three babies congregated at the fence, hoping for a tidbit from father. They teased and teased whenever he was near. Two flew to the ground and experimented busily, picking up little bits of things and tweaking cotton stalks. One actually got something for himself, for he ate and ate. While they were foraging, one of them noted that father had darted to the ground. He hurried toward him and got his reward. Father fed eight times in fifteen minutes. All of the food given on both days that I was present consisted of insects.

The parent shrikes looked alike, but it seems probable that mother was the one moving house for the second brood and that father was taking most of the care of the fledglings.—Margaret M. Nice. Columbus, Ohio.

Some Notes on the Fall Migration of Shore Birds.—"Practically nothing is known as yet of the manner in which single birds travel", says Wetmore, "since our observations to date have been restricted mainly to group identification." And again, "Definite data as to the rate at which birds travel south in autumn are lacking" (Migration of Birds, pp. 113-114). This being the case I thought that certain observations on shore birds made by me during the past autumn might be of interest.

On October 27 I saw a Black-bellied Plover on the shore of one of our Madison lakes. I was interested in it not only because these plovers are of uncommon occurrence here in the fall but also for the reason that this individual had but one good leg, the right one being severed about half way up. In spite of this mishap, however, the bird appeared to be in excellent condition and flew in an entirely normal manner. Up to and including November 4, I saw it at the same spot on five different days, so that its stay covered at least nine days. The weather during this period had been unseasonably warm, but on November 5, after an unusually cold night, the bird was gone.

On five occasions from October 21 to October 29, inclusive (another period of nine days), I saw a lone Pectoral Sandpiper on a neighboring pond. In this
instance there was no such distinguishing mark as in the case of the plover, so
that the evidence of its being the same bird each time was not so satisfactory,
but I believe this was the fact. It was a late date here for this species, the
latest in fact, on record, and although during this period I visited all the likely
spots in our area I found no others of its kind.

So, too, I saw on October 8, 12, and 15, a period covering eight days, a
little band of Dowitchers. Here again is a species that is decidedly uncommon
here at this time of the year, there being only three previous fall records. Bent,
indeed, gives no fall dates for any of the north-central states. There were three
birds in the small flock in question and they were found each time in the same
place, wading about in the shallow water of a tiny bay, feeding indifferently
with bills pointed downward in true Dowitcher fashion.

No variation in plumage could be discerned in any of these birds from day
to day, a fact which is of only negative value since none but young birds are
likely to appear so late in the year and they would look much alike. Their
scarcity at this season, however, and the fact that they were always found in
the same spot makes it highly probable that they were the same individuals. If
this is so they were surely traveling in a leisurely manner.—John S. Main,
Madison, Wis.

Migration Notes on Swans West of the Mississippi.—During the hunting
season of 1929, two reports of swans were received. Early in November a swan
was shot and wounded at Honey Creek Lake, near Council Bluffs, Iowa. The
bird was turned over to the State Game Farm, at Clive, Iowa. In the latter
part of November, a hunter killed a swan at Swan Lake, near O'Neill, Nebraska,
and he gave the bird to a Federal Game Warden.

The fall of 1930 furnished several records of the Whistling Swan (Olor
columbianus). Two hunters killed a swan near Castana, Iowa, about forty
miles south of Sioux City, during the last part of October. At about this same
time eight swans were destroyed by hunters at Mountain Lake, in southwestern
Minnesota. These birds were all given to a game warden. This same week wit-
tnessed the slaughter of six swans at Appleton, in western Minnesota, but in this
case the birds were confiscated by a game warden and the men were fined ten
dollars for each swan. I believe these latter birds were sent to the University
of Minnesota Museum. Two immature swans were shot by error on October
20, 1930, from a sandbar in the Missouri River about a mile or two above the
mouth of the Big Sioux River, which would be opposite the South Dakota shore.
Both birds were identified by T. C. Stephens as columbianus, and were later
turned over to the resident game warden.

Near the middle of November, three wounded swans were found by Game
Warden C. C. Watters, of Long Prairie, Minnesota. One of the birds died and was
given to the high school and the other two were cared for by Mr. Watters. The
last swan reported killed was on November 23, when hunters at Yankton, South
Dakota, saw two of the birds and shot one of them. This swan was identified
as a Whistling Swan by Dr. A. P. Larabee, of Yankton College, Yankton,
South Dakota.

The writer thinks that the birds recorded above were in most cases not
shot at deliberately, but were actually mistaken for Snow Geese, which come
through this region in great numbers. Another comment is that these swans
are often reported as Trumpeter Swans (Olor buccinator) but most likely all
the swans here recorded as taken in this region have been of the smaller species.

Two sight records of swans are also worthy of mention. During the first
part of November, 1930, Mr. M. A. Mather, of Sioux City, saw a flock of about
fifteen swans fly over Badger Lake, Monona County, Iowa. Early in December,
1930, a flock of swans was reported at Phoenix, in northern Nebraska, and was
said to be the only flock known to have passed through that region in the last
ten years.

Mr. B. W. Cartwright, of Deer Lodge, Winnipeg, Canada, reported a very
heavy flight of Whistling Swans at Lakes Manitoba and Whitewater, during the
fall of 1930. The above 1930 records show that the flight was more abundant
than usual, and that it was well scattered.—Wm. Youngworth, Sioux City, Iowa.

The 1930 Fall Migration at Cleveland’s Public Square.—Between
August 7, 1930, and December 29, 1930, a check of birds present at the Public
Square in Cleveland, Ohio, revealed a total of thirty-one species, visits being
made nearly every day except Sundays in this period. This locality was described
The following is my list of species seen this year:

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<th>Species</th>
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<th>Last Record</th>
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<td>Bay-breasted Warbler</td>
<td>Sep. 24</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Black-poll Warbler</td>
<td>Sep. 16</td>
<td>Oct. 15</td>
<td>16</td>
<td>2</td>
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<tr>
<td>Palm Warbler</td>
<td>Sep. 23</td>
<td>Oct. 4</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Louisiana Water-Thrush</td>
<td>Sep. 3</td>
<td>Sep. 5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Northern Yellow-throat</td>
<td>Aug. 21</td>
<td>Oct. 2</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Wilson’s Warbler</td>
<td>Sep. 24</td>
<td>Sep. 26</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Redstart</td>
<td>Sep. 19</td>
<td>Sep. 22</td>
<td>3</td>
<td>1</td>
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<td>Cathbird</td>
<td>Sep. 20</td>
<td>Oct. 18</td>
<td>19</td>
<td>2</td>
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<tr>
<td>House Wren</td>
<td>Oct. 1</td>
<td>Oct. 9</td>
<td>5</td>
<td>2</td>
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<tr>
<td>Winter Wren</td>
<td>Oct. 11</td>
<td></td>
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<td>1</td>
</tr>
<tr>
<td>Long-billed Marsh Wren</td>
<td>Sep. 17</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Golden-crowned Kinglet</td>
<td>Oct. 15</td>
<td>Oct. 21</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Veery</td>
<td>Sep. 19</td>
<td>Sep. 20</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Olive-backed Thrush</td>
<td>Sep. 18</td>
<td></td>
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<td>1</td>
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<tr>
<td>Hermit Thrush</td>
<td>Oct. 9</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Robin</td>
<td>Oct. 3</td>
<td></td>
<td>1</td>
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The largest number of species occurred on October 1, when I found eight,
totalling nineteen individuals. On October 25 I managed to pick out at least
forty-three White-throated Sparrows mingled among the many English Sparrows present at that time. Most of these white-throats were in the immature plumage, and after acquiring city soot for several weeks, they were almost indistinguishable from any other brown bird, except by mannerisms and form.

There are several species in this list which were new to me and rather unexpected in such a locality. The Sora was seen lying dead on the grass beside a tall, slender monument. It had evidently struck the shaft the night before. I saw the Duck Hawk several times from my office window as the bird soared over the Square, putting the flock of Pigeons into a frenzy of fear. The Bobolink was a bird in the fall plumage, well able to fly and apparently in good health. It stayed close to that portion of the Square where there is the largest area of lawn, and walked about among the English Sparrows, feeding with little evidence of fear of man. Among the most unusual was the case of the Louisiana Water-Thrush. In some manner this bird had blundered its way inside of the lobby of the Union Terminal Building, and there it spent three days flying over the heads of the many people who were going to and from the offices and trains. Occasionally it stopped to rest on a sash of one of the great windows which kept it a prisoner, and most of the time it called continually with its characteristic piercing chip. The Robin seen on October 3 was the second Robin which I have found at the Square in over five years of observation, although the bird breeds commonly in yards not much over a mile away.

Several of the birds were enough at home to venture fragments of their songs. The Veery, White-crowned Sparrow and White-throated Sparrow all sang, the last doing so quite frequently. With two exceptions, all of the birds seen appeared to be in good condition. The Golden-crowned Kinglet seen on October 15 was on the ground, barely able to hop, with its feathers very much ruffled and disheveled. One white-throat, seen over a period of several weeks, had lost its tail, but appeared to be handicapped only a little in its flight and efforts to find crumbs.

The remodeling of one section of the Square removed a fountain and pool which had been surrounded by flower beds and several shrubs and substituted plain patches of grass. This change made a noticeable reduction in the number of birds seen in the section, robbing several species of hiding places which had been very welcome in the past. A great increase in the number of Starlings about the Square, culminating in a flock, estimated at 3,000, on November 3, must have had some effect on the movements of native birds.—William H. Wattekon, Cleveland, Ohio.

Notes on the Starling from South-Central Indiana.—In the summer of 1925 I learned, through a short item in a daily paper, that the Starling (Sturnus vulgaris) had reached central Ohio. I knew that the Starling had been brought from England and liberated in New York some time in the 1880's, but, of course, I had never seen one. However, badly as I desired to meet the stranger, I feared his coming from the standpoint of our native bird life. But I knew that they would come, so I was on the lookout for the first arrival.

I met my first Starling shortly before noon on February 18, 1927. One was brought to me by J. W., a neighbor, who knew of my interest in birds. So the first one I ever saw I was permitted to hold in my hands. J. W. did not know what bird it was, but I recognized it at once from pictures that I possessed.
He had caught it the night before, together with some pigeons that he wished to market. Noting a strange bird among them, he blinded it with a flashlight and caught and imprisoned it in a box. He saw no others, and this one he liberated on his return home.

My first meeting with the Starling has now been almost four years ago and yet I have not seen their nests. J. W. has a flock of about sixty now, but the queer part of the matter is that they spend only the winter with him; during the summer not a Starling can be found on his premises. Where do they go? I know a few other places where one may find them in the winter but they all seem to disappear during the summer. Those that I have watched spend the bright days, or bright parts of a day, away from the buildings and among the trees or in the fields, but toward evening and on cloudy days they huddle with the pigeons in the higher, darker parts of the barn. The English Sparrows do not mingle with them to any extent. Also, I believe that the Starling, if possible, is the more intelligent bird. They seem to be sociable, congregating in flocks at various times and wheeling here and there as they move from tree to tree or from one part of a field to another. Their notes remind me not a little of those made by a flock of young turkeys: irregular, but not so continuous, nor so loud.

After becoming acquainted with the Starling, and having read everything pertaining to them that I could obtain, I had forgotten pretty much about them except that I had still to see one of their nests. So it was a bit of a surprise when, on December 27, 1928, another friend, a village storekeeper, brought me a shoe box containing half a dozen dead Starlings. He wanted to know what birds they were. I told him, "Write that down", he said, "I'll forget it, and Father Gadlage wants to know. I told him that I'd find out." Rev. Herman Gadlage of St. Maurice, a village west of my home, had found that morning about fifty dead Starlings under the evergreens in front of his home. Among them were about a dozen dead English Sparrows. What had killed them? Excepting a light rain the night before they had suffered nothing from the elements. The death of so many birds, under the circumstances, has me puzzled.

Since meeting my first Starling I have heard other reports to the effect that they are not nearly so bad as I had been led to believe. This is welcome news, indeed, if it is true. As we have them anyway, we can do no better than to wait and see how they conduct themselves.—GRANT HENDERSON, Greensburg, Ind.

The Gambel's Sparrow at National, Iowa.—Probably several of those who heard Prof. Swenk's admirable paper on "The Crown Sparrows" at the Des Moines meeting of the Wilson Ornithological Club resolved to be more careful when identifying sparrows with white crowns. My opportunity to profit by such a resolution came on October 6, 1930, under circumstances most favorable for identifying. The water of neighboring brooks had been dried up in the season of drought, therefore water for the birds had been placed for them in a bird bath fourteen feet from a window. To it there came on the date mentioned a Gambel's Sparrow that remained several minutes to drink and bathe. It was so near that its distinguishing marks could easily be seen.—ALTHEA R. SHERMAN, National, Iowa.
ORNITHOLOGICAL LITERATURE


In Part I of this book fifteen chapters tell of the dangers which confront American wild life—"the dark side". Here the gruesome story of destruction is placed on record, not merely for the information of future generations, but, doubtless, with a hope of stimulating the present generation from the lethargy of inaction. Chapters XIV and XV are especially interesting because they deal with the conservation contests of the past two or three years.

Part II consists of eighteen chapters dealing with the progress of conservation achievement in America—"the bright side". The facts show that much has been done, mostly, however, for the mammals. These chapters do not cover the establishment of the numerous bird refuges throughout the country, but they do disclose an amazing story of accomplishment. It is also amazing that in spite of so many victories for wild life, the latter is still in great danger owing to the tremendous increase in population and sport. Much of the story is very recent history—so recent that many people have not read it. Much of it has never been in print before.

It seems to be quite safe to say that no one man has been in the midst of so much effort and struggle in behalf of wild life as Dr. Hornaday. It may be doubtful if any one else has possessed the same broad knowledge of the field; no one else has shown greater devotion, greater acumen, more dogged persistency or greater courage in the face of herculean opposition than Dr. Hornaday. Future generations will scarcely fail to recognize him as the great leader in the fight for the protection of wild life. Some who have derived their livelihood for working in behalf of wild life have followed ignes fatae while the wild life suffered accordingly. Dr. Hornaday has never been side-tracked, and his language has never been misunderstood much as it may have been disliked. This book is not a story of his life, but it shows what a powerful force he has been in molding public sentiment and in putting theory into practice. No one interested in game protection will lay this book aside without completing the reading of it.—T. C. S.

REPORT ON A GAME SURVEY OF THE NORTH CENTRAL STATES. By Aldo Leopold.


This report is the most original and exhaustive study of upland game conditions which the reviewer has seen. The Survey has been carried out by Mr. Aldo Leopold (a holder of the gold medal of the Permanent Wild Life Protection Fund for distinguished services to wild life) under the auspices of the Sporting Arms and Ammunition Manufacturers' Institute, and for an area called the "North Central States", including Michigan, Wisconsin, Minnesota, Iowa, Illinois, Indiana, Ohio, and Missouri. The chapters deal chiefly with the following topics: Bob-white, Rabbits, Ring-necked Pheasant, the Game Cycle, Ruffed Grouse, Prairie Chickens, Big Game (including deer and turkeys!), Waterfowl, Predators, Game Lands and Game Administration, the Conservation Movement, Con-
conclusions. The chapter on Bob-white covers forty-five pages, divided under the following headings: history, status, movements, life history, food and coverts, effects of weather, management, etc. The detail gives some idea of the range of treatment.

This Survey has been undertaken by Mr. Leopold and the arms and ammunition manufacturers apparently for the purpose of ascertaining certain facts concerning the game, and perhaps also for the purpose of education and propaganda in the interest of an increased supply of game. One of Mr. Leopold's principal points of emphasis is the scientific study of game—game research. He points out that in 1927, to the best of his knowledge, there was only one person in this group of states who was carrying on research relative to game, whereas in 1930 there were fourteen. Of these fourteen workers three are in Minnesota, two are in Wisconsin, seven are in Michigan, and two are in Ohio, Iowa, Illinois, and Missouri have none. Three of these research men are holders of fellowships recently established by the Sporting Arms and Ammunition Manufacturers' Institute, as follows: at the University of Minnesota R. T. King is working on the complex problem of the Ruffed Grouse; at the University of Wisconsin Paul L. Errington is working similarly on the Bob-white; and at the University of Michigan R. E. Yeatter is working on the Hungarian Partridge. The other workers seem to be financed, in most cases, by the State Game or Conservation Department. The important fact is, however, that the work has been placed on a research basis. This means that the work is being carried on free from bias or control, and with reasonable thoroughness. The university connection engenders confidence in this.

It may seem that the arms and ammunition manufacturers have changed base somewhat in thus making a liaison with science. Perhaps so, but there is nothing strange or illogical about it. Continuation of their business, between war periods, depends to a large degree upon the perpetuation of game. Perpetuation of game is exactly the objective of conservationists. In this respect, therefore, there is a common basis of agreement. Let us make the most of that fact.

We are still opposed to the substitution of foreign game for native game. Such substitution is based on a galaxy of fallacies. But we believe that we are consistent in approving one part of the program and disapproving another, if we keep the two parts separate in our thinking. With these reflections in mind we feel indebted to the Game Survey for its fact-finding service, and we hope that it (and its sponsors) will find so much success in developing the native wild life that exotic forms will be found to be superfluous.—T. C. S.


Mrs. Nice presents in this paper not merely a revision of "The Birds of Oklahoma", by Mrs. M. M. Nice and L. B. Nice, (published in May, 1924, as a University of Oklahoma bulletin), but practically a rewritten work. The historical sketch is materially new. The "Itineraries and Reports of Field Workers in the State" is a new and most valuable addition, listing all known ornithological observers in the state from the earliest records; it is in reality a part of the history of ornithology of the state.

The list proper includes 385 forms, as contrasted with 361 in the 1924 edition. However, several of the forms listed in the old edition have been dropped.
in the new one, and, of course, new forms have been added, 35 in number. Ten species are listed as extirpated in the state, viz., Trumpeter Swan, Swallow-tailed Kite, White-tailed Kite, Sharp-tailed Grouse, Sage Hen, Whooping Crane, Eskimo Curlew, Passenger Pigeon, Louisiana Parquetry, and Ivory-billed Woodpecker.

The author has had the advice of Dr. Stone in the selection of the nomenclature, which will, therefore, probably conform closely to the new A. O. U. check-list. A bibliography relating to Oklahoma ornithology is appended, together with several maps and halftones. It is quite apparent that much effort is being made to advance the ornithology of this state, and keep it abreast of general progress.—T. C. S.


Howell's "Birds of Arkansas" (1911) listed 255 forms. Several other faunal lists for this state have appeared in the periodical literature, and are acknowledged by the author of the paper here reviewed. Baerg has increased the number to 312 species and subspecies. The list includes a description of the plumage, a statement of the range, and some discussion of habits for each species. This bulletin forms a very complete and useful handbook of the birds of Arkansas, named and arranged in the latest predicted nomenclature.—T. C. S.


This annual has now been published in twelve successive years. Most of the articles deal with local ornithology, but in a number of cases have general interest. For instance, Mr. Emilio records the capture of a specimen of Say's Phoebe at Ipswich, Mass., in October, 1930. Philip Emerson records the nesting of the Blue-gray Gnatcatcher in northeastern Massachusetts. The description of the bird is good, but the editors advise caution, because the nest is atypical. We should not be much surprised at the construction of an atypical nest by birds that get so far out of their normal range—they are probably not exactly typical birds, psychologically. Mr. Emilio also presents an instructive account of North American birds which have been recorded from time to time on the British Isles. Dr. Townsend and Dr. May both contribute articles on the birds of prey.—T. C. S.


We count 110 native species listed and described in this booklet. Ninety-four of the species are illustrated by pen sketches made by Mr. Frank Tose. There is also an appended list of eleven introduced species on the waters of the Park. We are not in a position to pass critical judgment on the inclusions or omissions from the list, but it is certainly a fine thing to have such a guide available to visitors in this western center of population, and it would seem that this substantial little book will serve its purpose well.—T. C. S.


Mr. Rapp lists 179 species (plus 3 extinct or hypothetical forms) based upon thirty-five years of observation.—T. C. S.

Good as far as it goes. This paper purports to be a reasonably complete bibliography of Ohio zoology, and the index indicates that a good many ornithological titles have been found, perhaps more than for any other animal group. It is quite apparent, however, that the Wilson Bulletin was not searched for Ohio material. In the Wilson Bulletin for 1909 G. Clyde Fisher reported the Prothonotary Warbler at the Lewistown Reservoir. The volume for 1908 contained a note by Robert J. Sim on another record of Brunnich’s Murre for Ohio, and L. S. Keyser reports Bachman’s Sparrow in Tuscarawas County. Two notes by Jones on Bachman’s Sparrow and Bewick’s Wren in 1909 are overlooked. In 1919 Oberholser reported the Hoyt’s Horned Lark for Ohio. Various other notes by Henninger, McConnell, Jones, Balch, Wharram, Henderson, Katie M. Roads, Pontius, Bilococ, Louis W. Campbell, Moseley, and others have been missed. Henninger published forty-four ornithological notes, mostly relating to Ohio, in the Wilson Bulletin, all of which were overlooked. These noted omissions are discovered by glancing in the few volumes picked out at random: doubtless they form a small part of Ohio ornithology overlooked by the bibliographers. It seems inexcusable to thus overlook a magazine which specializes in one branch of zoology, and especially in view of the fact that the Wilson Bulletin was for many years published in Ohio, and might be expected to contain many references to Ohio ornithology.

We suspect that the compilation of the bibliography was done entirely by consulting the volume indexes for state references. If, for example, we examine the volume of Bird-Lore for 1923 we find that its index contains eleven Ohio references, eight of which are included in the Ohio bibliography (the three not included are merely club reports). On the other hand pages 186 and 252 of the same volume contain ornithological notes from Ohio of as much value as others cited, and these two items are not cited in the volume index, nor do we find them listed in the Ohio bibliography. It would seem that we must conclude that the bibliography was compiled by scanning the indexes of the periodicals, an evidently faulty method of preparing a bibliography. If all periodical literature has been searched in the same faulty manner, with the same proportion of omission, just what reliance may workers place upon the Ohio bibliography as an aid? A bibliography is no easy matter, and when done no one can be quite certain of its completeness. The substance of our criticism in this case is that for the sake of accuracy the body of the journal should be searched, and that reliance can not be placed on the volume indexes.—T. C. S.


The bulletin here described reprints two of Mr. Baldwin’s most important papers on the bird banding work. The first paper, under the same title as above, was published in 1919 by the Linnaean Society of New York, and was the first published report on Mr. Baldwin’s method of trapping and banding wild birds as practiced by him during the preceding five years. Mr. Baldwin’s great contribution was the use of traps for capturing adult birds for banding. Previous to his work most of the banding had been done on nestling birds, with which the
mortality was very high, greatly reducing the percentage of returns. This paper is a classic in the literature of bird banding, and has been out of print for some time; the reprinting of it by the Cleveland Museum makes it again available. Along with this article Mr. Baldwin's paper on "The Marriage Relations of the House Wren" (first published in the *Auk* for 1921) is also republished. This paper demonstrated the usefulness of the banding method in working out the domestic and social relations of birds. We understand that free copies of this reprint are obtainable upon request to the U. S. Biological Survey, Washington.

—T. C. S.


The region described in this paper suggests to us Mr. Sutton's account of the Pymatuning Swamp in Pennsylvania, though the Peterboro Swamp seems to possess far fewer species of birds. Mr. Spiker divides his area into six plant habitats and describes the bird life of each. The total list of 114 species for the entire region suggests a very ordinary fauna, with the understanding that it has been studied in the winter and spring as well as summer. Mr. Spiker's study of the territory began with a six-weeks' sojourn in the summer of 1927. The paper does not state precisely the periods of later study, but "subsequent visits to the tract at other seasons of the year have given us a reasonably complete view of the area during the whole year."

In Part 2 the same author reports on a biological survey of Labrador Pond, located also in the center of the state. For this region 107 species of birds are reported. The surveys of both regions include some mention of the mammals, more extensive, however, for the Peterboro area. Both surveys were undertaken to determine the wild life present and also the fitness of the habitats for the introduction of game birds. Besides the numerous halftone illustrations by the author Mr. E. J. Sawyer has contributed a colored plate of the common winter birds.—T. C. S.


Work has been done on a wide variety of picine material, including particularly a study of the muscles and their attachments. The details of the origin and insertion of muscles in the Pileated Woodpecker are presented quite fully.

—T. C. S.


The older name for the entire island which now contains the Dominican Republic and the Republic of Haiti was Hispaniola, more recently known as Santo Domingo. The present work gives a full historical account of previous ornithological work, beginning with the visit of Columbus in 1492. Two hundred and fifteen species are listed by the authors, while thirteen others are considered as hypothetical. The status of each species is fully discussed in the light of the latest knowledge.—T. C. S.

Mr. Sawyer here gives in brief form most of the information needed in building and erecting houses for about sixteen species that most frequently nest around human dwellings. The detailed specifications are shown in full page plates prepared by the author.—T. C. S.


This pamphlet is a revision of a similar one issued in 1926, but the revised edition contains some additional matter and is enhanced by two tabulations and sixteen halftones. The greater part of this bulletin is made up of an enumeration of the commoner birds of the state, with some account of their habits. —T. C. S.


A statement of policy of the Bureau of Biological Survey with respect to its campaign against these mammals, and some general remarks on methods. This bulletin has been reviewed at considerable length in a circular published by the Emergency Conservation Committee, which may be obtained gratis by applying to Mrs. C. N. Edge, Secretary, 113 East 72d St., New York, N. Y.—T. C. S.


A List of the Birds of the Campus of the University of Oklahoma. By Margaret Morse Nice. Ibid., pp. 195-207.

The first paper presents a list of birds obtained in the western part of Oklahoma by an expedition from the University in 1926. Some additions were made to the knowledge of the range of certain species within the state. In the second paper Mrs. Nice gives a very full account of previous bird study on the University Campus, together with a list of all forms known to have been found there.—T. C. S.


The Wisconsin Conservation Commission inaugurated this study of the Prairie Chicken in 1928, and it has been in progress since that time. The present report is intended to place on record the results thus far obtained. The study has covered many phases of the life of this bird; we may merely mention the following topics which are considered: cycles, parasites and diseases (very full and instructive), food, migration (and some evidence is presented to show a limited seasonal movement), courtship, eggs, hatching, etc. Some very helpful suggestions are made about the construction of blinds, which will apply as well in the study of other birds. It is very pleasing to note the interest of state authorities in these scientific investigations.—T. C. S.
The Quail Shortage of 1930. By Aldo Leopold and John N. Ball. In Outdoor America, April, 1931. Reprint not paged.

A marked shortage of quail is noted in the quail range of the north central states (Minn., Wisc., Mich., Ohio, Ind., Ill., la., Mo.), in some parts approximating 75 per cent. The authors trace the shortage to the drought of that year, 1930. Four theories as to the specific manner in which the drought operated are offered, viz., by drying up the drinking water for the young birds, by adding the eggs in the nest, by bringing about disease, or by affecting the food supply. They also suggest that every state should have trained men available to trace these fluctuations of game, and determine the causes.—T. C. S.


These two different articles under the same title give short, narrative accounts of Mr. Sutton's winter sojourn (1929-1930) at the far end of Hudson Bay, and are not reports of scientific results. But it is interesting to learn that a breeding colony of Blue Geese was located at Cape Kendall, on the western side of the Island. While Mr. Sutton was in the North he learned by radio of J. Dewey Soper's success in finding, in the summer of 1929, the Blue Goose breeding on Baffin's Land. This news stimulated Mr. Sutton's search for the Blue Goose on Southampton.—T. C. S.


This paper contains nothing on birds, but is an ecological study of the common vegetation of North Dakota lakes. The relation of salinity to plant forms is considered. There is included an annotated list of the plants collected in and about the lakes and sloughs, and also a list of common and scientific equivalent names. Conclusions are not drawn as to relations to bird life.—T. C. S.


A general discussion of bird refuges as a conservation measure.—T. C. S.


Dr. Oberholser here presents a report of his study of a collection of birds obtained from Mr. W. W. Brown.—T. C. S.


Dr. Stoner and Prof. Dill have selected from the old notebooks of Mr. Jones various notes of interest made from 1873 to 1916 in Connecticut.—T. C. S.

The Florida Naturalist for January contains an article by Herbert R. Mills on "The Florida Brown Pelican", which informs us that the pelicans on the east coast of Florida nest in the fall, while the same species on the west coast nest in the spring. The April number contains the proceedings of the Society.
The Annual Bulletin of the Illinois Audubon Society (No. 21, for 1931) contains a short article by Dr. A. O. Gross on the Prairie Chicken; several appreciative sketches of Professor Frank Smith, with a portrait; and a paper by W. I. Lyon on a northern invasion of Little Blue Herons. Numerous other short articles make up an interesting booklet.

The Wren-Tit is published quarterly by the Santa Clara Valley Audubon Society. The January number tells of finding the roosting place of two Black Swifts on a ledge behind a water falls.

Iowa Bird Life is the title of a leaflet published under the auspices of the Iowa Ornithologists' Union, and edited by Fred J. Pierce. It is in reality a continuation of the I. O. U. Bulletin, but with a changed format and labelled Volume I, Number 1, new series. This number contains a considerable amount of matter of particular interest to Iowa bird students, including articles by Miss Sherman, E. D. Nauman, Dr. F. L. R. Roberts, and others. Starting as a mimeographed news letter issued by the Secretary, this leaflet developed into a larger printed sheet edited by Dr. Roberts: it is now reduced to octavo size with sixteen pages. We hope the venture will have staying power, and that its quality will not diminish.

The Migrant, of the Tennessee Ornithological Society, also appears in printed, octavo form, beginning with Volume II, No. 1, for March, 1931. This number consists of eight pages and cover, with the following articles: "The Black Vulture March number contains, "The Winter Birds of the Hastings Region", by A. F. Ganier, "Hawks and Owls", by H. P. Ijams, "Nesting Data on Middle Tennessee Birds", by Vernon Sharp, Jr., and besides these a blue-print sheet of specifications for a standard bird house.

The December number of the Flicker (a mimeographed organ of the Minnesota Bird Club) contains, "Experiences with a Green-winged Teal", by Marius Moree, "Summer Birds Near Onamia, Minnesota", by E. D. Swedeborg; while the March number contains, "The Winter Birds of the Hastings Region", by Jerome Stoudt, "A Day's Adventure", by Sterling Brackett, and "Bird Notes from Frontenac, on Lake Pepin, for 1930", by Alden Risser. In 1931 it is proposed to issue four numbers of the Flicker, instead of six.

The Raven, mimeographed organ of Virginia Society of Ornithology, continues to reach us monthly. The February number contains a provisional list of the birds of Virginia, based on observations in nine localities; the list includes 279 species. The first annual meeting of the Society was held at Richmond and is reported in detail in the March number of the Raven.

Three mimeographed periodicals relating to bird banding have been received. Bird Banding Notes, for April, 1931, Vol. 2, No. 3, contains a report on returns, doings of many individual workers, and miscellaneous information. Inland Bird Banding News, March, 1931, Vol. III, No. 1, is issued under the direction of the new I. B. B. A. Secretary, Mr. Edw. R. Ford. This number contains fifteen pages of interesting banding information. News from the Bird Banders, April, 1931, Vol. VI, No. 1, is issued by the Western Bird Banding Association. The active center, or perhaps it would be more correct to say the administrative center, has been transferred from Los Angeles to the Museum of Zoology at Berkeley as a more or less permanent arrangement. The Hooper Research Foundation of the University of California Medical School has agreed to examine diseased birds which are caught in trapping operations.
Dear Dr. Stephens:

Occasionally we have in the past received letters and notes from members complaining, sometimes gently, sometimes with more force, of the fact that we have invited them to become members when they are already members. These complaints somehow seem unavoidable because it appears impossible to eliminate all re-solicitation.

When you figure that the Secretary has three different files of prospective members containing about four thousand names, you will realize that the problem of accurate checking is a difficult one. A great many of the people whose names appear on these lists belong to a number of organizations or are interested in a number of fields of activity and consequently their names appear on a number of different lists. Sometimes the address on one list will be the person’s home address, on another, it may be his office address, on a third, it may be sent to him in care of a commercial firm or school or museum, et cetera. Sometimes a man’s initials, sometimes his first name are given, etc. The problem of checking these lists against each other and against the roll of the Wilson Ornithological Club seems a task in which complete accuracy is impossible.

It is one of the penalties of prominence that certain people appear on different lists in such a way that duplication and re-solicitation appears occasionally unavoidable. So I hope that our members to whom this occurs will understand that we are trying our best to keep from giving them unnecessary annoyance. One suggestion that you might care to make to the member who has been re-solicited is this: If he would take the letter, sample program, and application cards, which have been wasted in being sent to him and put them in an envelope addressed to a friend of his, it would help immensely. In this way our members would be helping the friends to whom they send this information and, of course, the Wilson Ornithological Club would profit by this new contact which it might not otherwise have been able to make.

I trust that this explanation will satisfy those members whom we have unwittingly re-solicited. We hope they will forgive us for our unknowing attempt to re-interest them in our organization.

Sincerely yours,

Jesse M. Shaver, Secretary, Wilson Ornithological Club.
Our Library

The Wilson Ornithological Research Library 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 subjects 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
THE WILSON BULLETIN

A Magazine of Field Ornithology

Published by the

WILSON ORNITHOLOGICAL CLUB

at

SIoux CITY, IOWA

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THE WILSON BULLETIN

Published quarterly, in March, June, September, and December, as the official organ of the Wilson Ornithological Club, at Sioux City, Iowa.

The current issue of the Wilson Bulletin is printed by the Verstegen Printing Company, Sioux City, Iowa.


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

New subscriptions, changes of address, and applications for membership should be addressed to the Secretary. Personal items, news of events in the scientific world, and other notes suitable for our "Notes Here and There" department may also be addressed to the Secretary.

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. W. Stack, M. S. C., East Lansing, Mich.
Vice-President—Mr. George Miksch Sutton, Bethany, W. Va.
Treasurer—Mr. W. M. Rosene, Ogden, Iowa.
Secretary—Prof. Jesse M. Shaver, Peabody College, Nashville, Tenn.
Editor—T. C. Stephens, Sioux City, Iowa.

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

The following societies are affiliated organizations:
The Nebraska Ornithologists’ Union.
The Iowa Ornithologists’ Union.
The Kentucky Ornithological Society.
The Tennessee Ornithological Society.
Common Tern at its nest, Upper Sugar Loaf Island, Maine. Fig. 33.
AN ANALYSIS OF A SERIES OF PHOTOGRAPHS OF THE COMMON TERN

BY OLIN S. PETTINGILL, JR.

From June 21-30, 1930, I made a study of a colony of the Common Tern (Sterna hirundo Linnaeus) on Upper Sugar Loaf Island, Maine, the primary purpose of which was to secure a series of photographs illustrative of the nesting activities of this well known species.

Upper Sugar Loaf Island, with an area at high tide of approximately an acre and a half, projects from the tidal-churn where the Kennebec River flows into the Gulf of Maine. It is of ledge formation, with many irregular shelves which rise step-like thirty feet above the tidal line to a more or less level summit. A few scrub conifers grow among the crevices in the rocks, and grass, poison ivy, and certain flowering weeds flourish where the scant soil permits. At the time of my visit there were about 350 pairs of the Common Tern, six pairs of the Roseate Tern (Sterna dougalli Montagu) and three pairs of the Arctic Tern (Sterna paradisaea Brunnich) nesting on the island.

The behavior of these birds was not notably different from that observed at other tern colonies by various ornithologists. Some of the photographs secured are of interest, however, in that they record certain body attitudes of the birds themselves which are worthy of more than passing notice. Nine of these photographs are presented here in the belief that such studies are always of interest to close students of bird behavior.

The photographs were made with a Graflex camera equipped with a Protar VIIa lens and a double extension bellows, and supported, where necessary, by a Crown A tripod. A burlap blind, with wooden framework, placed six or eight feet from the nests offered sufficient

--The author wishes to extend recognition to the following: Dr. Arthur A. Allen and Mr. George M. Sutton, of Cornell University, Ithaca, N. Y., for their helpful advice in the preparation of this manuscript; Mr. Paul A. Walker, of Bowdoin College, Brunswick, Maine, who accompanied him in this work; and Mr. Stanley W. Hyde, of Yarmouth, Maine, through whose hospitality the stay in the vicinity was made possible.--
concealment. With a floor space of six by four feet, and a height of six and a half feet, there was ample room in this blind for two people to work with comparative ease.

Frontispiece. (Fig. 33). Here the parent (sex uncertain), with wings loosely crossed, is about to settle upon the three eggs, one of which has already started to hatch. Most nests in the colony contained three eggs. The nesting-site is characteristic.

Figure 34. Here a parent tern is in the act of feeding a chick beneath the right wing of its brooding mate. The chick was about twenty-four hours old.

This type of “coöperative” feeding of the young was observed to occur in two ways. First, as shown in this photograph, where one adult gave the food directly to the young beneath the breast of its mate; and second, where the food was passed to the bill of the brooding bird who in turn fed the chick beneath it.

Forbush (cf. Bent: “Life Histories of North American Gulls and Terns,” 1921, p. 276) writes of a similar method of feeding the young among the Least Terns (Sterna antillarum Lesson). The first time the male Least Tern appeared, it performed this second type of feeding. The next time, the female refused to accept the fish, with the result that the male swallowed it.

Among the Common Terns observed on Upper Sugar Loaf Island, no such behavior was noted. If a brooding bird refused to take the fish from its mate, the mate always fed the young directly.

Figure 35. Here a tern is in the act of picking up a film carton which the wind carried to the nest.

The reaction of the returning adult to the presence of the film carton was both interesting and amusing. It approached the nest twice, the second time with its mate (distinguished by several white feathers on the crown), eyeing the object with grave suspicion. After a lapse of six minutes it began pecking at the box in several places in an attempt to pick it up. Finally it secured a satisfactory hold on the flap of the open end and flew with it to a distance of fifty feet out over the water and dropped it from mid-air.

I did not perform any experiments with other objects to determine the tern’s attitude toward chance material which might lodge in the nest. The film carton was treated precisely as empty egg shells are treated after the chicks have hatched. Twice I observed terns flying away with such shells which they dropped, invariably, in the water. When I placed another film carton about a foot away from the nest, the returning bird appeared to pay not the slightest attention to it.
Fig. 34. "Coöperative" feeding.

Fig. 35. Showing stereotyped behavior with a "foreign" object.
Fig. 36. One mate is distinguished from the other by certain white feathers in the crown.

Fig. 37. Both birds exhibiting the brooding instinct.
Fig. 38. Compare the forficate appearance of the tail in Figure 37 with this figure.

Fig. 39. The bird alighting. Note depressed tail, position of the feet, wings, and body.
Fig. 40. Brakes set. See text for description of this position.

Fig. 41. Horizontal flight.
Figures 36 and 37. These photographs, taken in rapid succession, show an adult Common Tern in the act of pushing its mate bodily from the nest. They were taken two days before the hatching of two chicks from the three eggs contained in the nest.

Judging from the actions of this pair of terns I am of the opinion that the incubation instinct is about equally strong in both sexes at least during the few days prior to the hatching of the chicks. Ornithologists agree that in this species the sexes are colored alike, so it is impossible, in these photographs, to make certain which is the female. For the sake of making our discussion easier, however, let us assume that the bird with the white flecking in the crown patch is the female.

When the male returned to relieve his mate, the female showed no inclination to leave the nest. He circled the nest several times, then flew away for a short period only to return and repeat the act. While standing in the vicinity of the nest he picked up pieces of vegetation, small pebbles, and bits of shells in his mandibles and deliberately tossed them about—sometimes over his back or to one side. He was obviously nervous and annoyed. Finally, as though able to withstand the desire to incubate no longer, he approached his mate and began pushing her bodily from the nest. The female reluctantly gave up her place and flew off as the male settled in the usual manner on the eggs.

As a rule no such behavior as this was noted. When one bird came to relieve the other of the duties of incubation, the shift was made without the slightest delay.

It will be noted, in these photographs, that the wings of the bird which had been incubating are crossed below, not above the tail. This attitude was frequently assumed on the nest. The white flecking in the crown of this individual is noteworthy also. A number of birds in the colony were marked thus, and this variation made it possible to recognize certain birds and therefore to keep a more accurate record of their individual activities and of their reactions to each other and to various elements of their environment.

Figure 38. A Common Tern is hovering above the vicinity of the nest. The wings have just begun the downward stroke. Note the strongly curved position of the primaries of the left wing, and the position of the yielding secondaries of the right wing.

Of particular interest is the fact that the tail in being widely spread has lost entirely its usual forficate appearance. Thus spread, the twelve rectrices are ready to act as a powerful brake should the tail be pressed downward, or, as in the present case, as the greatest
area of gliding surface capable of being produced by the tail alone. It is not functioning, for the moment, primarily as a rudder.

Figure 39. The tern is starting to alight, coming downward more or less vertically.

The tail has been directed downward from its usual horizontal position in flight and is serving as a brake. The feet, too, are extended, partly perhaps, as brakes, and partly in readiness for alighting. The head is, in turn, extended and bent downward, thus shifting the center of gravity forward to some extent.

Figure 40. Here a tern, hovering about four feet above a crest of a cliff, is about to alight.

The feet are extended. The body is in an almost vertical position. The wings, which are now beating forward, rather than directly downward as in usual flight, are loosely held at the wrists: and the tips of the primaries extend forward beyond the body of the wing.

The position of the feathers of the wing is exceedingly interesting. The manus evidently is loosely held, the forward-downward thrust being strongest at the wrist, thus throwing the proximal primaries, which are attached at the wrist, actually in advance of the distals. The distal secondaries, which are not so firmly attached to or connected with the bone as are the primaries, naturally are pulled downward with the primaries as the wrist is thrust downward, though it will be noted that there is a definite gap between the outermost secondary and the innermost primary.

Figure 41. Now, the bird is gliding rapidly forward with wings in a lateral position.

The general features of gliding flight are apparent here. The tail retains the typical deeply forked formation of the Sterninae. The legs are drawn partially backward and upward to the under surface of the body. As contrasted with the remiges in the three preceding figures, the primaries are partly folded and directed posteriorly due to an increase in flexion at the wrist.

Cornell University,
Ithaca, N. Y.
ECOLOGICAL FACTORS IN MIGRATION*

By RUSKIN S. FREER

Students of plant or animal ecology, the branch of biology dealing with environmental factors, have applied the term "endemic" to those forms of life which are confined to restricted areas. It is always interesting to make an analysis of the environmental factors of such areas, with the purpose of discovering just what factor or factors may control plant or animal distribution in the territory occupied by the endemics.

Certain plants or animals may be endemic in a very small area possessing peculiar environmental characteristics, in one section of the country, while in another the same species may be generally distributed. For example, certain plants characteristic of the northern tundra and peat bogs may be very common and have a general distribution in northern Canada, yet be endemic elsewhere, because of the almost complete absence of tundra or bog conditions.

The writer has been interested in the study of what appear to be endemic species of birds near Lynchburg, in the Virginia Piedmont. My early experience in bird study was with the birds of central and western Ohio. For the past seven years my ornithological studies have been mostly confined to the vicinity of Lynchburg. Since making the change in residence, several differences in the bird population have naturally been noted, some of which have been most pronounced when the general bird population around Lynchburg has been compared with the birds found within a restricted area known as the Edgewood Farm. This farm is located just at the southern edge of the city, in the angle between the old Salem turnpike, now better known as the Timber Lake Road, and the old Ward Road leading to Danville, now designated as U. S. Highway No. 170.

Before proceeding with a more detailed characterization of the Edgewood Farm as a bird habitat, some general comparisons of central and western Ohio with the Virginia Piedmont should be made.

Geologically, the Piedmont section is much older. Igneous and metamorphic rocks, particularly quartz, quartzite, schists, and granites, predominate. Rocks from the oldest geologic periods outcrop over much of the Piedmont. Western Ohio is younger geologically, and where surface rocks outcrop, they are of much more recent geological periods. Sedimentary rocks, such as limestone, shale, and sandstone, underlie the whole region.

*Read before the first annual meeting of the Virginia Society of Ornithology at Richmond, February 13, 1931.
The nature of the soils of the two regions, derived from the rocks, differs greatly. Piedmont soils are largely clay, with an abundant residue of quartzite fragments, mica, and other minerals, resulting from weathering of the country rock. The soils of western Ohio are largely loams, containing much more humus, and consequently are more fertile. Because of flatter topography, these Ohio soils are not being washed away by erosion by surface water and streams, as rapidly as is the case in the Piedmont, with its rough and sometimes mountainous topography.

Climatically also there are marked differences between the two regions. While I have no data on this point, certain facts are obvious. The average annual temperature of Virginia would be higher than that of western Ohio, and the available soil moisture in Ohio is greater than that in the Piedmont. The contrast in moisture conditions is attested by the fact that the climax forest of western Ohio is the mesophytic beech-maple forest, while that of the Piedmont is the more xerophytic oak-hickory. The available moisture in a given region may be expressed by the ratio between precipitation and evaporation for the year, and evaporation is determined by the interaction of several factors, such as sunshine, wind, and temperature, which also affect humidity.

This discussion of climate and soil differences leads up to and doubtless partially explains another fundamental difference, namely, the scarcity of meadows and grasslands in the Piedmont as compared with Ohio. On first coming to Lynchburg I noticed particularly how unusual it was to get a good sod on lawns. Later after more familiarity with the countryside, the same condition was noted with regard to farm crops. Hay and grass crops all seem scanty around Lynchburg as compared with western Ohio. This contrast is even more noticeable in the Piedmont of North Carolina.

In addition to the influence of climatic and soil or edaphic factors, the comparative scarcity of pastures and hay crops in the Piedmont is also due in large measure to different agricultural practice, though it is probably unwise to state arbitrarily whether this is effect or cause. However that may be, cultivated crops such as corn and tobacco have been grown continuously in the Piedmont from early colonial times. There has been very little stock raising or dairying.

The traveler through northern New York state is struck with the fact that grasses grow there in unusual luxuriance, producing condi-
tions in many places which ecologists refer to as natural parks. Much the same conditions characterize the Valley of Virginia or the famed blue grass regions of southwest Virginia. These sections of the state consequently have more of the species of birds that are found in grasslands.

As a result of different cultural methods, the Edgewood Farm previously mentioned seems to be an exception to the conditions described above as characterizing the Piedmont in the matter of hay and grass crops. On this farm may be found expanses of broad, grassy meadows and alfalfa fields. One can look across several hundred acres of cleared land, most of it in grass or alfalfa, without seeing the clumps of scrub pine so common elsewhere. And here are found, sometimes as residents, but principally as migrants, those species of birds common to the meadows and pastures in states to the west and north.

A list of the spring migrants found on this farm reads like a list of the breeding birds for the more open, grassy country to the north. One group of these has been found only at the Edgewood Farm. This group includes the Upland Plover, Dickcissel, Bobolink, and Savannah Sparrow.

The Upland Plover was seen on April 1, 1927, and on March 25 and April 26, 1930. I saw a pair of these birds. A single bird was seen on April 10, 1931. This species was a fairly common summer resident on upland pastures in Ohio ten or fifteen years ago. My only record for the Dickcissel for Lynchburg was made on this farm on May 27, 1927, when we saw a male and heard its song. This species is a common breeding bird in western Ohio.

The Bobolink, likewise a common breeding bird of the meadows in its summer range, selects the Edgewood Farm for its stops near Lynchburg. One male was listed there on May 18, 1928, another male on April 26, 1930, and a gay company of about fifteen males paid a brief visit on the morning of May 2, 1930. A flock of about fifty males and females was found on May 9, 1931.

Savannah Sparrows by the score stop at the height of their migration in an alfalfa field on this farm, where conditions closely simulate those of the Alleghenian life zone of northeastern Ohio, northern Pennsylvania, and New York state, where this species breeds. The song of the Savannah Sparrow was heard several times on this farm this past spring.
Another group of birds, including the Vesper Sparrow, Prairie Horned Lark, Pipit, Cowbird, and Grasshopper Sparrow, while found occasionally elsewhere than on this farm in the Lynchburg area, occur in much greater numbers here, and possibly in a few instances remain to breed.

Vesper Sparrows are present by the hundreds in the alfalfa field referred to. I have seen them in small numbers elsewhere, and should expect them to breed near Lynchburg, but have no records of their nesting. The Prairie Horned Lark, like the Vesper Sparrow, although frequently found elsewhere, may almost always be found at Edgewood Farm during the spring. This species does breed sparingly around Lynchburg. I have seen it several times during the summer, and a pair nested at the Edgewood Farm this past spring. Incidentally this appears to be the southernmost record of its nesting on the Atlantic slope.

Cowbirds stop at the farm in large flocks numbering one or two hundreds. They may be seen in much smaller flocks occasionally in other places around Lynchburg. I have no records of their breeding, but possibly a few birds remain for the summer.

The Grasshopper Sparrow, a common migrant and summer resident, is very much more abundant at Edgewood Farm than elsewhere in the Lynchburg area.

From the observations recorded above, it would appear that in this farm we have an isolated habitat, a sort of ecological island, surrounded by other and differing ecological conditions. The result is the occurrence within a restricted area of endemic species of birds, migrants and breeders, either entirely absent or found in much fewer numbers through other parts of the same general area.

Lynchburg College.
Lynchburg, Va.
PIONEERS IN ECONOMIC ORNITHOLOGY

BY MRS. H. J. TAYLOR

This paper permits only brief sketches of the men who made economic ornithology a scientific and important field of study; its scope does not extend to all who played a part in this pioneer work. Townend Glover and Samuel Aughey were forerunners, while F. E. L. Beal, Stephen A. Forbes, and F. H. King were outstanding leaders. Glover's work was done chiefly in Washington. Aughey, Beal, Forbes, and King were men of the middle west: their respective fields were Nebraska, Iowa, Illinois, and Wisconsin.

"The insectivorous habits of birds have been matters of common observation for centuries, but their scientific demonstration has been reserved for more modern times", said Beal. ("Birds as conservators of forests", page 237.) For many years the farmer and fruit grower faced the difficult problem of finding a remedy for the loss in his crops. Birds were believed to be partly guilty. The early movement for bird protection was largely a sentimental one. The farmer, who saw the birds eating his grain and fruit, was not deterred by the pleas of those who enjoyed the song and color of the bird. But problems are a challenge to investigation. Investigation must be along the lines of sound sense and logic. There, reason will discover truth for itself and action will follow.

Townend Glover, 1813-1883

According to C. R. Dodge, "Prof. Townend Glover, the first entomologist of the U. S. Department of Agriculture, was born at Rio de Janeiro, February 20, 1813. . . . His mother dying after a few days illness; when he was about six weeks old he was sent to his relatives in England; and upon the death of his father, which occurred some six years later, he was taken in charge by his paternal grandmother and maiden aunt in Leeds, [England]." Glover came to the United States at the age of twenty-three years. In 1863 he was appointed United States Entomologist in the recently established Department of Agriculture.

I have asked a number of persons for their estimate of Glover. A composite of their replies would read somewhat like this: "He made a contribution of value, but few men would work with him and I don't know anyone who could live with him." From that we may judge that he had a striking personality—that he was an outstanding individual—unlike most people.

Dodge, who was for a time assistant to Glover, says, "By nature the boy Townend was of a reserved disposition, making few close friendships... Indifference to country or home, distrust of mankind and of the motives of people about him, self-reliance and wish to be his own master... appear on many pages [of his diary]... he sailed for America June 24 of that year [1836]... married in September, 1840.

"Glover's life was for many years that of a recluse... [while in Washington he occupied] a single room... in which from choice he ate, slept, wrote, sketched, engraved... [it contained] his engravings and writing tables, his bookcases (constructed from boxes), trunks, toolchest, and insect cases, in addition to stove and regular bedroom furniture... One who knew him intimately for twenty or more years said of him, 'In his personal habits and intercourse he was peculiar.' He was peculiar even to the verge of eccentricity. In middle life, after a residence of five years in Washington, he said of himself, 'Acquaintances I have made many, but friends none'... his self interest was so absorbing that it left no heed for the interest of others... In his habits of living he chose to be untrammelled by conventionalities of custom, attending to necessities of existence in a way that offered the least personal inconvenience to himself. So the man who from having moved in the cultured society of his home on the Hudson, had in the performance of duty come to 'herd with negroes and Indians in Demerara, where a white man is as good as a darkey.'"

Glover prepared a large number of copper plate engravings of insects. Upon the recommendation of Messrs. Baird and Riley these plates were purchased by the Government for $7,500.

The Report of the Commissioner of Agriculture for the year 1865 contains, pages 33-45, the "Report of the Entomologist" [Glover] in which are made the following remarks upon the basis of which we may include this author among the pioneer economic ornithologists: "The birds mounted in the museum number nearly six hundred, the greater

_2Ibid._
part of them being insectivorous birds of this country. A knowledge
of their nature and habits is of as much importance to the farmer and
fruit culturist as is the science of entomology; hence the two studies
are combined by attaching to each bird a card on which is stated, not
only the scientific and common name, with reference to works on
ornithology where their history may be found, but also the habits and
food peculiar to each, so that the farmer may know his enemies from
his friends. In addition to this, the contents of the stomachs of birds,
taken at different seasons of the year, have been preserved, and are
placed in small boxes beside the specimens . . .” A few pages further
along in the same report Glover makes the following comments: “Now
we come to the family of thrushes . . . I cannot make this report as
full and complete as it should be, on account of the stringent laws
here (in Washington) prohibiting the shooting of small birds. So
conscientiously law-abiding were the officials, that I could not even
get a permit to shoot specimens for examination preparatory to making
this report. Yet, notwithstanding this, the markets here in spring are
literally overstocked with strings of robins, thrushes, cedar birds, and
even bluebirds, which are brought in and sold for food. . . The well
known and favorite bluebird is exceedingly useful to the horticulturist
and farmer. . . Small boxes put in the trees, or around the dwelling
house will invariably attract bluebirds to build in them. They are
sometimes turned out, however, by the small and more pugnacious
wren, which, after driving off the rightful occupant, leisurely turns
out the eggs, barricades the entrance, and takes possession.”

Townend Glover worked incessantly. He took no vacation and no
recreation. In time his health broke down. The last years of his life
were uninteresting to himself and to everyone else. When he was no
longer able to reside alone in Washington he reluctantly went to the
home of his adopted daughter in Baltimore. She and his wife were at
his bedside when he died September 7, 1893. He was buried in
Loudon Park Cemetery, Baltimore.

**Samuel Aughey. 1831-1912**

Little has been written on Aughey. A letter received February
17, 1931, by the writer from Professor Aughey’s daughter, Mrs. Helen
Aughey Fulmer, states: “My fathers’ library and records of work and
publications after leaving Nebraska were all lost.”

Samuel Aughey was born near Mifflin, Juanita County, Pennsyl-
vania, on February 9, 1831. (Other biographies give February 8 as
the date of birth, but the family Bible records it as February 9.) He
Fig. 43. Samuel Aughey, 1831-1912.
was graduated from Pennsylvania College\(^3\) in 1856. His reports on
the food of birds, and later his reports as geologist of territorial
Wyoming, being among the earliest, are both interesting and valuable.

On October 15, 1930, I had the privilege of meeting "Nebraska's
most distinguished citizen", as the University of Nebraska, in its Anni-
versary Book, calls Prof. Lawrence Bruner. Prof. Bruner gave me the
following information concerning Professor Aughey. He said, "I was
the second student to enroll in the University of Nebraska when it
opened its doors in 1871. Professor Aughey was my first teacher. He
taught the natural sciences as well as botany, German, chemistry, and
geology. Students said that 'Aughey teaches the natural sciences and
allied languages'.

"Aughey, like myself, was Pennsylvania Dutch. He was a hard
worker. Along with his university work he continued to preach. He
had a church in Dakota City, Nebraska, and also preached to other
nearby congregations. From the time of his arrival in Nebraska, in
1864, he gave much time and study to the grasshopper plague. His
work was earnest and sincere, but with so much put upon him, sci- 
cientific exactness could scarcely be expected. While I was a student at
the University Professor Aughey spent a week-end at my home in West
Point, Nebraska. He was a lovable personality, and a man of fine
quality."

Of Aughey's publications the most important one is entitled
"Notes on the Nature of the Food of the Birds of Nebraska", which
was published as Appendix II in the First Annual Report of the United
States Entomological Commission for the Year 1877 Relating to the
Rocky Mountain Locust. This report was published in 1878 under the
auspices of the Geological Survey, a division of the Department of
the Interior. At the time of its publication Aughey's work was re-
viewed by J. A. Allen, who wrote, "...although Mr. Aughey's paper
bears especially upon the subject of birds as grasshopper destroyers,
it forms at the same time a valuable faunal list of the birds of
Southern Nebraska, containing notes relating to the relative abundance
and season of occurrence of most of the species." (\textit{Bull. Nutt. Ornith.
Club.} IV. 1879, p. 110.)

Cyrus Thomas, writing to C. V. Riley, Chief of the U. S. Ento-
mological Commission, says, "...I have been fortunate in obtaining
...the assistance of Prof. Samuel Aughey, of Lincoln, Neb. ... Having
been engaged for a number of years in studying the birds of his State

\(^3\)Organized in 1832. Later the name of the institution was changed to Gettys-
burg College.
with special reference to their locust-eating habits, his report is quite full and complete. . . This record of the examination of the stomachs of birds is probably the most extensive ever made in this country. The list includes something over 630 specimens and 90 different species, and extends through a period of twelve years.” (Page 13 of the Appendices.)

And in addressing Professor Thomas, Aughey writes as follows: “At your request I have reduced to order the somewhat random notes that I have been taking on the birds of Nebraska and their relations to insect life, during the last thirteen years. . . Being convinced from my studies that the preservation of birds is worthy of national attention, I have added to these notes other facts and considerations showing the need of the enactment and the enforcement of laws to protect them.” (Page 13 of the Appendices.)

The grasshopper plagues of the sixties and seventies are still fresh in the minds of many in the middle west. The pioneer’s all was in the planted field. Various attempts were made to cope with this pest, but they availed little. Dexter Hutchins, of Algona, Iowa, made a machine to catch grasshoppers. Often special prayer meetings were held. If the grasshoppers left it was evidence that divine Providence had stayed the plague. A minister related to me the destruction wrought by a grasshopper plague of the seventies and the effectiveness of prayer in driving them out. “How do you know that prayer did it?” I asked. “How do you know it didn’t?” was his reply.

In November of 1930 I received a letter from a friend in Iowa which contained the following information: “Mrs. W. G. Hatter, of Sioux City, moved to Elk Point, South Dakota, a year after the prayer meeting of fifty years ago. She says that the Catholics called their people together and paraded the streets with banners and prayed all day. Many Protestants joined them. The grasshoppers disappeared, and later three crosses were erected in the vacant lot next to the Montagne School. One of these crosses still remains.”

In a paper prepared for the body of the Report of the Commission (ibidem, page 339) Aughey says: “Unfortunately the mass of the people have not and do not observe closely what the birds are doing. Hence they are still the victims of prejudice, and their character is rarely appreciated.”

Professor Aughey sent out many letters to farmers in an attempt to gather together their observations on the work of the birds. One reply to such a letter is condensed as follows: “During the last season | 1877 | I planted a tract . . . in corn. It was on new breaking,
where locusts had laid their eggs . . . the locusts began to hatch . . . and threatened to destroy all my corn. The blackbirds, however, in large numbers, commenced to feed on the locusts, and devoured them almost as fast as they hatched out . . . and I obtained a good crop.—Jacob Heikes, Dakota City, Nebr., October 3, 1877.” (Ibidem, page 341.)

And later in the same article (pages 343-344) Aughey says, “When I first came to Nebraska, in December, 1864, there were many species of birds far more abundant than they have been during recent years . . . vast numbers were poisoned [by strychnine] around the cornfields. . . It was done under the mistaken notion that the blackbirds were damaging the crops, especially the corn. Great numbers of birds of other species were destroyed at the same time. . . In a single autumn, in Dakota County alone, not less than 30,000 birds must have been destroyed in this way . . . the subject of the protection of insectivorous birds must, or ought, sooner or later, to become not only national, but international.”

On November 3, 1930, I received a letter from Professor Aughey’s daughter, Mrs. Helen Aughey Fulmer, who writes as follows: “I have vivid memory of hearing my father, during the early years of my life, deplore the killing of birds. It was then the sport, the recreation of boys and men. He was so sure that birds were the farmers’ friends that he undertook and carried on the observations and secured these facts. Then with them as a basis he lectured in towns, villages, and before groups of farmers throughout the state to persuade protection of birds in the interest of agriculture. . . Geology was his chosen field of science, but he was so tremendously interested in the new state of Nebraska, and in building up the state university and its museum, that he lent his energies in many directions while there. . . His death occurred in Spokane on February 3, 1912, just six days before reaching his eighty-first birthday. . . A year after his death my mother persuaded me to take his casket back to the old home near Patterson, Pa., where their first child was buried and where she now lies beside them.”

Foster Ellenborough Lascelles Beal, 1840-1916

Professor Beal was born in South Groton, Massachusetts, on January 9, 1840. The most complete account of his life has been prepared by Mr. W. L. McAtee from which the following lines are taken. His father “died of tuberculosis when his son was about 8 years of age . . . my mother had also contracted the disease . . . she took me [to]
Nathaniel C. Day . . . who was her cousin once removed. . . He agreed to take care of me until I was of age. . . I lived with Mr. Day on this farm for the next fourteen years. . . After she [Miss Harriet L. Gray] had worked for him for about a year, they were married. This lady took some interest in me and my tastes. . . I had been so kindly treated by Mrs. Day, that having no other, I had come to look upon this as a home."

Soon after enlisting in the Civil War Beal was discharged on account of illness. In 1867 he entered the Massachusetts Institute of Technology. At the close of the year he records in his diary, "I have been sitting alone studying all the evening, thinking of the past and trying to look forward into the dark, misty future, and wondering what another year has of joy or sorrow, in store for me; but joy or sorrow it matters little which, a few short years and both will be as naught in the light of a higher and nobler future."

On receiving his degree from the school of Technology in 1872 he went to Crete, Nebraska, where he surveyed for the Burlington Railroad. The open prairie was new field for the study of nature. Of this McAtee writes, "Professor Beal often referred to his experience on this trip; one reminiscence, in particular I remember, related to nighthawks. The birds immediately availed themselves of the newly-laid rails as perches, upon which, according to their custom, they sat lengthwise. They were so abundant, Professor Beal says, that he was certain there were enough nighthawks immediately along the right-of-way, to make a continuous row of the birds on both tracks clear across the state of Nebraska."

In March, 1876, Beal took a position in the Iowa State College of Agriculture, at Ames. During his seven years at Ames he wrote many articles on the birds of Iowa. Most of these articles were published in newspapers, especially the Iowa Homestead. The economic value of birds now became his chief interest. He examined the contents of birds’ stomachs, and discussed the food habits of various species. At this same time S. A. Forbes was also studying the food of birds in Illinois by examining the contents of the stomach. F. H. King was working on the same problem in Wisconsin. Beal continued this study through the remaining years of his life. It was he who made the oft-quoted estimate that the Tree Sparrows of Iowa annually destroy 196,000 bushels of weed seeds. In 1892 he took a permanent position with the United States Biological Survey, remaining in this service for twenty-four years, or until his death in 1916. During this time he examined the stomachs of 37,825 birds.
Among Professor Beal's published papers, one entitled "Some Common Birds in Their Relation to Agriculture", issued in the Farmers' Bulletin series of the Department of Agriculture, has been reprinted more than fifty times, including over a million copies. His most important non-official paper is, Mr. McAtee thinks, the "Birds as Conservators of the Forest", published in the report of the New York Forest, Fish, and Game Commission for 1902 and 1903. This paper is not only of great scientific value, but it also possesses literary charm.

Professor Beal also furthered economic ornithology by lecturing to various horticultural societies, granges, and ornithological clubs. We have a feeling of gratitude to Mrs. Day. Her mother heart made a home for a lonely orphan child. Her interest in him helped in no small way to give to the world the expression of the life of F. E. L. Beal. The founding of his own home and the inspiring companionship of Mrs. Beal made for him a rich personal life. He died in Branchville, Maryland, when the leaves were falling, on October 1, 1916.

Stephen Alfred Forbes, 1844-1930

The facts herein presented on the life of S. A. Forbes are derived chiefly from the sketch written by his son, Ernest Browning Forbes, at the time of his father's death at Urbana, Illinois, March 13, 1930. Forbes was born at Silver Creek, Stephenson County, Illinois, May 29, 1844.

I met Dr. Forbes but once, but I have talked with those who knew him, and whose interests brought them in close contact with him. Illinois was the place of his birth and his death. It was also the center of his field of labor through all the years of his long and useful life.

Dr. Forbes came from Scotch and Dutch parentage. Three of his forebears served in the War of the Revolution. When, in 1860, the country needed young men to defend the Union, Stephen Forbes responded to the first call and served throughout the war.

The Forbes family was one of Illinois' early pioneers. Theirs was one of the many one-roomed log houses that dotted the newly settled wooded states in the forties and fifties of the last century. Hardship and privation is the common lot of the early settler and the Forbes family was no exception. Was there ever a pioneer farm without the dreaded mortgage? That word and its burdens are an early recollection in the lives of many pioneer children. A college education was the aim of the parents for this family. The desire for an education was ingrained in the children to the point of their determina-
Fig. 44. Stephen Alfred Forbes, 1844-1930.
tion to secure it. A farm of 140 acres, heavily mortgaged, a one-roomed cabin furnished with a cookstove, a dining table, two beds, and a trundle bed, is the home and financial setting when the father died in 1854. Stephen Forbes was then ten years old. His brother, Henry, then twenty-one years old, had made his own way since he was fourteen years old, and was at this time working his way through college. These conditions tested and proved the Forbes family. The brother returned from college and took upon himself the care of the family. Dr. Forbes, looking back on these early years, calls him "our guardian angel".

At fourteen and fifteen years of age Stephen Forbes wrote two essays, "Do Noble Things", and "The Dignity of Reason". No set schoolhouse was needed to demonstrate that Stephen Forbes was a scholar. Wherever he found himself there was his school. He looked upon his four years of service in the Civil War as a course of instruction in a new field. During his four months in prison he studied Greek and Spanish.

Until the University of Indiana, in 1884, conferred the degree of Ph. D. he had no college degrees. In 1905 the University of Illinois conferred upon him the degree of LL. D. One year at Beloit, a year at Rush Medical, and a year at Illinois State Normal seems rather a piecemeal preparation for all that he accomplished. He never ceased his study. He entered the university of life and remained an active student to his last day. In this university Stephen A. Forbes received the degree that time evaluates for service rendered.

Professor Forbes was a zoologist, a botanist, an ornithologist, an entomologist, an ecologist, a limnologist, etc. There was no phase of natural history unfamiliar to him. He founded the Illinois State Laboratory of Natural History, and was its director from 1877 to 1917. From 1884 to 1930 he was a member of the faculty of the State University of Illinois. He once said, "I have never, in university or normal school, received one hour of formal instruction in any one of the subjects I have taught". (University of Illinois Memorial to Stephen A. Forbes.) "His continuous study of plant and animal life of the Illinois River system from 1894 on made the biology of this stream better known than that of any other in the world." (Cyclopedia of American Biography.)

His publications number over five hundred. Though varied in character all are conspicuous because the Forbes stamp of thoroughness and accuracy is apparent. In his study of birds he gives a wide range of data on the life of many species. It is here that he laid the
foundation for a thorough, comprehensive, scientific study of economic ornithology.

In his paper on “The Food of Birds” (Bull. Ill. State Lab. Nat. Hist., Vol. I, No. 3, 1903, pp. 86-161) he says, “Excluding the inhabitants of the great seas, birds are the most abundant of the Vertebrata, occupying ... the same prominent position that insects do among invertebrate animals ... their power of flight ... enables birds to choose their climates and their seasons ... enables them readily to escape unfavorable conditions, and their immense activity and higher rate of life requiring for their maintenance an amount of food relatively enormous, give to birds in their relation to the pursuits and interest of man a significance which only here and there one seems ever fully to have realized ... the knowledge we need is such that we shall be able to afford for every species a tolerably correct answer to the questions. What would be the main consequences if this species were exterminated? if it were reduced to half its present numbers? What if it were doubled in number? if it were quadrupled? When this is known, we shall evidently be able to act wisely and with the best results.”

In referring to Professor Beal and Professor Forbes Mr. W. L. McAtee wrote. “These two are the founders of the scientific method of studying the economic value of birds.” (Auk. 1917, page 249.)

Franklin Hiram King, 1848-1911

Townend Glover and Samuel Aughey, as pioneers, opened the field of economic ornithology. King was a contemporary of Beal and Forbes. Franklin Hiram King was born near Whitewater, Wisconsin, on June 8, 1848. He died at Madison, Wisconsin, on August 4, 1911.

King’s contribution to economic ornithology is contained in his long paper, “Economic Relations of Wisconsin Birds”, which was published in the “Geology of Wisconsin” (Survey of 1873-1879, Vol. I. Part II, pp. 441-610). In the preface he says: “The field work ... was commenced ... in July, 1873, and was prosecuted as time could be devoted to it, until October, 1877. ... The facts recorded in the report were obtained from an examination of the contents of the stomachs of over eighteen hundred birds, sixteen hundred and eight of which contributed results which have been incorporated in the report. The contents of one-half of the stomachs were examined under the hand-lens on the day they were obtained, while the contents of seven hundred and fifty were transferred at once to small apothecary phials containing alcohol. ... The examination of the material which has been collected was completed in June, 1878. ... The valuable results obtained
by Prof. S. A. Forbes in regard to the food of birds of Illinois has been included, and the whole nomenclature has been made to conform with Dr. Coues' new 'Check List of North American Birds'. But had it been possible to identify specifically the 7,663 insects, etc., taken from the stomachs of the 1,608 birds, this would have been by far the smallest part of the task set, for then it would be required to command a full and broad knowledge of the economic relations of the insects eaten. Birds are insignificant in numbers when compared with the abundance of parasitic and predaceous insects, but their larger size, their active habits, their longer lives, the greater facility with which they move about, and the greater range of country over which they roam, go far toward compensating for smaller numbers."

In the Bulletin of the Nuttall Ornithological Club (Vol. VIII, 1883, p. 107) Dr. Elliott Coues, Associate Editor, makes the following comment, in a three-page review of King's paper: "Upon the heels of Prof. Forbes' paper . . . comes the very elaborate result of Prof. Kings' examinations of the food of birds in its bearing upon our agricultural interests. The question—one of great economic importance—seems to be only of late brought forward with sufficient prominence; and it is evident from what these two investigators have accomplished, that our ornithologists have hitherto taken it up, if at all, only after methods entirely inadequate to its solution . . ."

King's life service was given to his native state. "From 1883 to 1901 he was professor of agricultural physics in the University of Wisconsin, the first chair of its kind in America. (National Cyclopaedia of American Biography, Vol. XIX, page 292). On the same page (ibidem, page 292) mention is made of King's work, "Farmers of Forty Centuries", and concerning it the National Geographic Society is quoted as follows: " 'The first award of the Society from the Grant Squires fund, relating to commerce and industries of the Orient, has been made to the author of "Farmers of Forty Centuries", Mr. F. H. King. This book is an exhaustive study of the methods by which a very populous nation have been so skillfully cultivating their lands for more than 4,000 years that the fields of China are today more fertile than when first cultivated by man.'"

Pioneers are prophets in a true sense. From the present they read the dangers and the possibilities of the future. Through perseverance and tenacity they attain. We are their debtors. The debt of gratitude would lose its value if it could be paid. It may be acknowledged. We acknowledge our debt to these pioneers in economic ornithology.

Berkeley, California.
BIRDS OF SOUTHERN LOUISIANA

BY ALFRED M. BAILEY AND EARL G. WRIGHT

(Continued from page 142 of the June number)

AMERICAN BITTERN. Botaurus lentiginosus. This is a rather common bird throughout the year. They were observed during the past summer at Avery Island, May 13; at Chenier au Tigre, May 23; and in Cameron Parish, June 7. While we found no nests, we saw an immature with down on the head feathers, at Chenier au Tigre. We were going through waist-high grass, collecting Seaside Sparrows. It was a particularly favorable place for cotton-mouth moccasins, for they like to sun themselves upon the matted vegetation. Suddenly, as we were walking along, Bailey was struck a sharp blow upon the hand. It is safe to say that he was considerably relieved when he found it was a young bittern unable to rise from the tangled grass, rather than a moccasin, which had caused him to lose two years' growth.

LEAST BITTERN. Ixobrychus exilis. This, the smallest of our herons, is very common throughout the lowlands during the summer. A few winter, it is said, but we have no records. They were so common that specific records are unnecessary. Bailey recorded them common at the mouth of the Mississippi River during the last week in October, 1928, and in Cameron Parish on November 1. Several nests typical of the species, were found at Chenier au Tigre during the latter part of May, 1930. The earliest date we have is a nest with four eggs found by Bailey at Chenier au Tigre, May 6, 1917.

GREAT BLUE HERON. Ardea herodias herodias.

Ward's Heron. Ardea herodias wardi. Large herons are common throughout the year. We collected no specimens and made no effort to determine the forms observed. Ardea herodias herodias is undoubtedly the common one during the winter months, while wardi is given as the breeding subspecies. We found a nesting colony of twenty or more pairs in Cameron Parish among the cypresses. Young of the year were in flight, and others, half grown, were still in the nests. Bailey collected two specimens in this colony in March, 1918, both breeding birds. One was under the minimum in length for herodias, and the other was over the maximum for wardi. The large size of the wardi seems the only diagnostic feature (inasmuch as colors are not dependable) in determining between wardi and herodias. As the size of the birds in the same colony vary from the minimum of the small form to the maximum of the large one, it will be seen that determining the race to which a bird belongs is rather a difficult task.

AMERICAN EGRET. Casmerodius egretta. These beautiful herons are becoming more abundant each year. They were uncommon fifteen
years ago, but they have increased wonderfully, and are now common throughout the marsh country. Flocks of fifteen or more were seen at the mouth of the Mississippi, the latter part of October, 1928, and a dozen or more could be seen at any time near Chenier au Tigre, the first part of December, 1925. The majority of the birds migrate south, but a few remain the winter through. We made motion pictures of the egrets in Cameron Parish, where a dozen pairs nested on Bird Island, the nests usually being placed in the high cypresses. Young were observed nearly full grown, while others had just hatched, on June 1. Mr. Stark showed us a roost in the tules on his property near the gulf; the birds assembled in company with a few Snowy and Louisiana Herons, at sundown, and alighted on the matted vegetation. We estimated that there were more than one thousand birds. We were disappointed in the colony on Bird Island, for it has not increased in size in the last fifteen years. Many Black Vultures hang about the colony, and it is probable that they destroy the young birds.

**Snowy Egret.** *Egretta thula thula.* This species has also benefited by years of protection, and is now one of the common birds of the marshlands; it was persecuted by the feather hunters until it was on the verge of extinction. Mr. E. A. McIlhenny’s heronry on Avery Island is one of the finest examples of practical conservation in the country; he has a small artificial pond in which he planted button bushes and willows, and years ago, when the Snowy Herons were few in numbers, he captured several pairs of young and kept them in captivity over the summer. They were liberated in the fall, and a few returned the following spring and nested; they have returned year after year. Other species have joined them, and there are several thousand pairs of birds now nesting within a few hundred feet of a busy factory. A train runs within thirty feet of the nesting birds, and during the season, hundreds of motorists drive along the roadway to admire the unique sight—all without interfering with the housekeeping in the least. These same birds, so tame in the nesting colony, are far different in the open marsh. They are as wary as any other heron, and when they fly to and from their feeding grounds, they trek high in the air until over their home port, and then descend abruptly upon half-closed wings. There are many colonies scattered throughout the lowlands, but the one at Avery Island is the largest of all. In other colonies, the Snowy Herons prefer to nest among the low growths at the edge of clumps of cypresses. While this is often a common form in winter, by far the greater number move south during the coldest
months. Very few of the Snowy Egrets nest on the offshore islands. At Avery Island, many young birds were half grown on May 15, 1930, while other nests contained fresh eggs.

Louisiana Heron. Hydranassa tricolor ruficollis. This is probably the most common of the medium sized herons; it is resident the year around and its distribution is general throughout the lowlands. Many hundreds nest at Avery Island, and the species will be found in every colony of herons. Unlike the preceding, these birds are common on the offshore islands where they nest on the tangled vegetation. They are pugnacious fellows, and as they are armed with strong beaks, they are capable of caring for themselves. Messrs. Arthur and Bailey once found a dead Yellow-billed Cuckoo upon the nest of this species. The heron had jabbed the egg robber in the side of the head.

Little Blue Heron. Florida caerulea. This is a common bird, and like the preceding, generally distributed. The majority migrate southward during the winter, but a few will remain during cold weather. While these birds are found in the same colony with other herons, they seem to choose isolated sections for themselves. They are very common at Avery Island, and many photographic studies were made during the past summer. The immatures are white, greatly resembling the young of the Snowy Heron. There are many mottled herons in changing dress in the spring, often referred to as the "calico birds", and Mr. McIlhenny has secured excellent photographs of specimens nesting in their transition plumage.

Green Heron. Butorides virescens virescens. This is a common form, but it does not nest in large colonies. The nests will be found in the bushes along bayous and canals, or hidden away in the heavy vegetation along the edge of the swamps. The Green Herons nest in the colonies of other marsh birds, but rarely more than a few pairs will be found within a given vicinity. It is a resident, but the majority winter in the south, the bulk of them returning in March.

Black-crowned Night Heron. Nycticorax nycticorax naevius. These birds are common the year around. They may be seen rising from the marsh growth at dusk, as they fly from their resting to their feeding grounds. A few pairs will be found nesting in most of the large heronries, and they are common nesting birds of the offshore islands where their frail platforms are placed on low bushes.

Yellow-crowned Night Heron. Nyctanassa violacea. We have no winter records for this species, but it is a common one during the summer. It was not observed so often during the past season, however, as in former years. There were comparatively few to be seen in the
heronry at Bird Island in Cameron Parish and we failed to find a nest, whereas we had no difficulty in locating several in other years. The yellow-crows are often found nesting in scattered colonies in the deep swamps, where they make their nests in high trees, and they feed in the open marsh. They are prized by the local people as game birds.

**Whooping Crane.** *Megalornis americana.* This fine bird has been nearly exterminated; few are to be found where it was once a common form. In November, 1916, Messrs. Arthur and Bailey saw three birds at Chenier au Tigre, and several were seen the following fall. Three were reported wintering six miles from the ridge in 1925, and we were told that two were seen during the winters of 1929-30-31. It would seem that this bird will soon be classed with the Passenger Pigeon and the Great Auk.

**Florida Sandhill Crane.** *Megalornis canadensis pratensis.* The sandhill crane is a rare bird during the breeding season, and as far as we know, is confined to western Louisiana. The only definite nesting record is a downy young one secured by Mr. Stanley C. Arthur in Cameron Parish in the summer of 1917. He kept the bird alive for some time in Audubon Park, and when it died, still in its downy stage, it was presented to the Louisiana State Museum.

**Sandhill Crane.** *Megalornis canadensis mexicanus.* The Sandhill Crane was formerly fairly numerous in western Louisiana, but it has become rare in recent years. Several large flocks wintered near Cameron Farm in 1919, and they were often seen during the latter part of February. It was a wonderful experience to see these long-winged birds sailing high overhead, and often to hear their guttural voices when the cranes were so high they were nearly lost in the blue. It is certain that these birds were not resident in the region; resident cranes are few and far between, so they were doubtless the migrating form. Four cranes were observed at Chenier au Tigre. In addition to the young *pratensis* in the Louisiana State Museum, there were several adult cranes from Cameron Parish which doubtlessly belong to *mexicanus.* In 1925, Mr. James L. Peters proposed the above names; it will be noted that he considers the sandhill as a subspecies of the Little Brown Crane.

**King Rail.** *Rallus elegans.* This common marsh bird is a resident of the state, and several nests were found by Mr. McIlhenny and the adults collected, in May, 1930. Young of various sizes were also taken with the parent birds. A series of adults shows that they vary greatly in color, few of them being as brightly marked as northern birds. Also, they appear to average slightly smaller. Owing to the
rail's secretive habits. They are difficult to observe, but late in the evening or early in the morning of mid-May, we often saw the adults along the edge of the ponds with their broods of black-clothed youngsters. As Avery Island is inland from the Gulf, the marshes are fresh water. No King Rails were observed near salt water, in summer, but they were very common in winter throughout the lowlands. Bailey collected four at Chenier au Tigre, January 15, 1919.

**Louisiana Clapper Rail.** *Rallus longirostris saturatus.* This is the common breeding form of the brackish and salt marshes. Its nesting habits seem similar to those of the King Rail, except that the one is usually found in fresh water marshes while this form prefers the coastal areas. We have several nesting records: a set of five eggs in low marsh growths on Snake Island, May 12, 1917, and another of nine eggs on Alexander Island the same day. We found a nest on Chenier au Tigre, May 23, 1930, with eight eggs; it was in a little marshy area just back from the ridge. We attempted to photograph the bird on the nest, from a blind, but the rail deserted her eggs. *Saturatus* is a common resident.

**Virginia Rail.** *Rallus virginianus.*
**Sora Rail.** *Porzana carolina.* These two forms are common during the fall and winter. When one is tramping the marsh, they will be seen as they rise awkwardly from the grass, with long legs dangling. They often remain late in the spring. We saw a Virginia Rail in Cameron Parish, June 3, 1930. Many of both species are killed by stepping into traps which have been set for muskrats.

**Yellow Rail.** *Coturnicops noveboracensis.* We saw no specimens during the season of 1930, and although the form is recorded as common, Bailey has observed but one, on Grand Isle, March 15, 1919, a single specimen which was flushed by a dog. We have a specimen, a female, which was collected in the latter place by E. S. Hopkins, on March 31, 1928. Beyer, Allison, and Kopman say the form is fairly common in the rice fields in winter.

**Purple Gallinule.** *Iorniris martinicus.* This beautiful bird is common in the marsh country during the summer. We have no winter records. We found many nests in the vicinity of Chenier au Tigre and in Cameron Parish; in the latter place we made motion films of the gallinule on her nest, and found that the reactions of the adult on the nest were similar to those of the King Rail—after eyeing the camera lens for a few moments, she began to pull the grass back in front of the nest. Gallinules occasionally plunder the nests of other birds, and on one occasion, at Avery Island, Bailey saw one climb
upon the nest of a Louisiana Heron, look around quickly as though fearing an interruption, and then grab a pot-bellied youngster by the head and run off through the vegetation with the young heron swaying back and forth like a pendulum. We found nests in Cameron Parish with only one and two fresh eggs. June 1, while half grown broods were seen at Avery Island a few days earlier.

Florida Gallinule. Gallinula chloropus cachinnans. This is a common form in summer, which is often found nesting in the same region with the above species; in fact, nests were found at Avery Island the past season, within a few yards of the nests of their near relatives. One nest we have cause to remember, was situated in a small isolated clump of button bushes and grass in rather deep water. It was ideally located for photographic purposes, until we discovered (or had it impressed upon us) that a hornet’s nest was hidden eighteen inches above the eggs.

Coot. Fulica americana. These birds, locally known as Poule d’eau, are extremely abundant during the winter. They begin to arrive early in October, and they are characteristic birds of the marshes until late in spring. A few remain throughout the summer, and we believe those observed in Cameron Parish the first week of June, 1930, were breeding. We have no proof, however, other than that a Coot flushed from a tangle of water plants in which was a newly constructed nest. Purple Gallinules were building in the same vicinity.

Black-necked Stilt. Himantopus mexicanus. This form is a common one, locally. The stilts prefer open lagoons with muddy shores, and their eggs are laid upon the bare ground in sparse vegetation. The courtship antics of these birds are interesting; they gather in a group, and males will crouch over, wings held open horizontally, quivering up and down. They keep up a continuous indescribable screeching, the birds running back and forth, stopping momentarily with open wings, crouching, and then going through the whole performance again. Stilts were common in Chenier au Tigre in the spring of 1917, 1918, and 1919, but canals have been dug through the marshes, and the water level lowered, so conditions are no longer favorable. Several nests with three and four eggs were found in this vicinity May 5, 1917 and May 11, 1918. In regard to their courtship, Bailey records under the latter date, “the stilts are peculiar birds, and when disturbed near the nest, they crouch down and ruff out their breast feathers and scold in high-pitched voices. When excited, they jump in the air, fluttering their wings, for all the world like a yell leader at a football game; and again, they often hold their wings horizontally, quivering and calling monotonously.”
We found three downy youngsters which had just left the nest, in Cameron Parish, June 3. The nest was upon the bare mud of a canal bank. The long-legged babies had no objection to water, and paddled lustily along after they had waded beyond their depth.

Woodcock. Rubicola minor. We have few records of this species. Mr. McIlhenny reports them more common at Avery Island during the winter of 1929-30 than for many years previous. Bailey saw a few birds at this locality in November, 1918, and others in a “branch” at Bogalusa the first week in March, 1917. They can no longer be considered a common form, except possibly in a few areas. We were told that hunters sometimes used lights to locate Woodcocks.

Wilson’s Snipe. Capella gallinago delicata. This species is a common one in the coastal marshes, in many places. They prefer wet, muddy areas with suitable cover, in preference to the deep marshes. They arrive early in the fall and are abundant until December, again becoming common in February and April. Their occurrence is irregular, however: they may be abundant in a given locality one season and few will be seen in the same place the following season at the same time.

Dowitcher. Limnodromus griseus griseus.

Long-billed Dowitcher. Limnodromus griseus scolopaceus. Both forms occur commonly during the fall, winter, and spring; they are often seen in large flocks along the tidal flats, and at times they are very tame. Non-breeding individuals remain all summer. There is such individual variation in these birds that it is practically impossible to positively distinguish between them. The “bird observer” is unfortunate, for the plumage of the sexes is the same, so it is impossible to tell whether a live bird is a male of one form or a female of the other. Three specimens collected June 11, 1930, along the east coast, would probably be referred to griseus.

Stilt Sandpiper. Micropalma himantopus. We have but one record for this species, one collected in a marshy area back of Chenier au Tigre, April 6, 1919, by Bailey.

Knot. Calidris canutus rufus. This species is a rare straggler along the coast. Two in high plumage were collected by E. Kalmbach on Errol Island, June 6, 1919, and Wright took one, a female in gray plumage, off the east coast, June 9, 1930.

Pectoral Sandpiper. Pisobia maculata. This is a common form in spring and fall, but we have no winter records. It is often seen in grass-grown marshy areas. A few were observed at Avery Island as late as May 11, and Wright collected one on this date.
White-rumped Sandpiper. *Pisobia fuscicollis*. This is not a common bird, according to our experiences. They were quite plentiful, however, during the first week in May, 1930, and Messrs. McIlhenny and Wright secured a half dozen highly plumaged specimens. We have no winter records.

Least Sandpiper. *Pisobia minutilla*. This is a fairly common bird during migration, when it may be seen in flocks, associated with Red-backed and Semipalmated Sandpipers. A few stragglers remain during the summer, and several were observed on Breton Island, June 9. They were fairly common on Avery Island, May 7, and at Chenier au Tigre, May 22, 1930.

Red-backed Sandpiper. *Pelidna alpina sakhalina*. This is a common bird during migration, and usually they are plentiful along the coast during the winter. A few remain throughout the summer. They were very common in Vermilion Parish, November, 1916, and the following spring, many were observed at Chenier au Tigre. Specimens collected on May 5 were acquiring their new plumage, and were full of pinfeathers. They were numerous March 6, 1917, at the same station, and were common on Lost Island, December 8, 1918. They may be seen feeding upon the tide flats in company with other species.

Semipalmated Sandpiper. *Ereunetes pusillus*. These little pipers are common during migration, and often during the winter. They arrive on the coast early in October; they were numerous at the mouth of the Mississippi, October 25, 1928. They seem to be irregular in their occurrence, however, for they may be plentiful in a given region one season, and none will be observed the following year in the same locality. We have records for all seasons except midsummer. It is a wonderful sight to see great flocks of these graceful sandpipers as they perform their aerial evolutions, turning and twisting, now flashing their white underparts, and again, as they turn their gray backs to the observer, nearly fading from view.

Western Sandpiper. *Ereunetes mauri*. This is a fairly common species during the migration, and often, during winter. Many were observed in Vermilion Parish in November, 1916, and several flocks were seen daily at Chenier au Tigre in early December, 1925.

Sanderling. *Crocethia alba*. Sanderlings are abundant during migration, and a few remain during the winter. They are very common along the coast during the early spring, and several were observed on Breton Island the first week in June. The majority noted in May were in their gray and white plumage.
Greater Yellow-legs. Totanus melanoleucus. This is not an abundant form, according to our experiences. It is found all along the coastal marshes, but not in as great numbers as are many other species. They arrive early in the fall. For a few specific dates, Bailey records, "common in Bayou German, Vermilion Parish, November 17, 1916, Chenier au Tigre, May 5, 1917; few noted in Cameron Parish, November 1, 1928." We have no records for midwinter.

Lesser Yellow-legs. Totanus flavipes. The Lesser Yellow-legs occur in the same localities and are about as numerous as the preceding species. We find, however, that the majority of our records are for the spring months. A few were observed at Chenier au Tigre, May 5, 1917; they were common the following year on March 15 and April 6, 1919. During the spring these birds are pugnacious, and on the latter date Bailey records, "the yellow-legs were fighting like game cocks all over the tide flats."

Solitary Sandpiper. Tringa solitaria solitaria. This is a common form and is generally distributed during the migration in early spring and fall. We have no winter records. Many return from the north early in September, and they become scarce by the latter part of November. They are rather common during April, but the majority leave for the north early in May.

Eastern Willet. Catoptrophorus semipalmatus semipalmatus.

Western Willet. Catoptrophorus semipalmatus inornatus. Willets are common along the gulf coast the year around. It is probable that the wintering birds are inornatus, although we have no specimens on hand to verify this. Beyer, Allison, and Kopman, and Arthur call the breeding bird inornatus, but Bent has identified all specimens he collected in Louisiana and Texas as semipalmatus. A study of the measurements of eight breeding birds from Chenier au Tigre is interesting. They measure as follows:

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If one compares these measurements with those given by Ridgway, it will be seen that the Louisiana breeding birds are intermediate
between *semipalmatus* and *inornatus*, and as some author has said, "could with equal propriety be referred to either form".

Some of the specimens appear typical of *semipalmatus*, while others are less heavily barred below and are slightly lighter above. Willets are common nesting birds all along the coast and on offshore islands; they are exceedingly tame, and give an intruder in their midst a noisy reception. They gather in small bands to hurl recriminations at one's head, when a breeding area is invaded. The nests are rather well constructed and are well hidden in the grass, and, as with other shore birds, are hard to find.

**Bartramian Sandpiper. Bartramia longicauda.** This species has become rare of late years, and our only observations are from the vicinity of New Orleans where a few birds were seen during the middle of March, 1917. It was once a common and well loved game bird of Creole hunters, but due to persecution over a great part of its range, its numbers are now woefully few. We have no winter records. There are a half dozen specimens in the Chicago Academy collection, taken by Beyer at New Orleans in the spring of 1890.

**Buff-breasted Sandpiper. Tryngites subruficollis.** We have only two records; on February 27, 1919, Bailey collected a specimen at Cameron Farm, Cameron Parish, and from the same region two were taken by Thomas Hoffman about August 12, 1919.

**Spotted Sandpiper. Actitis macularia.** This is a common form in spring and fall, and a few may be seen during the summer months. It is not a bird of the tide flats so much as it is of the mud banks of fresh water streams, so it is more apt to be seen in the interior of the state than along the coast. We have no winter records.

**Long-billed Curlew. Numenius americanus.** This form is not abundant during migration, but it was recorded on many of Bailey's trips along the coast. None was observed during the fall migration, but a few were noted during the months of January, March, and April at Chenier au Tigre, and two stragglers, a late record, on the Chandeleur Islands, June 7, 1918. Invariably the long-bills were found upon the tidal flats where they were feeding upon fiddler crabs.

**Hudsonian Curlew. Numenius hudsonicus.** These fine birds are rather common at Chenier au Tigre during migration. A few may winter (we have no winter records), but the majority pass south of this region. At times they may be seen in flocks of one hundred or more as they rest upon the mud bars or feed on fiddler crabs on the tide flats. A few specific dates are as follows, for the Chenier: November 17, 1916, a few noted; May 6, 1917, common; May 11,
1918, common; April 6, 1919, several flocks observed. On this date one was taken which was very thin, as though just in from a long flight. The men of the Chenier said the birds seen on this date were the first for the spring. A couple of dozen late stragglers were seen May 22-27, 1930, at the same place.

**American Black-bellied Plover. Squatarola s. cynosurae.** The "sea pigeon", as the Creoles call this plover (Pigeon de mer), is a common resident of the coast. They are abundant during migration in the spring and fall. Many remain throughout the winter, and stragglers in gray plumage may be seen throughout the summer. We have recorded them on every trip to the coast, regardless of the season—in fact, no bit of wind-whipped beach would seem like Louisiana without these fine shore birds to complete the picture. Our notes for this species, under the different months from November to May, are always the same, namely, "common". Strangely enough, we have never, to our knowledge, observed the Golden Plover in Louisiana, although a close watch was kept for it on every field trip.

**Killdeer. Oxyechus vociferus.** These birds are very common in the fall, winter, and spring, their distribution being so general that specific occurrences are unnecessary. They are rather common during the summer, and they nest regularly at Chenier au Tigre and in Cameron Parish. We saw many nesting pairs in both localities during the season of 1930. In the latter place, the birds seemed to nest along the highways, possibly because of the safety given from high water by the slightly elevated roads.

**Semipalmated Plover. Charadrius semipalmatus.** This is a common form during spring and fall, but we have never seen it in such large bands as other shore birds. They arrive from the north early in September—many were seen at the mouth of Main Pass during October, 1928—and by November, the majority pass south of our borders. We have no winter records. They are most abundant in April, as they return from the south. We saw a few at Avery Island, May 10-15, but failed to record the species in other localities.

**Wilson's Plover. Pagolla wilsonia wilsonia.** This is the common summer form along the exposed sand beaches. They nest all along the coast and offshore islands, and their plaintive notes may be heard at all times of the day. They lay their eggs in slight depressions in the sand, and when an intruder comes near, they creep away and then run back and forth, calling plaintively in their efforts to attract attention from the nest. On Breton Island, Messrs. Arthur and Bailey found a nest by back-tracking a nesting bird through the fine
beach sand, the dainty footprints being easy to follow. We doubt that the species winters in any numbers along the Louisiana coast.

**Ruddy Turnstone.** *Arenaria interpres morinella.* Turnstones are common all along the coast. They are found at all seasons of the year, as many non-breeding birds remain throughout the summer. They work along the beaches, and are especially busy when onshore winds are rolling the waves high; then the shore line is continually changing and these agile fellows find an abundant food supply. On one occasion, June, 1919, on the mud lumps at the mouth of the Mississippi, Bailey saw turnstones breaking and eating eggs of the Caspian Terns.

**Oyster-Catcher.** *Haematopus palliatus.* These fine shore birds are summer residents of the offshore islands, the majority being found off the east coast. A pair noted during June, 1918, on the bird islands east of Marsh Island, is the only record we have west of the river. These birds are far from common; in fact, one may visit many localities without a sight of one. During the past season we cruised for a week among the bird islands, and saw them only on North Island—six birds. We searched carefully for nests, in the hope of making motion pictures, but were unsuccessful in finding one. We have a few records from other years. Bailey found a nesting pair, June 7, 1918, on the Isle de Pitre. Dr. T. Gilbert Pearson captured the young one, a half grown bird; it had brown eyes, with a brown eye-ring, and the bill was of dark ochre with scarcely any sign of red. The adult has a bright coral red beak, yellow eyes, and flesh-colored legs and feet. Other records are: two noted on the Chandeleur the same date, one on Free Mason Keys, June 7, 1919, and two at Elephant Pass the following day. The boatmen tell us that one may expect to see a few birds in the same localities.

**Bob-white.** *Colinus virginianus.* Avery Island is the only locality south of the Southern Pacific tracks from which we have recorded quail. There, owing to ideal conditions, and protection offered them by Mr. McIlhenny, they are still numerous. The cheery ‘bob-white’ of the male is only one of the incentives for the field man to be out early in the morning. According to Mr. McIlhenny, nesting begins the latter part of April. Specimens at hand are much smaller than typical *virginianus*, but we have not sufficient material for comparison at this time.

**Attwater’s Prairie Chicken.** *Tympanuchus americanus attwateri.* This form seems doomed to extinction within the state. If any survive, it is in the western part, along the Texas border. Bailey records the species but once. February 26, 1919, at Cameron Farm.
Cameron Parish, when two birds were flushed. During the past season, we worked on the same farm, and we were told that no “chickens” had been seen for years.

**Mourning Dove.** *Zenaidura macroura carolinensis.* This bird is a resident, but is much more numerous in winter, when northern birds arrive, than in the summer. It is generally distributed over the higher portion, especially about the fields. They nest rather commonly within the area covered by this paper, and we found them commonly during May. Several nests were found in the live oaks, and some of them were substantial affairs in comparison with the fragile platforms usually built. As the doves are considered game birds, thousands are shot during the open season.

**Turkey Vulture.** *Catharta aura septentrionalis.* This is a common resident of the region, but it is not so numerous as the next form. It is more abundant during winter, when northern birds have congregated near the marsh country.

**Black Vulture.** *Coragyps urubu.* Common resident. The two vultures are rather unpopular with the trappers of the marsh country, for the birds have the unfortunate habit of destroying the pelts of fur bearing animals caught in traps. They are found all over the south, and act as scavengers in many of the little backwoods communities. In spite of the fact that the birds nest commonly, and Bailey made several trips especially to find nests, he never succeeded in doing so. We found the form too numerous in the heronry in Cameron Parish, and have no doubt that the failure of the colony to increase in size can be laid directly to the plundering of nests by these black pirates.

**Swallow-tailed Kite.** *Elanoides forficatus.* This species is rare in Louisiana. In three years’ field work, Bailey failed to record it. There is a specimen in the Louisiana State Museum taken by E. S. Hopkins on Grand Isle, Louisiana, in April, 1927, and Mr. Hopkins informed us he had seen two others in the same locality in April, 1930.

**Mississippi Kite.** *Ictinia mississippiensis.* This is another species which has been recorded as common, and yet one may take trip after trip along the coastal marshes and fail to record a specimen. It is a summer resident, however, and during the seasons of 1917, 1918, and 1919, Bailey saw a pair which nested in a great tree on Avery Island. Mr. McIhenny said the birds had been using the general site for many years. During the past season we saw a single bird near New Iberia, but none was observed at Avery Island, where they were always found in other years. On May 25, at Chenier au Tigre, we saw six of these fine little fellows sailing westward along the coast. They were
so low they barely cleared the tall live oaks, so we had a good opportunity of observing them as they passed overhead.

**Marsh Hawk.** *Circus hudsonius.* This is a very common bird during the early fall, winter, and spring. It is said to nest in the southwestern part of the state (in Cameron Parish), but we saw only one specimen during our trip of 1930. They are the most numerous of the birds of prey, however, at other seasons. In 1928, they were common at the mouth of the Mississippi by the middle of October. Owing to the fact that Marsh Hawks occasionally destroy fur in traps, and take crippled ducks, they are not held in high esteem by the people of the marsh country.

**Sharp-shinned Hawk.** *Accipiter velox.* This bird is seen occasionally over the marsh; it is far from being a common form, but a few will be seen on each trip in the fall and winter. Bailey collected one November 17, 1916, along Vermilion Bay.

**Harris's Hawk.** *Parabuteo unicinctus harrisi.* This is a rare species. Mr. McIlhenny has secured a few specimens from time to time, at Avery Island. One, a female, was taken on October 1, 1918, and is in the Louisiana State Museum.

**Red-tailed Hawk.** *Buteo borealis borealis.* A common winter bird; they prefer wooded areas rather than the marsh country, but pairs may be seen sailing over the ridges along the gulf at any time of day, and the familiar cry of the red-tail is one of the characteristic sounds of marsh winter.

**Red-shouldered Hawk.** *Buteo lineatus lineatus.*

**Florida Red-shouldered Hawk.** *Buteo lineatus alleni.* These hawks are fairly common in the marsh country; the former occurs in winter, while the latter is said to be the breeding bird. We took no specimens to verify the identification. Several were noted at Avery Island during May; in fact, one would have to be a poor observer not to see one form or the other on any trip along wooded bayous.

**Bald Eagle.** *Haliaeetus leucocephalus.* These birds are generally distributed in the southern part of the state, making their nests in the great cypress trees—usually in the dense swamps. Two nests, however, which Bailey has examined, were in rather isolated clumps of trees along Black Bayou in Cameron Parish, and one of them was scarcely thirty feet from the ground. This nest contained a newly-hatched young and an addled egg on February 27, 1919. On Avery Island, February 2 of the same year a nest in a great cypress contained two large downy young. As hunters try to kill eagles at every opportunity, the birds are becoming rare, and have no chance to rear
their young except in remote regions. One will occasionally be seen sailing over the marsh, but it is a fortunate observer who witnesses such a sight.

Duck Hawk. *Falco peregrinus anatum*. These fine fellows are often seen during winter and at migration time, over the marshes. At least six individuals were making life miserable for the Sanderlings on Timbalier Island during November of 1916, and although we sympathize with the Sanderlings, there is no grander sight in nature than a fast flying Duck Hawk as he swoops upon a victim. Several birds were noted at the mouth of the Mississippi River during October, 1928. We speak of a hawk as being common if we see a few on a given trip, while ducks are rare if we see one hundred during the same time. There is no such thing as a common hawk, with the single exception of the Marsh Hawk, for one will travel long distances and see only a few birds.

Pigeon Hawk. *Falco columbarius columbarius*. These fine little fellows are more numerous than the above, but one will not see many on a week’s excursion. They are occasionally seen in the marshes or wooded ridges, and they secure an easy living among the flocks of small birds. One, collected on Chenier au Tigre during December, 1925, had been feeding upon Myrtle Warblers. A few were seen at the mouth of the Mississippi River the last week in October, 1928 (Bailey), but we did not observe the species during the trip of 1930. Mr. Hopkins collected a female on the Chenier, March 10, 1931.

Sparrow Hawk. *Cerchneis sparveria sparveria*. These handsome fellows are found about the ridges in the fall, winter, and spring, but we have no summer records from the coastal plains. They are not numerous, only a few being seen in a given region. A dozen or more were observed along the Mississippi the latter part of October, 1925, however, on the run from Buras to Pilot Town, and two lived in the trees near “Chateau Canard”, the shooting lodge of Mr. Joseph Leiter.

Osprey. *Pandion haliaëtus carolinensis*. Again we must differ from the opinion of other writers of the birds of this region; this is another hawk which is far from “common”. It is a resident of the state, however, nesting in limited numbers, but the only nest we have seen was in a large lake on Avery Island, during May of the past season. The site was a beautiful one, high up in a dead cypress, and the bulky nest decorated with waving Spanish moss. We saw but one other bird, on Chenier au Tigre, May 23.

Barn Owl. *Tyto pratincola*. Barn Owls frequent most of the oak ridges, and several pairs have nested on Chenier au Tigre for the last
fifteen years. They are resident wherever found, and are well distributed over the southern portion of the state. We were shown the nest of an owl of this species on the Paul Rainey Reserve; it was in a box placed high up in the warden’s watch tower. The tower was several miles from the nearest timber, so the barn owl in this case had the extensive marsh as his hunting country. Muskrats and Boat-tailed Grackles seemed to make up a good percentage of the food of this particular pair, as was shown by the pellets. Often times the nests are in abandoned buildings, or in buildings in use only a part of the year. While this species is nocturnal, birds are often flushed during the day. Three young were hatched in the box mentioned above, in 1931, the first on March 7, the last five days later.

**Short-eared Owl.** *Asio flammeus.* Wright flushed an owl from the roadway at night, on Avery Island, May 21, which he identified as this form. It was seen by Wright, his brother, and Mr. Komarek, so there can be little doubt of the identification, although it seemed late in the season. In three years’ field work, Bailey did not record this species. Mr. Hopkins collected a specimen at Buras, March 4, 1931.

**Florida Screech Owl.** *Otus asio floridanus.* Screech owls are to be found in all parts of the state; as they are nocturnal, they are heard more often than seen, so one has little opportunity to observe them. Two specimens collected at Chenier au Tigre proved to be this subspecies. Several families live in various parts of Avery Island, and we have observed or heard them at the mouth of the Mississippi, on Pecan Island, and in Cameron Parish.

**Great Horned Owl.** *Bubo virginianus virginianus.* These fine birds are not numerous, but they are widely distributed. A pair has nested for many years back of Mr. McIlhenny’s home on Avery Island; he protects the owls until they become too numerous, and then a few are killed. These horned owls secure an easy living, for they have thousands of nesting herons within a few yards of their home. The owls nest early, of course, before the herons are in numbers, but there are many other species of wild fowl to choose from in February and March. A few of these owls may be found upon the ridges bordering the gulf, and Bailey observed one or two from time to time at Chenier au Tigre, the last record being in December, 1925. The birds are resident wherever found.

**Burrowing Owl.** *Speotyto cunicularia hypogaea.* Records for this owl for southern Louisiana are few: Bailey collected one on Chenier au Tigre, March 6, 1918, and another on December 10, 1925. Both proved typical *hypogaea.* Mr. Hopkins collected three specimens or:
Grand Isle, one in April, 1926, and two the following April. All were dark colored birds, and one is now in the Louisiana State Museum, and one in the collection of the Department of Conservation.

Yellow-billed Cuckoo. Coccyzus americanus americanus. These are very common birds throughout the lowlands in spring, summer, and fall; they are often flushed from the thickets far out in the marshes, at which time they dart rapidly back and forth through the fast growing vegetation. We found them very common on Chenier au Tigre in May, and on the bird islands in the gulf during June. On June 3, 1917, Bailey and Mr. Arthur found a cuckoo dead upon the nest of a Louisiana Heron, where it had undoubtedly been killed by a thrust from the heron’s beak. We were told that the cuckoo often eats the eggs of other birds.

Belted Kingfisher. Ceryle alcyon alcyon. This species is not common during summer; a few may be seen daily along the canals and bayous in almost any part of the marsh country during the fall, winter, and spring, but during the past season our only records were from Avery Island, where several birds were seen.

Southern Hairy Woodpecker. Dryobates villosus auduboni. Fairly common in the wooded regions, usually, although we did not record an individual during the past season. They are seen most often when one is sitting quietly in the woods, especially in the fall when deciduous trees have dropped their leaves.

Yellow-breasted Sapsucker. Sphyrapicus varius. This is not a rare bird in winter in wooded portions of the coastal plain. We have not recorded it from Chenier au Tigre during the several winter trips, but they are seen quite often at Avery Island. Mr. McIlhenny reports them fairly common, at times. Many were seen on the Chenier during March, 1931.

Pileated Woodpecker. Phloeotomus pileatus pileatus. The Cock of the Woods is becoming rare over most of the range; the heavy swamps bordering Avery Island are ideal, but the birds are far from numerous. From one to a half dozen were observed on practically every excursion into the swamps during the seasons of 1917, 1918, and 1919. During June, 1919, three were seen in the orchard back of Mr. McIlhenny’s home. Wright observed one in a cypress, June 10, 1930. Owing to the birds being so large, they offer a target to thoughtless hunters, and are in need of careful protection.

Red-headed Woodpecker. Melanerpes erythrorhynchus. Not a common form of the swamp country. As with many forms, Avery Island is the best place to observe this species. A few were noted
in New Iberia, May 10, and a few daily, probably the same individuals, at Avery Island. We found that even in this southern part of its range, the red-head is being killed by automobiles, for one was observed in the road between New Iberia and Avery Island. It nests sparingly.

**Red-bellied Woodpecker.** *Centurus carolinus.* This is the common woodpecker of the forested areas of the lowlands; they are resident, and are seen daily in practically any of the southern woods. Several specimens were collected on Avery Island, and they averaged considerably smaller than northern breeding ones.

**Flicker.** *Colaptes auratus auratus.* Common during winter in open wooded areas; uncommon during the summer months. A few were observed at Avery Island, but they were not recorded from other areas the past season. They are too numerous on Chenier au Tigre in the winter, for they have the unfortunate habit of drilling into the houses—a procedure which makes them rather unpopular with the people. Specimens collected all proved to be this form. Mr. Hopkins collected a hybrid near Covington, January 10, 1931, which had several red feathers in tail and wing.

**Florida Nighthawk.** *Chordeiles virginianus chapmani.* Early in fall there is an incoming flight from the north, birds which are probably *virginianus,* the northern breeding form. The only specimens we have examined, however, have been local breeding birds, and these were identified by Mr. Peters as *chapmani.* They vary greatly in color, and average much lighter in coloration than *virginianus.* Nighthawks are very common along the coast and on offshore islands during the summer. They usually have two eggs which are laid upon the sand or ground; the nesting sites vary from the open beaches to places upon the ground, under palmettos and live oaks. Several nests were found the latter part of May, and half-grown young were seen on Brush Island the second week in June. Birds collected in the western part of the state appear identical with those taken along the eastern border.

**Chimney Swift.** *Chordeiles pelagica.* This is a common species in summer in southern Louisiana, and it nests throughout the region. A nest with three eggs was located in the chimney of our cottage on Avery Island. During the early part of the season swifts are not so apparent as in the latter part—the last of June and July—when the young are on the wing.

**Ruby-throated Hummingbird.** *Archilochus colubris.* A fairly common form in migration, and a few remain and probably breed in
the region under consideration. We observed them at Avery Island early in the past season. They are often rather abundant about the gardens of New Orleans.

**Scissor-tailed Flycatcher.** *Muscivora forficata.* We have never been fortunate enough to observe this species in life, but the men on the Chenier told us that "forked-tailed" flycatchers had been seen the week previous. Mr. Hopkins has taken three on Grand Isle, one of them on April 2, 1927, and he secured another on Bayou Lafourche, April 1, 1930.

**Kingbird.** *Tyrannus tyrannus.* This bird is found commonly throughout the region during the summer; its nests are found along canal and bayou banks where the vegetation overhangs the water. One could not take a trip along the inland waterways in June without flushing a few from their nests. One pair, which we recorded in the movies, had a beautiful nest made from Spanish moss; it was placed in a button bush in the middle of the heronry pond on Avery Island. Squawking young herons were near neighbors, but the Kingbirds did not seem to mind. They were so tame, they made ideal subjects for the photographer.

**Crested Flycatcher.** *Myiarchus crinitus.* This is a common form in the wooded sections, and their strident voices are characteristic of the southern region. They were seen daily at Avery Island and Chenier au Tigre during May, 1930. This species arrives at the latter place with other migrants the last week in March, are numerous for a few days, and then the majority of them move northward.

**Derby Flycatcher.** *Pitangus sulphuratus derbianus.* Early one morning we were walking along the beach at Chenier au Tigre, watching the Wilson’s Plover running ahead when we saw a large flycatcher rise from a log of drift, flutter upward as though catching an insect, and then drop to perch. We placed the glasses upon it and saw immediately that it was a bird with which we were unfamiliar. It had a black patch across the head, and bright yellow underparts. Wright collected the specimen, which proved to be a fine-plumaged Derby Flycatcher, the first record for this species from Louisiana, we believe. The normal range of the species is along the Rio Grande in Texas, and southward.

**Phoebe.** *Sayornis phoebe.* This is a common winter bird. They begin to arrive in October and remain until April, and a visitor to the wooded areas between these months will note them daily. They were particularly common on Avery Island and Chenier au Tigre in December, 1925.
Wood Pewee. *Myiochanes virens*. This form occurs chiefly during migration. In November it is fairly numerous, and one of the delights of still hunting for deer along the wooded regions, is to watch the small birds working through the tree tops. Small warblers are ever on the move, but the pewee often sits motionless on twigs over the water, and then comes suddenly to life long enough to flutter into space, seize an insect, and drop back to perch. We have one specimen, a male, collected at Avery Island.

Blue Jay. *Cyanocitta cristata cristata*. This is a common, but not an abundant, form in any one locality. The birds assemble in the pecan groves, and at times, harvest more than their share of the crop, so they are not well liked by the natives. They appear more abundant in the southern part of their range during the winter than in the summer; they are common on Chenier au Tigre, for instance, during the cold months, but they are rarely seen during the breeding season. On a visit to the Chenier in May, 1930, we failed to see a jay, and only a few were observed daily on Avery Island, while they were abundant in March, 1931.

Crow. *Corvus brachyrhynchos brachyrhynchos*. This species is resident, but is more common inland than upon the coast; they occur along the higher ridges, such as Chenier au Tigre, at all seasons, and at times come into the fields in numbers. They are very common at Avery Island throughout the year, and they are even found on the delta of the Mississippi. Several were recorded October 22, 1928, at the mouth of Main Pass.

Fish Crow. *Corvus ossifragus*. These small crows are common on Avery Island. Mr. McIlhenny showed us a nest containing three eggs, on May 12, 1930. They are found along the entire coast, but we never observed them in great numbers. On Chenier au Tigre, for instance, not more than a dozen birds were seen in a week's time, December, 1925, and only six at once, as they gathered in a tree to torment a Barn Owl. We saw several about the heronry on Bird Island in Cameron Parish; they may have been nesting, or merely waiting to steal eggs from the nesting birds.

Bobolink. *Dolichonyx oryzivorus*. This is said to be an abundant bird at times, during migration, but we have never seen it in numbers. It arrives early in the fall, during September and October, and many gather in the rice fields. A few were seen at Avery Island the second week in May—the only records we have for the season.

Cowbird. *Molothrus ater ater*. These birds are residents in the southern section, and distributed generally in favorable localities. A
flock of fifteen or more hung about our headquarters on the Chenier au Tigre, and we saw a good many on Avery Island and in Cameron Parish. A specimen collected proved typical *ater*. A close watch was kept for *obscurus*, which, according to Kopman, is a fairly common bird north and west of New Orleans. We failed to record it.

**Red-winged Blackbird.** *Agelaius phoeniceus phoeniceus.*

**Southern Red-winged Blackbird.** *Agelaius phoeniceus littoralis.* Blackbirds are exceedingly common throughout the lowlands of the Gulf Coast. The breeding form, which is abundant, is given as *littoralis*, while specimens collected in the winter of 1925 proved to be *phoeniceus*. Red-wings are ever present, and often are so numerous as to present a serious problem to the rice growers.

**Southern Meadowlark.** *Sturnella magna argutula.* This is a very common bird, and we found it in favorable localities over the entire area. They were particularly plentiful in the vicinity of Avery Island where a nest was found on May 17. They are also plentiful during the winter, and were in full song in December, 1925.

**Orchard Oriole.** *Icterus spurius.* This is a common breeding bird on the southern lowlands. The first arrivals make their appearance the middle of March, and nest building commences a month or more later. The seasons vary, however; on the Chenier we found nests with small young, and others which were not completed, the last week in May. Wherever little peninsulas of willow and other small trees project into the marsh, or where the banks of meandering tidal streams are overhung with tall growths, there one will find the beautiful, strongly-made nests of these orioles. The males were in full song during our trip, and we were surprised to find birds in second year plumage breeding.

**Florida Grackle.** *Quiscalus quiscula aglaeus.* This is a rather common bird, but is more evident after the breeding season, when they have congregated into flocks. They are found about habitations, and a few were collected at Avery Island. In addition, they were observed at Chenier au Tigre the latter part of May, and in several localities along the Mississippi below New Orleans, on June 7. On this date we saw them flying singly over the river and oftentimes they would hover over a given area, and then pick something from the water, much as Black Terns do.

**Boat-tailed Grackle.** *Megaquiscalus major major.* This is a very abundant bird and it nests all through the marsh country. The nesting period begins the latter part of March and extends through
June, and, in one colony among the tules on the Chenier, on May 27, we found nests being built and others which contained half grown young. After the breeding season, the "chocks" form in large flocks and oftentimes raid the rice fields along with the red-wings, much to the displeasure of the farmers.

**Goldfinch.** *Astragalinus tristis tristis*. This is a common winter visitor in the vicinity of New Orleans and northward, but we have seen few in the southern area; they may be seen daily in winter on Avery Island, along the edges of the fields.

**Savanna Sparrow.** *Passerculus sandwichensis savanna*. This is a common form in winter, being found on high ground, in the fields, and even in the marsh. They begin to arrive in October, and remain until late spring (April).

*Passerculus sandwichensis* subsp. There is a dark form found along the coastal marshes. Bailey secured specimens in December, 1925, and several additional ones were taken by Messrs. McIlhenny and Wright in May, 1930, at Avery Island. All observed at this late date were dark colored, but specimens collected were not nesting. Those collected at Chenier au Tigre in 1925 were submitted to Mr. Outram Bangs for identification, and his reply, as published in the *Auk*, Vol. XLV, was as follows:

"Three very dark birds from Louisiana, with very blackish upper parts, deep chestnut edges to wing feathers, much black on the head and intense black stripes below. These are so different from eastern specimens of *savanna* that I feel pretty sure they represent an undescribed form. Where does this form breed is the question. I wonder if it can be resident and breeding in the marshes of Louisiana. They are too large to be stray migrants of the *California bryanti*, and are also still darker, or rather, blacker than that form. There is a rather dark Savannah Sparrow that breeds in Wisconsin and Michigan and migrates to Arkansas, Texas (sometimes), and Tarpon Springs, Florida, (though most of the specimens from there are the eastern bird). This form, which is rather ill defined, is, however, much less blackish than your birds. We have four skins from Louisiana, one taken at Rigolets as late as April 4. These are much nearer to yours than they are to eastern specimens of *savanna*, and are the darkest of our several hundred Savannah Sparrows."

A close watch was kept for these dark plumaged birds, in May, 1930, and March, 1931, on Chenier au Tigre, where the above-mentioned specimens were taken in December, 1925, but we failed to see one.
Nelson’s Sparrow. *Passerherbulus nelsoni nelsoni*. These common winter visitors are found in the salt marshes bordering the gulf. We have collected specimens in December on Chenier au Tigre, and found them very plentiful in “needle grass” at the mouth of Main Pass the latter part of October. Hunters in blinds have many opportunities to observe these little fellows, for they are rather secretive and are easily alarmed. They have a quick, erratic flight, and when flushed, will dart away for fifteen or twenty feet, and then dive out of sight in the thick vegetation. We have no summer records.

Louisiana Seaside Sparrow. *Ammodramus maritimus fisheri*. This is a common nesting species of the salt marshes, and was observed all along the coast. The males were in full song, and often we would see half a dozen at a time, scattered over a considerable area, perched upon the marsh grass. Specimens collected at the mouth of Main Pass in October, 1928, were molting, and many had new tail feathers half grown.

Howell’s Seaside Sparrow. *Ammodramus maritimus howelli*. Three specimens taken on offshore islands off the east coast of Louisiana were grayer than birds taken to the westward, and slightly larger. They were sent to Mr. Peters who identified them as *howelli*. The habitats of the two birds seem to be different, for the latter were found on low islands where the coarse vegetation was scant and low, and the islands were flooded at high tide. The Louisiana Seaside Sparrows were always found in heavy grass where oftentimes it was almost impossible to find a specimen after it was collected.

Two nests of this race were found, both about one foot above the water, in “sea cane”. One nest contained four fresh eggs, and the other, four newly hatched young. A photographic blind was erected at the latter place and motion films were made of the old one as she returned to brood the nestlings. This form was observed on Breton Brush, and the Chandeleur Islands, and along the low salt marshes inshore from these islands.

Swamp Sparrow. *Melospiza georgiana*. This is a very common winter bird of the southern area. It arrives the latter part of October, and thereafter is a conspicuous form along the edges of the fields bordering the oak woods. They were very numerous at Avery Island and Chenier au Tigre during December, 1925. They leave for the north the latter part of April.

Towhee. *Pipilo erythrophthalmus erythrophthalmus*. This is not a common form in the southern section; in fact, the only place we have recorded it is from Avery Island. One was collected May 18.
and a few others observed. They occur there regularly, according to Mr. McIlhenny, often coming around his home where they find abundant food in the nearby garden.

**Louisiana Cardinal.** *Cardinalis cardinalis magnirostris.* This form, described by Mr. Bangs, is very common, and, owing to its beautiful plumage, is the most conspicuous of the song birds. Specimens collected proved to have heavier beaks than northern birds, and seemed to bear out Mr. Bangs in his opinion. We have two skins from Arkansas, however, which are like the Louisiana birds. We found several nests in the low mesquite, and one was located within fifty feet of the gulf. The nest was made of grass and Spanish moss, and was decorated with a big piece of snake skin. We made motion films of the female on her nest; she proved shy and was frightened at the whirr of the camera, but we finally secured a good strip of film. The male flew into the near vicinity a few times, but in the two days we had the nest under observation, it never offered to aid in the work of incubation. Another nest observed contained young, and the adults were feeding them on cicadas.

**Rose-breasted Grosbeak.** *Hedymeles ludovicianus.* Not an abundant bird, and only seen in late spring and early fall. We did not observe a single individual the season of 1930 or 1931. We have one specimen, a male, taken by E. S. Hopkins, May 3, 1925, at Grand Isle.

**Painted Bunting.** *Passerina ciris.* These beautiful fellows are fairly common during the summer. A few were seen on Avery Island in May, but we failed to find a nest. They prefer heavy thickets bordering fields, and in spite of the fact that they are protected, they appear very timid. They are most conspicuous in the middle of March, when they make their first appearance along with other migrants.

**Scarlet Tanager.** *Piranga erythromelas.* These tanagers occur in the southern portion only in migration, and unless one is afield for the few brief days, he is likely to miss the species altogether. When they first appear along the coast, on Chenier au Tigre or Grand Isle, the middle to latter part of April, they rest from their over water flight for a few days, and then move northward. One spring, the exact date which we failed to keep, Messrs. Arthur and Bailey were offshore on a Department of Conservation boat, when a tired tanager came alongside, hesitated, and then dropped upon the deck. It was merely exhausted. They were but a few miles offshore, and the bird flew away shortly after.
Summer Tanager. *Piranga rubra rubra.* Not common in the lowlands except along the ridges during migration. They arrive in early April and depart in October. Mr. E. S. Hopkins presented us with a male collected on Grand Isle, April 29, 1925. Bailey has recorded them from Grand Isle, Chenier au Tigre, and Avery Island.

Purple Martin. *Progne subis subis.* These are common birds during the summer. They arrive earlier than the majority of migrants, the last of February or first week in March, and leave again in September. On Avery Island they were nesting in bird houses made from joints of bamboo, the latter part of May.

Barn Swallow. *Hirundo erythrogaster.* Occurs commonly as a migrant. Oftentimes when the migration is at its height, they will be seen in numbers, but they usually disappear, for the most part, by the middle of May. We were fortunate the past season, in seeing them at Avery Island on May 9, Chenier au Tigre, May 24, and in Cameron Parish (Ged), May 31. They arrive from the north rather early in August and September. Bailey saw a few at the mouth of Main Pass, October 22, 1928. The majority leave for the south by early November.

Tree Swallow. *Iridoprocne bicolor.* This migrant is very common, and a few seem to remain throughout the summer. They were observed at Avery Island only, however, during the past season. Some years they remain all winter, and Bailey found them over the marshes by thousands in December, 1925, at Chenier au Tigre.

Rough-winged Swallow. *Stelgidopteryx serripennis.* A few of this species were observed at Avery Island, but no specimens were collected. The identifications were made by Mr. McIlhenny who stated that the Bank Swallows were not found on the island so late in May.

Cedar Waxwing. *Bombycilla cedrorum.* These fine little northern birds make their appearance on the Gulf Coast in late winter. The earliest we have recorded were those seen by Bailey on Chenier au Tigre the first week in December, 1925. They remain late in the spring, some not making their departure until the first week in June. This past season, 1930, we saw them in flocks at Avery Island on May 12—several bands of twenty or more individuals, and on Chenier au Tigre on May 22. We saw approximately fifty birds at the latter place.

Loggerhead Shrike. *Lanius ludovicianus ludovicianus.* A common breeding bird of the area, which is to be seen daily during the summer months. Its status as a wintering bird has not been worked out, however; at least, we have no records for the cold months.
Migrant Shrike. *Lanius ludovicianus migrans*. Shrikes are common in winter, and it is possible that the majority are the northern breeding birds. Specimens collected at Chenier au Tigre in December proved to be *migrans*.

Red-eyed Vireo. *Vireosylva olivacea*. This is a common bird in summer. It arrives at Chenier au Tigre early in March, and is a conspicuous bird upon the ridge for a few days; then the wave passes on, leaving comparatively few. We saw many, however, the latter part of May, often in willows and other low growths along the meandering streams, far back in the marsh.

Warbling Vireo. *Vireosylva gilva gilva*. Common during migration in March and April on the Chenier, but not observed at other seasons; the earliest record we have for the ridge is March 4, 1918. There were only a few birds at this date.

Blue-headed Vireo. *Lanivireo solitarius solitarius*. This is not an uncommon bird in winter, especially at Avery Island. We have two records for the Chenier, a specimen collected in December, 1918, and another March 10, 1931.

White-eyed Vireo. *Vireo griseus griseus*. A fairly common bird during the summer; they are found in wooded areas, especially in the vicinity of water. Many were observed at Avery Island in November, 1925—which we believe to be a rather late date.

Black-and-white Warbler. *Mniotilta varia*. Rather common along the ridges in migration. They arrive early and a few may remain through the summer. We have a pair taken at Grand Isle by E. S. Hopkins, March 31, 1928.

Prothonotary Warbler. *Protonotaria citrea*. Common during migration, and a few may be observed daily along wooded bayous. It is one of the most beautiful of the southern birds. They arrive early. We have one specimen taken at Grand Isle, April 11, 1928, by E. S. Hopkins. Bailey has collected several near New Orleans, during the months of April and May.

Swainson’s Warbler. *Lymnothlypis swainsoni*. We have no record of this form from the area under consideration, although it undoubtedly occurs in favorable places. Bailey saw a few birds at Mandeville, across the lake from New Orleans, in July, 1916, and there were several specimens in the Louisiana State Museum collected from the same region.

Northern Parula Warbler. *Compsothlypis americana pusilla*. This is a fairly common breeding bird of the region. It seems to prefer moist areas at the edge of the swamps. Strangely enough, we did
not record a single specimen in 1930, but in other years many have been seen on the Chenier, at Avery Island, and in the vicinity of New Orleans. They are most evident when they first arrive from the south, the latter part of March. At this time the deciduous trees are still without their full foliage, and small birds may more readily be observed.

**Yellow Warbler.** *Dendroica aestiva aestiva.* This is a common bird during spring and late summer. One was observed on the Chenier, May 21, a rather late date. They become common again during August. One was seen at the mouth of the Mississippi River, at Chateau Canard, October 22, 1928, which seems to be a late fall record.

**Myrtle Warbler.** *Dendroica coronata.* This is one of the really common winter birds. It is found throughout the wooded areas of the south, and along the wooded edges of fields. It arrives the latter part of October and remains until April, when it joins the other migrants on their northward journey.

**Magnolia Warbler.** *Dendroica magnolia.* This is a common form during the fall migration, especially on the higher ridges. Specimens were taken near New Orleans by Bailey, May, 1918.

**Cerulean Warbler.** *Dendroica caerulea.* Not abundant. It arrives rather early in the spring and leaves early in the fall. Bailey collected specimens near New Orleans, and we have a male taken by E. S. Hopkins, April 15, 1928.

**Chestnut-sided Warbler.** *Dendroica pensylvanica.* Not common. Aside from a few taken near New Orleans in May, 1918, the only definite record we have is a specimen taken by E. S. Hopkins at Grand Isle, April 13, 1925.

**Blackburnian Warbler.** *Dendroica fusca.* We have no personal records, but Mr. Hopkins presented us with a male taken April 15, 1925, at Grand Isle.

**Sycamore Warbler.** *Dendroica dominica albilora.* The only record we have of this species is a fine female taken at Chenier au Tigre March 10, 1931. Mr. Hopkins states that he has observed them regularly during migration at Grand Chenier, but that they are not numerous.

**Palm Warbler.** *Dendroica palmarum.* A not uncommon wintering bird; many were seen on Avery Island in November and early December, 1925, and a few on the Chenier the first week of December.

**Maryland Yellow-throat.** *Geothlypis trichas trichas.*

**Florida Yellow-throat.** *Geothlypis trichas ignota.* Yellow throats are common in the marsh country, and during May and June
they may be heard singing on all sides. The breeding bird is *ignota*, while it is probable that the majority of wintering birds are *trichas*. Both forms were collected at the mouth of the Mississippi River, near Pilot Town, October 22, 1928.

**Hooded Warbler. Wilsonia citrina.** This is a common bird throughout the wooded lowlands during the summer. They arrive rather early in the spring and remain until well into October. Bailey has taken specimens in New Orleans in May.

**Pipit. Anthus spinolitta rubescens.** These northern visitors are generally distributed during the winter months. They were numerous in the Chenier au Tigre in March, 1931, and specimens were collected.

**Sage Thrasher. Oreoscoptes montanus.** The only records we have for this form were given us by Mr. E. S. Hopkins who collected a male and saw five others in Cameron Parish, January 1, 1928. Mr. Hopkins' records are the first from Louisiana, we believe.

**Mockingbird. Mimus polyglottos polyglottos.** This is a common bird the year around throughout the entire region. They have interesting habits during the mating season. Under the date of March 3, 1918, Bailey writes: "We had a good trip down Bayou Vermilion, and we saw several mockers going through courtship antics. Perched on the highest limb of a tree, exactly as do the Cardinals, with throats swelled and beaks pointed upward, they could literally be seen singing. After an outburst of song, a bird would spring a few feet into the air with wings and tail spread to their greatest extent, and then, drifting downward, would alight gracefully and start singing again. Coming down the bayou, we saw at least six of these fine songsters in the courtship role, presumably males, so I have no doubt it is a characteristic performance." Most of the young had left their nests on Chenier au Tigre by the last week in May, 1930.

**Catbird. Dumetella carolinensis.** Occurs in migration, but not commonly. A few winter during mild seasons, but winter records are rather rare. Bailey recorded two on Chenier au Tigre the first week in December, 1925.

**Brown Thrasher. Toxostoma rufum.** We have no summer records from the southern area, but the thrasher occurs commonly throughout the area in migration. They winter in small numbers, and on Chenier au Tigre, December, 1925, they were fairly numerous. A few could be seen in an hour's walk. The birds were shy and remained in heavy cover.

**Carolina Wren. Thryothorus ludovicianus ludovicianus.** These are common residents, being found on all the ridges and wooded areas.
They can be heard singing early and late at all seasons of the year. Even in December, when "northers" make humans shrivel to a small size, the wrens were out singing. Nests were found upon the ground, at the base of trees, and upon rafters of sheds and barns. The birds are extremely tame, and are found in numbers about dwelling places.

**House Wren.** *Troglodytes aëdon aëdon*. These are common winter visitors, but they do not stay around habitations as they do during the breeding season. They were plentiful at Avery Island in November, 1925, and a few were seen on Chenier au Tigre the first week in December.

**Short-billed Marsh Wren.** *Cistothorus stellaris*. Owing to the secretive habits of these little fellows, they are hard to observe. They occur more or less commonly on the ridges and at the edges of the marsh, during the winter. We have specimens collected near Pilot Town, the last week in October, 1928; several were observed at this time, and Bailey has taken others, one on Bayou Ferman, Vermilion Parish, November 25, 1916, and another on Chenier au Tigre in December, 1925.

**Prairie Marsh Wren.** *Telmatodytes palustris iliacus*. This form probably occurs more or less commonly, but owing to the habits of the long-bills, there are few in collections. Bailey took a male of this form, October 24, 1928, near Pilot Town, at Chateau Canard. This is the first record for the state, as far as we know.

**Louisiana Long-billed Marsh Wren.** *Telmatodytes palustris thryophilus*. This well-marked, dark-colored bird is the common breeding bird of the region. They are abundant in certain areas along the coast, and on one afternoon walk, we counted more than thirty. They prefer the cane, tules, and cattails in the open marsh, and we saw many perched on the highest point, where they sang their "spring song". Several old nests were found, and one new one which contained four eggs. We could see no difference in the nesting habits of *thryophilus* from that of other subspecies. We found this form along the gulf in Cameron Parish, on Chenier au Tigre, Marsh Island, and on Breton Island. No specimens were secured from the islands off the east coast, however, so we are not sure the birds observed there were of this race.

**Tufted Titmouse.** *Baeolophus bicolor*. Fairly common in wooded regions, especially in the fall. Many are to be seen on Avery Island after the deciduous trees have dropped their leaves.

**Golden-crowned Kinglet.** *Regulus satrapa satrapa*. Very common winter birds. They are found on the ridges close to the gulf.
Ruby-crowned Kinglet. *Regulus calendula calendula*. These little fellows are also abundant, and may be seen working through the tree tops on any winter day. They are, however, not so common as the preceding form. They arrive from the north the latter part of October, and return again in April.

Blue-gray Gnatcatcher. *Polioptila caerulea caerulea*. Fairly common during the summer, and a few winter along the gulf. Only a scattering few will be seen in a day’s walk through the open woods, however. They were fairly common on Chenier au Tigre in December, 1925.

Wood Thrush. *Hylocichla mustelina*. These are fairly common in the fall, and a few may be seen on Avery Island and nearby places during the entire summer. We observed several on Avery Island the second week in May.

Hermit Thrush. *Hylocichla guttata pallasii*. While this species is a common one of the wooded area, we have recorded it rarely in the southern part of the state. Several were seen March 9-12, 1931, at Chenier au Tigre, and one specimen was taken.

Robin. *Planesticus migratorius* subsp. Robins are very common in the fall, winter, and early spring in the southern area, but we have no early summer or summer records. It is probable that both *migratorius* and *achrusterus* are represented, but we have never taken specimens for comparison.

Bluebird. *Sialia sialis sialis*. The only records we have from the lowlands are in winter. Bluebirds are very common in the Chenier au Tigre and Avery Island at this season, and their sweet, plaintive notes are characteristic sounds of the southern woods.

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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: Albert F. Ganier, Nashville, Tennessee; Alfred M. Bailey, Chicago Academy of Sciences, Chicago, Illinois; 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 $2.00 a year, and 60 cents a number. Subscriptions and orders for single copies should be addressed to the Secretary, Dr. Jesse M. Shaver, Peabody College, Nashville, Tennessee, U.S.A.

EDITORIAL

Some Interesting Results have now been obtained by marking mammals. The Cleveland program of the Ecological Society contained a paper on "Territory in Mammal Life", by W. L. Strunk, of the University of Michigan. In the Journal of Mammalogy (August, 1931) we find a paper on the "Travels of Peromyscus", by O. J. Murie and Adolph Murie. These mice were trapped and marked by means of ear punches, then liberated at varying distances from the home station. Subsequent recaptures gave information as to range of travel. Mice liberated far from home found their way back. One mouse found its way home over a distance of one mile. The authors are inclined to explain this capacity for orientation by the "sense of direction" idea.

Newspapers in August carried a press report stating that Prof. A. Brazier Howell, of Johns Hopkins University, claims that the "grasshopper" irruption in the middle west "is a result of the government policy of extermination of rodents." The August number of the Journal of Mammalogy contains the full report of the Committee on Predatory Mammal Control of the American Society of Mammalogists. While couched in polite terms this report is an indictment of the Biological Survey. The report lays the blame for the crisis now confronting our wild life directly on the executive officers of the Survey. It is saddening to watch the deterioration of a scientific bureau of which in the past we have been duly proud. We have been watching in recent years for an output of the Survey which would correspond in some measure with the work of Merriam, Cooke, Beal, Judd, McAtre, and others.

In connection with the Survey's poisoning campaign we may call attention to an article by Dr. Jean M. Linsdale entitled "Facts concerning the use of thallium in California to poison rodents—its destructiveness to game birds, song birds, and other valuable wild life", which appeared in the Condor for May-June, 1931. The facts therein presented are astounding. The number of kinds of
animals killed in California is listed at sixty. Of these thirty-four are birds, native and domestic, including 3314 Mourning Doves, 713 Valley Quail, 67 Meadowlarks, etc. And, of course, these figures are for a limited area, and must be regarded as incomplete.

New Orleans is a city of somewhat less than half a million population, located on the Mississippi River 110 miles from the mouth. There are many features about this city to interest the visitor. First of all, perhaps, its historical background claims our attention: many old buildings and customs still remain to give one glimpses of American conditions as they were a hundred and fifty years ago.

New Orleans was founded in 1718 by a French-Canadian named Bienville. Therefore, it is now more than 200 years old. While destructive fires, in 1788 and 1794, destroyed many of the oldest buildings, there are still many which are more than 100 years old, and some considerably older. Most of these picturesque structures are located in the "old quarter", called the Vieux Carre. From the time of its beginning until 1764 New Orleans was under French dominion. From that year until 1803 was the Spanish era. In the latter year the city came under American control, although the French again held the keys of the city for twenty days between the Spanish and American régimes.

Many relics of these early years still exist to make New Orleans one of the most interesting and picturesque of American cities. A few miles below the city is the Chalmette Battlefield, where, in 1814, General Jackson defeated the British. A beautiful monument has been erected to commemorate the event. We started out to make a list of the many monuments and historic buildings which might be classified as among the city's sights; but the task was immediately found to be too great.

The visiting engineer will find much to interest him. Part of the city is about one foot below the water level of the Gulf of Mexico. A much greater part is below the high water level of the Mississippi River. For many years this condition made it impossible to have cellars under the houses, or to have wells of pure water; wooden cisterns provided a fresh water supply. The dead could not be buried under the ground. An adequate sewage system was impossible. The Mississippi River overflowed its banks, causing destruction and disease. Now the city has protected itself with a system of levees, in comparison with which "the stone walls of the most famous mediaeval cities are toys". The total length of the "Great Wall of New Orleans" is said to be more than 100 miles, erected at a cost of $11,000,000. The city has also an efficient drainage system operated by enormous pumps, which have a discharge capacity of seven billions of gallons daily. Opening the mouth of the Mississippi River for navigation, construction of passable land highways, including a five-mile concrete bridge across Lake Ponchartrain, into the city are other engineering problems which have been
solved. These constructions have cost a great deal of money. Besides the cost of the levees mentioned above, $43,000,000 were spent for the drainage, sewerage, and water systems; $160,000,000 for harbor facilities; and $11,000,000 for making the wharves and buildings rat-proof to protect against the bubonic plague.

Within easy distance from New Orleans are the largest and most densely populated bird sanctuaries in the world. To describe these would make a long article. The article by Messrs. Bailey and Wright concluded in this issue is intended to give some idea of the bird life of this region.

Those who wish to make themselves familiar with the city before visiting it may secure descriptive pamphlets by writing to the New Orleans Association of Commerce. A splendidly illustrated article, with an excellent map of the state, will be found in the *National Geographic Magazine* for April, 1930.

All of these things make New Orleans an interesting city. The American Association for the Advancement of Science met in New Orleans once before, a quarter of a century ago, in 1905-1906; it is likely to be as long before a third meeting is held there. This is our opportunity. Times are hard, but life is short.

Beyond this, plans are being investigated by which our members may take a trip to Havana, Cuba, at much reduced cost immediately following the W. O. C. meeting. Details of this trip may be expected in the Secretary's letter of announcements for the meeting.
GENERAL NOTES
Conducted by M. H. Swenk

Another Early Hour's Bird List.—The following was suggested by Mr. Eifrig's list in the Wilson Bulletin for March, 1931, p. 58. I was still in bed, the hour was 6:00 to 6:30 o'clock on the morning of March 21, 1931. The temperature was about 60°. The birds heard were the Red-bellied Woodpecker, Flicker, Blue Jay, Crow, Meadowlark, Grackle, White-throated Sparrow, Field Sparrow, Cardinal, Loggerhead Shrike, Mockingbird, and Bluebird.—HELEN M. EDWARDS, Fairhope, Ala.

Migration Notes from Sioux City, Iowa.—The migrating shore birds have been quite plentiful this spring. Some of the less common species listed were the Hudsonian Godwit, Long-billed Dowitcher, and Stilt Sandpiper. Brewer's Blackbird and the Arctic Towhee were found both in Woodbury County, Iowa, and in Union County, South Dakota. A specimen of the latter bird was taken for verification. The Turkey Vulture and the Yellow-breasted Chat were found in the adjacent Dakota County, Nebraska. The Yellow-throated Vireo was seen in Union County, South Dakota, and has apparently been overlooked, as it does not appear in the Birds of South Dakota, by Over and Thoms. The Black-throated Green Warbler, Red-bellied Woodpecker, and Osprey were also seen in Union County.—WILLIAM YOUNGWORTH, Sioux City, Iowa.

Pectoral Sandpiper at Winslow, Arkansas.—On May 12, 1931, it was my good fortune to receive a specimen of the Pectoral Sandpiper (Pipelia melanotos) that had been shot near a small pond here, where it was feeding in company with five other birds of the same species. The bird was a female and the skin is now in my collection.

This is the first record for the Pectoral Sandpiper from this section of the state. Pindar found the bird in Poinsett County in 1888-89, and reported it as rare, while Howell, while making his study of the birds of Arkansas for the Biological Survey, recorded it on May 15, 1910, at Arkansas City, Arkansas County. These are the only two locations from which the bird has been reported. Both of these records are from the lowlands portion of the state, on the east side near the Mississippi River. Winslow is in the extreme northwestern part of the state, in the Ozark Mountains. The pond where the Winslow specimen was secured is in all probability the highest natural pond in the Mississippi Valley, being 2250 feet above sea level, and far away from the regular migration route of this species.—J. D. BLACK, Winslow, Ark.

The Mating of the Western Mockingbird.—On June 21, 1929, at San Diego, California, I witnessed a pair of Western Mockingbirds (Mimus polyglottos leucopera) in copulation. I had several times noticed a female carrying nesting material into a certain clump of shrubbery, and on the morning of the day stated above she flew from her nesting site and alighted on the ground among the shrubbery under the window from which I watched. She appeared to be feeding on something which she was finding on the ground. The male was singing from the top of a tall flagpole nearby. Suddenly he dropped from his perch. In full song, he shot down into the shrubbery about fifteen feet beyond the female. As he sped past her, the female crouched a little and began to quiver her wings. She continued in this as the male, singing excitedly and with tail and wings half
spread, advanced toward her with dancing steps. As he neared her his excitement grew but his approach was stately and unhurried. As he came near he seemed to be floating along just over the ground and he rose gradually and settled upon her back. All this time he had been pouring forth impassioned melody. The act lasted several seconds and was accompanied by much fluttering of wings.

This mating was surprisingly different from what I have witnessed in other Passeriformes. With House Finches (Carpodacus mexicanus frontalis), Western Lark Sparrows (Chondestes grammacus strigatus) and English Sparrows (Passer domesticus), observed on numerous occasions at San Diego, California, copulation occurred at intervals of a very few seconds for many successive times.—Frank F. Gander, Natural History Museum, San Diego, Cal.

Skunks as Prey for Owls.—As long ago as 1892, when Dr. A. K. Fisher wrote his classic "Hawks and Owls of the United States in Their Relation to Agriculture", it was recognized that in regions where the skunk is common it forms a not uncommon article of the Great Horned Owl's food. However, skunks are not listed in that work as among the stomach contents of any other kind of owl. It was therefore of interest to the writer to find that an American Barn Owl (Tyto alba pratincola), which had been killed on the highway by a motorist and was brought to the San Diego Natural History Museum on April 29, 1931, was strongly pervaded with the odor of skunk. Furthermore, the scent could be positively identified as that of the genus Spilogale (Spotted Skunk), which, in the writer's experience, can be distinguished without difficulty from that of other genera of skunks when it is fresh.

When the wings of the dead Barn Owl were spread, a round yellow spot about five inches in diameter was found on the secondary feathers of the left wing, and it was from this spot that the strongest skunk odor emanated. Two similar incidents were recalled to the mind of the writer, both involving Western Horned Owls (Bubo virginianus pallescens) which had been in close contact with skunks. One of these birds was collected in December, 1915, at Fort Lowell, near Tucson, Arizona, and had a discolored area on its plumage where the scent had struck, which was, however, of a light pinkish color, not yellow. As there are three genera of skunks (Conopatus, Mephitis, and Spilogale) to be found in or near the locality where this owl was secured, we may perhaps assume that one of the two larger forms, not Spilogale, had been the victim of the owl. Further experience may determine which of the two had been attacked.

The other Horned Owl was taken in January, 1917, at Potholes, Imperial County, California, and was marked with a yellow stain like that upon the recent Barn Owl. We may now assume that this Horned Owl had been preying upon a Spilogale.

Frank F. Gander, a member of the San Diego Natural History Museum staff, informs me that several years ago a dead Short-eared Owl (Asio flammeus flammeus) was brought to him, very odorous with skunk scent. Although the events which led up to this condition are not known, we may perhaps add the Short-eared Owl to the list of owls which have killed, or attempted to kill, skunks.—Laurence M. Huey, San Diego, Cal.

Incompatibility of House and California Wrens.—I have been wondering if any other lover of birds has noticed anything odd in the attitudes of House
Wrens (Troglydtes aedon aedon) and Carolina Wrens (Thryothorus ludovicianus) toward each other. Several years ago, when I was quite a small boy, we had here at my home what I now know to have been Carolina Wrens. As I grew older and became interested in birds, I realized that Carolina Wrens were the first birds ever to have chosen a house of my construction for a nesting site. But they were then gone from my premises, though they were still to be found in my neighborhood, and House Wrens were using my houses. They reigned supreme for several seasons; then the Carolina Wrens returned. The House Wrens left, and have not been here to nest since, but the Carolina Wrens nest with me each year. A pair of House Wrens come each spring but they do not stay. Though the Carolina Wrens are with me at odd times throughout the winter, they spend the greater part of this period in the heavier woods; one spring when they were later than usual in beginning to nest, a pair of House Wrens came and began a nest in a rick of wood, but the Carolina Wrens appeared before the nest was complete, and the House Wrens abandoned the premises.

House Wrens are quite common in this vicinity: almost all farm homes have one or more pairs each season, though most of them do not have the Carolina Wrens. My premises appeal more to the Carolina Wren than do most homes here, due to the fact that the forest comes almost to my door. However, I know that if it were not for the Carolina Wrens, I would have at least one pair of House Wrens nesting with me each spring. But I am not complaining. I like the Carolina Wren well enough. Nevertheless, I certainly wish that both species of wrens could get along together peaceably. I would like to have them both. But, whether true in other localities or not, I know that here, where many different birds throng each spring, the two species of wrens do not agree.—Grant Henderson, Greensburg, Ind.

Bird Notes from Lake County, Ohio.—Twice in past years I have reported the Parasitic Jaeger (Stercorarius parasiticus) to the Wilson Bulletin, but both were dead birds found on the beach of the lake. However, on August 17, 1930, I saw my first live specimen, and to make it more interesting it was in the black phase of plumage with the contrasting straw color on the neck. When first seen it was flying swiftly just above the water and close to the beach. A Spotted Sandpiper left the shore and I was immediately treated to some wonderful aerial gymnastics, as the Sandpiper mounted by twisting spirals high into the air, while the jaeger easily kept pace and at times rose above to strike at the victim with its bill. The sandpiper finally escaped and the jaeger came flying swiftly back past me, again low over the water, affording another fine view of its plumage and falcon-like appearance.

I was much surprised on October 21, 1930, to find a Red Phalarope (Phalaropus fulicarius) busily feeding in a quiet little bay of Grand River, fully three miles from the lake, where it has previously been reported on rare occasions. The bird was entirely unsuspicious and fed up to within six feet of me as I stood at the edge of the water. A full plumage description was taken on the spot and the bill proportions noted.

On the same day as the discovery of the Red Phalarope (October 21), I had the pleasure of a good study of the Harris’s Sparrow (Zonotrichia querula), though I had seen the bird and suspected its identity on October 18. It was an immature bird, which as yet had acquired no noticeable black feathers on the
Fig. 45. Habitat and nests of the Black-necked Stilt in Florida. 1. Lagoon, with the "fill" in the distance. 2. Nest of the Black-necked Stilt with shell lining. 3. Another nest with twig and grass-stem lining. 4. Another nest placed on the marl fill and lined with a small amount of shell and grass-stem.
breast, but the black malar stripes were at once in evidence and served to distinguish it quickly from the white-throats and white-crowns with which it was associated. The broad buffy-brown flank stripes were also noted as well as the large size of the bird, its light bill, the buffy line over its eyes and the buffy sides of its head. It also would fly up and perch when startled from the ground instead of scurrying away like the white-throats.

While making a Christmas bird census on December 22, 1930, I was lucky enough to discover a Franklin’s Gull (Larus franklini) standing all alone at the lake. It was an immature bird in its first winter plumage, and the white forehead contrasting with the dark malar collar, which it wears at this period, made it easily separable from any other species of small gull. As the bird has remained at the same place up to the present writing (last of January, 1931) and I have had several opportunities for observing it, the identification is unquestionable. The eye ring, broad black subterminal tail band, pure white breast and black-tipped wings with their narrow white lower edges, combined with the striking head markings, made it an unusual looking little gull for this section.—E. A. DOOLITTLE, Painesville, Ohio.

Some Types of Nests of the Black-necked Stilt in Florida.—While the Black-necked Stilts (Himantopus mexicanus) have bred in many localities in Florida in the past, it was not until last year (1930) that a suitable artificial breeding place, and one to their liking, was made for them by the real estate development companies.

This was near the head of Biscayne Bay, and adjoining the inland waterway canal where a large area was filled by suction dredging, or pumping up from the bottom of the canal. Muck, sand, marl, and shell areas showed on top of the fill when it had finally settled, to which was attracted for a breeding ground, not only the stilts but Least Terns, Wilson’s Plovers, and Florida Nighthawks. Brackish water rises and falls in the lake or lagoon, the depth depending on the tide (1 in fig. 45), and here the birds find an abundance of food at all times.

While looking for nests over this area, tracks of raccoon, civet cat, and bobcat were seen, and incomplete sets of eggs left one week were missing the next, so I presume mortality will be high because of these animals.

One type of nest shows the slight depression, or wallow, lined and surrounded with small shells and bits of shell, and placed in a heavy patch of shell (2 in fig. 45). Another shows the nest out in the open, and made of small black twigs and grass stems (3 in fig. 45). The third type, shows the nest placed down in the crack of the dried marl area, the lining being both shell and dried stems (4 in fig. 45).

On Merritt’s Island, I have found them nesting out in the short, newly grown green marsh area that followed a fire, also around brackish water ponds and at the edge of the shore grass. They also breed in the “Glades”, around open sawgrass ponds, where water has receded, and on the shores of ponds found on many of the keys in Florida Bay, and in back of the Cape Sable region lakes.—HAROLD H. BAILEY, Miami, Fla.
A Cross Section of Shore-Bird Migration Near Toledo, Ohio.—
Very few observers are in a position to study the movements of Limicolae as a class, for, generally speaking, the sand-bars and mud flats so attractive to shore birds are seldom found away from the larger rivers and lakes. For this reason, there is much to be learned concerning the numbers and movements of this order. It is with the hope of adding something to the general fund of knowledge that the following data are submitted.

These records were obtained during 1930 on thirty-five field trips made into the country around Bono (twelve miles east of Toledo) and at Little Cedar Point (ten miles east of Toledo). Bono is a small village about a mile inland from Lake Erie, located upon land which lies at or very near lake level, and which has been reclaimed through a series of dikes and drainage canals. In the spring of 1929, due to a combination of high lake levels and severe storms, dikes were washed out in several places, and hundreds of acres of farm land flooded. In 1930 much of the land was either under several inches of water or a vast expanse of mud, depending on the direction of the wind, which controls lake levels. These mud flats attracted flocks of shore birds and here observations were made.

For those birds preferring sand beaches, trips were made to Little Cedar Point, a sand-bar terminating the marshy peninsula which marks the dividing line between Lake Erie and Maumee Bay.

In showing the period of migration, three dates are given: First seen, maximum on one trip, and last seen. The figure in parentheses following the date indicates the number of individuals. To round out my data, a few significant records from other observers have been included.

American Woodcock (Rubicola minor). Fairly common summer resident. March 22 (1); August 2 (10); October 26 (3). Found in the wooded margins.

Wilson’s Snipe (Capella gallinago delicata). Common migrant. April 12 (10 maximum); May 17 (1). Fall. July 20 (2); September 1 (8); November 9 (1).

Long-billed Dowitcher (Limnodromus griseus scolopaceus). Fairly common. May 4 (2); May 17 (6)—R. Bailey. Fall. July 20 (6); July 27 (25); September 1 (3).

Stilt Sandpiper (Micropalama himantopus). Not common. July 20 (10); July 27 (10); August 10 (2). No spring records.

Knot (Calidris canutus). Not common. May 16 (6)—Mrs. Littlefield; May 31 (12). No fall records.

Pectoral Sandpiper (Pisobia maculata). Common. March 16 (50)—Mrs. Littlefield; April 26 (300); May 25 (1). Fall movement, July 14 (5); August 3 (100); October 18 (8).

White-rumped Sandpiper (Pisobia fuscicollis). Rare migrant. May 31 (1); June 8 (1); July 27 (1).

Baird’s Sandpiper (Pisobia haitdi). Rare migrant. May 31 (2); July 27 (1); August 10 (1).

Least Sandpiper (Pisobia minutilla). Common. May 11 (6); May 25 (25); May 31 (20). Fall. July 13 (10); August 3 (200); October 5 (1).
Red-backed Sandpiper (Pelidna alpina sakhaliana). Common. May 11 (2); May 31 (20); June 8 (4). Fall. October 5 (1); October 18 (15); November 2 (4).

Semipalmated Sandpiper (Ereunetes pusillus). Common. May 11 (1); May 25 (100); June 8 (75). Fall. July 4 (2); July 27 (200); September 27 (1).

Western Sandpiper (Ereunetes mauro). Rare (?). July 27 (2); August 2 (2).

Sanderling (Crocethia alba). Regular in small numbers in fall. June 7 (10); July 13 (3); July 26 (15); September 27 (5).

Greater Yellowlegs (Totanus melanoleucus). Common. March 16 (25)—Mrs. Littlefield; April 26 (25); May 11 (5). Fall. July 19 (2); August 10 (50); November 22 (1).

Yellow-legs (Totanus flavipes). Common. April 12 (2); May 4 (50); May 25 (14). Fall. July 14 (10); July 20 (100); October 5 (15).

Solitary Sandpiper (Tringa solitaria solitaria). Regular in small numbers. April 27 (1); May 6 (3); May 31 (1). Fall. July 20 (2); August 10 (5); September 1 (1).

Western Willet (Catoptrophorus semipalmatus inornatus). Very rare migrant. August 17 (1).

Upland Plover (Bartramia longicauda). Not common summer resident. May 16 (1); August 3 (12); August 24 (4).

Buff-breasted Sandpiper (Tryngites subruficollis). Rare migrant. September 1 (2).

Spotted Sandpiper (Actitis macularia). Common summer resident. April 27 (4); August 17 (20); September 20 (1).

Hudsonian Curlew (Numenius hudsonicus). Rare migrant. May 17 (4)—Lawrence Hicks. The same day a flock of twenty was seen by the writer at Lakeside, Ohio.

Black-bellied Plover (Squatarola squatarola cynosurae). Common. May 16 (6); May 25 (125); June 8 (8). Fall. August 3 (2); August 21 (25); November 22 (1).

Golden Plover (Pluvialis dominica dominica). Common. March 16 (13); April 26 (100); June 1 (1)—Charles Walker. These birds arrived still in winter plumage. Fall. August 17 (1); September 21 (40); November 16 (12).

Killdeer (Oxyeohus vociferus vociferus). Common summer resident. February 23 (1); August 3 (500); November 23 (3).

Semipalmated Plover (Charadrius semipalmata). Common. May 11 (35); May 25 (150); June 8 (15). Fall. July 20 (4); August 3 (125); September 21 (1).

Piping Plover (Charadrius melodia). Rare summer resident. June 24, two pairs—Joe Bailey.

Ruddy Turnstone (Areneria interpres morinella). Fairly common. May 17 (6); May 31 (100); June 8 (10). Fall. July 26 (6); August 24 (1).—Louis W. Campbell, Toledo, Ohio.
The Breeding of the Blue-Gray Gnatcatcher in Northwestern Iowa.—

For the past two years we have heard the song of the Blue-gray Gnatcatcher (Polioptila caerulea caerulea), and at various times have seen the songster from a distance, but until this summer (1931) have been unable to observe the bird closely.

This year we first heard the song the latter part of May. On June 14 we first saw the bird sitting in an ash tree some thirty or thirty-five feet above the ground, singing. The song, although faint, is a cheery one. In the many times we have heard it we have been unable to tell which notes were accented, but we are fairly certain that the second and fifth ones are. The song is very sweet, short, and often repeated. On this particular day, after singing its little song, it darted down from its limb and struck at the head of a female Cowbird as she sat with her mate on the branch below. As soon as it struck it darted back to its perch and sang again. This was repeated anyway a dozen times. Its movements were swift and as it sang each note the tail gave a little jerky flip.

An hour or so later I went out to the ash tree by the front walk and stood looking at the leaves through the glass. Soon the little bird flew to a clump of leaves and alighted there for possibly fifteen or twenty seconds. Then it scurried down the limb for a couple of feet, and soon disappeared into another little clump of foliage just below the limb. Upon examining the spot more closely I discovered a tiny nest hanging in the fork of a branch some twenty-six feet over the sidewalk. At first the nest appeared to be empty. Then I saw a tail sticking out of it, and a little later a head peered over the edge. In the many times afterwards when we went out to look at it we always noticed that only the tail showed until our presence was discovered, when the head would appear.

On June 21 we first noted that the birds were carrying insects to the nest. A week and a half later I saw three young birds fly from the ash tree, and soon after they were in the elm south of the house. One of the old birds was with them. Since then I have not seen the young ones, but every once in a while the male could be seen sitting high up in one of the cottonwood trees, singing.—Margaret L. Weir, Hawarden, Iowa.

Goldfinches Feeding Upon Goatsbeard Seeds.—Mrs. J. M. Leen of Ray, Williams County, North Dakota, writes that she has been watching the Goldfinches feeding upon seeds of the goatsbeard (Tragopogon pratensis). She states that a friend observed as many as fifty birds in a flock feeding on these seeds. She sends a head of the plant in the condition in which they are taken. This agrees with my own observation on the dandelion, that some of the bracts are removed and the seeds picked out just before the head is ripe enough to open for the seeds to blow. The goatsbeard is abundant in North Dakota, especially in the central and western part, apparently becoming much more common and spreading eastward in recent years.—O. A. Stevens, Fargo, N. D.
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Himmel, Walter J., Dept. of Botany, University of Nebraska, Lincoln, Nebr..1916
Jeeks, Randolph, Mesa Ranch School, Mesa, Arizona............................1930

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*Taylor, Dr. A. C., University General Hospital, Madison, Wisconsin...1929
Thayer, John Eliot, Box 98, George Hill Road, Lancaster, Massachusetts.....1903
Thorne, Mrs. W. V. S., 810 5th Avenue, New York City....................1930
Tinker, E. R., 711 Fifth Avenue, New York City............................1930
Tucker, Mrs. Carl Penwood, Mount Kisco, New York........................1928
Uhlig, Mrs. A. R., Oconomowoc, Wisconsin................................1926
Young, Colonel John P., Renwick Drive, Ithaca, New York................1913

Active Members
Adams, Roy H., North Street Station, Navogdoches, Texas..................1930
Aldrich, John W., Cleveland Museum of Natural History, Cleveland, Ohio..1930
Allen, Dr. Arthur A., McGraw Hall, Cornell University, Ithaca, New York...1914
Anderson, Edwin C., R. F. D. No. 4, Dell Rapids, South Dakota........1921
Ayres, Douglas, Jr., 111 Canah Street, Fort Plain, New York.............1924
Bailey, Alfred M., Chicago Academy of Science, Chicago, Illinois........1928
Bailey, Mrs. Florence Merriam, 1834 Kalorama Road, Washington, D. C......1911
Bailey, Mrs. Mary L., 2109 Nebraska Street, Sioux City, Iowa...............1918
Bailey, Reeve M., 2230 Laurence Avenue, Toledo, Ohio.....................1931
Baird, Robert L., 279 Oak Street, Oberlin, Ohio............................1902
Baker, Luther, 205 Delta Street, East Lansing, Michigan................1931
Bennett, Walter W., 1629 West Palmer Avenue, Sioux City, Iowa...........†1925
Bergold, Dr. William Harry, 1159 Race Street, Denver, Colorado...........1916
Blisscoe, Benj. J., Route 13, Dayton, Ohio................................1920
Book, Miss Lois Adelaide, 733 Franklin Street, Columbus, Indiana.........1930
Bowditch, Beecher Scoville, Demarest, New Jersey.........................1924
Breckenridge, Walter J., Museum of Natural History, University of Minnesota, Minneapolis, Minnesota...1930
Brooks, Henry Winston, Jr., Hotel Prince George, New York City...1931
Brooks, Major Allan, Okanagan Landing, British Columbia, Canada...1930
Brown, Elmer E., 1602 Walk Avenue, Greensboro, North Carolina...1931
Bruun, Chas. A., 1510 Central Avenue, Hot Springs, Arkansas...1921
Bryens, Oscar McKinley, McMillan, Luce County, Michigan...1924
Bull, Chas. Livingston, Oradell, New Jersey...1931
Burdick, Harold C., Zoological Building, S. U. I., Iowa City, Iowa...1929
Burdick, Dr. George Merton, Box 176, Milton, Wisconsin...1921
Burleigh, Thos. D., U. S. Biological Survey, Asheville, North Carolina...1923
Burleigh, Dr. W. J., 53 Aberdeen Place, Hillcrest, St. Louis, Missouri...1927
Burnt, Verdi, Branchport, New York...1924
Butler, Dr. Amos W., 52 Downey Avenue, Indianapolis, Indiana...1911
Butler, Rev. L. Ermil, First Methodist Episcopal Church, Bidwell, Ohio...1926
Cahn, Dr. Alvin R., 902 West Nevada Street, Urbana, Illinois...1917
Camp, R. D., Box 495, Brownsville, Texas...1925
Carr, William H., % American Museum of Natural History, New York City...1930
Carroll, J. J., Box 356, Houston, Texas...1926
Chaffee, H. L., Amenia, North Dakota...1930
Chapman, Dr. Frank M., American Museum of Natural History, 77th Street and Central Park West, New York City, N. Y...1910
Clay, Miss Marcia B., Bristolville, Ohio...1925
Clow, Miss Marion, Box 163, Lake Forest, Illinois...1929
Coiffel, Hal. H., Pennville, Jay County, Indiana...1929
Coiffy, Ben, 1434 Bank of Commerce Building, Memphis, Tennessee...1927
Cole, Dr. Leon J., Agricultural-Chemical Building, Madison, Wisconsin...1921
§Commons, Frank W., 608 Chamber of Commerce, Minneapolis, Minnesota...1923
Cook, G. M., 39 Tod Lane, Youngstown, Ohio...1923
Cookman, Alfred, 909 Bradford Street, Pomona, California...1928
Coryell, Sherman, 1500 Hood Avenue, Chicago, Illinois...1920
Coursey, C. Blair, 651 East 69th Place, Chicago, Illinois...1927
Danforth, Stuart T., College of Agriculture, Mayaguez, Porto Rico...1925
Darling, A. B., 4501 Country Club Boulevard, Sioux City, Iowa...1925
Deane, Ruthven, 112 West Adams Street, Room 813, Chicago, Illinois...1910
Delury, Dr. Ralph E., Dominion Observatory, Ottawa, Ontario, Canada...1921
Dickey, Donald R., California Institute of Technology, Pasadena, California...1912
Dickinson, F. R., 1518 Astor Street, Chicago, Illinois...1931
Dickinson, Joseph Edward, 409 N. Horsman Street, Rockford, Illinois...1923
Doolittle, E. A., Box 44, Painesville, Ohio...1925
Douglas, Donald W., Bird Section, University Museum Building, Ann Arbor, Michigan...1929
DuMont, Philip A., Wilton, Connecticut...1928
Earl, Thomas M., R. F. D. No. 5, Box 40, Xenia, Ohio...1921
Ebinger, Dr. C. E., 730 Grand Avenue, Keokuk, Iowa...1926
Eifrig, Prof. C. W. G., 1029 Monroe Avenue, River Forest, Illinois...1907
Ekblaw, Dr. George F., 233 West Orleans, Paxton, Illinois...1914
Ekblaw, Dr. W. Elmer, Clark University, Worcester, Massachusetts...1910
Emilio, S. Gilbert, 7 Winter Street, Salem, Massachusetts...1930
Everman, Dr. Barton Warren, California Academy of Science, San Francisco, California...1931
Fields, E. A., 2111 Douglas Street, Sioux City, Iowa...1925
Fleming, James Henry, 267 Rusholme Road, Toronto 4, Ontario, Canada...1906
Floyd, Joseph L., 1009-11 Geo. D. Harter Bank Building, Canton, Ohio...1903
Ford, Edward Russell, 7077 Ridge Avenue, Chicago, Illinois...1914
Frazer, T. Atchison, M. D., Marion, Kentucky...1930
Freer, Ruskin S., Lynchburg College, Lynchburg, Virginia...1930
Gabrielson, Ira N., 516 Post Office Building, Portland, Oregon...1913
Gault, Benjamin True, 421 South Main Street, Glenn Ellyn, DuPage County, Illinois...1895
Gillespie, R., Bay City Business College, Bay City, Michigan..............................1930
Gleason, Jr., Clark H., Box 47, Placerville, California........................................1929
Gleason, Louisa R. (Mrs. Clark H.), 700 Madison Avenue, South East, Grand Rapids, Michigan.................................................................1921
Goddard, Henry N., Western State Normal School, Kalamazoo, Michigan..............1926
Goetz, Christian J., 3503 Middleton Avenue, Cincinnati, Ohio.............................1930
Green, Prof. George Rcx, Dept. of Natural Education, The Pennsylvania State College, State College, Pennsylvania................................1930
Gregory, Jr., Stephen S., Box N., Winnetka, Illinois............................................1922
Gunnell, Dr. Joseph, Museum of Vertebrate Zoology, University of California, Berkeley, California .................................................................1914
Guest, Marjorie Lee, State Hospital, Athens, Ohio.................................................1924
Guthrie, Prof. Joseph E., 319 Lynn Avenue, Ames, Iowa........................................1922
Handley, Chas. O., Ashlund, Virginia.................................................................1925
Hankinson, Prof. T. L., 96 Oakwood Avenue, Ypsilanti, Michigan.........................1911
Hann, Dr. Harry W., Associate Professor of Zoology, University of Michigan, Ann Arbor, Michigan.................................................................1930
Hayward, W. J., 2919 Jackson Street, Sioux City, Iowa.........................................1913
Hedge, Homer William, 203 Kansas Avenue, Holton, Kansas..................................1931
Heft, Russell D., Route 2, Nevada, Ohio..................................................................1928
Henderson, Archibald Douglas, Belvedere, Alberta, Canada....................................1922
Henderson, Prof. Junius, 1305 Euclid Avenue, Boulder, Colorado.........................1903
Herrick, Dr. Francis H., Biological Laboratory, Western Reserve University, Cleveland, Ohio .................................................................1916
Hilue, Prof. James S., Ohio State University, Columbus, Ohio..............................1910
Hinshaw, Thomas D., 1908 Scottwood Avenue, Ann Arbor, Michigan.....................1926
Hoffman, E. C., 1041 Forest Cliff Drive, Lakewood, Ohio........................................1925
Holcombe, C. E., 2917 Ezra Avenue, Zion, Illinois................................................1927
Holley, Mrs. H. P., 420 West 8th Avenue, Bristow, Oklahoma.................................1930
Holt, Ernest Golsan, 312 Bell Building, Montgomery, Alabama...............................1926
Howell, Arthur Holmes, 2919 South Dakota Avenue, Washington, D. C....................1921
Hunt, Chreswell J., 310 South Eighteenth Avenue, Maywood, Illinois.....................1904
Hutchtinson, Chas., 500 Crocker Building, Des Moines, Iowa..................................1930
Hyde, B. T. B., 558 Camino del Monte Sol, Santa Fe, New Mexico.........................1928
Johns, Dr. Erwin W., 1909 E. Lead Avenue, Albuquerque, New Mexico..................1925
Jung, Clarence S., 2502 E. Stratford Court, Milwaukee, Wisconsin.........................1921
Kahmann, Karl W., R. F. D. No. 2, Hayward, Wisconsin.......................................1914
Kee, Hunter, 36 Ninth Avenue, Marlinton, West Virginia......................................1922
Kelso, Leon, 9901 E. Colfax, Aurora, Colorado..................................................1930
Kendig, Dr. S. Charles, Biological Laboratory, Western Reserve University, Cleveland, Ohio .................................................................1923
Keyes, Prof. Chas. R., Cornell College, Lock Box J., Mount Vernon, Iowa............1925
Kirn, Albert J., Box 157, Somerset, Texas............................................................1918
Kretzmann, Dr. Paul E., 801 DeVlun Avenue, St. Louis, Missouri............................1924
Lambert, Earl Logan, 237 North First Street, Carthage, Illinois.............................1922
Larrabee, Prof. Austin P., Yankton College, Yankton, South Dakota.......................1921
Laskey, Mrs. F. C., Graybar Lane, Nashville, Tennessee.........................................1928
Law, J. Eugene, Box 217, Altadena, California...................................................1911
Leopold, Aldo, 222 Van Hise Avenue, Madison, Wisconsin.....................................1928
Levings, James Eads, 420 West Court Street, Paris, Illinois..................................1929
Lewis, John B., Amelia, Virginia..............................................................................1924
Lewy, Dr. Alfred, 2051 East Seventy-second Place, Windsor Park Station, Chicago, Illinois .................................................................1916
Longstreet, Rupert James, Daytona Beach, Florida...............................................1924
Loring, J. Alden, Owoyo, Tioga County, New York..............................................1926
Lowe, John N., Northern State Teachers College, Marquette, Michigan..................1927
Lyon, Mary C., 811 North Sheridan Road, Waukegan, Illinois.................................1925
McAtee, W. L., Biological Survey, United States Department of Agriculture, Washington, D. C.................................................................1911
McCabe, T. T., Barkerville, British Columbia, Canada............................................1928
McCreary, Otto, Agricultural Hall, University of Wyoming, Laramie, Wyo. 1930
McGregor, Richard C., Bureau of Science, Manila, Philippine Islands 1919
McNeil, Dr. Chas. A., 111 West Fourth Street, Sedalia, Missouri 1922
Magann, J. Wilbur, Oklahoma Gas and Electric Co., Oklahoma City, Okla. 1927
Maillard, Joseph, 1815 Valljjo Street, San Francisco, California 1921
Main, John Smith, 610 State Street, Madison, Wisconsin 1930
Malcomson, R. O., 1603 Ross Street, Sioux City, Iowa 1926
Marsh, Mai, 1005 Lexington Avenue, Altoona, Pennsylvania 1927
Mayfield, Dr. George R., Vanderbilt University, Nashville, Tennessee 1917
Metcalf, Dr. Franklin F., % Arnold Aboretum, Harvard University, Jamaica Plain, Massachusetts 1919
Metcalf, Dr. Zeno P., State College, West Raleigh, North Carolina 1906
Middleton, Raymond Jones, Marshall Street and Whitehall Road, Norristown, Pennsylvania 1921
Millard, Mrs. F. A., 1032 North Fourth Street, Burlington, Iowa 1926
Minich, Edward C., 1047 Fairview Avenue, Youngstown, Ohio 1923
Morse, Harry G., Huron, Ohio 1923
Morse, Margarette E., Viroqua, Wisconsin 1922
Moseley, Prof. Edwin Lincoln, State College, Bowling Green, Ohio 1921
Mote, G. A., Marshalltown, Iowa 1930
Mounts, Mrs. Beryl Taylor (Mrs. Lewis H.), Ballard Normal School, Macon, Georgia 1923
Neff, Johnson A., P. O. Box 935, U. S. Biological Survey, Marysville, Calif. 1921
Nice, Mrs. Margaret M., 156 West Patterson Avenue, Columbus, Ohio 1921
Oberholser, Dr. Harry Church, 2805 Eighteenth Street, N. W., Washington, D. C. 1894
Olsen, Richard E., 1120 East Ann Street, Ann Arbor, Michigan 1930
Over, Prof. Wm. H., University Museum, Vermillion, South Dakota 1930
Palas, A. J., 663 Forty-ninth Street, Des Moines, Iowa 1923
Palmer, Dr. Theodore Sherman, 1939 Biltmore Street, N. W., Washington, D. C. 1914
Pammel, Dr. L. H., Iowa State College, Ames, Iowa 1929
Parker, Herbert, South Lancaster, Massachusetts 1928
Penbererton, John Roy, 525 North Palm Drive, Beverly Hills, California 1922
Pennock, Charles John, Kennett Square, Chester County, Pennsylvania 1900
Pettingill, Jr., Olin S., Maple Street, Middleton, Massachusetts 1930
Phillips, Dr. John H., 2117 Blair Boulevard, Nashville, Tennessee 1921
Pickwell, Dr. Gayle B., Dept. of Natural Science, San Jose State Teachers College, San Jose, California 1925
Porter, James V., Box 266, Glenwood, Minnesota 1929
Praeger, Prof. Wm. E., 2 College Grove, Kalamazoo, Michigan 1916
Price, Homer F., Payne, Ohio 1931
Prill, Dr. Albert G., Main Street, Scio, Oregon 1892
Quattlebaum, W. D., 1925 Paloma Street, Pasadena, California 1930
Quillian, Prof. Marvin C., Wesleyan College, Macon, Georgia 1927
Randall, Mrs. W. S., 618 East Fifteenth Street, Oklahoma City, Oklahoma 1925
Reed, Mrs. C. I. (Bessie P.), 738 South Highland, Oak Park, Illinois 1924
Reid, Russell, 811 Twelfth, Bismarck, North Dakota 1920
Richardson, W. D., 4215 Prairie Avenue, Chicago, Illinois 1918
Robards, Katie M., 463 Vine Street, Hillsboro, Ohio 1914
Robinson, J. M., Box 264, Alabama Polytechnic Institute, Auburn, Alabama 1923
Rodock, Roy E., Lewistown State Normal School, Lewistown, Idaho 1928
Rosen, Walter M., Ogden, Iowa 1923
Ross, Marjorie Ruth, R. F. D. 3, Freeville, New York 1921
Runk, Otto H., Mt. Kisco, New York 1930
Rust, Henry J., Box 683, Coeur d'Alene, Idaho 1921
Sallee, Roy M., 131 North Normal Street, Macon, Illinois 1930
Satterthwait, Elizabeth Allen, Webster Groves, Missouri 1925
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<th>Name</th>
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<tr>
<td>Savage, James</td>
<td>Buffalo Athletic Club, Buffalo, New York</td>
<td>1930</td>
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<td>Schantz, O. M.</td>
<td>3219 Maple Avenue, Berwyn, Illinois</td>
<td>1903</td>
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<td>Schorger, Dr. A. W.</td>
<td>2021 Kendall Avenue, Madison, Wisconsin</td>
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<td>Shadle, Prof. Albert R., Biology Department, University of Buffalo, Buffalo, New York</td>
<td>1930</td>
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<td>Shaftesbury, Archie D., N. C. C. W.</td>
<td>Greensboro, North Carolina</td>
<td>1930</td>
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<td>Shaver, Dr. Jesse M., George Peabody College for Teachers, Nashville, Tennessee</td>
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<td>Shelford, Prof. Victor, Vivarium Building, University of Illinois, Urbana, Ill.</td>
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<td>Sherwood, Jack W., Box 264, Salinas, California</td>
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<td>Silliman, Oscar</td>
<td>Penny, Corner Alisal and Riker Streets, Salinas, Monterey County, California</td>
<td>1914</td>
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<td>Simmons, Geo. Finlay</td>
<td>2727 Euclid Avenue, Cleveland, Ohio</td>
<td>1928</td>
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<td>Skinner, M. P.</td>
<td>5810 John Avenue, Long Beach, California</td>
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<td>Smith, Prof. Frank M., 79 Fayette Street, Hillsdale, Michigan</td>
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<td>Smith, Frank R., Fredericktown, Pennsylvania</td>
<td>1930</td>
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<td>Smith, Prof. Jesse L., 331 Vine Street, Highland Park, Illinois</td>
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<td>Smith, Malcolm M., 327 Ashburne Road, Elkins Park, Pennsylvania</td>
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<td>Spann, Liza, Averett College, Danville, Virginia</td>
<td>1930</td>
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<td>Spear, James</td>
<td>Wallingford, Pennsylvania</td>
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<td>Spiker, Chas. J., New Hampton, Iowa</td>
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<td>Stack, Prof. Joseph W., Department of Zoology, Michigan State College</td>
<td>1925</td>
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<td>Stacker, Margaret, Cumberland City, Tennessee</td>
<td>1930</td>
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<td>Stewart, Clare R. (Mrs. L. P.), 3475 Morrison Place, Cincinnati, Ohio</td>
<td>1923</td>
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<td>Stickney, Gardner, 3218 North Summit Avenue, Milwaukee, Wisconsin</td>
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<td>Stoner, Dr. Dayton, New York State College of Forestry, Syracuse, N. Y.</td>
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<td>Streeker, John Kern, Baylor University, Waco, Texas</td>
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<td>Strong, William Abner, 247 Grand Avenue, San Jose, California</td>
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<td>Strunk, W. L., % Luther College, Decorah, Iowa</td>
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<td>Stuart, Anne</td>
<td>1905 D. Street, Lincoln, Nebraska</td>
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<td>Sturgis, Mrs. S. D., 2219 California Street, N. W., Washington, D. C.</td>
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<td>Sutton, Mrs. J. C., 122 South West 7th Street, Richmond, Indiana</td>
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<td>Swarth, Harry S., 2800 Prince Street, Berkeley, California</td>
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<td>Thomas, Edward S., 1116 Madison Avenue, Columbus, Ohio</td>
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<td>Thomas, H. H., Box 625, Pomeroy, Ohio</td>
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<td>Tinker, Almerin David</td>
<td>519 O-wego, Ann Arbor, Michigan</td>
<td>1909</td>
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<td>Todd, W. E. Clyde, Carnegie Museum, Pittsburgh, Pennsylvania</td>
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<td>Townsend, Dr. Chas. W., Ipswich, Massachusetts</td>
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<td>Treat, Dorothy Ackley, 10912 Carnegie Avenue, Suite 26, Cleveland, Ohio</td>
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<td>Tyler, Dr. Winsor M., 112 Pickney Street, Boston, Massachusetts</td>
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<td>Urner, Charles A., 596 Westminster Avenue, Elizabeth, New Jersey</td>
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<td>Van Tyne, Dr. Joselyn, Museum of Zoology, Ann Arbor, Michigan</td>
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<td>Vernon, John, Box 152, R. F. D. No. 1, South Sheridan Road, Kenosha, Wis.</td>
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<td>Viesscher, Dr. Paul, Biological Laboratory, Western Reserve University, Cleveland, Ohio</td>
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<td>Warren, Edward R., 1511 Wood Avenue, Colorado Springs, Colorado</td>
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<td>Weber, Alois J., 904 Grand Avenue, Keokuk, Iowa</td>
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<td>Welds, H. B., 229 Forty-second Street, Sandusky, Ohio</td>
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<td>Wertz, Miss Vera M., 101 Eighth Avenue, Juniata, Pennsylvania</td>
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<td>Wetmore, Dr. Alexander, U. S. Museum, Washington, D. C.</td>
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<td>Weydemeyer, Winton, Fortine, Montana</td>
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<td>White, Francis Beach, St. Paul's School, Concord, New Hampshire</td>
<td>1926</td>
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<td>Wilson, Mrs. Etta S., 9077 Claremont Avenue, Detroit, Michigan</td>
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<td>Wilson, Frank Norman, 804 Lawrence Street, Ann Arbor, Michigan</td>
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<td>Wilson, Prof. Gordon, 1434 Chestnut Street, Bowling Green, Kentucky</td>
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<td>Wing, Leonard W., R. F. D. 3, Jackson, Michigan</td>
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<td>Wolcott, Dr. Robert H., University of Nebraska, Lincoln, Nebraska</td>
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<td>Woodrow, Mrs. J. W., 2322 Baker Street, Ames, Iowa</td>
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<td>Worthington, William A., Annville, Kentucky</td>
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</table>
Wright, Dr. Albert H., 113 East Upland Road, Ithaca, New York .................................. 1921
Yoder, William H., Jr., 859 Granite Street, Philadelphia, Pennsylvania ....................... 1926
Youngworth, William, 3119 East Second Street, Sioux City, Iowa ................................ 1927

ASSOCIATE MEMBERS

Adams, Benjamin, Wethersfield, Connecticut ............................................................... 1920
Adkins, T. R., 301 Smith Young Tower, San Antonio, Texas ....................................... 1926
Ainslie, Charles Nicholas, 2000 South St. Anfin, Sioux City, Iowa ............................... 1930
Alexander, Frank M., Box 95, Wellington, Kansas ...................................................... 1929
Allen, A. F., 302 Follis Apartments, Sioux City, Iowa ................................................ 1925
Albert, Oscar P., R. F. D. No. 1, McGregor, Iowa ....................................................... 1923
Allison, C. W., Box 968, St. Louis, Missouri ............................................................... 1926
Applegate, Mrs. A. L., 2081 Lamar Boulevard, Memphis, Tennessee ............................ 1929
Appleton, J. L., 1332 Citrus, Hollywood, California .................................................... 1930
Ashworth, Charles W., 76 South Laurel Street, Ventura, California .......................... 1930
Atkinson, Ethel, 1566 Western Avenue, Toledo, Ohio .................................................. 1921
Austin, Dr. Oliver L., Tuckahoe, Westchester County, New York .............................. 1930
Avery, Eula V., 1123 Michigan Avenue, Ann Arbor, Michigan .................................... 1930
Bacus, Mrs. O. H., Howard, Kansas .................................................................................. 1930
Badger, Kenneth, Burbank, R. F. D. 2, Ohio ................................................................. 1931
Baker, John H., 1165 Fifth Avenue, New York, New York ............................................ 1930
Baker, William C., 223 W. Pershing Street, Salem, Ohio ............................................. 1931
Baldwin, Mrs. Harry L., 6335 Kimbark Avenue, Apt. B., Chicago, Illinois ............. 1926
Ball, William Howard, 1891 Ingleside Terrace, N. W., Washington, D. C. ............. 1924
Ballentine, Mrs. V. H., 1010 E. Park Avenue, Savannah, Georgia .............................. 1931
Barnburn, John, Kingston Road, Knoxville, Tennessee ................................................ 1930
Barber, Bertram Alpha, 350 West Street, Hillsdale, Michigan .................................... 1923
Barcley, Mabel A., Meredith College, Raleigh, North Carolina ................................. 1930
Barrody, Mrs. Nellie L., 3130 Wewonah Avenue, Berwyn, Illinois ......................... 1927
Barry, Anna Kingham, 5 Bowdoin Avenue, Dorchester, Massachusetts ..................... 1930
Bassett, Mrs. V. H., 319 E. Park Avenue, Savannah, Georgia ...................................... 1931
Batheleder, C. F., 7 Kirkland Street, Cambridge, Massachusetts ............................... 1927
§Bates, Rev. John Mallory, Red Cloud, Nebraska ......................................................... 1926
Beals, Mrs. Marie V., 5833 Eighty-fifth Street, Elmhurst, Long Island, N. Y. .......... 1930
Beard, Miss Mary, 406 East Fifth Avenue, Knoxville, Tennessee ............................. 1928
Beardslee, Clark S., 132 McKinley Avenue, Kenmore, New York ............................... 1931
Beebee, Ralph, 1314 Empire Avenue, Lincoln Park, Michigan ..................................... 1924
Bell, Glenn W., The Berry Schools, Mt. Berry, Georgia .............................................. 1930
Benedict, Mrs. Howard Smith, 18320 Kinsman Road, Shaker Heights, Cleveland, Ohio .......................................................... 1926
Benson, Seth B., Museum of Vertebrate Zoology, Berkeley, California ...................... 1930
Bergman, Miss Vera, 708 South Page Street, State College, Pennsylvania .............. 1928
Bernier, Glenn, 121 East Front Street, Jamestown, North Dakota ............................ 1930
Bevan, Mrs. Arthur, 304 Preston Court, University, Virginia .................................... 1931
Biggs, Lawrenee, Dassel, Minnesota ................................................................................ 1931
Bird, Dr. R. D., Biological Survey, University of Oklahoma, Norman, Oklahoma .... 1929
Birge, Miss Willie L., College of Industrial Arts, Denton, Texas ......................... 1925
Bischoff, Mrs. Marguerite Johnstone, Box 236, Summerville, South Carolina ......... 1930
Black, J. D., Winslow, Arkansas ..................................................................................... 1925
Blanchard, Dr. Frank N., Department of Zoology, University of Michigan, Ann Arbor, Michigan .......................................................... 1928
Blijdienstein, Louis, Box 262, Leesburg, Florida .......................................................... 1930
Blincow, Mrs. Benjamin J., R. F. D. No. 13, Dayton, Ohio ......................................... 1926
Bliss, Sallie H., State Teachers College, Harrisonburg, Virginia ............................ 1930
Bloom, Nellie R., 108 W. Lovett Avenue, Shenandoah, Iowa .................................... 1930
Bodine, Margaret L., Rittershouse Plaza, 19th and Walnut Streets, Philadelphia, Pennsylvania ........................................................................................................... 1930
Bolt, Benj. F., 5300 Brookside Boulevard, Kansas City, Missouri ............................. 1917
Bonessteel, V. C., American National Bank, Aurora, Illinois .................................... 1925
Bordner, Mrs. Robert I., Hudson, Iowa ............................................................................ 1930
Borror, Donald J., Department of Zoology and Entomology, Ohio State University, Columbus, Ohio.................................................1927
Bosler, John, Hamburg, Berks County, Pennsylvania..........................................................1928
Boulton, Wolfrid Rudyard, Jr., Carnegie Museum, Pittsburgh, Pennsylvania.............1922
Bowman, John G., University of Pittsburgh, Pittsburgh, Pennsylvania..................1928
Bradford, Miss Mary A., Moline High School, Moline, Illinois..........................1930
Bradshaw, F., Director, Prov. Museum, Normal School, Regina, Saskatchewan, Canada.......1930
Brady, Dr. John A., St. Augustine College, Lakewood, Ohio.............................1925
Braly, John Claude, 285 Fairfax Terrace, Portland, Oregon.............................................1927
Brasher, Rex, Chickadee Valley, Kent, Connecticut......................................................1926
Bready, Mrs. Marcia B., 99 Waban Hill Road, North Chestnut Hill, Mass.............1930
Bridges, Harvey A., Fayetteville, Tennessee.................................................................1930
Brigham, Edw. M., Jr., Museum of Natural History, Battle Creek, Michigan ..........1930
Brooks, A. B., Ogelbay Park, Wheeling, West Virginia................................................1931
Brooks, Maurice, French Creek, West Virginia..............................................................1926
Broomhall, W. H., Stockport, Ohio......................................................................................1930
Brown, S. H., West Lawn, Pennsylvania.................................................................1930
Browning, Miss Louanna, Box 1346, Department D., Columbus, Ohio......................1930
Bruce, Jim A., 557 Spring Street, Wooster, Ohio............................................................1929
Bruner, Mrs. H. A., 3118 Cottage Grove, Des Moines, Iowa......................................1930
Buchheister, Carl W., The Lawrence School, Hewlett, Long Island, N. Y...........1929
Buchner, Mrs. E. M., 2453 North Central Park Avenue, Chicago, Illinois.............1914
Bulthouse, Peter, R. F. D. No. 3, Napierville, Illinois..............................................1930
Bunting, Henry, 2020 Chadbourne Avenue, Madison, Wisconsin..............................1930
Burcham, Frank W., 510 North Church Street, Fayette, Missouri..........................1929
Burgdorf, Miss Sophie, 1813 Rock Road, Cleveland Heights, Ohio.........................1931
Burk, W. L., 701 East Third Street, Vinton, Iowa.........................................................1930
Burkhard, Fred, Accident, Maryland.................................................................1922
Burnett, Prof. W. L., State Agricultural College, Fort Collins, Colorado..............1926
Burt, W. H., California Institute of Technology, Pasadena, California..............1928
Butler, Cora C., 624 West 70th Street, Kansas City, Missouri.....................................1930
Buzby, Mrs. William, 221 Greene Street, Boise, Idaho...............................................1930
Campbell, Louis W., 304 Fearing Boulevard, Toledo, Ohio.........................................1926
Canby, Caroline P., 11275 San Fernando Road, San Fernando, California...........1931
Carlson, Prof. Carl Olof, Dept. of Biology, Doane College, Crete, Nebraska.......1923
Carman, Mrs. F. S., R. F. D. No. 2-27, Grand Junction, Colorado.........................1930
Carter, John D., Lansdowne, Pennsylvania..............................................................1930
Carter, S. E., 309 North Pioneer Avenue, Ashland, Oregon......................................1931
Cartwright, Bertram William, 392 Woodlawn Street, Deer Lodge, Winnipeg, Canada..........................................................1930
Case, Mrs. F. E., 1717 Market Avenue, North, Canton, Ohio......................................1928
Cathcart, Maude Eola, Appalachian State Teachers College, Boone, N. C...........1930
Chamberlain, Chauncey W., Hotel Hemenway, Boston, Massachusetts.......................1922
Chamberlain, Glen D., Suite 20, 60 Queensbury Street, Boston, Mass......................1930
Chilcott, Mrs. E. F., Woodward, Oklahoma...............................................................1923
Christianson, Anna, 1812 Jackson Street, Sioux City, Iowa......................................1925
Christy, Bayard H., Box 950, Pittsburgh, Pennsylvania...........................................1922
Clark, Mrs. C. C., 922 North Third Street, Burlington, Iowa.....................................1925
Clark, George R., Cynwyd, Pennsylvania.................................................................1931
Clayton, Luella B., Feasterville, Pennsylvania...........................................................1930
Cleenden, Dr. L. Jack, 105 Collins Street, Melbourne, Victoria, Australia..............1930
Coles, Victor, 2910 Grasselli Avenue, Westwood, Cincinnati, Ohio..........................1929
Collins, III, Henry H., 7950 Ardmore Avenue, Chestnut Hill, Pennsylvania...........1931
Compton, Lawrence Verlyn, Museum of Vertebrate Zoology, University of California, Berkeley, California..................................................1923
Compton, Leila A., 422 Eddy Street, Ithaca, New York..............................................1930
Conant, Roger, Toledo Zoological Park, Toledo, Ohio.............................................1930
Cook, Fanny A., Crystal Springs, Mississippi.............................................................1925
Cook, Florence R., Grand Meadow, Minnesota............................................................1930
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<tr>
<th>Name</th>
<th>Address and Details</th>
<th>Year</th>
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<tr>
<td>Cook, Mrs. Horace P.</td>
<td>412 W. 11th Street, Anderson, Indiana</td>
<td>1931</td>
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<tr>
<td>Cook, William Bolton</td>
<td>5 Oakley Avenue, White Plains, New York</td>
<td>1930</td>
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<td>Cottam, Clarence</td>
<td>Bureau of Biological Survey, Washington, D. C.</td>
<td>1929</td>
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<td>Couper, Mrs. E. A.</td>
<td>Britt, Iowa</td>
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<td>Cox, P. E.</td>
<td>Memorial Building, Nashville, Tennessee</td>
<td>1929</td>
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<td>Crabb, Alfred</td>
<td>1701 Eighteenth Avenue, South, Nashville, Tennessee</td>
<td>1930</td>
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<td>Cramer, William G.</td>
<td>Apartment 10, The Nelson, 2501 Kemper Lane, Cincinnati, Ohio</td>
<td>1923</td>
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<td>Crook, Compton N. Jr.</td>
<td>2207 Leslie Avenue, Nashville, Tennessee</td>
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<td>Crouch, Brockway</td>
<td>% Flower Craft, Knoxville, Tennessee</td>
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<td>Crouch, James</td>
<td>214 Thurston Avenue, Ithaca, New York</td>
<td>1930</td>
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<td>Culver, W. L.</td>
<td>2701 Russ Building, San Francisco, California</td>
<td>1931</td>
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<td>Cunningham, O. L.</td>
<td>County Agricultural Agent, Post Office Building, Dayton, Ohio</td>
<td>1930</td>
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<td>Currier, Edmonde S.</td>
<td>416 E. Chicago Street, St. Johns Station, Portland Ore.</td>
<td>1930</td>
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<td>Curtis, John</td>
<td>325 Grand Avenue, Waukesha, Wisconsin</td>
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<td>Cutter, Mrs. J. T.</td>
<td>Castana, Iowa</td>
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<td>Dales, Mrs. Marie</td>
<td>14 Twenty-fourth Street, Sioux City, Iowa</td>
<td>1925</td>
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<td>Danner, Mrs. Mary S.</td>
<td>1646 Cleveland Avenue, N. W., Canton, Ohio</td>
<td>1921</td>
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<td>Davis, George</td>
<td>State Teachers College, Murfreesboro, Tennessee</td>
<td>1930</td>
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<td>Davis, Mrs. L. N.</td>
<td>2016 Lexington Avenue, Ashland, Kentucky</td>
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<td>Dawley, Jean Wilson</td>
<td>1361 Granger Avenue, Lakewood, Ohio</td>
<td>1931</td>
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<td>Deaderick, Dr. Wm. H.</td>
<td>36 Circle Drive, Hot Springs, Arkansas</td>
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<td>Denison, Maggie</td>
<td>Galloway College, Searcy, Arkansas</td>
<td>1930</td>
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<td>Dennis, Wm. A.</td>
<td>1, R. F. D. No. 1, Paris, Illinois</td>
<td>1930</td>
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<td>DePree, Con</td>
<td>Macatauna Road, Holland, Michigan</td>
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<td>Dille, Fred M.</td>
<td>Rapid City, South Dakota</td>
<td>1912</td>
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<td>Dingle, Edward</td>
<td>von Scholz, Huger, South Carolina</td>
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<td>Dole, J. Wilbur</td>
<td>51 East Stone Street, Fairfield, Iowa</td>
<td>1930</td>
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<td>Dolman, Helen</td>
<td>1010 Washtenaw Avenue, Ypsilanti, Michigan</td>
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<td>Dragoo, Miss Lavinia</td>
<td>826 E. Avenue, West, Cedar Rapids, Iowa</td>
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<td>DuMont, Mrs. W. G.</td>
<td>2700 Forty-ninth Street, Des Moines, Iowa</td>
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<td>Duston, Mrs. A. W.</td>
<td>1744 South Yorktown, Tulsa, Oklahoma</td>
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<td>Dyer, Mrs. Minnie M.</td>
<td>Byington, Tennessee</td>
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<td>Eastman, Mrs. E. P.</td>
<td>719 Columbia Street, Burlington, Iowa</td>
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<td>Eastwood, Sidney K.</td>
<td>301 South Waynebiddle Avenue, Pittsburgh, Pa.</td>
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<td>Edelen, Muir</td>
<td>1820 Pendleton Avenue, Kansas City, Missouri</td>
<td>1930</td>
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<td>Edge, Mrs. Charles Noe</td>
<td>113 East 72nd Street, New York, New York</td>
<td>1931</td>
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<td>Edminster, Jr., Frank G.</td>
<td>107 Wood Street, Ithaca, New York</td>
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<td>Edson, J. M.</td>
<td>90 Marietta Road, Bellingham, Washington</td>
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<td>Edwards, Mrs. W. H.</td>
<td>Fairhope, Alabama</td>
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<td>Eheim, J. M.</td>
<td>236 South Adams Street, Hutchinson, Minnesota</td>
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<td>Effert, Paul</td>
<td>R. F. D. No. 1, St. Cloud, Minnesota</td>
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<td>Eldredge, Everett K.</td>
<td>West Chatham, Cape Cod, Massachusetts</td>
<td>1930</td>
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<td>Elrod, Mrs. Walter D.</td>
<td>Witt, Box 103, Okmulgee, Oklahoma</td>
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<td>Ellsworth, Miss Mary</td>
<td>3107 Redick Avenue, Omaha, Nebraska</td>
<td>1930</td>
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<td>Emerson, William Otto</td>
<td>Box 39, R. F. D. No. 1, Palm Cottage, Hayward, California</td>
<td>1922</td>
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<td>Erickson, Mary M.</td>
<td>Museum of Vertebrate Zoology, University of California, Berkeley, California</td>
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<td>Erwin, Mrs. Marjorie B.</td>
<td>Williamsburg, Iowa</td>
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<td>Esten, Sidney R.</td>
<td>4112 Gracewild Avenue, Indianapolis, Indiana</td>
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<td>Evans, Dr. Evan M.</td>
<td>550 Park Avenue, New York, New York</td>
<td>1929</td>
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<td>Evins, Samuel N.</td>
<td>38 East Fourteenth Street, Atlanta, Georgia</td>
<td>1922</td>
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<td>Fekst, Henry</td>
<td>3240 North Third Street, Milwaukee, Wisconsin</td>
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<td>Felton, W. R.</td>
<td>1709 Summit Street, Sioux City, Iowa</td>
<td>1930</td>
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<td>Fennell, Chester M.</td>
<td>Box 160, R. F. D. No. 1, Olmsted Falls, Ohio</td>
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<td>Field, Caroline L.</td>
<td>38 Hampton Court, 1161 Mountain Street, Montreal, P. Q. Canada</td>
<td>1930</td>
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<td>Finfrock, C. M.</td>
<td>3166 Oak Road, Cleveland, Ohio</td>
<td>1926</td>
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Finster, Ethel B., Asheville Normal School, Asheville, North Carolina……1930
Fischer, Donald, Shakopee, Minnesota.............................................1926
Fisher, Dr. G. Clyde, American Museum of Natural History, New York,
   New York..................................................................................1925
Fitzpatrick, Dr. F. L., Teachers' College, Columbia University, New York,
   New York........................................................................1924
Fitz-Gerald, Mary E., 541 N. Clay Avenue, Kirkwood, Missouri....1930
Fleetwood, Raymond J., Kurtz, Indiana..............................................1931
Fletcher, Jane Ada, “Lyeltya”, Eaglehawk Neck, Tasmania...................1930
Flickinger, Frederick R., 2402 Putnam Street, Toledo, Ohio..............1929
Floyd, Charles B., 454 Wolcott Street, Auburndale, Massachusetts.....1924
Forse, Edith R., 3021 East Eighth Street, Tulsa, Oklahoma................1926
Ford, Louise P., Barnwell Avenue, Aiken, South Carolina.................1921
Fordyce, George Lincoln, 40 Lincoln Avenue, Youngstown, Ohio..........1914
Frankel, Mrs. Henry, 301 Tonawanda Drive, Des Moines, Iowa.............1925
Franzen, A. J., Field Museum, Chicago, Illinois.................................1929
Frazier, John M., Station A, Box 156, Hattiesburg, Mississippi..........1930
Fredholm, Miss Saide, R. F. D. No. 5, Mountain Grove, Missouri........1930
French, Mrs. Menl, Box 171, Wayland, Massachusetts........................1928
Friedrich, George Walker, 3029 Belmont Avenue, Chicago, Illinois......1914
Fryklund, P. O., Roseau, Roseau County, Minnesota..........................1926
Fulton, Lester B., 7000 North Rockwell Street, Chicago, Illinois........1929
Funk, Mrs. A. B., 614 Harwood Drive, Des Moines, Iowa....................1925
Funkhouser, Dr. William D., Dept. of Zoology, University of Kentucky, Lexington, Kentucky.....................................................1918
Gall, Harold J. F., 1427 Belle Plaine Avenue, Chicago, Illinois.........1931
Gander, Miss Erna M., 604 Caldwell-Murdock Building, Wichita, Kansas..1930
Gander, Frank F., Natural History Museum, Balboa Park, San Diego, Calif.1928
Gardiner, A. W., 1010 Standard Bank Building, Cleveland, Ohio............1831
Geist, Robert Miller, Dept. of Biology, Capital University, Columbus, Ohio.1923
Getty, Mrs. B. M., 621 South Minnesota Avenue, Sioux Falls, South Dakota.1925
Ghigi, Prof. Alessandro, R. Universita, Bologna, Italy.........................1931
Gifford, Jr., Harold, 3676 Buri Street, Omaha, Nebraska...................1930
Gierest, O. E., 5831 Waterbury Circle, Des Moines, Iowa.....................1930
Giles, Jr., Norman H., 959 Drewry Street, N. E., Atlanta, Georgia.......1930
Gillette, Fredericka B., 1319 Forest Avenue, Ann Arbor, Michigan.......1928
Gloyd, H. K., Museum of Zoology, University of Michigan, Ann Arbor,
   Michigan..............................................................................1925
Goldsmith, Dr. G. W., Box 1611 University Station, Austin, Texas.........1931
Good, Henry G., Alabama Polytechnic Institute, Auburn, Alabama..........1926
Gordon, Robert B., Dept. of Botany, Ohio State University, Columbus, Ohio.1931
Grant, C. P., Field Museum, Chicago, Illinois..................................1928
Grant, Martin Lee, University of Minnesota, Minneapolis, Minnesota.....1926
Grass, Arthur M., 339 B. Street, Northeast, Linton, Indiana................1930
Graves, Mrs. Chas. B., Box 1054, New London, Connecticut.................1930
Green, Dr. Wyman R., Dept. of Biology, University of Chattanooga, Chat-
   tanooga, Tennessee.....................................................................1926
Greene, Earle R., 642 Orme Circle, Atlanta, Georgia..........................1930
Greenfield, Roy H., 127 Maple Avenue, Takoma Park, Maryland.............1931
Gregory, C. E., Box 215, Morgantown, North Carolina........................1928
Grimes, S. A., 109 Catherine Street, South Jacksonville, Florida.........1924
Gronow, Owen J., Milwaukee Public Museum, Milwaukee, Wisconsin.......1924
Gross, Dr. Alfred O., Bowdoin College, Brunswick, Maine.....................1927
Guernsey, Raymond G., Trust Company Building, Poughkeepsie, New York.1926
Habeger, Ruth, 401 W. Main Street, Marshalltown, Iowa......................1931
Hadeler, Edward William, 336 South State Street, Painesville, Ohio.......1917
Hagar, Mrs. Jack, Box 291, Corsicana, Texas....................................1930
Hagin, Florence, Sweet Briar College, Sweet Briar, Virginia................1931
Hainsworth, William P., 214 Railroad Avenue, North Andover, Mass........1930
Hall, Mrs. J. L., Wakulla, Florida.............................................................. 1930
Hall, Watson, Athens, Illinois................................................................. 1929
Hallinen, Joseph Edward, R. F. D. No. 1, Coopertown, Oklahoma...... 1922
Hallman, R. C., Box 847, St. Augustine, Florida............................... 1928
Hamilton, Dr. B. A., Lock Box 22, Highland Park, Illinois.............. 1916
Hanawalt, F. A., 65 West Broadway, Westerville, Ohio................. 1927
Hangreed, Miss Alma, Route 3, Hawley, Minnesota..................... 1930
Hardisty, Arthur H., 4831 Thirty-sixth Street, N. W., Washington, D. C. 1927
Harkin, J. B., Commissioner, Dept. of Interior, Ottawa, Ontario, Canada 1924
Harper, Francis, 206 Dickinson Avenue, Swarthmore, Pennsylvania..... 1930
Harris, C. L., 921 West Central, Eldorado, Kansas......................... 1928
Harris, Mrs. Ward E., 1805 Meredith Avenue, Lincoln, Nebraska...... 1930
Havereschmidt, Fr., 50, Kromme Nieuwe, Gracht, Utrecht, Holland.... 1930
Hebard, Helen, Bells Mill Road, Germantown Avenue, Chestnut Hill, Philadelphia, Pennsylvania......................................................... 1930
Hempill, Frederick A., 128 Broad Street, Elizabeth, New Jersey..... 1928
Henderson, Grant, Route 9, Greensburg, Indiana............................. 1930
Henderson, W. C., 3 Magnolia Parkway, Chevy Chase, Maryland........ 1928
Henning, Carl F., Ledges State Park, Boone, Iowa....................... 1925
Herman, Mrs. E. Olney, Momence, Illinois............................... 1928
Hicks, Lawrence Emerton, Botany Dept., Ohio State University, Columbus, Ohio......................................................... 1925
Heatt, Martha, Danville, Kentucky..................................................... 1930
Heitt, Lawrence D., 2617 Parkwood Avenue, Toledo, Ohio............... 1929
Hill, Helen F., 116 S. Mt. Vernon Avenue, Uniontown, Pennsylvania 1930
Hillmer, Davis B., 454 Colburn Place, Detroit, Michigan............. 1926
Hilton, Dr. Davis C., 305 Richards Block, Lincoln, Nebraska....... 1918
Hinchman, Richard May, 501 Randolph Avenue, Milton, Massachusetts 1931
Hisongs, R. D., 1908 Ingleside Avenue, Sioux City, Iowa............ 1927
Hoo, Benjamin, Carfield, Rensselaer County, New York.................... 1922
Holland, Harold May, Box 515, Galesburg, Illinois..................... 1915
Hood, Miss Ada M., 1002 Ninth Street, Sioux City, Iowa............. 1913
Huff, Prof. N. L., 1219 Seventh Street, Minneapolis, Minnesota... 1928
Hufford, G. N., 216 Sesser Street, Joliet, Illinois..................... 1929
Hughes, George T., Box 153, Plainfield, New Jersey.................. 1929
Hunsaker, W. J., 1211 Second National Bank Building, Saginaw, Michigan... 1931
Hurst, John H., Woodward, Dallas County, Iowa......................... 1931
Huyler, Mrs. C. D., Greenwich, Connecticut............................. 1931
Hyde, A. Sidney, Temple University, Philadelphia, Pennsylvania.. 1926
Hians, H. H., Box 1150, Knoxville, Tennessee............................ 1924
Ingersoll, Albert M., 908 F. Street, San Diego, California........ 1921
James, Mrs. A. O., 4100 Grove Avenue, Richmond, Virginia........... 1931
Janes, Ralph G., Dept. of Biology, Battle Creek College, Battle Creek, Michigan................................................................. 1930
Jay, William, 5338 Wingfooting Terrace, Germantown, Philadelphia, Pa. 1924
Jefferson, Mrs. Edith H., 1381 Prairie Avenue, Des Plaines, Illinois 1927
Jelier, F. P., Groote Visscherstraat 19a, Rotterdam, Holland........ 1931
Jenner, William A., 806 West Davis Street, Fayette, Missouri........ 1930
Jennings, Mrs. J. J., Hedrick, Iowa............................................... 1930
Jenser, J. P., Box 364, Dassel, Minnesota.................................. 1926
Jewell, Mrs. W. G., R. F. D. No. 2, Irving, Kansas..................... 1930
Johnson, I. H., Bird Haven, South Hills, Charleston, West Virginia 1923
Johnson, Robert A., State Normal School, Onconota, New York...... 1930
Jones, Mrs. D. F., 425 No. Park Street, Watertown, South Dakota... 1928
Jones, George T., 322 West College Street, Oberlin, Ohio............... 1923
Jones, Harold C., 1553 North 27th Street, Lincoln, Nebraska........ 1929
Jones, John C., 928 Goodrich Avenue, St. Paul, Minnesota............ 1931
Jones, S. Paul, 509 West Avenue, North Waukesha, Wisconsin........ 1921
Josten, Erick, Klemme, Iowa.................................................. 1928
Kalter, Lewis B., 535 Belmont Park, N., Dayton, Ohio........................................................1931
Kearby, Miss Vera, George Peabody College for Teachers, Nashville Tenn........................1927
Keim, Thomas Daniel, Glenendale, Prince George County, Maryland................................1921
Kennedy, H. N., 25 Strathmore Avenue, Garrett Park, Maryland........................................1925
King, Mrs. E. R., 1416 West Fifteenth Street, Sioux City, Iowa........................................1930
Klewer, Louis A., 2088 North Kennison Drive, Toledo, Ohio..............................................1930
Klinek, Norman, 38 W. Parade Avenue, Buffalo, New York.............................................1927
Klotz, Charles D., Box 142, Pearisburg, Virginia..............................................................1930
Knapp, Elmer, R. F. D. No. 2, Troy, Pennsylvania............................................................1930
Knappen, Phoebe, 2925 Tilden Street, North West, Washington, D. C..................................1926
Knight, Dr. Harry H., Dept. of Zoology and Entomology, Iowa State College, Ames, Iowa........1926
Knoth, Sibyl, Gulf Park College, Gulfport, Mississippi.....................................................1930
Koch, Cora M., 3017 Dudley Street, Lincoln, Nebraska.....................................................1929
Koelz, Dr. Walter, University Museum, Ann Arbor, Michigan............................................1929
Koffel, Gerald L., 1012 Gorgas Street, Louisville, Ohio....................................................1926
Krug, Carl B., % George Krug, Minonk, Illinois.................................................................1930
Kubichek, W. F., Coe College, Cedar Rapids, Iowa............................................................1926
Kucera, William, R. F. D. No. 2, Box 37, Tyndall, South Dakota.......................................1931
Kummerloewe, Dr. Hans, Gieborius Strassa 6 III, Leipzig, Germany...................................1931
Kuser, J. Dryden, Bernardsville, New Jersey.............................................................................1913
LaMar, Kate E., 1253 Forty-second Street, Des Moines, Iowa...............................................1930
Lang, Libbie M., 2857 High Street, Des Moines, Iowa.........................................................1930
Larson, Adrian, 611 E. 14th Street, Sioux Falls, South Dakota..............................................1930
Castretto, C. B., 260 California Street, San Francisco, California.........................................1930
Lawrence, A. G., City Health Dept., Winnipeg, Manitoba, Canada.......................................1928
Lee, Mrs. Arthur, Fourteenth and Locust Streets, Atlantic, Iowa..........................................1926
Ledy, Chas. A., % The Telegram, Youngstown, Ohio..............................................................1927
Lewis, Edward H., Catalina Bird Park, Avalon, California..............................................1930
Lewis, Merriam G., 512 Highland Road, Lexington, Virginia.............................................1930
Lewis, Walter E., Gate, Oklahoma..........................................................................................1927
Lincoln, Frederick C., Bureau of Biological Survey, Washington, D. C.................................1915
Lindsdale, Dr. Jean M., Museum of Vertebrate Zoology, University of California, Berkeley, California..................................................1928
List, E. E., % Shurtleff College, Alton, Illinois.......................................................................1931
Lively, E. L., Hillcrest, Fairmont, West Virginia.................................................................1924
Livingston, Phillip Atlee, Box 302, Narbeth, Pennsylvania..................................................1926
Lloyd, C. K., 12 North Elm, Oxford, Ohio..............................................................................1925
Lloyd, Hoyes, 582 Mariposa Avenue, Rockcliffe Park, Ottawa, Ontario, Canada.....................1922
Lodge, Fred S., 423 S. Stone Avenue, La Grange, Illinois..................................................1929
Lomax, Dr. Claude C., Dale, Indiana.......................................................................................1921
Luppenthin, B., Sundholm B I, Copenhagen S, Denmark......................................................1930
Low, Seth H., 50 Glendale Road, Quincy, Massachusetts......................................................1931
Lowrie, E. R., 552 Oberlin Avenue, Lorain, Ohio.....................................................................1930
Luce, George W., R. F. D. No. 1, Hayward, California.........................................................1930
Lundquist, Arthur, Peabody Hospital, Webster, South Dakota..............................................1930
 Lyon, John D., Jr., Box 6, R. F. D. No. 1, Tucson, Arizona..................................................1931
McCabe, Olivia, 3516 Fifth Street, Des Moines, Iowa...........................................................1925
McCann, Horace D., Box 175, Paoli, Pennsylvania..................................................................1928
McCun, Miss Carrie H., 805 Calhoun Street, West Liberty, Iowa.........................................1930
McCorkle, Eloise, % High School, Portage, Michigan............................................................1925
McCullough, Mabel, % Jewish Hospital, School of Nursing, Burnet Avenue, Cincinnati, Ohio.................................................................1931
McDavitt, Edna J., 401 East Court Street, Paris, Illinois......................................................1930
McDavitt, Neva, 608 Normal Avenue, Normal, Illinois...........................................................1930
McGill, Dr. J. T., Vanderbilt University, Nashville, Tennessee............................................1929
MacLoghlin, Mrs. F. E., 43 Inglewood Drive, Hamilton, Ontario, Canada..............................1928
McManus, Reid, Jr., Memramcook, New Brunswick, Canada.......................... 1931
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A Magazine of Field Ornithology
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**THE WILSON BULLETIN**

Published quarterly, in March, June, September, and December, as the official organ of the Wilson Ornithological Club, at Sioux City, Iowa.

The current issue of the *Wilson Bulletin* is printed by the Verstegen Printing Company, Sioux City, Iowa.

The *Wilson Bulletin* is sent to all members not in arrears for dues. The subscription price is $1.50 a year, invariably in advance, in the United States. Outside of the United States the subscription rate is $2.00. European Agents, Dulau and Company, Ltd., 34-36 Margaret St., Oxford Circus, London, W. 1., England.

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**THE WILSON ORNITHOLOGICAL CLUB**

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

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THE STATUS, BREEDING RANGE, AND HABITS OF MARIAN’S MARSH WREN

BY H. E. WHEELER

Though we are primarily concerned with the occurrence of Marian’s Marsh Wren in Alabama, and especially with its breeding habits, heretofore so little understood, our discussion will necessarily lead us into an examination of the Florida records, and of the status of those birds on the Atlantic seaboard that have been treated at one time or another under the name of “marianae”.

We shall confine our treatment to the facts which have recently come to our notice and to the analysis of all published records of this species. There remains a great deal of work to be done, not only on the west coast of Florida and in Alabama, but particularly in all the marsh regions of South and North Carolina. This paper is presented in the hope that many observers will be prompted to make careful records of all marsh wrens in their territory.

After considerable correspondence about our Alabama marsh wrens it became evident that the question as to the breeding range of Telmatodytes palustris marianae in Alabama could be settled only by personal investigation. Such an investigation among the inaccessible marshes would not be possible by land. Access to the shallow waters around Mobile Bay and an examination of the tidal flats and marshes of the mainland and islands could be had only with a small vessel that could anchor in shallow water and thus allow frequent trips to the shore in a skiff. Had it not been for the exceptional courtesies shown me by Captain W. H. Edwards and his wife, of Fairhope, Alabama, the objectives of our expedition to the Gulf Coast of Alabama would never have been realized.

Captain Edwards put at our disposal for the week of June 14-20, 1931, his thirty-five foot yacht, the Osprey, which he himself built after the model of the Islander, a yawl-rigged vessel, in which Captain Harry Pigeon made his famous trip around the world. The Captain evidenced his skill not only as shipbuilder but also as navigator, for
he had a perfect knowledge of Mobile Bay and the Gulf shores and of their many bars and islands. In the party were the Captain's wife, well posted on the birds of the coast, his 15-year-old son Dan, Homer Flagg (a high school graduate), my wife, and our little daughter Edith. The Osprey was our home for the entire trip. We visited practically the entire coast of Alabama, every hour of daylight being utilized in field work ashore, or in sailing to the next anchorage.

The map will indicate the course of the yacht and the several places visited, every marsh or island offering any possibility of finding breeding marsh wrens being investigated. Beginning our course at Fairhope, we surveyed in succession Week's Bay, Navy Cove, Isle aux Herbes, Bayou La Batre, Marsh Island, another section of Isle aux Herbes, Berron Point on Mon Louis Island, Heron Bayou (where we found breeding wrens in considerable number), and the eastern and western ends of Dauphin Island. Limitation of time forbade our investigation of Cat Island, Petit Bois Island, and the extensive marshes of the Mobile River delta, but an auto trip from Fairhope down the east coast of Mobile Bay to Gulf Shores yielded some important information.

I. MARIAN'S MARSH WREN IN FLORIDA

Before presenting our findings as to the breeding of Marian's Marsh Wren in Alabama it is proper to review the history of the species beginning with the notes of its discoverer, W. E. D. Scott. As we shall see, subsequent observers have given us but glimpses of the bird, and we are not sure that they correctly identified the birds which were reported under the name of marianae.

Marian's Marsh Wren was first discovered and described by W. E. D. Scott in 1888, his description being published in the Auk
Fig. 47. A small bayou penetrating the marshes of West Heron Bay, Mobile County, Alabama. Typical breeding grounds of Marian's Marsh Wren. June 18, 1931.

Fig. 48. Typical breeding grounds of Marian's Marsh Wren. Heron Bayou, in Mobile Bay. June 18, 1931. Photographs by H. E. Wheeler.
(Vol. 5, p. 7) under the caption, "Supplementary Notes on Florida Birds". The new marsh wren was assigned to the genus *Cistothorus*.

In this article, Mr. Scott says: "The great difference between this species and *palustris* is in the conspicuous barring of the upper and under tail-coverts and the feathers of the flanks, and olive instead of rufous brown coloring throughout, with the much darker coloring of underparts.

"The new bird is quite common on all the salt marshes of this immediate vicinity (Tarpon Springs), and probably all along the coast of Florida as far north as Cedar Keys, where it is known to occur. It is probably resident and breeds, though of this I have as yet no positive knowledge".

In the Bulletin of the Nuttall Ornithological Club for 1881 (Vol. 6, p. 15), Scott reported the Long-billed Marsh Wren (*Telmatodytes palustris*) as "abundant in the salt marshes at the mouth of the Withlacooche River". The date of this observation is January, 1879, just nine years prior to the naming of *marianae*. In 1888, in his article naming *marianae*, Scott made no reference to this Withlacoochee habitat; but he did state that both *palustris* and *marianae* were associated together at the same season of the year (January), and that *marianae* was the predominant species. In all probability, then, the records of *palustris* in Citrus County in 1879 included *marianae*; and if so, this would be the earliest published reference to the wren that Scott separated in 1888.

In 1893 Scott listed his new species as a *migrant* in the Caloosahatchee region, which region is more than one hundred miles south of the Anclote Keys, and he reported that "enough representatives remain during the winter to allow the species to be regarded as resident".

In 1893, (Auk. Vol. 10, pp. 218-219), William Brewster separated from *palustris* a much lighter form of marsh wren from Georgia under the subspecific name, *griseus*; and in giving the measurements of ten specimens of his new subspecies, he added the measurements of an equal number of *marianae*, which he states were "selected at random from the large series" of specimens before him. Presumably these *marianae* were collected from the type locality on the west coast of Florida, but whether by Scott or by himself is not apparent. This new subspecies was called Worthington's Marsh Wren in honor of its discoverer, Mr. Willis Woodford Worthington.

1The Withlacoochee River, which empties into the Gulf of Mexico, is between Levy and Citrus Counties, its mouth being approximately sixty miles north of the Anclote Keys. This region is now known to be a typical habitat of *marianae*. 
In 1902 (Auk, Vol. 19, p. 353) Outram Bangs reported that *Cistothorus marianae* was an inhabitant of the “salt marshes of western Florida, non-migratory”.

In the Twelfth Supplement to the A. O. U. Check-List (Auk, Vol. 20, p. 357, 1903) Marian’s Marsh Wren is registered under the name *Cistothorus marianae*, but in the Thirteenth Supplement (Auk, Vol. 21, p. 418, 1904) the bird is reduced to subspecific rank because it was found to intergrade with *palastris*, and it is assigned to the genus *Telmatodytes*. This is based on Oberholser’s report in the Proceedings of the Biological Society, Washington, Vol. 16, p. 149, 1903.

In 1906 (Auk, Vol. 23, p. 67) Wayne’s article on South Carolina Birds entered a protest against *his* Atlantic Coast “*marianae*” being reduced to subspecific rank, and took issue with Bangs as to the non-migratory character of the Floridian *marianae*. Wayne was firmly of the opinion that the Florida birds were migratory and inseparable from the South Carolina birds which he reported in 1899.

Our next references, chronologically taken, are in reports of several Christmas censuses made at Palma Sola, near Bradenton, in Manatee County, Florida. The first of these was by Eleanor Earle, in 1908; the others by Carlos Earle, in the years 1909, 1910, and 1912, respectively. These reports appear in order in Bird Lore, Vol. 10, p. 33; Vol. 11, p. 28; Vol. 12, p. 30; and Vol. 14, p. 33. Two birds were observed in each census taken, except that of 1912, when three birds were noted, making a total of nine birds for the four years. If the identifications are correct, the range of Marian’s Marsh Wren is carried considerably farther south of the type locality. Whether these birds were only straggling migrants, or individuals belonging to wintering flocks, is not apparent; but since they were observed for four winters during a period of five years the presumption is that they were regularly wintering in the region.

In 1919, “John Williams”22 published a paper on the birds of Wakulla County, Florida, in the Wilson Bulletin (Vol. 31, p. 56) in which he listed Marian’s Marsh Wren as abundant in the broad salt-water marshes of the coast. In the following year he again listed Marian’s Marsh Wren in his “Notes on the Birds of Wakulla County, Florida” (Wilson Bulletin, Vol. 32, p. 56).

In 1924, Frank M. Chapman, in the revised edition of his “Handbook of the Birds of Eastern North America”, p. 481, published the

2The nom de plume of C. J. Pennock. For a time he was a resident of St. Marks Lighthouse, in Wakulla County, Florida, where his observations were made.
winter range of Marian's Marsh Wren as (in part) the west coast of Florida.

In 1926, William G. Fargo, in his "Notes on the Birds of Pinellas and Pasco Counties, Florida" (WILSON BULLETIN, Vol. 38, p. 155) reported Marian's Marsh Wren as abundant in the salt marshes west of Elfers. This locality is indicated on the map. Mr. Fargo further stated that male birds were singing "vigorously" on April 5, which would almost certainly identify the habitat as a preferred breeding area.

In the same year, 1926, Worthington and Todd (WILSON BULLETIN, Vol. 38, p. 223) reported Marian's Marsh Wrens in the marshes of Choctawhatchee Bay, which is mostly in Walton County, one of the West Florida counties. They state that a pair of these wrens were shot on April 18, presumably of that year; but they state also that "these birds" (meaning probably similar specimens) were examined some years previous to that time by Dr. Harry C. Oberholser and identified as Marian's Marsh Wren. They do not state whether the birds Oberholser had in hand came from Choctawhatchee Bay region or not.

Mr. Francis M. Weston, in a letter under date of June 29, 1931, states that Marian's Marsh Wren cannot be listed from the Pensacola region, except as a winter visitor.

In a letter from Mr. C. J. Pennock under date of July 7, 1931, Marian's Marsh Wren is reported as having been taken on April 13, 1921, at Punta Gordo, in Charlotte County, Florida. Evidently more than one species of marsh wren is found at this season in this locality. On April 11, 1923, Mr. Pennock reports finding a nest of Marian's Marsh Wren about a mile from Punta Gordo, "up Peace River". The nest was new, and nearly completed. Mr. Pennock states that there are abundant marshes along the tidal creeks of Charlotte Harbor, but he does not know what marsh wrens could be identified as breeding in them. Perhaps this single nest, at that time unoccupied, and without a specimen of the bird, would be insufficient to base any conclusion on, but it would not be surprising to learn that even this southernmost section of the range of mariana is also a breeding habitat.

As to the breeding range of Marian's Marsh Wren in Florida, Mr. Donald J. Nicholson, of Orlando, Florida, in a letter under date of May 23, 1931, furnishes me some very interesting facts:

"I do not know just how far north along the Gulf Coast this species breeds, but it is found west and southwest of New Port Richey, Pasco County, Florida, and breeds in late April through June, and probably a few continue into July."
"The birds in this vicinity (New Port Richey) nest among Juncus (*J. roemerianus*), a sharp-pointed rush, and principally in mangrove trees from five to fourteen feet above the mud in salt marshes. The tree-nesting may seem strange to you and it was quite a surprise to me when I found them nesting under such odd circumstances. I think high water and rats had something to do with this nesting custom here, and it may be a comparatively recent habit. The sets range from three to five, but sets of five are not as commonly found as the smaller sets.

![Map of the Gulf Coast of Florida](image)

**Fig. 49.** The Gulf Coast Range of Marian's Marsh Wren.

"The bird may nest anywhere along the Gulf Coast in suitable marshes and it should be found at or in the vicinity of St. Marks, and at New Port Richey was found within a few yards of the open Gulf. This latter point may aid you in looking for nests".

The following facts are also derived from the notes of Nicholson, and constitute the only information we have concerning the construction of the nest of Marian's Marsh Wren and the character of the eggs.

The nest of *marianae* does not differ from that of *griseus* (which does not occur on the Gulf Coast) either as to materials used in its construction or as to size and appearance. On the inside, and on a level with the entrance, there is a small shelf or platform, extending a
little on each side of the entrance, and so constructed that it is impossible for the eggs to roll out, or for them to be blown out when the nests are swayed by the stiff sea breezes. In collecting the nests and eggs it is necessary to turn the nest upside down, allowing the eggs to roll around to the top and down on the smooth side of the nest to the opening at its upper side. Only in this way can the nest be taken without injuring the little interior projection below the entrance. This peculiarity in the construction of the nest is found also in the nest of *griseus.* Nests of *marianae* found in mangrove trees were fastened to the forks of small limbs, generally at their ends, or in the tops of small mangrove bushes.

The top of the nest is usually larger than the bottom, and in a majority of nests examined, the opening is about one-third of the way from the top. The entrance to the nest is so small that it is with difficulty located, especially in the case of those newly constructed. Occupied nests are lined with soft shredded grasses, and sometimes with feathers, and they are so cleverly woven together that they are a complete protection against rain. None have even been found that were damp inside. Although the marsh wrens nest in colonies, the nests of *marianae* are seldom less than forty feet apart. On the east coast of Florida Nicholson counted four to six "dummy nests" to every occupied nest of *griseus*; but in the colonies of *marianae* on the west coast near Elfers, he found only one or two bachelor nests to one that was occupied.

The male bird is invariably found singing near the occupied nest, either in the same tree, or in the grass very close by. He is the collector's best guide to the location of the nest. The females are so suspicious that they never have been observed to enter or to leave the nest. Mr. Nicholson once touched a nest with young birds in it, and they darted out like winged bullets. It is probable that when they are able to leave the nest they can fly and do not return to it. The collector may actually take the nest and eggs in the presence of the male, who continues to sing undisturbed only a few feet away.

The males of both *marianae* and *griseus* sing so much alike that they could not be identified by this test, although slight differences in their songs not easily remembered might differentiate them if they could be heard singing in the same locality. The song is delivered in the same manner by both wrens.

The eggs of Marian's Marsh Wren are identical in size, shape, and color with those of Worthington's Marsh Wren. There is much variation in color, however, some eggs being quite pale, but most of
them being of a deep rich chocolate brown. In some sets the eggs are without darker capping or wreathing of brown dots at the larger end. When the eggs are wreathed, which is true of a majority of sets examined, the dots are generally confluent. The eggs are sometimes glossy, always thick-shelled, and not easily broken in handling.

In all these respects the eggs of Worthington's Marsh Wrens are the same.

II. MARIAN'S MARSH WREN IN ALABAMA

On our survey of the coastal region of Alabama we found no clue to the location of breeding marsh wrens until we got to Bayou La Batre. Mr. Willie Collier, an observant young fisherman, told us that he had seen plenty of "Grass Wrens" on Marsh Island, and at
Berron Point on Mon Louis Island. A careful search through the marshes of Marsh Island gave negative results; for here, as elsewhere, the grass had been burned, creating situations that could have no appeal to marsh-loving wrens.

In addition to the frequent damage done to the grass by fires, marsh wrens must suffer many indignities from rats and mice, which are abundant in all salt marshes. Other birds, such as Fish Crows and hawks, probably invade their breeding grounds. High winds and tides doubtless wreck many of their nests. Should young birds climb out of the nest before they can manage themselves in the thick vegetation, or use their wings, they can but fall victims to their enemies.

As a further discouragement to the birds we found on Dauphin Island, whose former bars and sand spits are now continuous with the inhabited section, herds of cattle grazing over vegetation that seemed to offer the poorest prospect for a living. Many of the nesting colonies of terns and gulls, as well as those of Florida Nighthawks, must be repeatedly broken up by these cows. We saw some nests of Least Terns, Black Skimmers, and Florida Nighthawks, the eggs of the latter being laid almost in the trails of ranging cattle. On Petit Bois Island, which lies west of Dauphin, and which is uninhabited, immense colonies of terns and gulls formerly nested; but now wild hogs threaten the extermination of all ground-nesting birds. Petit Bois Island is partly in Alabama and partly in Mississippi. We learned that somewhat recently hunters from the mainland have been making raids on the hogs, since they are at least good for food. This commendable poaching, if we should call it that, may be the salvation of the birds at last.

Berron Point, although ideally adapted to the needs of the marsh wrens, yielded only a few singing birds but no evidence of their nesting. They were evidently on territory accepted as their own, but their nesting sites had been destroyed by the fires that the boys had kindled to aid them in finding the nests of Clapper Rails and Florida Gallinules. Roasted eggs of marsh birds may be a great delicacy for the "eggers", but they are a costly one if we consider the interests of Seaside Sparrows, marsh wrens, and Florida Redwings, to say nothing of the ground-nesting gallinules and rails.

3In a letter, dated July 13, 1931, Mr. Collier enclosed a sketch map showing the following localities in which at various times in season he had found marsh wrens breeding: Marsh Island; Isle aux Herbes, east coast near the middle of the island; Pass 0' Barrow, local name for Berron Point of Mon Louis Island; and the marshes of Fowl River, which are some distance north of Berron Point, in Mobile County. See map.
We did find on a low platform, sheltered by the small vegetation of a narrow ditch, the nest of a Green Heron. The birds in it were old enough to fly, so that it was with some difficulty that we captured one of them to make sure of our identification. In the brackish waters of this region, especially on the margins of the muddy bayous, we found great numbers of mollusks; mostly *Littorinas*, *Neritinas*, and the common bivalve, *Mytilus*.

It was on the tidal flats, or rather monotypic marshes, of Heron Bayou that we found marsh wrens nesting, enough to satisfy the heart
of any ornithologist. This region of vast and almost impenetrable marshes is known to the fishermen as West Heron Bay. Several narrow bayous penetrate the grass-grown region, one of them widening into a so-called lake. In such a region, in the tall bladed grasses, which grow higher than the rushes, and nearer open water, we found the marsh wrens numerous. They were singing near their neatly built nests, their entrancing songs being much in the tempo of the songs of the Prairie Marsh Wren.

It is not difficult to identify these marsh wrens, for their darker colors, especially those underneath, are good field marks. In hand, the birds had the characteristic black spots, which were obscured but little by the lighter markings of the feathers on the breast.

Contrary to our expectation, we did not find these wrens particularly shy. The breeding birds were very easy to approach; and though they did not remain long on open perches they seemed quite unmindful of our invasion of their territory, singing joyously all the while, and often within two or three feet of us. Often and again the males would reappear and perch in plain view on the side of the tallest reed, and that without interruption of their song. If we could have walked through the thick vegetation at low tide with a Graflex camera, we might have gotten pictures of the birds in action. It was slow, sloppy work at best, getting into the habitats of the birds, especially when we left the skiff. Without doubt the search for nests developed that type of patience and perseverance which all members of our party came prepared to supply. At high tide, when a few pictures were taken of a nest and the habitat, a platform was improvised with life preservers spread over downturned rushes in order to give the camera tripod a footing. By this device a sufficiently good elevation was obtained for photographic work.

The nest of Marian's Marsh Wren differs in no essential way from the nest of other closely-related species or subspecies. It is globular in shape, well secured to the taller marsh grasses, and usually about two or three feet above high tide. Oftentimes the nest can be detected from a moving skiff. The bachelor nests, which are unlined, are in the proportion of four or five to one which is lined and occupied. One nest contained remains of eggs already hatched, which eggs were, as

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4 "This tiny wren is inconspicuous and easily overlooked by reason of its secretive habits. It dwells exclusively in the wet salt marshes, hiding most of the time in the dense tangle of rushes and marsh grass. . . . But usually the birds are very difficult to detect as they flit about under cover of the rank vegetation." Howell, Birds of Alabama, p. 338. Perhaps Howell intended this description to apply to individuals under observation in seasons other than the breeding season.
far as color is concerned, like those of *Telmatodytes p. palustris* or *T. p. griseus*. We were unable to secure more data on the eggs, since all of the nests examined either had young birds in them, or were empty. Many young birds were, at this time (June 18) old enough to fly.

Mrs. Edwards banded one of these half-grown birds, this making the first instance, as far as I can learn, of the banding of a Marian’s Marsh Wren in Alabama. She also banded five birds, which were taken from the nest. This nest was located about three feet above the water (high tide) on the margin of one of the smaller bayous leading off from Heron Bayou. After the birds were banded the nest was photographed.

The beginning of the nesting season, estimated by the conditions as we found them, is probably May 20, perhaps even earlier. In all probability the season continues well into June. We could not tell whether the birds raise more than one brood or not. If so, the second nestings can hardly be dated earlier than the middle of June.

Marian’s Marsh Wren cannot be reported as a rare bird in the locality cited above. It is evidently abundant in the region where it was first discovered, Pasco and Pinellas Counties, Florida, but it remains to be ascertained whether it is more than a casual visitor, or resident, in many of the localities shown on the map and listed in the table. We did not visit the extensive marshes at the head of Mobile Bay, which belong to the delta of the Alabama and Tombigbee Rivers, whose larger channels are known as Mobile River and Tensaw River, respectively. In exploring this section during the breeding season, Howell found the wrens abundant, but though he saw nests he found none that were occupied. Since he recorded the wrens as present in this region during the winter, it is evident that they are permanent residents in this part of Alabama. Howell states that Gutsell found the birds in winter near Orange Beach, and that he himself found them in the same region on the Gulf at Bon Secour. Howell further reports finding a Marian’s Marsh Wren, but no nests, on Little Dauphin Island2 in June. He did not find the species in the marshes about Bayou La Batre or on Grand Batture Island.

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2At the time Howell visited Dauphin Island, it was broken in many places by bars and channels, which still appear in the official maps of that region. At this writing the island is continuous from end to end, a distance of fourteen miles, and is seldom overflowed by tides except in a season of storms. Little Dauphin Island is a much smaller island lying north of the eastern section of Dauphin Island.
It becomes apparent that the territory of *marianae* is almost continuous from the head of Mobile Bay and the coastal and island marshes of Alabama to Manatee County, Florida, wherever suitable habitats are available. The Caloosahatchee region, reported by Scott as a winter home for this species, is a considerable distance from the localities in which it is abundant; but whether the birds are only migrants or regular winter visitors in this region cannot be confidently stated.

The accompanying map correlates these several reports and indicates the need of careful observations of *marianae* all along the Florida Gulf Coast, both in the breeding season and in the winter. It can thus be stated, with some confidence, that Marian's Marsh Wren is a permanent resident of the coastal marshes of Alabama and Florida all the way from Isle aux Herbes and upper Mobile Bay to New Port Richey in Pasco County, Florida*; and that it is a migrant, or a winter visitor, in Manatee County, and in the Caloosahatchee River region.

III. MARIAN'S MARSH WREN ON THE ATLANTIC COAST

Our next problem will be to examine the records which mention Marian's Marsh Wren as an inhabitant of the Atlantic seaboard.

In 1891, Robert Ridgway's paper, entitled *Cistothorus Marianae... in South Carolina*, appeared in the *Auk* (Vol. 8, p. 240). This record, however, must be referred to *griseus*, a subspecies described by Brewster in 1893. (See *Auk*, Vol. 10, p. 218). In the *Birds of South Carolina*, by Wayne (1919, p. 187), in the discussion of Worthington's Marsh Wren, this correction is made. The report of Marian's Marsh Wren from Sapelo Island, Georgia, made by Brewster (*Auk*, Vol. 5, p. 432, 1888), is also corrected to read *griseus*. Mr. Wayne adds: "There is no evidence that *griseus* interbreeds with *marianae*, and I think it should be given full specific rank".

Since Wayne was fully acquainted with *griseus* from his boyhood, this statement has a significant bearing on the disposition of the (so-called) *marianae* in South Carolina; for if *marianae* cannot be admitted as a valid species for the Atlantic seaboard may not these so-called *marianae* be another form of *griseus*, or more probably an unnamed species similar to the true *marianae* but having a range altogether different?

In 1899, Arthur T. Wayne published in the *Auk* (Vol. 16, pp. 361-362) his article entitled, "Notes on Marian's Marsh Wren (*Cistothorus Marianae*) and Worthington's Marsh Wren (*Cistothorus palustris* *South of Pasco County marshes are scarce, and this explains the absence of marsh wrens."
griseus)”. Several statements made in this account focus on our investigations:

1. Wayne reports taking a wren near Mt. Pleasant, S. C., on April 16, 1897, which Ridgway declared was an intermediate form between marianaee and griseus, but which he considered finally as “an exceptionally dark specimen of griseus”.

2. The same specimen, when examined by Brewster was confidently identified as marianaee.

3. Both of these authorities had before them a series of specimens, in which both griseus and marianaee occurred.

4. Accepting as valid the opinion of Brewster, Wayne claimed this record was the first to extend the range of the species “to the Atlantic Coast”.

5. Wayne then followed with the statement that Marian’s Marsh Wren was an abundant bird in South Carolina “during the migration” season, giving dates upon which he had collected specimens; namely, from October 4 to May 8. He further stated that “this wren does not breed anywhere near Mt. Pleasant, but is simply a migrant”.

Wayne further predicted the breeding range of Marian’s Marsh Wren on the coast of North Carolina!

7. When Wayne took notice of Mr. T. Gilbert Pearson’s report in the July issue of the Auk (Vol. 16, p. 250, 1899) a specimen collected at Beaufort, N. C., had been identified as griseus by Mr. Ridgway. When, however, Wayne received this specimen from Pearson, he declared it to be a typical example of marianaee.6

Apparently nothing more developed in the situation until 1910, when Wayne published his “Birds of South Carolina”, on pp. 188, 189 of which he reviews the history of the species. He states with confidence that the breeding range of marianaee does not include Florida, “as Scott supposed”, but that it is North Carolina. He does not admit South Carolina as other than a migrant range for marianaee, but at this point a curious situation is discovered. A male and female wren, identified as Marian’s Marsh Wren, taken in 1896 in South Carolina, are described as being much darker above and below than specimens of the same species taken in Florida. The North (?) Carolina specimens, on the contrary, are described as normally lighter than those from Florida!

In view of these statements we infer that the Atlantic Coast birds are not migrants from Florida, nor can they be identified as Marian’s

6The reference of Bishop in the Auk (Vol. 16, p. 268, 1901) to the marsh wren that he took on Pea Island in North Carolina in February, 1901, must, of course, be referred to griseus.
Marsh Wrens. We are forced to the conclusion, previously expressed, that they will classify as a form of *griseus* or as a new species.

A factor in reaching this conclusion appears in Wayne's own statement that Marian's Marsh Wrens reach the vicinity of Charleston, S. C., *about the second week in September and that they remain until about the first of November*. Either he was under the impression that these migrants passed through South Carolina *from* Florida on their way to North Carolina, or that they were migrants from North Carolina on their way *to* Florida. Apparently it did not occur to him that they might be migrants from North Carolina which winter on the Atlantic Coast, some of them in the vicinity of Charleston, but the majority finding more congenial winter homes either north or south of Charleston. The evidence is that these birds do not migrate *to* Florida, or *from* Florida.

If we accept the theory that Marian's Marsh Wren migrates from Florida to, or through, South Carolina *after the breeding season*, we shall have a new factor to deal with in the general problem of migration. Why is it that there are no families of birds that feature a northbound migration in search of a winter home? In some families, individuals or flocks may wander about for a time in almost any direction; but the birds that are given to such wanderings are, as a rule, permanent residents of the region. Among such wanderers are some species of herons and some birds of prey. The Pine Warbler is a striking illustration of this roaming habit.

The predilection for a winter home south of the breeding range applies not only to birds of the Northern Hemisphere, but it is apparently not reversed in the case of migratory birds in the Southern Hemisphere. It is impossible to be dogmatic on this point. The only thing that can be said is that there are available no records that contradict this supposition, neither in the keeping of the Biological Survey in Washington, nor in the literature of migration, as far as we have been able to examine it. Correspondence with ornithologists in Africa, Australia, and South America has not shed much light on the subject. There are surely some South African species that nest in the palaearctic regions, and migrate after the nesting season northward, but we are waiting confirmation of this assertion. Then there are birds which migrate in more or less of an easterly or westerly direction, but their choice of a winter home is generally in a latitude south of their breeding grounds.

This digression has little bearing on the discussion of Marian's Marsh Wren. However, it would be a most interesting thing if this
species could be the first one among migratory birds of North America to be reported as immediately seeking a northern clime for its winter home after the nesting season. There are accumulating reasons for making the supposed Marian’s Marsh Wren of the Atlantic Coast a different bird from the Marian’s Marsh Wren of the Gulf Coast, and for believing that the latter is a permanent resident in most of the marshes where it is found, migrating perhaps from some of its breeding habitats in Florida to the more southern Caloosahatchee River region.

In 1924. Dr. Frank M. Chapman, in the revised edition of his *Handbook of the Birds of Eastern North America*, p. 481, states that the breeding range of Marian’s Marsh Wren is the coast of North Carolina, and that it winters in South Carolina and along the west coast of Florida. In variance with this statement he gives a breeding record for the species on the east coast of Florida: “Mantanzas Inlet, May 24”. Chapman writes me that this record, however, cannot now be traced. He further states that the Atlantic Coast species will have to be referred to *griseus*, which opinion I had already put in writing before receiving his letter.

Under date of June 30, 1931, I received a letter from Mr. A. H. Howell, in which he says:

“There is considerable doubt regarding the Atlantic Coast records of *marianae*, and quite likely these birds may prove to be a distinct race”.

Following this came a letter from Dr. Chapman, under date of July 13, 1931, in which he says:

“In my letter of July 6th, the range of *marianae* was given from galley proofs of the forthcoming A. O. U. Check-List. On July 11th I received page proofs of this book, and therein the ranges of *griseus* and *marianae* are given below:

“*griseus*: Lower Austral Zone in the South Atlantic coast region from South Carolina to northern Florida.

“*marianae*: Gulf Coast from Charlotte Harbor, Florida, to Mississippi.

This seems to be a more logical distribution”.

In other words, the range of these two wrens as given in the forthcoming Check-List compares very well with the range which we have worked out after a careful analysis of available records and correspondence with local observers. It will be noted that records for the east coast of Florida do not materialize in the case of *marianae*.

Charlotte Harbor lies in Charlotte and Lee Counties, Florida, a little north of the Caloosahatchee River region, already treated in the text.
### Table I

Range of Marian's Marsh Wren in Florida and Alabama.

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<th>Season</th>
<th>Observer</th>
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<td>Winter</td>
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<td>Winter</td>
<td>Howell</td>
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<td>Howell</td>
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<td>Wheeler</td>
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<td>Marshes Fowl River</td>
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<td>West Coast, Fla.</td>
<td>Permanent</td>
<td>Bangs</td>
</tr>
<tr>
<td>Punta Gordo</td>
<td>Charlotte Co., Fla.</td>
<td>Breeding?</td>
<td>Pennock</td>
</tr>
</tbody>
</table>
The statements found in Bailey’s “Birds of Florida” (p. 139) add nothing to our findings, and therefore can be neglected; similarly those in Pearson and Brimley’s “Birds of North Carolina”, since they apply either to griseus or to a new species.8

SUMMARY

With such meager records in hand it is presumptious to go farther than to suggest that the birds of the Atlantic Coast which have been reported under the name of marianae are a new species, differing from griseus sufficiently to make identification comparatively easy.

The territory of the two birds as far as breeding is concerned seems to be distinct, the range of griseus being South Carolina to Florida (east coast), that of the supposed marianae being North Carolina. Marianae, however, migrates to South Carolina in winter.

Marian’s Marsh Wren is distinctly a salt-water species, for with the exception of Scott’s record of 1890, it has never been reported on any fresh-water marshes. Even in this case the fresh-water marshes were not far from salt water.

Marian’s Marsh Wren is a coastal species, being unknown in the interior, even as a migrant. It has never been reported farther inland than ten miles, and that by Scott, as given above.

The range of Marian’s Marsh Wren is the Gulf Coast of Florida and Alabama.

Marian’s Marsh Wren is apparently a permanent resident in most of the situations in which it has been found. This applies particularly to the extensive salt marshes in Alabama, such as are found in upper Mobile Bay; and to salt marshes of the Florida west coast, the center of which is the type locality of Tarpon Springs.

There are several localities along the west coast of Florida which Marian’s Marsh Wren visits in winter. Pensacola and the Caloosahatchee River region in Lee County having been reported specifically.

The nesting habits of Marian’s Marsh Wren do not differ from those of the Long-billed Marsh Wren as regards the nest and the size and number of eggs.

Marian’s Marsh Wren usually chooses a situation in all respects similar to that preferred by other marsh wrens. It is the only marsh

8A letter from Mr. Brimley, under date of July 11, states that the only record for Marian’s Marsh Wren that has been made since 1919 is a bird taken on July 17, 1929, at Beaufort, N. C. At this writing, Howell’s “Florida Bird Life” is in press, and doubtless will add information based on his personal observations in that state.
wren, however, that resorts occasionally to trees, building in mangroves above the muddy marshes on the very margin of the open Gulf.

The nesting season of Marion’s Marsh Wren extends from the middle of May well into July. It is not known whether more than one brood is raised.

Marian’s Marsh Wren is so retiring in habit that it may be easily overlooked, especially in winter; but it is very confiding during the nesting season, the colony being readily located by the distinctive song of the male.

Marian’s Marsh Wren, which presents so many interesting characteristics and problems, is confined to Alabama and Florida. It has never been reported from either Mississippi or Louisiana. It deserves protection throughout its range, especially from fires, which deprive it of indispensible shelter. While locally the birds are not rare, taken in all, the species must be considered as one of the rarest of the southern song birds.

The author acknowledges his obligations to many writers and correspondents mentioned in the text, and especially to Dr. R. M. Harper of the Florida Geological Survey, for critical examination of the text, and to Mrs. Emily Willcoxson, assistant librarian of the Field Museum, for aid in searching the literature.

BIBLIOGRAPHY


Since this was written Donald J. Nicholson reports finding a Worthington’s Marsh Wren’s nest on the east coast of Florida situated in a small mangrove bush.


1903. Twelfth supplement to the American Ornithologists’ Union Check-List of North American birds. *Auk*, Vol. 20, pp. 331-368 (p. 357). This changes the name to *Telmatodytes marianae*.


BIRMINGHAM, ALA.
THE AMERICAN EGRET AND THE LITTLE BLUE HERON IN OHIO DURING THE SUMMER OF 1930

BY LAWRENCE E. HICKS

Dr. J. M. Wheaton in his "Report on the Birds of Ohio", published in 1879, mentioned the American Egret (Casmerodius albus egretta) as a rather common visitor in July, August, and September, believing that the species might even breed in western Ohio. The Snowy Egret (Egretta thula thula) was listed as being very rare or accidental and the Little Blue Heron (Florida caerulea) was suspected of occurring, though never positively identified up to that time, probably being commonly confused with the Snowy Egret.

Mr. Julius F. Stone, of Columbus, reports having observed numerous "white herons" upon several occasions one summer in the late "eighties" at the Lewiston Reservoir (Indian Lake), in Logan County.

From about 1885 to 1905, the continued depredations of plume hunters in the heronries of southern United States, gradually reduced the numbers of our several species of herons until many were approaching the point of extinction. Of the three species mentioned above, probably the Little Blue Heron suffered the least, as neither the white nor the blue plumage of the species was ever in great demand. This reduction in numbers at the breeding grounds seems to have also greatly reduced the number of records obtained in our northern states during the post-nidification migrations and wanderings of late summer.

William Leon Dawson in his "Birds of Ohio", published in 1903, lists the Snowy Egret as a rare and irregular summer visitor, the American Egret as "formerly not an uncommon summer visitor, now very rare", and the Little Blue Heron as "formerly unknown, recently discovered to be not uncommon in late summer in the lower Scioto Valley and represented casually throughout the state". Henninger reported and collected Little Blue Herons in Pike County in August, 1901, and J. N. Proctor observed a number of the same species in Butler County in July, August, and September of the same year, collecting one specimen. Most of these birds were in the white plumage.

Lynds Jones in his "Revised Catalog of the Birds of Ohio", also published in 1903, lists the American Egret as rare in summer, mentioning records from several scattered northern Ohio counties, the Little Blue Heron as rather rare and irregular, and the Snowy Egret as rare and irregular, mentioning several records from scattered northern Ohio counties, many of which probably actually referred to Little Blue Herons.
American Egret and Little Blue Heron in Ohio

A few scattered records of Little Blue Herons and American Egrets were reported from various sections of the state from 1905 to 1920, but both species during that period were regarded as rather rare and very irregular in occurrence.

Robert B. Gordon, in an article in "Short Papers on Ohio Birds", an Ohio State Museum publication of April, 1928, summarizes the

![Fig. 52. The 1930 Records of the American Egret in Ohio. Little Blue Heron and the American Egret records in Ohio for the preceding five years. In 1924, no less than 26 Little Blue Herons (19 reports) and 3 American Egrets (9 reports) were recorded. The year 1925 was dry with drought conditions prevalent in many areas in eastern United States and 6 Little Blue Herons (6 reports) and 14 American Egrets (19 reports) were tabulated. In 1926 only one Little Blue Heron was reported, but American Egrets were seen in at least four widely separated localities.](image-url)
No records were obtained in 1927 and only a few scattered reports, including both species, however, in 1928. Of more than 35 Little Blue Herons recorded during these years, all but 6 or 7 were in the white plumage. In 1929 both species were recorded again, including one American Egret observed by the writer in the extreme northeastern part of Ohio at Lake Cardinal in Ashtabula County on July 21, and a number of the same species observed by others at the O'Shaughnessy Reservoir in Delaware County and in the Toledo region.

Lewis W. Campbell in his check list of "The Birds of Toledo, Ohio, and Vicinity" (1930), lists both the American Egret and the Little Blue Heron as rare summer visitors.

During the past 1930 season, a combination of continued unusual conditions was apparently responsible for the influx of American Egrets and Little Blue Herons into the state in numbers far in excess of those that have ever occurred since the dawn of ornithological studies in our state.

The snowy Egret and the Yellow-crowned Night Heron occurred in at least one locality each, bringing the total number of the bittern and heron tribe represented in Ohio during the year 1930 to at least nine species.

During June, July, August, September, and October, the writer was fortunate enough to be able to spend the entire time afield, some field work being done in each one of the eighty-eight counties of the state. During that time, at least one person and in many cases five or more individuals were interviewed in each county concerning the occurrence of "white herons". In addition reports were received from each one of the eighty-one Ohio Division of Conservation game protectors of the state. About 180 questionnaire letters were mailed to field workers of various types who might furnish records and an especial attempt was made to reach every Wilson Club member in the state.

Mr. Milton B. Trautman, of Columbus, was engaged in making some aquatic studies during these months, visiting nearly every county of the state, and especially those localities most likely to be frequented by these birds; to him I wish to express my sincere appreciation for the numerous records furnished. I wish to thank Robert H. McCormick, who assisted me in my own work during the summer; E. L. Moseley, of Bowling Green; Lewis W. Campbell, of Toledo; Jim A. Bruce, of Wooster; and many others, who in addition to furnishing records of their own, aided in the work by compiling records of other observers from their own localities. Without this combined coöperation of several hundred bird enthusiasts from all sections of the state,
the task of attempting to compile even a very incomplete record of heron occurrences would have been impossible.

The two distribution maps following indicate the localities of the state from which what seemed to be authentic records of either the Little Blue Heron or the American Egret were received. Many of the circles represent several groups of "white herons" reported from ad-

Fig. 53. The 1930 Records of the Little Blue Heron in Ohio.

jacent localities or groups of herons which were repeatedly observed for a period of from one to three months in a single locality.

The distribution maps are followed by a list of the records for each county, with locality, number of each species observed, date of observation, and the name of the observer or observers. Listing records by counties was found to be not entirely satisfactory, as several concentrations of these birds occurred near county line boundaries. It is also regrettable that it was not found possible to give a complete
list of all of the records received. In four instances, however, a num-
ber of records have been listed from a single locality to show the
abundance and fluctuations in numbers of the two species as the sum-
mer progressed. These are the Buckeye Lake records in Licking, Fair-
field, and Perry Counties, the Wayne County records in swampy areas
south of Wooster, the Scioto River records in Delaware County, and
the Maumee River records in Lucas and Wood Counties.

A survey of the records shows that the American Egrets were re-
corded in 45 of the 88 counties of the state, with about 110 localities
represented. Little Blue Herons were recorded from at least 40 counties
and about 95 localities. Not a single bird of this species in the blue
adult plumage was reported. At least one of the two species was re-
ported from 54 of our Ohio counties and a number of the localities
reporting either Little Blue Herons or American Egrets or both, totals
about 115. In all, however, more than 410 reports were received.

In addition to these species, an immature Snowy Egret (Egretta
candidissima) was collected by Milton B. Trautman at Buckeye Lake
on August 27, 1930. Twelve American Egrets and twenty Little Blue
Herons were present at the lake on the same day. The specimen is
now to be found at the Ohio State Museum in Columbus. Two Yellow-
crowned Night Herons were positively identified by Mr. Trautman at
Indian Lake in Logan County on September 1, 1930, and the presence
of this species was suspected, though not positively established in sev-
eral other localities of the state. The Snowy Egret also probably
occurred elsewhere in the state, but in the immature plumage espe-
cially, would have been very difficult to single out from the numerous
Little Blue Herons in white plumage.

The first American Egret record of the year was of two indi-
guals observed by the writer at Venice on Lake Erie in Erie County
on July 17. A railroad employee who had been working for some
time along the edge of the marsh where the herons were feeding, told
me that the birds had been present three days. The next records were
Reno, Ottawa County, and Bono, Lucas County, on July 20; St. Marys,
Mercer County, on July 21; Buckeye Lake, Licking County, and
Wooster, Wayne County, on July 25; O'Shaughnessy Reservoir, Dela-
ware County, and Upper Sandusky, Wyandot County, on July 27; and
Napoleon, Henry County, Millersburg, Holmes County, and Frederick-
town, Knox County, on July 28. This appearance of the species in
numbers in so many widely separated localities within ten days of the
first known occurrence, is rather significant.
The last American Egret reported for the season was a single bird at Buckeye Lake observed by M. B. Trautman on October 14. Another single bird was observed at the lake on October 6, and two individuals on the same date at O'Shaughnessy Reservoir, Delaware County. Other last dates were Toledo, Lucas County, September 20; New Moorfield, Clark County, September 21; and Wooster, Wayne County, September 1.

The species, then, is known to have been present in the state from July 17 to October 14, a total of ninety days; rather general from July 25 to September 20, reaching its height in numbers between August 8 and September 1.

The first Little Blue Heron record of the year was of two individuals observed by Robert H. McCormick and the writer at O'Shaughnessy Reservoir, Delaware County, on July 19. The next records were at Reno, Ottawa County, Bono, Lucas County, Englewood Dam, Montgomery County, and Ohio Brush Creek, Adams County, on July 20; Xenia, Greene County, on July 21; Tuscarawas River, Coshocton County, on July 23; Antwerp, Paulding County, Indian Creek, Butler County, and Wooster, Wayne County, on July 28. Here again, the species occurred in widely separated localities and in considerable numbers within ten days after its first occurrence.

The last Little Blue Herons reported for 1930, were two individuals observed by Gus Stucker at New Moorfield, Clark County, on September 21. Other last dates were Buckeye Lake on September 23; Little Cedar Point Marsh, Lucas County, on August 24; and Olen-tangey River, Delaware County, on August 30. Previous extreme dates of the Little Blue Heron recorded in the Wheaton Club records of Columbus were July 24, 1926, and September 18, 1924; and of the American Egret, July 24, 1926, and September 24, 1924.

The Little Blue Heron, then, is known to have been present in the state from July 19, 1930, to September 24, 1930, a total of sixty-eight days; rather general from July 23 to September 10, reaching its height in numbers between July 27 and August 28. The Little Blue Heron made its appearance at practically the same time as the American Egret, but became numerous much more quickly, was common for about a month, and disappeared about three weeks before its larger relative.

The total number of individuals of each species included in the 410 reports received is, American Egret 755 and Little Blue Heron 1185. This would seem to indicate that in the state as a whole, three
<table>
<thead>
<tr>
<th>County</th>
<th>Location</th>
<th>American Egrets</th>
<th>Little Blue Herons</th>
<th>Date</th>
<th>Observed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Adams</td>
<td>Ohio Brush Creek</td>
<td>0</td>
<td>12</td>
<td>7-20-30</td>
<td>O. K. Loudenback, W. Union</td>
</tr>
<tr>
<td>2. Athens</td>
<td>4 miles northwest Athens</td>
<td>1</td>
<td>1</td>
<td>9-10-30</td>
<td>J. C. Hambleton, Columbus</td>
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<tr>
<td>3. Auglaize</td>
<td>St. Marys Res.</td>
<td>3</td>
<td>3</td>
<td>8-30-30</td>
<td>M. B. Trautman, Columbus</td>
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<tr>
<td>4. Brown</td>
<td>White Oak Creek 2 mi. south Georgetown</td>
<td>1</td>
<td>12</td>
<td>8-14-30</td>
<td>J. R. Srofe, Georgetown</td>
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<td></td>
<td>Eagle Creek</td>
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<td>2</td>
<td>8-18-30</td>
<td>J. R. Srofe, Georgetown</td>
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<td></td>
<td>Straight Creek</td>
<td>2</td>
<td>3</td>
<td>8-24-30</td>
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</tr>
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<td>White Oak Creek</td>
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<td>1</td>
<td>8-16-30</td>
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<td></td>
<td>Fayetteville</td>
<td>1</td>
<td>0</td>
<td>8-17-30</td>
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<td>5. Butler</td>
<td>Four Mile Creek</td>
<td>0</td>
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<td>J. E. Beaver, Hamilton</td>
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<td></td>
<td>Miami R.—Hamilton</td>
<td>0</td>
<td>10</td>
<td>9-4-30</td>
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<td></td>
<td>Indian Creek</td>
<td>0</td>
<td>26</td>
<td>7-25 to 9-5</td>
<td>J. E. Beaver, Hamilton</td>
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<td>6. Champaign</td>
<td>Near Woodstock</td>
<td>4</td>
<td>0</td>
<td>8-17-30</td>
<td>C. W. Cushman, Woodstock</td>
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<tr>
<td></td>
<td>1 mile east Urbana</td>
<td>1</td>
<td>0</td>
<td>8-15-30</td>
<td>Earl Zirkle, Urbana</td>
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<td>8. Clark</td>
<td>Buck Creek, near New Moorfield</td>
<td>1</td>
<td>1</td>
<td>9-1-30</td>
<td>Gus Stucker, Springfield</td>
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<td></td>
<td></td>
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<td>0</td>
<td>9-2-30</td>
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<td>9. Clermont</td>
<td>Little Miami R. at Milford</td>
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<td>12</td>
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<td>Frank Stagg, Batavia</td>
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<td></td>
<td>Williamsburg</td>
<td>2</td>
<td>11</td>
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<td>4</td>
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<td>River at Milford</td>
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<td>0</td>
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<tr>
<td>10. Columbiana</td>
<td>Beaver Lake</td>
<td>1</td>
<td>0</td>
<td>9-7-30</td>
<td>Paul A. Stewart, Wooster</td>
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<td>11. Coshocton</td>
<td>Killbuck Creek, north of Coshocton</td>
<td>0</td>
<td>4</td>
<td>7-25 to 8-28</td>
<td>P. Johnson, Coshocton</td>
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<td></td>
<td>Tuscarawas River, east of Coshocton</td>
<td>0</td>
<td>4</td>
<td>7-23 to 8-26</td>
<td>P. Johnson, Coshocton</td>
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<tr>
<td>County</td>
<td>Location</td>
<td>American Egrets</td>
<td>Little Blue Herons</td>
<td>Date</td>
<td>Observed by</td>
</tr>
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<td>12. Delaware</td>
<td>O'Shaughnessy Res.</td>
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<td>6</td>
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<td>O. H. Neimeyer, Prospect</td>
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<td>Warrensburg</td>
<td>2</td>
<td>3</td>
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<td>13. Erie</td>
<td>Venice on Lake Erie</td>
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<td>Sandusky</td>
<td>1</td>
<td>0</td>
<td>8-19-30</td>
<td>H. Crossley, Sandusky</td>
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<td>14. Fairfield</td>
<td>Buckeye Lake</td>
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<td>21</td>
<td>7-31-30</td>
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<td>Rush Creek—Rushville</td>
<td>12</td>
<td>12</td>
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<td>C. F. Walker Columbus</td>
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<td>15. Fayette</td>
<td>Madison Township</td>
<td>4</td>
<td>7</td>
<td>8-17-30</td>
<td>M. B. Trautman, Columbus</td>
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<td>16. Gallia</td>
<td>Lower Raccoon Creek</td>
<td>3</td>
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<td>J. Harrison, Gallipolis</td>
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<td>17. Greene</td>
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<td>4</td>
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<td>E. Harner, Xenia</td>
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<td>17</td>
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<td>0</td>
<td>9-14-30</td>
<td>E. S.-B. J. Blincoe, Dayton</td>
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<td>6 miles northeast Xenia</td>
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<td>0</td>
<td>9-10-30</td>
<td>J. C. Hambleton, Columbus</td>
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<td>18. Hamilton</td>
<td>Lower Whitewater River</td>
<td>0</td>
<td>7</td>
<td>8-1-30</td>
<td>D. M. Bowersox, Cincinnati</td>
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<td></td>
<td>Mouth Big Miami River</td>
<td>10</td>
<td>0</td>
<td>8-17-30</td>
<td>D. M. Bowersox, Cincinnati</td>
</tr>
<tr>
<td>19. Henry</td>
<td>6 miles south Napoleon</td>
<td>1</td>
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<td>Date</td>
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<td>Date</td>
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<td>Date</td>
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<td>Little Blue Herons</td>
<td>Date</td>
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<td></td>
<td>Grand Rapids</td>
<td>1</td>
<td>0</td>
<td>8-24-30</td>
<td>Mrs. A. Jenkins</td>
</tr>
<tr>
<td></td>
<td>Otsego, Maumee River</td>
<td>4</td>
<td>0</td>
<td>8-11-30</td>
<td>G. Grames</td>
</tr>
<tr>
<td></td>
<td>Otsego, Maumee River</td>
<td>1</td>
<td>15</td>
<td>8-13-30</td>
<td>E. L. Moseley, B. Green</td>
</tr>
<tr>
<td></td>
<td>Montgomery Township</td>
<td>1</td>
<td>2</td>
<td>8-30-30</td>
<td>M. B. Trautman, Columbus</td>
</tr>
<tr>
<td></td>
<td>Otsego</td>
<td>2</td>
<td>0</td>
<td>8-30-30</td>
<td>M. B. Trautman, Columbus</td>
</tr>
<tr>
<td></td>
<td>Maumee Rapids</td>
<td>4</td>
<td>3</td>
<td>7-28-30</td>
<td>G. Grames</td>
</tr>
<tr>
<td></td>
<td>Otsego</td>
<td>0</td>
<td>1</td>
<td>8-9-30</td>
<td>E. L. Moseley, B. Green</td>
</tr>
<tr>
<td></td>
<td>Otsego</td>
<td>0</td>
<td>47</td>
<td>8-12-30</td>
<td>A. Daniels</td>
</tr>
<tr>
<td></td>
<td>Otsego</td>
<td>0</td>
<td>50</td>
<td>8-14-30</td>
<td>R. Conant</td>
</tr>
<tr>
<td></td>
<td>Waterville</td>
<td>0</td>
<td>15</td>
<td>8-6-30</td>
<td>W. Daniels</td>
</tr>
<tr>
<td></td>
<td>Otsego</td>
<td>0</td>
<td>15</td>
<td>8-31-30</td>
<td>E. L. Moseley, B. Green</td>
</tr>
<tr>
<td></td>
<td>Grand Rapids</td>
<td>4</td>
<td>0</td>
<td>8-19-30</td>
<td>G. Grames</td>
</tr>
<tr>
<td></td>
<td>Otsego</td>
<td>2</td>
<td>12</td>
<td>8-27-30</td>
<td>M. B. Trautman, Columbus</td>
</tr>
<tr>
<td>54. Wyandot</td>
<td>5 miles east U. Sandusky</td>
<td>1</td>
<td>0</td>
<td>7-27-30</td>
<td>M. B. Trautman, Columbus</td>
</tr>
</tbody>
</table>
American Egrets were present for every five Little Blue Herons. Of course, many of these birds were perhaps counted two or more times in the same locality or counted by different observers as they moved from one locality to another. In making estimates of the total number of any species present, we have no way of making allowances for repeated counts.

On the other hand, it seems certain that usually only a part of the individuals present in any locality on a certain day could be enumerated by observers, however well planned an attempt may have been to take a complete count in a given area. Also, in spite of the combined efforts of several hundred observers, the localities listed undoubtedly represent a minority percentage of the total number of localities in which the species did occur, although unusual drouth conditions did surprisingly limit the possible situations where birds might be found, and tend to concentrate our “white heron” population on a relatively small number of isolated tracts. The conspicuousness of the birds in question and the excitement and interest which their appearance always aroused, did materially aid in bringing occurrences to the attention of parties interested in reporting records.

Any attempt to estimate the total number of individuals of each species which spent some portion of the summer of 1930 within the state of Ohio, would be a rather wild speculation in spite of considerable data on the basis of which such an estimate might be made. Any estimate, however, can hardly be proven erroneous, so one might be pardoned for venturing that perhaps 3,000 American Egrets and 5,000 Little Blue Herons did occur at some time during the summer of 1930 in the Buckeye State. The combined number of both species certainly must have exceeded 3,000 individuals and could hardly have been in excess of 15,000.

This estimate is considerably lower than that made for Indiana by Mr. Sidney R. Esten, field worker on birds for the Indiana Department of Conservation. Indiana has a considerably greater number of habitats attractive to summering “white herons” than Ohio, and numerous letters were received from many localities of that state reporting herons in flocks of 50 to 600. Mr. Esten believes that the total number of both species in Indiana in 1930 must have been considerably in excess of 25,000.

A glance at the distribution maps shows that about three-fourths of all records received were from the western half of Ohio. Concentrations occurred at all of the larger reservoirs of the state, at the western end of Lake Erie, and along the Scioto and Miami River Val-
American Egret and Little Blue Heron in Ohio

leys. Many of the smaller tributaries of the Ohio River in the southwestern part of the state were attractive to herons. Both species were scarcely reported from the eastern, rough, Appalachian third of the state except in the valleys of some of the larger streams such as those of the Hoeking, Muskingum, and Tuscarawas Rivers.

During the months of July, August, and September, the water table in most sections was undoubtedly lower than it had ever been since the coming of the first white man to Ohio. Hundreds of small lakes, ponds, swamps, marshes, and fairly large streams, became completely dry early in the summer. This fact was important in concentrating the heron population about the few remaining bodies of stagnant water and along the larger streams and rivers, making their numbers more conspicuous than ever before.

Similar conditions prevailing in most of the normal late summer range of most of these birds in southern United States, induced them, after the nesting season, to travel farther northward in greater numbers than ever before. Another factor undoubtedly important in explaining their recent abundance, is that there has recently been a rapid increase in the total population of these species in the gulf states, in part at least, due to increased protection at the breeding grounds. Another factor, perhaps still more important, was the abundance of food made readily available to herons by the retreating waters of pond and stream as the unusual drought progressed, making it possible for large numbers of birds to concentrate in a restricted locality for a considerable time. It will be of extreme interest to make a further study of the occurrence of these birds during the coming year and to record whether any considerable number return to those localities first visited during the summer of 1930.

Ohio Division of Conservation.
Columbus, Ohio.
THE EFFECT OF POLE TRAPS ON HARMLESS AND BENEFICIAL SPECIES*

BY H. M. WIGHT

An investigation of Michigan's privately owned State game refuge system was made by the writer in 1928, as a coöperative project between the School of Forestry and Conservation, University of Michigan, and the State Department of Conservation.

This investigation considered among many other factors the different types of management that were in use upon the 118 refuges studied. It was found that the opinion prevailed that the most important factor in management was the control of predatory animals. One of the common methods of destroying hawks and owls is by means of the pole trap, and although such traps were not in excessive use at the time, they appeared to be increasing in popularity. Those who were practicing this type of control apparently had given but little thought to the possibility that beneficial or innocent species might be trapped accidentally and, as far as could be ascertained, no reliable information on this question was available in the state. Data concerning this and other information pertaining to pole traps were collected by means of direct experimentation and by distributing questionnaires among users of pole traps. On these questionnaires the trappers were asked to record information from which the ratio of the injurious animals to the beneficial or innocent species taken could be determined. Unfortunately this latter method yielded but little information. One man who had used pole traps for several years, discarded them after keeping trapping records for a few days, for song birds and squirrels were the only animals taken. Obviously because of previous failure to keep records he had not realized the preponderance of beneficial or neutral forms of life that were trapped. Most of the others apparently either failed to keep the records or neglected to send in their results and little definite information was obtained from the questionnaires. An actual test made in the field under personal supervision, however, yielded better results.

This test was made between the 10th and 23rd of April, 1928, a period of the year that appeared to be well suited to a test of this sort. While the period covered was so short that the results cannot

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*Contribution No. 16 from the School of Forestry and Conservation, University of Michigan.
be regarded as conclusive, they are nevertheless suggestive and are unquestionably reliable so far as they go. The data obtained are therefore presented for the information of those interested and in the hope that they may stimulate some pole trappers to keep records that will serve as a basis for drawing generally applicable conclusions.

A section of land was chosen which included diversified agricultural area, an excellent tamarack bog and swamp, three sedge and wild grass marshes, and six woodlots well stocked with old growth hardwood timber. A good sized spruce and tamarack swamp and several lakes were situated in the immediate vicinity. A reconnaissance of the area clearly showed it to be typical of the better class of Michigan's privately owned state game refuges and demonstrated its suitability for the trapping experiment. The woodlots provided nesting sites for numerous crows and hawks and the location of one red-shoulder's nest and several crows' nests was determined. Both the swamp and the sedge-grass marshes harbored an abundance of mice and provided cover for both pheasants and quail. Ruffed Grouse found food and shelter in the tamarack swamp and the adjoining hardwoods. The area was constantly hunted by Marsh Hawks, a pair of which was known to nest in one of the sedge-grass marshes. Three old strawstacks and three isolated storage barns provided shelter and food for a heavy mouse population. In short, conditions were ideal for hawks and owls.

That these birds were present was proved by a preliminary survey which showed the following species of predatory birds to be within or in the immediate vicinity of the area: The Red-shouldered Hawk, Sharp-shinned Hawk, Marsh Hawk, Broad-winged Hawk, Cooper's Hawk, Red-tailed Hawk, and the Barred Owl, while there were reliable reports of Great Horned Owls and numerous Screech Owls in the nearby timber, and several of the latter were trapped.

The experiment was outlined to obtain definite information on the ratio of the various species captured in pole traps and to determine the effect on efficiency of the size of trap, the length and diameter of the pole, the nature of the sets, and the bait used.

Four dozen jump traps, including numbers 0, 1, and 2, were used in seventeen different batteries with from one to five traps set in a cluster. The site of each set was definitely chosen for specific reasons. For instance, the location of Set No. 1 was chosen for its slightly ele-
vated position, the cover provided by a few trees, its proximity to a
marsh, a heavy population of Microtus and cottontails, an abundance
of blackbirds, and also because other birds were observed to be com-
mon here. As Sharp-shinned Hawks had been observed in this locality,
this set was made especially with the hope of catching these birds.
This cluster of traps yielded Robins, blackbirds, and Red-shouldered
Hawks instead of the Sharp-shinned Hawks which were expected.

Set No. VI was located close to the carcasses of a horse and a
sheep, which were being eaten by Turkey Vultures and Crows. This
set yielded a Crow, a Red-shouldered Hawk, a Sharp-shinned Hawk
and a Robin. That there frequently occurred a general relationship
between the choice of the locality for expected species and those
captured, is demonstrated by Set No. VII which consisted of a battery of
three traps placed within the marsh and along its margins, where both
pheasant and quail were common. An examination of the margins of
this marsh demonstrated a concentrated mouse population. The catch
here consisted of a Marsh Hawk, two Screech Owls, and a Meadowlark.
Meadowlarks and Marsh Hawks have been observed repeatedly in this
vicinity and the concentrated mouse population here provided excellent
feeding grounds for the owls and the hawks.

The traps were placed on top of the poles by means of small
blocks of wood provided with headless nails. When a trap closed it
readily became loosened from the block and fell off, leaving the ani-
mal suspended by the trap chain in some instances, while in others
the chain was looped about the pole allowing the traps to slide to
the ground. Poles from three to twenty feet in length were used.
These varied from two inches to six inches in diameter.

Some sets were not baited: others, as already mentioned, were
baited by carcasses of animals, while living White Leghorn roosters
were used as decoys in the majority of cases. One set used a live
Barred Owl as a decoy. This set successfully decoyed and caught the
second Barred Owl during the first night. The roosters were either
retained in cages with wire or slat tops, or were tethered out by the
leg, while one was turned loose and was successfully kept near the
traps by daily feeding and watering at the base of the poles. The
traps were visited early each morning and were observed frequently
throughout the day, to alleviate unnecessary suffering.
Forty-eight pole traps were kept in constant operation from six to thirteen days with a total of 548 pole trap days. Twenty-nine animals were trapped during the period or approximately one catch per nineteen trap days. The animals taken consisted of the following:

**Hawks**

- Red Shouldered Hawk: 6
- Marsh Hawk: 1
- Broad-winged Hawk: 1
- Sharp-shinned Hawk: 1

Total: 9

**Owls**

- Screech Owl: 3
- Barred Owl: 4

Total: 7

**Crow**: 1

**Song Birds**

- Robin: 2
- Blackbird: 2
- Meadowlark: 2
- Vesper Sparrow: 2
- Hermit Thrush: 1
- Song Sparrow: 1

Total: 10

**Mammals**

- Fox Squirrel: 2

Grand Total: 29

A stomach examination of each owl, hawk, and crow gave the following results:
Predatory Birds Pole Trapped Between April 11 and April 23, 1928, on or Near Mason Farm, Washtenaw County, Northfield and Webster Townships

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Trap No.</th>
<th>Species</th>
<th>Stomach Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1</td>
<td>Red-shouldered Hawk</td>
<td>1 field mouse</td>
</tr>
<tr>
<td>I</td>
<td>2</td>
<td>Red-shouldered Hawk</td>
<td>1 field mouse</td>
</tr>
<tr>
<td>I</td>
<td>4</td>
<td>Red-shouldered Hawk</td>
<td>1 shrew and 2 field mice</td>
</tr>
<tr>
<td>IV</td>
<td>3</td>
<td>Red-shouldered Hawk</td>
<td>Few feathers, mouse hair, parts of beetle, and vegetation</td>
</tr>
<tr>
<td>VI</td>
<td>3</td>
<td>Red-shouldered Hawk</td>
<td>1 field mouse</td>
</tr>
<tr>
<td>XVI</td>
<td>3</td>
<td>Red-shouldered Hawk</td>
<td>Trace of mouse hair</td>
</tr>
<tr>
<td>VI</td>
<td>4</td>
<td>Sharp-shinned Hawk</td>
<td>Feathers—small seed eating bird. (Seeds obtained)</td>
</tr>
<tr>
<td>VII</td>
<td>4</td>
<td>Marsh Hawk</td>
<td>3 field mice</td>
</tr>
<tr>
<td>II</td>
<td>1</td>
<td>Barred Owl</td>
<td>Stomach empty (owl kept as decoy)</td>
</tr>
<tr>
<td>II</td>
<td>1</td>
<td>Barred Owl</td>
<td>Stomach empty (owl kept as decoy)</td>
</tr>
<tr>
<td>V</td>
<td>2</td>
<td>Barred Owl</td>
<td>Stomach empty</td>
</tr>
<tr>
<td>VIII</td>
<td>1</td>
<td>Barred Owl</td>
<td>Stomach empty</td>
</tr>
<tr>
<td>VII</td>
<td>3</td>
<td>Screech Owl</td>
<td>2 white-footed mice</td>
</tr>
<tr>
<td>VII</td>
<td>3</td>
<td>Screech Owl</td>
<td>Mouse hair and feathers</td>
</tr>
<tr>
<td>XVI</td>
<td>3</td>
<td>Screech Owl</td>
<td>Mouse hair and parts of a beetle</td>
</tr>
<tr>
<td>VI</td>
<td>1</td>
<td>Crow</td>
<td>Pieces of tissue, presumably from dead horse nearby</td>
</tr>
</tbody>
</table>

An examination of the legal status of the twenty-nine animals listed reveals that ten, or nearly 34.5 per cent, were protected by the State laws of Michigan, and that twenty-seven, or over 93 per cent, are protected by the laws of several other states.

The examination of the stomach content demonstrated that only three of the predators trapped had fed upon birds and two of these had also fed upon mice. Obviously the amount of data collected in the course of this experiment was not sufficient to serve as a basis for the economic classification of the species caught, therefore Fisher’s classification of the economic status of predatory birds as given in “Hawks and Owls of the United States in Their Relation to Agriculture” has been adopted as a basis for classifying the birds captured into harmful and beneficial groups. Fisher’s classification is based upon the most complete investigation of the subject produced to date. Upon this basis 93.75 per cent of the predatory birds taken in this in-
Effect of Pole Traps on Harmless Birds

Investigation between April 11 and April 23, 1928, are chiefly beneficial, and only 6.25 per cent are positively harmful. In addition to these predatory birds, ten song birds, one Crow and two fox squirrels were taken.

It was thought that by the use of large traps the number of song birds taken would be decreased. This did not, however, prove to be the case.

The trap size, the number of each set and the catch for each type is as follows:

<table>
<thead>
<tr>
<th>Size</th>
<th>Number Set</th>
<th>Large Birds</th>
<th>Small Birds</th>
<th>Squirrels</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 0</td>
<td>14</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>No. 1</td>
<td>17</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>No. 2</td>
<td>17</td>
<td>8</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>

From this it appears that larger traps may take a higher percentage of both large and small birds. A selective tendency on the part of the birds may possibly be expected on the basis of sight.

The forty-eight traps set at varying heights gave the following results:

<table>
<thead>
<tr>
<th>Height 6-6'</th>
<th>Catch per Trap Day</th>
<th>Height 7-10'</th>
<th>Catch per Trap Day</th>
<th>Height 11-20'</th>
<th>Catch per Trap Day</th>
<th>Total Trap Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of traps</td>
<td>26</td>
<td>10</td>
<td>12</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trap days</td>
<td>302</td>
<td>115</td>
<td>131</td>
<td>548</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large birds taken</td>
<td>7</td>
<td>.023</td>
<td>2</td>
<td>.017</td>
<td>4</td>
<td>.03</td>
</tr>
<tr>
<td>Small birds taken</td>
<td>7</td>
<td>.023</td>
<td>4</td>
<td>.034</td>
<td>3</td>
<td>.022</td>
</tr>
<tr>
<td>Mammals taken</td>
<td>2</td>
<td>.006</td>
<td>0</td>
<td>.0</td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td>Total for class</td>
<td>16</td>
<td>.052</td>
<td>6</td>
<td>.052</td>
<td>7</td>
<td>.053</td>
</tr>
</tbody>
</table>

The height of the poles did not prove to be an important factor in the determination of either the number or species taken, except that both of the squirrels were taken on short poles. Neither did the diameter of the pole appear to have any differential effect upon the number or species taken.

If the average pole trap catches as large a proportion of harmless or beneficial birds as were captured in this experiment, its use should either be safeguarded or discontinued. One other method of reducing the objectionable slaughter of innocent birds by pole traps has been suggested; namely, the use of a trap that cannot be set off by a light bird. Any trap can be equipped to provide this safeguard. But even so the problem is by no means solved, for the Sharp-shinned Hawk, one of the most injurious species, might be given the same protection by such devices as is provided the larger song birds, while the beneficial and more readily trapped larger species will be taken together with the Cooper's Hawk, Goshawk, and the Great Horned Owl.
## Field Data Table

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Trap No.</th>
<th>Days in Operation</th>
<th>Trap Size</th>
<th>Bait</th>
<th>Pole Diameter at Top</th>
<th>Species Taken</th>
<th>How Caught</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1</td>
<td>13</td>
<td>2</td>
<td>White rooster in crate—slat top</td>
<td>3 in.</td>
<td>R. S. Hawk</td>
<td>Both legs broken</td>
<td>4-11 P. M.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>13</td>
<td>1</td>
<td>White rooster in crate—slat top</td>
<td>4 in.</td>
<td>Blackbird</td>
<td>Both legs broken</td>
<td>4-11 A. M.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>13</td>
<td>2</td>
<td>White rooster in crate—slat top</td>
<td>4 in.</td>
<td>R. S. Hawk</td>
<td>One foot</td>
<td>4-18 P. M.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>13</td>
<td>0</td>
<td>White rooster in crate—slat top</td>
<td>5 in.</td>
<td>R. S. Hawk</td>
<td>High on leg</td>
<td>4-17 A. M.</td>
</tr>
<tr>
<td>II</td>
<td>1</td>
<td>13</td>
<td>2</td>
<td>White rooster in crate—wire top</td>
<td>3 in.</td>
<td>Barred Owl</td>
<td>One toe</td>
<td>4-11 A. M.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>13</td>
<td>2</td>
<td>White rooster in crate—wire top</td>
<td>3 in.</td>
<td>Barred Owl</td>
<td>Toes of one foot</td>
<td>4-17 A. M.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>13</td>
<td>1</td>
<td>White rooster in crate—wire top</td>
<td>4 in.</td>
<td>Vesper Sparrow</td>
<td>Both legs</td>
<td>4-17 A. M.</td>
</tr>
<tr>
<td>III</td>
<td>1</td>
<td>13</td>
<td>2</td>
<td>White rooster tethered out</td>
<td>2 in.</td>
<td>Vesper Sparrow</td>
<td>Both legs</td>
<td>4-11 A. M.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>13</td>
<td>1</td>
<td>White rooster tethered out</td>
<td>2 in.</td>
<td>Vesper Sparrow</td>
<td>Both legs</td>
<td>4-17 A. M.</td>
</tr>
<tr>
<td>IV</td>
<td>1</td>
<td>13</td>
<td>2</td>
<td>White rooster in crate—wire top</td>
<td>4 in.</td>
<td>Thrush</td>
<td>Caught high on both legs</td>
<td>4-23 A. M.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>13</td>
<td>2</td>
<td>White rooster in crate—wire top</td>
<td>4 in.</td>
<td>R. S. Hawk</td>
<td>One leg broken</td>
<td>4-17 A. M.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>13</td>
<td>2</td>
<td>White rooster in crate—wire top</td>
<td>4 in.</td>
<td>Fox Squirrel</td>
<td>One leg broken</td>
<td>4-20 A. M.</td>
</tr>
<tr>
<td>V</td>
<td>1</td>
<td>12</td>
<td>0</td>
<td>Barred owl tethered out</td>
<td>5 in.</td>
<td>Barred owl</td>
<td>Both legs broken</td>
<td>4-17 A. M.</td>
</tr>
<tr>
<td>Site No.</td>
<td>Trap No.</td>
<td>Days in Operation</td>
<td>Trap Size</td>
<td>Bait</td>
<td>Diameter at Top</td>
<td>Height</td>
<td>Pole</td>
<td>Species Taken</td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
<td>------------------</td>
<td>-----------</td>
<td>------</td>
<td>----------------</td>
<td>--------</td>
<td>------</td>
<td>---------------</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>2</td>
<td></td>
<td>Barred owl tethered out</td>
<td>2 in.</td>
<td>13 ft.</td>
<td>Barred Owl</td>
<td>One leg, high up</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>0</td>
<td></td>
<td>Barred owl tethered out</td>
<td>2 in.</td>
<td>12 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>2</td>
<td></td>
<td>Barred owl tethered out</td>
<td>5 in.</td>
<td>4 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>1</td>
<td></td>
<td>Barred owl tethered out</td>
<td>3 in.</td>
<td>10 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>1</td>
<td>12</td>
<td>0</td>
<td>Carcasses of horse and sheep</td>
<td>4 in.</td>
<td>5 ft.</td>
<td>Crow</td>
<td>One toe uninjured</td>
</tr>
<tr>
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<td>1</td>
<td>Carcasses of horse and sheep</td>
<td>4 in.</td>
<td>5 ft.</td>
<td>Robin</td>
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</tr>
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<td>1</td>
<td></td>
<td>Carcasses of horse and sheep</td>
<td>4 in.</td>
<td>5 ft.</td>
<td>R. S. Hawk</td>
<td>Two toes</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>1</td>
<td></td>
<td>Carcasses of horse and sheep</td>
<td>4 in.</td>
<td>5 ft.</td>
<td>S. S. Hawk</td>
<td>Both legs above feet</td>
</tr>
<tr>
<td>VII</td>
<td>1</td>
<td>11</td>
<td>1</td>
<td>White rooster in crate—wire top</td>
<td>2 in.</td>
<td>18 ft.</td>
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<td>10 ft.</td>
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<td></td>
</tr>
<tr>
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<td>11</td>
<td>2</td>
<td></td>
<td>White rooster in crate—wire top</td>
<td>5 in.</td>
<td>4 ft.</td>
<td>Screech Owl</td>
<td>Both legs</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>0</td>
<td></td>
<td>White rooster in crate—wire top</td>
<td>6 in.</td>
<td>6 ft.</td>
<td>Screech Owl</td>
<td>Both legs</td>
</tr>
<tr>
<td>VIII</td>
<td>1</td>
<td>12</td>
<td>2</td>
<td>White rooster in crate—wire top</td>
<td>4 in.</td>
<td>9 ft.</td>
<td>Meadowlark</td>
<td>Two toes</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>12</td>
<td>0</td>
<td>White rooster in crate—wire top</td>
<td>8 in.</td>
<td>3 ft.</td>
<td>Marsh Hawk</td>
<td>One leg above foot</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>White rooster in crate—wire top</td>
<td>4 in.</td>
<td>9 ft.</td>
<td>Barred Owl</td>
<td>With legs above feet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fox Squirrel</td>
<td></td>
<td></td>
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<td>Front foot</td>
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<tr>
<td>Site No.</td>
<td>Trap No.</td>
<td>Days in Operation</td>
<td>Trap Size</td>
<td>Bait</td>
<td>Pole Diameter at Top</td>
<td>Height</td>
<td>Species Taken</td>
<td>How Caught</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>-------------------</td>
<td>-----------</td>
<td>------</td>
<td>----------------------</td>
<td>--------</td>
<td>------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>IX</td>
<td>1</td>
<td>12</td>
<td>0</td>
<td>White rooster in crate—slat top</td>
<td>2 in.</td>
<td>9 ft.</td>
<td>Blackbird</td>
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<td>12</td>
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<td>3 in.</td>
<td>4 ft.</td>
<td>Song Sparrow</td>
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<tr>
<td>X</td>
<td>1</td>
<td>9</td>
<td>1</td>
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<td>3 in.</td>
<td>20 ft.</td>
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<tr>
<td></td>
<td>2</td>
<td>9</td>
<td>2</td>
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<td>4 in.</td>
<td>5 ft.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>3</td>
<td>9</td>
<td>2</td>
<td>White rooster in crate—wire top</td>
<td>4 in.</td>
<td>5 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XI</td>
<td>1</td>
<td>12</td>
<td>1</td>
<td>White rooster in crate—wire top</td>
<td>3 in.</td>
<td>12 ft.</td>
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<tr>
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<td>5 in.</td>
<td>5 ft.</td>
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<td>0</td>
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<td>5 in.</td>
<td>5 ft.</td>
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<td></td>
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<td>XII</td>
<td>1</td>
<td>11</td>
<td>2</td>
<td>White rooster loose</td>
<td>3 in.</td>
<td>15 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>11</td>
<td>1</td>
<td>White rooster loose</td>
<td>2 in.</td>
<td>10 ft.</td>
<td>Vesper Sparrow</td>
<td>One foot</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>11</td>
<td>0</td>
<td>White rooster loose</td>
<td>2 in.</td>
<td>10 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XIII</td>
<td>1</td>
<td>11</td>
<td>1</td>
<td>White rooster tethered out</td>
<td>4 in.</td>
<td>5 ft.</td>
<td>Broad-wing Hawk</td>
<td>Escaped with trap, identified in air by assistant</td>
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<tr>
<td></td>
<td>2</td>
<td>11</td>
<td>0</td>
<td>White rooster tethered out</td>
<td>4 in.</td>
<td>5 ft.</td>
<td></td>
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### Field Data Table—Continued

<table>
<thead>
<tr>
<th>Site No.</th>
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<th>Days in Operation</th>
<th>Trap Size</th>
<th>Bait</th>
<th>Pole</th>
<th>Species Taken</th>
<th>How Caught</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>11</td>
<td>1</td>
<td></td>
<td>White rooster tethered out</td>
<td>4 in.</td>
<td>5 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>0</td>
<td></td>
<td>White rooster tethered out</td>
<td>4 in.</td>
<td>5 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XIV</td>
<td>1</td>
<td>9</td>
<td>0</td>
<td>No bait</td>
<td>5 in.</td>
<td>4 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XV</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td>No bait</td>
<td>3 in.</td>
<td>15 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XVI</td>
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<td>11</td>
<td>1</td>
<td>White rooster tethered out</td>
<td>3 in.</td>
<td>12 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>11</td>
<td>0</td>
<td>White rooster tethered out</td>
<td>4 in.</td>
<td>8 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>2</td>
<td></td>
<td>White rooster tethered out</td>
<td>4 in.</td>
<td>8 ft.</td>
<td>R. S. Hawk</td>
<td>4-13 A. M.</td>
</tr>
<tr>
<td>XVII</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>No bait</td>
<td>3 in.</td>
<td>14 ft.</td>
<td>Meadowlark</td>
<td>4-13-28</td>
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<tr>
<td>XV</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XVI</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thus it appears that even the traps that are equipped especially to take only the heavier birds cannot be safely set if the majority of the larger hawks and owls are to be generally conserved, as is very definitely demonstrated by competent authorities to be advisable in most instances.

As a result of this experiment, it appears that under conditions existing at the time a larger preponderance of harmless or beneficial birds were captured. The number of harmful species captured was so small as to be insignificant in so far as the protection of game on natural areas is concerned. The height at which the trap was set and the diameter of the pole had no significant effect upon the proportion of harmful and beneficial species taken. It is true that the experiment covered a relatively short period of time, and there is of course a possibility that results at another season might be more favorable for the pole trap, but there is no evidence, either published or within our experience to indicate that such would be the case.

Therefore, until further evidence is available it seems wise to limit carefully the use of pole traps to those areas where game is concentrated in unnaturally large numbers, such as at game farms, or where it can be definitely established that damage of a serious nature is being done by species which can best be controlled by these devices. Our observations indicate that on the majority of the privately owned game refuges investigated in Michigan, the damage done by predatory birds is too small to justify the sacrifice of innocent birds and mammals that pole trapping evidently entails.

School of Forestry and Conservation,
University of Michigan, Ann Arbor, Mich.
WINTER FOOD OF OKLAHOMA QUAIL*

BY LOIS GOULD BIRD AND R. D. BIRD

This study is based upon an examination of the crops of 138 quail taken in nineteen counties of Oklahoma. Of these, 135 were taken in December, 1929, during the latter part of the quail season and were sent to us by the state game rangers in response to a request made to Mr. Marsh B. Woodruff, then Assistant Game Warden. Three crops were taken in November by R. D. Bird. With the exception of four crops from Arizona Scaled Quail (*Callipepla squamata pallida*) from Cimmarron County, they were all from Bob-white (*Colinus virginianus virginianus*).

The study of the winter food of birds is important because winter is the critical time of food gathering. It is then that food is scarcest.

Food taken from bird crops is easily studied, for the contents have not been subjected to the process of digestion and are not affected by chemical action. The crop is a membranous, sac-like region of the oesophagus, easily distensible, which is used for the reception of food. Its capacity is from four to six times that of the gizzard. (2, p. 23). Seeds and insects in the crop, although in some cases broken and dirty, are in practically the same condition as when lying on the ground.

Previous Work

Dr. Sylvester D. Judd, of the United States Biological Survey, who has made extensive studies of the food of the Bob-white, states: “The Bob-white is probably the most useful abundant species on the farm. It is one of the most nearly omnivorous birds, consuming large quantities of weed seeds, and destroying many of the worst insect pests with which the farmer has to contend. It does not injure grain, fruit, or any other crop.” (1, p. 194).

The food habits of the Bob-white have been studied by the Biological Survey both in the laboratory and in the field. On the basis of 918 stomachs from twenty-one states. Canada, the District of Columbia, and Mexico, collected in every month of the year, the food, calculated by volume, was: seeds, chiefly weeds, 52.83 per cent; grain 17.33 per cent; fruit 9.57 per cent; miscellaneous vegetable matter 3.81 per cent; animal matter, mainly insects, 16.41 per cent. (2, p. 27).

The character of the food varies with the season. It is chiefly vegetable matter from October to March and largely insects during the late spring and summer. (2, p. 28).

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*Contribution from the Zoological Laboratory of the University of Oklahoma, Second Series, No. 106.
Leguminous seeds form 15.52 per cent of the yearly food. Of this all but a small fraction comes from wild plants which are classed as weeds. In December legume seeds are eaten to the largest extent, when they form 25 per cent of the food. (2, p. 28).

The Bob-white is a notable exception to the fact that grain-eating birds are likely to do much harm to crops. The grain taken by Bob-whites is gleaned from stubble fields after harvest. This gleaning of waste grain is a beneficial habit, for volunteer grain is undesirable, especially where insect pests or parasitic fungi are to be combated. (2, pp. 29-30).

Among the insects eaten by the Bob-white are included many pests, some of which are the potato beetle, twelve-spotted cucumber beetle, striped cucumber beetle, various cutworms, army worm, cotton bollworm, cotton boll weevil, may beetle, red-legged grasshopper, Rocky Mountain locust, and chinch bug. The foraging habits of the Bob-white which extend to the center of the cultivated fields are of much benefit to the farmer. (2).

The amount and variety of food eaten by the Bob-white has been studied by Mrs. Nice (4), who says that “the Bob-white is known to eat 129 different kinds of weed seeds”. “They eat 15 grams, or half an ounce, of weed seed daily throughout the winter” “and from 12 to 24 grams of insects daily in the summer”. An estimate of the average amount eaten by a single Bob-white in a year is about five pounds of insects and nine and three-quarters pounds of weed seeds, equivalent to over sixty-five thousand insects and more than five million weed seeds. (4, p. 312).

Recent studies have been made of the food of quail by Stoddard (7) and Tate (8). In the study of 120 Bob-white stomachs taken in Georgia in December, 1924, Mr. Stoddard reports that pine mast made up 41 per cent of the food by bulk, legume seeds 31 per cent, sweet gum 4 per cent, ragweed 3 per cent, corn 3.5 per cent, and grasshoppers 5 per cent. (6, p. 16).

Mr. Tate, observing in the Panhandle of Oklahoma, reports as the favorite foods of the two quail within the state:

**Bob-white**: Grasshoppers, flies, crickets, aphids, burdock, pigweed, lamb's quarter, and Russian thistle seeds, milo maize, kaffir, and millet.

**Arizona Scaled Quail**: Grasshoppers, flies, ants, beetles, sunflower seeds, Russian thistle and lamb's quarter seed, milo maize, and kaffir.

Mr. Tate's observations were made as a result of examination of crop contents, field observations and feeding table records. (8, p. 33).
Ortenburger and Little (6) give the stomach contents of two Bob-whites from Harmon County and one Arizona Sealed Quail from Cimarron County.

As far as we now know, no other studies have been made of the food of Oklahoma quail.

**Distribution of Crops**

The crops were well distributed over the state. (See map, fig. 54). The counties represented were:
- Panhandle: Cimarron, Texas, Beaver.
- Southwest: Beckham, Jackson, Comanche.
- Central: Noble, Oklahoma, Cleveland.
- Northeast: Osage, Washington, Nowata, Rogers, Craig.
- Southeast: Choetaw, Pittsburg, Latimer, LeFlore.

This was a sufficiently uniform distribution, represented by an ample number of crops, to give a good representation of the food of the quail throughout the state during December.

**Procedure**

The crops were taken from the birds, wrapped in paper and sent to us. They were opened, sorted and the contents placed in glass vials or gelatin capsules. The capsules proved most satisfactory for keeping separate small quantities of seeds, since they could be written upon and were transparent and inexpensive.

After the seeds were sorted, samples of undetermined species were sent to Mr. W. L. McAtee, of the United States Biological Survey, for
identification. From these identified samples, the others were named.

Insect identifications were made by R. D. Bird. Because of the fragmentary and broken condition, some of these could be placed only to the order. Others in better condition could be placed to the species.

Identification completed, the percentages of different kinds of seeds in each crop were estimated. Following the advice of Mr. McAtee, the percentage by bulk method was used rather than the numerical method. (3) The crop percentages were combined into county averages and from these the state average was computed. These averages are shown in the accompanying table (Table I) and graph (fig. 55).

DISCUSSION

Food of the Bob-white

The examination showed that the proportions of the total state food of the Bob-white was:

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weed seeds*</td>
<td>50.8%</td>
</tr>
<tr>
<td>Grain</td>
<td>35.1%</td>
</tr>
<tr>
<td>Tree and shrub seeds</td>
<td>11.9%</td>
</tr>
<tr>
<td>Insects and snails</td>
<td>1.5%</td>
</tr>
<tr>
<td>Miscellaneous vegetable matter</td>
<td>.7%</td>
</tr>
</tbody>
</table>

Plant Food

Vegetable matter made up 93.5 per cent of the food. Half of this consisted of weed seeds, chiefly from common and bothersome weeds, such as ragweed, sunflower, smartweed, pigweed, beggar-ticks, tick trefoil, and thistle. A total of fifty-three different kinds of wild seeds were eaten.

The dry character of the food is noticeable. December is a time of dry seeds and fruits. No fresh juicy berries are present to vary the diet and the only greens eaten were leaves. Small brown galls, which resembled seeds, were found three times. Tiny pebbles were occasionally taken, probably as grit for the gizzard.

Amount of Food Eaten

The volume of the contents varied from crops filled to almost bursting to some which were almost and one which was entirely empty.

One crop contained 905 ragweed seeds and another 722. Other examples of large numbers of seeds in crops were 1902 bush clover seeds, 88 trailing wild beans, 722 sunflower seeds.

*The word seeds has been used throughout to include the dry seeds and fruits eaten by the quail.
Weed Seeds

Ragweed* seeds were abundantly eaten by quail all over the state. They were found in eighty-one crops from sixteen counties. On the graph (fig. 55) ragweed shows the most even average and distribution of all foods. No high peaks appear and in no county did it form more than 40 per cent of the food eaten. The destruction of this amount of ragweed seed is most beneficial, for this is a disagreeable and noxious roadside weed. It is hated by farmers and feared by everyone who is a victim of hay fever.

*Two kinds of ragweed seeds were found in the crops: a large type, *Ambrosia trifida*, the great ragweed, and a small type, which has been referred to in the table as *A. artemisiifolia*, the common ragweed. It is possible that some of this latter kind may belong to some of the other small ragweeds found in the state, but the greater part are probably *A. artemisiifolia*. 

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Fig. 55. A graphical representation of the percentages in bulk of the most important items of the winter food of quail in Oklahoma. The counties read from west to east across the state. The total column represents the average percentage of each throughout the state.
Sunflower seeds (*Helianthus sp.*) formed 9.8 per cent of the total diet. These were eaten mainly by the Bob-white of the western and central part of the state. Three from Cleveland County had 58.3 per cent of their crops filled with them. In the southwestern counties, Beckham, Jackson, and Comanche, sunflower seeds composed from 20 to 40 per cent of the food.

Legume seeds were eaten largely by quail in the eastern counties, although some were found in crops from all but Beaver, Beckham, and Jackson Counties. The state average was 17.3 per cent. Pittsburg County (56.8 per cent), Craig (56 per cent), and Rogers (55.3 per cent) led with the largest proportions.

The seeds of the trailing wild bean (*Strophostyles helvola*), a prostrate annual of sandy places, were eaten in the largest percentages. This seed is large, dark, and of an oblong shape with truncate ends. Its dark color would make it show up easily against the light-colored sand.

Two species of bush clover (*Lespedeza spp.*) , one with seeds of dark brown (this was the most common) and the other with green seeds, formed nearly 5 per cent of the total food. These were eaten mainly in the southeastern counties. *Lespedeza* is a well known legume advocated as a range food for livestock. It is interesting, therefore, to note its importance as a quail food.

The downy milk pea (*Galactia volubilis*) also was an important leguminous food. Partridge pea (*Cassia chamaecrista*) and tick trefoil (*Desmodium sp.*), were eaten in smaller quantities.

The thistle (*Cirsium sp.*) formed less than 2 per cent of the total and was eaten largely in the Panhandle.

Snow-on-the-mountain (*Euphorbia marginata*), a conspicuous green and white herb, with large seeds, was eaten to some extent, mainly in Noble County and in the northwest. Other spurge (*Euphorbia sp.* and *Croton sp.*) appeared in small quantities in crops from scattered parts of the state.

The yellow seeds of the ground cherry (*Physalis sp.*) were eaten in Beckham, Jackson, and Noble Counties.

The tiny black shining seeds of pigweed (*Amaranthus retroflexus*) attracted the sharp eyes of the Bob-white in various parts of the state but were not eaten to a large extent.

Beggar-ticks (*Bidens sp.*) were eaten in the central and eastern part of the state and formed 1.2 per cent of the state total.

Indications of the work of the Bob-white in the grain fields appeared in the counts of some Comanche County crops. One of these
had 90 per cent kaffir corn and 10 per cent crab grass (*Digitaria sanguinalis*). Other crops showed combinations of sunflower or ragweed with corn, or sunflower with wheat, with a sprinkling of crab grass. It is evident that these Bob-whites when killed were feeding in weed grown stubble fields, gleaning the fallen grain and eating the seeds of bothersome weeds.

Panic grass (*Panicum* sp.) was found in a number of the crops, but the smallness of the individual seeds kept it from being of more importance.

Other seeds eaten by the Bob-white in quantities too small to be of importance were:

- *Acalypha* sp.
- *Andropogon jurecatus*
- *Arenaria* sp.
- *Aster* sp.
- *Callirhoe* sp.
- *Carex* sp.
- *Cenchrus pauciflorus*
- *Chenopodium album*
- *Comuelina* sp.
- *Crotonopsis linearis*
- *Croton* sp.
- *Diodia teres*
- *Euphorbia dentata*
- *Euphorbia* sp.
- *Geranium carolinianum*
- *Hosackia* sp.
- *Iva* sp.
- *Paspalum* sp.
- *Polygala* sp.
- *Psedera* sp.
- *Rhynchosia* sp.
- *Rhynchospora* sp.
- *Ramex (altissimus?)*
- *Scleria* sp.
- *Sesbania macrocarpa*
- *Setaria glauca*
- *Solanum rostratum*
- *Stillingia* sp.
- *Stillingia sylvatica*
- *Stipa* sp.

**Grain**

Corn picked up as waste grain from the winter fields formed a large part of the quail diet in the northeastern counties. It is to be noted that this corn was taken in a corn growing district where kaffir and milo maize were not grown to a large extent.

Kaffir corn and milo maize were eaten in the western part of the state.

Wheat, in the region of winter wheat, formed but 1 per cent of the total and was eaten in only three counties, Noble, Comanche, and Texas. Barley formed 20 per cent of the food in Beckham County (this was on the basis of one crop, the only one sent in from this locality).

Red-top cane, Johnson grass, and Sudan grass were taken in Comanche County and to a much smaller degree in Cimarron.

**Tree and Shrub Seeds**

Fragments of acorns (*Quercus* sp.) were eaten in large numbers by the Bob-white in the southeast. Fifty per cent of the diet of those
## WINTER FOOD OF OKLAHOMA QUAIL

### BOB-WHITE

<table>
<thead>
<tr>
<th>Species</th>
<th>Cimarron</th>
<th>Texas</th>
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Table I. A tabulation by counties of the percentages in bulk of all items observed in the crops examined. The counties read from west to east across the state. The total column gives the average percentages for the state.
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*Three of the six crops included in the Rogers County column were taken in Nowata County. The six were wrapped together and could not be separated.*
taken in Latimer County consisted of these. The total was 7.3 per cent. Some of the acorns had been swallowed whole, a tribute to the stretching capacity of the Bob-white’s gullet, but most were in fragments and had probably been pecked to pieces before being eaten.

The red berries of the sumac (*Rhus glabra*), of wide distribution in the state, formed 3.7 per cent of the quail’s food. This was greatest in Washington County, an erratic record, for sumac berries were not found in any of the crops from the adjoining counties. Of three of the four crops taken in Washington County, each showed over 80 per cent sumac. This shrub grows along the forest edge, a habitat frequented by the Bob-white.

The shiny, large brown seeds of the chittimwood berries (*Bumelia lanuginosa*) had been eaten by the quail of Comanche County. The blue-black berries may have dried and lost their envelope of goodness before the birds found them, for only the hard seeds were found in the crops. Since these had been subjected to no digestive process, the outer coats were probably not present when eaten by the quail. Because of the large size of these seeds, a comparatively few would form a large percentage of the food. Some forty-three were eaten by three of the twenty-two quail taken in Comanche County. These accounted for the .7 per cent of the state total and 13.3 per cent of the county average.

The winged seeds from the rough burrs of the sweet gum trees (*Liquidambar styraciflua*) of LeFlore County were eaten there, also the seeds of the sassafras (*Sassafras sassafras*).

**Animal Food**

Insects, at a season when the insect population was low, formed a small part of the quail diet. Part of the forms eaten were pupae and larvae. Most of the insects eaten hibernate on or near the surface of the ground and hence are easily found by the ground-feeding quail.

Insects and spiders eaten were:

- **Arachnida**: Spider (1).
- **Orthoptera**: Mole Cricket, *Gryllotalpa* sp.(?) (fragments); Grasshopper, *Melanoplus* sp. (4).
- **Isoptera**: Termite (1).
- **Homoptera**: Leafhopper, *Cicadellidae* (7); Leafhopper, *Oncometopia lateralis* (4).
- **Hemiptera**: Bug, *Lygaeidae* (1); Tarnished Plant Bug, *Lygus pratensis* (?) (1); Assassin Bug, *Reduviidae* (1).
- **Lepidoptera**: Small Moth Larvae (1); Noctuidae (?) pupae (5).
- **Diptera**: *Cyclorrhaphus* pupa.
Coleoptera: Flea Beetle (4); 12-spotted Cucumber Beetle, Diabrotica 12-punctata (1); Carabidae (3); Staphylinidae (1); Weevil (1).

Hymenoptera: Ichneumon wasp (1); Chalcid Wasp (1); Ant, Lastius interjectus (?) (2); Ant, Camponotus caryae (2).

Grasshopper eggs (Melanoplus sp. and Oedipodinae, allied to Mestobregna) were found in one of the crops taken in Cimarron County. Mr. Norman Criddle, who identified the eggs, suggests that the quail probably secured the eggs while dusting in the old mound of a burrowing animal, as certain grasshoppers use such places as egg beds.

Several injurious insects which occur as common pests in cultivated fields were included among those found in the crops. Notable species were grasshoppers of the genus Melanoplus, which are very destructive to all grain crops and pastures, and leafhoppers which suck the juices of many plants. The tarnished plant bug is a general feeder on the juices of plants and at times does a great deal of damage. A close relative of the chinch bug (family Lygaeidae) was found. Quail undoubtedly eat a number of hibernating chinch bugs. Pupae of the moth family, Noctuidae, were found. In this family are many injurious cutworms. Among the beetles a notably destructive species was Diabrotica 12-punctata, which is known in the adult stage as the 12-spotted cucumber beetle, on account of its fondness for these plants, and as the southern corn rootworm in the larval stage. Other injurious beetles were flea beetles and a weevil. Most of the other insects were of neutral importance, except the ichneumon wasp, which parasitizes injurious insects.

Small snails of two genera, Succinea and Pupoides (?), had been eaten by the Bob-white of six counties in widely scattered parts of the state. Quail evidently eat snails whenever they get a chance, but there are so few in December that they do not form an important part of the diet. The Succinea were eaten in the largest numbers.

Food of the Arizona Scaled Quail

The Arizona Scaled Quail is resident in the state in Cimarron County. (5). Two of the four crops sent in were from the eastern part of the county and two were from Black Mesa in the extreme north-west. Seeds of Russian thistle and sunflower comprised the greater part of the food. Other seeds eaten were pigweed, giant ragweed, panic grass, lamb’s quarter, and leaves.

Insect remains consisted of one lepidopterous larva and a bug, Miridae. Grasshopper eggs (Melanoplus bivittatus or M. differentialis) were found in one of the crops.
Included among the Russian thistle seeds was a tiny snail, *Vallonia (?)* sp., which in color, size and appearance resembled the seeds. It is a question whether the quail was fooled by the snail or the snail by the quail, but the quail won out in the end.

**Summary**

On the basis of the contents of 138 crops (135 taken in December and 3 in November, 1929) from quail in nineteen counties well distributed over the state of Oklahoma, the following conclusions were reached:

1. Of the total food eaten by Bob-white all over the state, weed seeds composed 50.8 per cent; grain 35.1 per cent; tree and shrub seeds 11.9 per cent; animal matter 1.5 per cent; and the remainder .7 per cent.

2. The food of the Arizona Scaled Quail in Cimarron County consisted of weed seeds 98.1 per cent; animal matter 1.7 per cent; leaves .2 per cent.

3. Insects and snails form a low percentage of the food eaten in December.

4. The high percentage of grain consists of waste grain picked up from winter stubble fields.

5. Winter food of the Bob-white in the following sections of Oklahoma consists largely
   A. In the Panhandle of kaffir corn, sunflower seeds, ragweed, Russian thistle, and thistle seeds.
   B. In the southwest of corn, kaffir corn, other grain, chittimwood seeds, sunflower and ground cherry seeds.
   C. In the central part of ragweed, sunflower, legumes (especially the trailing wild bean), and wheat.
   D. In the northeast of corn, legumes, sumac, and ragweed.
   E. In the southeast of legumes, acorns, and ragweed.

6. Our results, in comparison with those of the U. S. Biological Survey, show a higher percentage of grain and of seeds, chiefly weed seeds. There is a much lower percentage of fruit and animal life. These differences are explained mainly by the fact that the Biological Survey average was based upon crops collected during all the months of the year, while ours were taken during early winter.
ACKNOWLEDGMENTS

Our thanks are due to Mr. Marsh B. Woodruff, Assistant State Game Warden, and Mr. Van Montgomery, State Game Warden, through whom the crops were obtained. Mr. Woodruff sent letters to the state game rangers requesting that the crops be obtained and sent to us. Rangers who responded were Claude Beeson, Guymon (19 crops); A. D. Self, Boswell (17 crops); Salmon Woffard, Poteau (24 crops); Thad Wilkes, McAlester (8 crops); W. A. Ricker, Perry (9 crops); Everet W. Evans, Collinsville (21 crops); and L. E. Crawford, Lawton (22 crops). Mr. Harry Young collected fifteen crops from Oklahoma County and turned them over to the Oklahoma city ranger who sent them on to us. Our appreciation is due all of these who helped in the collection of the material.

Mr. W. L. McAtee, of the United States Biological Survey, helped with advice and had identified for us by Mr. A. C. Martin some eighty-five samples of seeds. Mr. Carl Horn, of Oklahoma City, identified seven samples also. Mr. Norman Criddle, of Treesbank, Manitoba, identified the grasshopper eggs, and Mr. Alan Mozley, of the University of North Carolina, the snails. All of these persons we wish to thank; also Mrs. M. M. Nice who kindly lent reprints otherwise unavailable to us.

LITERATURE CITED


UNIVERSITY OF OKLAHOMA,
NORMAN, OKLAHOMA.
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; Albert F. Ganier, Nashville, Tennessee; Alfred M. Bailey, Chicago Academy of Sciences, Chicago, Illinois; 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 $2.00 a year, and 60 cents a number. Subscriptions and orders for single copies should be addressed to the Secretary, Dr. Jesse M. Shaver, Peabody College, Nashville, Tennessee, U. S. A.

EDITORIAL

The *Ibis* (London) for October reviews Dr. Linsdale’s paper on the use of thallium in California, concluding with the following remarks: “This campaign has been going on for four years with apparently quite useless or harmful results, but we are astonished to learn that it has been done in cooperation with the Biological Survey! At all events it is a lesson to the rest of the world how not to tackle a pest question.”

Nowhere have we seen anything in print, by anyone outside the Survey, in defense of the Biological Survey’s poisoning program. There seems to be a growing and unanimous tendency on the part of scientific societies to condemn the Survey’s policy. However, with a desire to be fair and as impartial as possible we pass along the following claims made by the friends of the Survey.

1. That very little, if any, of the actual poisoning (in California) has been done directly by the Survey.
2. That the poisoning will be done anyway, whether the federal Survey participates or not; and it is better that it be done under scientific control.
3. That the poisoning is not indiscriminate, but is carefully selective, and that birds are not highly susceptible to doses used for mammals.
4. That much (or some) of the poisoning in California has been done in “plague” areas, that is, in areas within which the ground squirrels, or other rodents, have become infected with the Bubonic Plague (with the germs corresponding to the *Bacillus pestis* of Asia).
5. That with one or two exceptions the poisoning efforts have not been exterminatory in any area, the rodents having recovered in numbers within a few years.
6. That in many parts of the west the agricultural lands are limited to the valleys, beyond which lies the public domain, usually consisting of waste land. This public domain becomes a breeding ground for pests which then overrun the fertile agricultural lands, destroying crops. Those speaking for the Survey state that the Survey aims to destroy the rodents on the public domain only within a certain zone surrounding the producing areas. Beyond this the rodents are not disturbed.

To what extent these arguments are grounded upon fact we are not in position to affirm. One of the arguments presented to Congress for so large an appropriation (one million dollars a year for ten years) to the Survey for control work was that by making a sufficiently large appropriation now a thorough job
could be done and would not have to be repeated. Of course, this argument is based on the idea of extermination. With less control than extermination the animals have been able to recover, thus making necessary renewed appropriations. (Of course some of the Survey's friends claim that no funds from this large appropriation have yet become available).

It seems to be evident that the federal Survey has organized and dignified the poison work, spread it over greater territory, and multiplied it a hundredfold. The Survey may make the defense that they have been beset by landowners and agriculturists: but, nevertheless, before the world the responsibility is on the Survey. The action is theirs, they sought the enlarged appropriation, they have emphasized this work, and at the expense and sacrifice of the scientific investigation which formerly was the major function of the Survey. Scientific research has been on the wane, so far as publication shows, ever since the Survey became charged with the administration of federal game laws (beginning chiefly in the later years of the Migratory Bird Law). Aside from our scientific and sentimental attitude against the extermination of any forms of life, there is a certain repugnance against our government scattering poison over the earth for destructive purposes. The finer human sensibilities recoil against such practices, much as they are shocked by the use of poison gas in human warfare.

It has seemed to us for some years past that the Biological Survey is in need of a reorganization. The Bureau was originally organized as a scientific bureau, pure and simple. In more recent years it has had thrust upon it the burdensome administrative work of game law enforcement, rodent control, and predatory animal control. These have become the major functions, and scientific research has been compelled to take a back seat. Here the claim is made that it is easy to get money from Congress for animal control and such things because partisans are always present to assist the Survey in urging Congress to grant the desired funds. It is more than likely a fact that the scientific interests of the country have been derelict in their active support of the Survey in seeking appropriations for scientific investigations. To remedy this weakness biological societies throughout the country should take steps to have representatives at Washington at the proper time to lobby for appropriations for scientific research by the government forces. There should be some sort of a clearing-house, or tie-up, between the biological societies of the country and the biological bureaus of the government, to the end that the latter may have the moral support of the scientific world in securing financial support from the government for scientific research. In the meantime it may be necessary for the Biological Survey to show a different hand, and it may become advisable to find some means of making the scientific staffs independent of these other distracting functions which seem, at present, to be securing a strangle hold on the Survey. This is the reorganization referred to at the beginning of the paragraph.

While the subject of thallium is being widely discussed as a poison for rodents, it will be interesting to note that the Journal of the American Medical Association for May 30 and September 5, 1931, contains reports of young women being seriously poisoned by thallium obtained in the use of depilatory creams.

A complete and well-bound set of the Auk (Volumes 1 to 48) is offered for sale by Mr. Clarence Bretsch, 650 Broadway, Gary, Ind.
GENERAL NOTES
Conducted by M. H. Swenk

Starlings in Washington County, Iowa.—A wandering flock of twelve Starlings (Sturnus vulgaris) was seen on August 22, 1931, two miles southwest of Washington, Iowa. All were in dull plumage, presumably birds of the year.—PHILIP A. DUMONT, Des Moines, Iowa.

The Brown Pelican in South Dakota.—I wish to report the occurrence of five Brown Pelicans (Pelecanus occidentalis) among a flock of White Pelicans (P. erythrorhynchos) on Lake Oakwood, about twelve miles northeast of Arlington, South Dakota. They were seen on August 26, 1931, by Mr. George P. Reed, who was familiar with the Brown Pelican in Florida and Texas, where he lived for several years.—ADRIAN LARSON, Arlington, S. D.

An Additional Observation of Food Regurgitation by Young Kingbirds.
—Referring to C. S. Bauman’s article “Food Regurgitation by Young Kingbirds” (Wilson Bulletin, XLIII, pp. 146-147, June, 1931), I wish to report that on August 22, 1931, several boys found near my home a young Kingbird (Tyrannus tyrannus) with a wounded left wing and no tail. It could not fly and would not eat. I fed it sour cherries, bread, and insects. After each feeding of cherries, it would regurgitate a pellet comprised of the skins of the cherries. When fed insects, I would find in the cage pellets of portions of the insects, perhaps the indigestible parts.—MARI V. BEALS, Elmhurst, L. I., N. Y.

A Probable Extension of the Breeding Range of the Prairie Warbler.
—The Prairie Warbler (Dendroica discolor), a bird not previously accredited to the state of Louisiana as a breeder, can now probably be considered such, judging from the following records of observations made in the region of Monroe in northern Louisiana:

On June 9, 1931, in a section of scattered oak and pine covered with scrubby growth and thickets, two birds were heard in full song. In the same locality, on June 19, an adult male was collected, and upon dissection the testes were found to be large and well developed. Again, on July 8, this species of warbler was observed.

These records cannot be considered as positive indications of the species breeding here, but due to the favorable situations in which it was found, and the regularity of occurrence, it is highly probable that it does.—GEORGE LOWERY, West Monroe, La.

A Bald Eagle Swims.—On February 3, 1931, Dr. Lynds Jones and the writer watched a Bald Eagle (Haliaeetus leucocephalus) from less than a hundred yards distance for about ten minutes. The eagle circled around four or five times, apparently trying to get a fish in the open water of Lake Erie, at Beaver Park four miles west of Lorain, Ohio. Each time it failed to lift the fish from the water. Finally it settled down on the fish and sat there in the icy water, floating as nicely as a gull. It kept working with its feet and occasionally with its wings, moving the latter with a forward and backward motion and keeping them above the water. At last it seemed to be gradually sinking, until only its head and wings were above water. We wondered if it was in trouble and had gotten so soaked it could not get up. Then it apparently made rather earnest efforts to come in toward the shore. At last it shook itself desperately and tried to fly up. It brought the fish, a carp about eighteen to twenty inches long, to the surface,
but had to drop it there again. It then gave it up as a bad job and flew away. Floating ice was near at hand so the water was ice cold. The eagle was in the water for between five and eight minutes, at least.—Robert L. Baird, Oberlin, Ohio.

Records of the White Ibis in Southern Indiana.—Records of ibises north of the Ohio River are so few that the following experiences seem worth recording. On July 25, 1925, the Louisville Courier-Journal carried this item in a “box” on the front page.

"QUEER WATER BIRDS STOP AT NEW ALBANY"

“A flock of birds of unusual species that flew across the country just north of the city and roosted in a tree on the knobs just off the Dixie Highway a half mile north of New Albany attracted much attention yesterday. It is said that twenty or more were in the flock.

“Measuring approximately three feet from tip to tip of the wings the birds had a rather short body with legs approximately eighteen inches long, a beak ten inches long with a sharp point, and are web-footed. In color the birds are pure white with a black border on the lower part of the wings, apparently one row of black feathers.

“No bird of the species ever has been seen in this section by old residents of the knobs.”

With all due allowance for the inaccuracies of a newswriter’s description, it tallies fairly well with that of the White Ibis (Platalea alba), which would certainly be of rare occurrence in this part of Indiana.

On August 18, 1925, the writer stopped on a journey from Henderson, Kentucky, to Mt. Vernon, Indiana, to investigate a creek-bottom swamp, overgrown with arrowhead, cane, and buttonbush. A large dead tree stood lonely sentinel in the midst of the swamp. Perched on the topmost branches were two tall white birds, preening their plumage in the morning sunlight. Two Boy Scouts, James N. Childs and Robert Kopp, of Huntington, West Virginia, were with me at the time. We all had a splendid view of the birds through binoculars at an easy stone’s throw from the tree. At such close range we observed that each bird had yellow legs and a yellow bill, downcurved at the tip, the latter a distinguishing character of the White Ibis. When we ventured too close the birds extended their black-tipped wings and with outstretched necks flew slowly away.—Robert B. Gordon, Ohio State University, Columbus, Ohio.

The American Egret and Least Tern in South Dakota.—On July 25, 1931, a lone American Egret (Casmerodius albus egretta) was found at Loblolly Lake, South Dakota, by T. C. Stephens. The bird was in company with one hundred or more Great Blue Herons (Ardea h. herodias) and quite a few Black-crowned Night Herons (Nycticorax nycticorax lowei). This egret has been seen many times since with the other herons. Probably the first record of the American Egret in South Dakota was in June, 1929, when Professor W. F. Kibicheck, of Coe College, Cedar Rapids, Iowa, collected one at Rush Lake, in the northeastern part of the state.

The past summer (1931) has evidently been a good one for the Least Terns (Sterna a. antillarum), as the writer has noticed them in many parts of northwestern Iowa and southeastern South Dakota. One of the nesting sites near Sioux City was on a bar in the Missouri River, about one mile from Loblolly Lake. On August 3, the writer counted not less than 150 Least Terns, many im-
mature birds, at the above lake, where the birds were no doubt gathering for the fall migration.—Wm. Youngworth, Sioux City, Iowa.

A Virginia Rail Spends a Day in the City.—On June 7, 1930, my neighbor called me to see a strange bird in her clump of lilac bushes. I recognized it as one of the rails. My first thought was that the bird was injured or it would not have been there. I tried to catch it, but it eluded me so completely that I failed to find it though I was confident it had not left the bushes. I retired to my dining room window, and soon I saw it walking about. Again I tried to catch it and failed. I placed a shallow pan of water at the edge of the bushes. It was not long till the bird came and waded around in the water. At noon we surprised the bird in the open, and were able to guide it into the garage, where it demonstrated that it could fly perfectly well. I caught it and put it in a small cage. With my friend, Mrs. W. J. Armour, I studied it carefully and identified it as a Virginia Rail (Rallus l. limicola). Satisfied about its identity, I gently placed the cage at the edge of the bushes, and it stepped out very leisurely and went back into the shadows. Often it came and waded in the pan of water. As the sun was setting it came out into the patch of sunlight, put its head under its wing and went to sleep. It was still there when it was too dark to see well. The next morning it was gone, after its day of rest in the city.—Mrs. Marie Dales, Sioux City, Iowa.

The Roosting-place of Fledged House Wrens.—What becomes of the young House Wrens (Troglodytes aedon aedon) after they have left the nest has always been a perplexing question about our home, for after the first day they can be found nowhere in the vicinity. In 1930, however, we had the pleasure of having them around for four days after leaving the nest, and they were the source of much amusement. Just before dusk every evening the parent birds would work frantically to get the young ones into a then abandoned Robin's nest in an apple tree, seventy-five feet distant from their own nest box and twenty feet from the ground. But what a time they had. After much arguing and scolding, they would succeed in getting two or three of the six young into the nest, and would dart after the remaining ones, only to find upon their return that the first group had departed into a neighboring cherry tree. This, of course, called for more scolding and coaxing. They used the Robin's nest for four nights; the fifth day they vanished, and were never seen about the premises again.—Carl W. Rahe, Cleveland, Ohio.

An Icebound Woodpecker.—The morning of January 21, 1927, dawned bright and cold, after an almost night-long siege of rain, sleet, and snow. Directly after sunup I hastened out to run a short trampoline, and while hurrying through a woods I saw, scurrying on the ground ahead of me, a male Red-headed Woodpecker (Melanerpes erythrocephalus), apparently injured. He could race rapidly, nevertheless, and would often ascend a tree trunk for a few feet, but would always drop off and resume the race. He was an expert at dodging and I experienced no little difficulty in capturing him, part of my inability to get him in hand being due to the fact that I feared trampling him as he dodged here and there. Imagine my surprise when I found that the tips of his wings, where they met over the base of the tail, were securely held together by a piece of ice! Flight was entirely out of the question. I removed the ice that bound him, but for a moment he remained quiet in my hands, not realizing, probably, that he was free, then with a cry he left me, flying heavily in a crooked, wavering flight. He was im-
Popularly set upon by some of his family, many of whom had been crying loudly all the while. Perhaps they were congratulating him upon his escape, but it seemed to me that they were scolding him soundly for having been foolish enough to have spent a night, such as the last had been, on the outside of a tree!

Grant Henderson, Greensburg, Ind.

Some Bird Records for South Dakota.—During a recent trip to South Dakota in company with Mr. Lewis Knowles, of the Biological Survey, a number of birds were observed which seem to be sufficiently uncommon in that state to warrant reporting them in the Wilson Bulletin.

On July 29, 1931, one adult male Cinnamon Teal (Querquedula cyanoptera) was observed in a small flock of Mallards at a shallow lake about five miles northeast of Mound City, Campbell County. Over and Thoms, in their “Birds of South Dakota”, regard this as a “straggler” and report one collected in Miner County in 1896.

At Long Lake, McPherson County, on this same day I approached within twelve yards of three Long-billed Dowitchers (Limnodromus griseus scolopaceus). These birds were feeding in company with a small flock of Pectoral, Baird’s, and Least Sandpipers, Western Willets, and Lesser Yellow-legs. These birds were probably all early migrants from the far north.

Also on this same day, in northern McPherson County about eight miles southeast of Ashley, North Dakota, I collected an adult male, a female, and a juvenile Bendire’s Crossbill (Loxia curvirostra bendirei) while they were feeding on sunflower seeds. These specimens were examined by Dr. H. C. Oberholser, of the Biological Survey. They represent a subspecies new to South Dakota. In the Survey collection is another specimen of this subspecies, a male, collected by Merritt Cary at Elk Mountain, South Dakota, October 16, 1903, which bears U. S. N. M. number 193289.

Another adult male Loxia curvirostra (subsp.?) was observed the next day (July 30) about twenty miles north of Mitchell. This individual was also feasting on the seeds of sunflower. Over and Thoms report that Loxia c. pusilla “has been taken in the eastern part of the state as a migrant”, but seem to regard it as being quite uncommon. These new and out of season records should, therefore, be of interest. Because of South Dakota’s geographical position it is not surprising to find both races of Red Crossbills occurring there.

About five miles northeast of Eureka, McPherson County, one adult female Baird’s Sparrow (Ammodramus bairdi) was collected on July 29, 1931. This species is a common migrant in South Dakota, but is not regarded as a summer visitor there.—Clarence Cottam, U. S. Biological Survey, Washington, D. C.

The American Egret in Manistee County, Michigan.—On August 7, 1930, I observed a pair of American Egrets (Casmerodius albus egretta) feeding along the marshy border of Arcadia Lake on the northern border of Manistee County, Michigan. This lake had held my attention for several days previous to this date, since it was richer in bird life than any I had seen heretofore in any part of Michigan. Coots, Pied-billed Grebes, and various ducks were the chief tenants, but Great Blue and Little Green Herons, both species of bittern, Greater Yellowlegs, and Solitary Sandpipers were also abundant.

The egrets did not commonly associate with the other birds but were seldom seen apart from one another. Occasionally, however, they were observed feeding in the company of a Great Blue Heron.
On the succeeding day, August 8, I obtained a boat and by this means was able to get within a hundred feet of the egrets so that their characteristics (the large size, black feet, and yellow bill) could be easily observed even without the binoculars which were necessary for certain identification on the day of their discovery. I was also able thus to photograph them.

On August 9, when I left Arcadia, the egrets were still on the lake. Two or three townspeople when interrogated on the presence of the egrets spoke of "white herons" as being not unusual visitors on their lake, but their ornithological discrimination must be open to question since Ardea herodias herodias at a distance and in bright sunlight might well appear to be a "white" heron.—FREDERICK J. HERMANN, Ann Arbor, Mich.

The Yellow-throated Vireo Nesting in Buchanan County, Iowa.—On June 28, 1931, while lying on the lawn under a group of black maple trees (Acer nigrum) at my home near Winthrop, Iowa, I discovered a nest of the Yellow-throated Vireo (Vireo flavifrons). The nest was about twenty feet from the ground and was securely built into a crotch at the end of a small limb fifteen feet from the main trunk. Four well grown young were in the nest.

The parents were busy bringing food to the little birds, which at this date filled the nest to its capacity and hung with heads out on all sides of it. This was during a period of intensely warm weather. For nine consecutive days (June 23-July 1) the temperature registered well over 100° in the shade, and as high as 102°. Although the trees furnish luxuriant shade and the young birds were well shaded most of the day, they were apparently affected by the heat. They lay panting, with heads out of the nest and bills wide open. The parent birds brought food to the young at two or three minute intervals during the time the nest was under observation. They searched for it in the nesting tree and in nearby trees that stand near my home. The food seemed to consist chiefly of insects and an occasional inch-long hairy caterpillar.

The young birds left the nest on June 30 and July 1. They fluttered to the lawn from the trees and kept my wife and me busy putting them back to a higher perch so that they would not fall victims to the pair of farm cats which occasionally came into the yard. The courageous little birds would often make another futile attempt to fly on inadequate wings almost as soon as replaced in the tree, and would come tumbling down to the lawn again. The call of the young is a locust-like, buzzing note. We heard this as they perched in the trees and called for food, and again when we handled them on the ground. The old birds appeared very anxious for the safety of their young when they were handled. They jumped about on limbs just above our heads and squealed in earnest solicitation as we returned the little fellows to higher perches.

I was much surprised at the agility that the young displayed in running up a tree trunk. When placed on the rough bark they at once clutched it tightly with their feet, and, wings furnishing impetus, they would run up a vertical trunk almost as easily as a nuthatch or a creeper.

The loud, clear notes of the Yellow-throated Vireo were first heard in our yard on May 23, when one bird was seen. It was not seen again and I supposed that the bird was a migrant, until the nest was found on June 28. This is the first time I have known the species to nest in Buchanan County, Iowa. Since its notes are quite similar to those of the Red-eyed Vireo, and the bird lives well up in the heavy foliage of trees, it is possible that it is frequently overlooked.—FRED J. PIERCE, Winthrop, Iowa.
Birds and Motor Cars in South Dakota.—The increasing menace of motor cars to wild life was forcibly brought to my attention while engaged in field work in South Dakota during the latter half of July, 1931. My work necessitated automobile travel from Mitchell, southeast to the Nebraska border through the grasshopper-infested area of the state, north to the North Dakota border and southeast by way of Aberdeen and Huron to Mitchell. In all, nearly a thousand miles were traveled, of which at least six hundred were on well-graveled main traveled state highways through typical South Dakota farming sections that were only moderately thickly populated.

I could not continuously watch the road for dead birds, but twenty-seven careful separate counts were made at various one-mile stretches throughout the trip. In each case an effort was made to select only representative sections of the road.

These twenty-seven one-mile counts averaged 2.26 dead birds per mile with a maximum number of nine and a minimum of zero. The numbers zero and three repeated most frequently, each occurring seven times. A large toll was also levied on other forms of vertebrate life, particularly the smaller mammals such as jack rabbits and ground squirrels. As many as five of these mammals were counted in one mile. Because of the repeated dragging or grading of the graveled roads and the rapidity with which the crushed bodies dry out, it seemed quite probable that in most cases, at least, the dead represented casualties that had occurred within a three-day period.

Usually the greatest number of dead were encountered on the best stretches of road, showing further that the greater speed is chiefly responsible for the damage done. I feel quite certain that only in exceptional cases are birds killed if the speed does not exceed thirty-five miles an hour, provided of course, the driver makes an effort to miss rather than strike the birds. In most cases the various forms of life, if given a reasonable time to escape, will cause the motorist little if any delay.

The species most affected were ground-loving forms, such as Prairie Horned Larks and Chestnut-collared Longspurs, that frequent the more barren areas. The Prairie Horned Larks, particularly, concentrate in large flocks on the highway of that prairie region, where they glean weed seeds, grain, and insects blown or dropped upon the uncovered ground. Because of their gregarious nature and because they are tame and allow approaching cars to come very close before taking flight, great numbers are killed. The juveniles, which are especially slow and awkward, suffer the greatest number of casualties. Nearly half of all dead birds found were juveniles. Bird life in general is usually more concentrated near a roadside than elsewhere because of the greater facilitis for nesting, feeding, and resting.

The list of vertebrates identified, given about in descending order as to the number killed, is as follows:

- Prairie Horned Lark (*Otocorhynchus montanus*).
- English Sparrow (*Passer domesticus*).
- Chestnut-collared Longspur (*Calcarius ornatus*).
- Birds unidentified.
- Lark Bunting (*Calamospiza melanocorys*).
Thirteen-striped Ground Squirrel (Citellus t. tridecemlineatus).
White-tailed Jack Rabbit (Lepus townsendii campanius).
Domestic Chicken (Gallus domesticus).
Western Meadowlark (Sturnella neglecta).
Bronzed Grackle (Quiscalus q. aeneus).
Richardson Ground Squirrel (Citellus richardsonii).
Arkansas Kingbird (Tyrrannus verticalis).
Pheasant (Phasianus torquatus).
Red-winged Blackbird (Agelaius p. phoeniceus).
Kingbird (Tyrrannus tyrannus).
Grasshopper Sparrow (Ammodramus s. bimaculatus).
Burrowing Owl (Speotyto c. hypugaeus).
Mourning Dove (Zenaida m. marginella).
Domestic Cat (Felis domesticus).
Lark Sparrow (Chondestes g. grammacus).
Upland Plover (Bartramia longicauda).
Robin (Turdus m. migratorius).
Northern Flicker (Colaptes auratus luteus).
Bull-snake (Pituophis sp.).
Undetermined snakes.
Virginia Rail (Rallus l. limicola).
Toad (Bufo sp.).

Mourning Dove Notes.—During the summer of 1930, while attending the University of Missouri at Columbia, the following observations on the Mourning Dove (Zenaidura naucoriae carolinensis) were made.

June 19. Marjorie informed me at noon that a pair of Mourning Doves have a nest on their bathroom window ledge on the second floor. I went over about sundown to look at it from the bathroom. In it are two young doves almost ready to fly. The mother dove sat with her head nearly touching the screen. From the outside the nest is scarcely visible because of the ivy that covers the entire west side of the brick building. My room is next door and directly opposite the nest on the same level. It is unfortunate that I did not bring bands with me to the University, for I might be able to band these doves.

June 20. I arose at 5:30 a. m. and sat down to study at my table by the window. While thus engaged, I heard a dove arrive. He was on the ledge with something for the female. I supposed that he was bringing food for the young. He left and in a few minutes returned again. I counted the trips and from 5:30 to 7:00 a. m. he made twenty-seven trips. I noticed that on most of the trips he brought roots and grass, but carried nothing away. Twice he had so great a load that he could not alight, and had to fly away and drop some of it. Through the ivy leaves I could see her take something and see her body move, but thought she was feeding the young. I wondered what was becoming of all the sticks since none were left in sight. He always announced his arrival and departure with the peculiar sound made by the wings.

June 21. Marjorie told me this morning that there is one egg in the nest. So the twenty-seven trips of yesterday were made by another dove that was re-
building the nest that was deserted late the evening before or before daylight on June 20. The nest had not been allowed to get cold. As the first nest was already above the average built by doves, I suppose the only excuse for building was to satisfy the instinct. I went over at noon and tried to frighten the bird off the nest, but she sat on. Ten noisy girls were using the bathroom, but all the thumping on the screen that one could do would bring only a slight movement of the head.

June 22. 9:50 A. M. The male arrived and the female left. Each time that the exchange takes place, as the arriving dove steps on the ledge, the one leaving flies off the nest and the one arriving immediately steps on. 10:15 A. M. The doves exchange places again. 12:15 P. M. They exchange again. 4:00 P. M. The female is sitting on the nest and the temperature must be at least 110°.

June 24. 7:00 A. M. Each morning the sun shining on one of our windows reflects a sunny spot about two feet square with the center directly on the nest. Thus for about two hours the nest gets the morning sun as well as all of the afternoon sun of this extremely hot summer. Marjorie reported this morning that there are two eggs in the nest. 11:00-12:00 A. M. The male dove sat still for the entire hour on the window ledge while the female sat on the nest.

June 25. 5:00 P. M. The doves exchange places.

June 26. 10:45 A. M. The doves exchange places, the female getting on. 12:00 Noon. The female is still sitting.

June 27. 5:45 P. M. Doves exchange places.

June 28. 5:45 P. M. Doves exchange places.

June 29 and 30. I was not in the room during the afternoon.

July 1. 5:50 P. M. Doves exchange places.

July 2. 11:45 A. M. Doves exchange places. 5:40 P. M. Doves exchange places.

July 3. 5:10 P. M. Doves exchange places. Their timepieces must have been too fast today.

July 5. The young doves are hatched. This is the twelfth day.

July 13. 4:30 P. M. The female left the nest and young alone. Temperature 102° downstairs. 6:00 P. M. The female returned.

July 14. 4:30 P. M. The female left the nest and young alone.

July 15. 4:30 P. M. The male arrived and made a few circles, then lit on the ledge and the female left. Five minutes later he left. The two young birds are now quite large.

July 17. 4:30 P. M. The female pushed one young bird out of the nest. It stood on the ledge trembling and flapping its wings, then retreated while the second one came out and exercised, and returned to the nest.

July 18. The two young doves are sitting on the window ledge.

July 19. They are gone.

It would have been interesting, had there been no lessons to study, to have watched every movement of this pair of doves. At the times that I could observe there seemed to be considerable regularity of time for exchange of places. The second pair of doves must certainly have had the site selected before the first pair left. It was also very interesting to note the confidence that the two pairs of doves put in the window screen.—Cora E. Shoop, Mascoutah, Illinois.
Notes on the Nesting Habits of the Hooded Warbler.—During the spring of 1931 two nests of the Hooded Warbler (Wilsonia citrina) were located in Chapel Hill, North Carolina, one on May 3, while the female was building it, and another on May 20, at which time it held three slightly incubated eggs. A few notes concerning these nests and the nesting habits of this beautiful warbler may be of interest.

The first nest was attached between a small buckeye and a honeysuckle stem that ran parallel to each other about four feet from the ground. It was fastened to the stems by plant fibers and a few cobwebs, and supported by small twigs branching out below the nest. The situation was in a typical Hooded Warbler ravine, consisting of steeply sloping, wooded hillsides abundantly covered with undergrowth, and a small stream running down the middle, bordered by a luxurious growth of buckeye, honeysuckle, and poison ivy. A visit to the nest on May 9 revealed two eggs, and two days later the set of four was complete.

The second nest was placed in much the same kind of situation as the first one. It was attached to two separate alder stems that crossed under the nest, forming a sort of fork, and it was about ten feet from a small stream. About twenty feet from this nest were the remains of a last year's nest in a fork of a small oak. Both the old and the new nests were about three feet from the ground. The ravine in which this was placed differed from the other ravine in that the hillsides were only gently sloping and not so thickly covered with undergrowth, and the main growth bordering the stream was alders and ferns.

The two nests were very much alike in construction, being composed mainly of cedar bark with a few dry leaves and stems interwoven. The nests measured about two and three-fourths inches across the top and bulged out slightly at the bottom. The rim was about three-eighths of an inch thick, making the inside diameter about one and one-half inches. The inside depth was about one and one-half inches, while the whole nest was about three inches high, thus making the bottom about one and one-half inches thick. The first nest was unusual in that it was lined with horse hair, probably because there was a supply of horse hair near by, on a path where horses and riders often passed.

Because of the inconvenient situation of the first nest, most of the observations were made on the second one. The following observations apply to the second nest, unless otherwise stated:

During incubation the male spent much of his time singing on the hillside or up-stream. When the female left the nest to feed, the male would meet her and a lot of "chip"ing would follow, as if they were glad to see each other. The male would follow the female about as she fed and accompany her part of the way back to the nest, both of them keeping up a continual "conversation". The eggs hatched on May 27, and from then on frequent visits were made to the nest for longer or shorter periods.

The male of this pair had a peculiar habit of singing close to the nest when approaching it with food. Without a single exception during the first seven days after the eggs hatched, the male would sing from one to four times at a distance of twenty to forty feet when approaching the nest, and then feed the young. The male of the first nest was silent about the nest during all observations. Both pairs used two notes about the nest that I had never heard the species utter before, and which are evidently used only in such cases. Whenever the male
approached the nest and the female was brooding, he would give several throaty chips closely resembling the common call note of the Maryland Yellowthroat given softly. The female would answer him, and then either fly away or raise up and allow him to feed the young. This note was used whenever the two parents met at the nest. Brewster, in speaking of the Prothonotary Warbler (Chapman's Warblers of North America), states that when the sexes meet a soft “tchip” of recognition is given, which is also common to nearly all the warblers. In this case the Hooded Warbler probably uses this note at other times.

Another note used was a sharp warning chip. It resembled more a chip of a sparrow than the ordinary “chip” of the Hooded Warbler. Once a jay perched near the nest when the male was approaching the nest with food; the female saw the jay and gave the warning chip, and the male immediately turned about and flew away. I heard this note on several other occasions also, which assured me that it was a distinct note in the warbler’s vocabulary.

Another point of interest that I noticed with both pairs was that when the male fed the young he almost always perched on an upright twig and fed hanging head downward, while the female usually perched on the rim of the nest. The male also left the nest immediately after feeding the young, while the female often rested several minutes on the rim, which tended to make her slower than the male in feeding.

During the first three days after the young had hatched, the male fed on the average of six times per hour, and the female fed three times and brooded three times per hour, during the five hours of observation. The average length of brooding periods was about ten minutes. During the remaining days that the young were in the nest brooding was discontinued, and the male fed on the average of every ten and one-half minutes and the female every fourteen minutes, in eight hours of observation. The nest was somewhat infested with lice, and the female often spent several minutes eating. The excreta was usually carried away.

The young were hatched almost naked, but soon were clothed in a coat of gray down. By the eighth day, when their eyes opened, they were partly feathered, and were beginning to utter audible food cries, resembling those of other young warblers. Their food seemed to be entirely insects, many of which were caught on the wing. Large brown crane-flies formed an important item in the fare.

While observing the nest I usually stationed myself about twenty feet away, and the birds paid little attention to me. But on the seventh day, when I took my usual place, the female began scolding me vigorously. She went to the nest and got rid of her mouthful and came back to scold. She and her mate refused to feed until I had retreated to about forty feet. For the remaining observations I was forced to stay out of sight. It seemed that when the young grew older the parents began to have more concern for their welfare.

When I arrived at the nest on June 5 the young were just leaving. The male had already led two of the youngsters up the slope, while the female stayed behind with the third which was evidently the “runty”. The young of the first nest were also, as far as I know, successfully reared.—EUGENE P. ODUM.

Chapel Hill, N. C.
ORNITHOLOGICAL LITERATURE


At last the Check-List has made its appearance, after more or less impatient anticipation. In its mechanical make-up we think the new Check-List surpasses its predecessors, chiefly because of the grade of paper used.

The new Check-List contains twenty orders and seventy-five families—the species and subspecies included number 1420 as compared with 1200 in the previous edition. These groups are arranged in the order worked out by Wetmore and Miller in 1926 (Auk XLIII, 1926, 337-347). The changed sequence of certain of the larger groups has become more or less familiar by previous announcements and various published lists. Considerable change has also been made in the order of the genera and species within the families. The forms are no longer numbered, as they were in the first and second editions; but the old numbers are retained in brackets following the names—this primarily for the convenience of egg collectors. While this is undoubtedly an important concession to egg collectors, both individuals and museums, it is just as certainly a hardship for all who keep a card index to have no fixed numerical order for the arrangement of the cards.

In this Check-List the subspecies has become more than ever the taxonomic unit. There are comparatively few instances of binomial species, and these are listed in sequence with the trinomial forms. Of course, the difficulty here is that subspecies have very little meaning to any but museum men.

The vernacular names have been applied to the subspecies, leaving no vernacular name for the species. It does seem useless and pedantic to concoct a vernacular name for every subspecies, for instance, for each of the sixteen subspecies of the Horned Lark. Vernacular names are supposed to originate with the hoi polloi, who know nothing of subspecies. There is something unbecoming and ludicrous in a committee of scientists, ornithological taxonomists, exerting themselves to apply a “common” name to something which the common people have not heard of. And when, at the same time, the effort robs a common object of its common name the incongruity is made all the more apparent. The Check-List should have listed species independently, with Latin and vernacular names: subspecies need only the Latin name.

Nomenclature is, doubtless, the chief function of a check-list. But the statement of distribution is scarcely less important and useful. Since the Biological Survey has published so little in recent years on the distribution of North American birds, we had hoped that the new A. O. U. Check-List would be generously complete. But we find that brevity has been the aim. Where a form is limited to an island, its range may be briefly stated. But where the range is well distributed over a continent an official statement of distribution should be in such detail that one might trace, with some degree of satisfaction, its range area.

However, while we make these criticisms we recognize the Check-List as an authoritative nomenclatural guide. It is necessary for us to have such a guide, and we shall follow it to the best of our ability. We have already encountered editorial difficulty in translating the “Crested Flycatcher—Myiarchus crinitus”
into the terms of the new edition, since the author wished to discuss the species, and not the subspecies.

In offering criticism we are not unmindful of the great labor and sacrifice in time in producing the new Check-List with its many important changes, in which the Chairman has, doubtless, shared to a greater extent than other members of the Committee. We think our criticisms arise simply from a different viewpoint, and we see no reason for suppressing it. At the same time we feel free to express to the Committee our gratitude for its long-continued effort and final achievement.—T. C. S.


As one opens this massive volume and superficially runs through it the impression is formed that biological science has reached the period of invoicing. The literature has become so extensive and voluminous that without the labors of bibliographers we would find our science in chaos. We are all familiar with the instalments of Dr. Coues' "American Ornithological Bibliography". More recently we have the three volumes of Meinel's "Bibliography of American Natural History, 1769-1865", published five or six years ago.

There are doubtless hundreds of unpublished bibliographies of vertebrate literature in varying degrees of completeness. Many institutions and many individuals have them. But it is only at long intervals that means can be found for the publication of a valuable one.

In the present work nineteen chapters (146 pp.) are in the form of reviews of the literature of vertebrate zoology, with a very fair consideration of ornithological literature. Whoever would undertake to prepare a history of ornithology would find here the field pretty well sketched. The same might, doubtless, be said with reference to the other vertebrate sciences, viz., ichthyology, herpetology, mammalogy, etc.

Although the compiler reviews the subject of textbooks of vertebrate zoology he does not mention the works of Kingsley, Wilder, Newman, and Walter, though some of these are listed in the catalogue. Likewise, some of the best works on avian embryology are left unmentioned, for example, Lillie's "Development of the Chick", and Duval's "Atlas D'Embryologie". A serious omission is made, it seems to us, in making no mention of the work of W. T. Hornaday under the head of "Protection of Animals"; it may be that the compiler has received his impressions in the east where the heat of controversy has rendered a fair appraisal impossible.

The second major part of the book consists of the annotated catalogue of titles on vertebrate zoology which are contained in the libraries of McGill University. This includes books and periodicals, but not titles in periodicals; and, of course, it includes titles in various languages other than English. A great many entries are annotated by the compiler, usually in sufficient detail to be in-
formative. Most, if not all, periodicals devoted to ornithology are listed herein, with cross references to the societies by which they are published. In this connection we should probably call attention to the fact that the annotation concerning the Wilson Ornithological Club is erroneous in giving the date of founding as 1858 (instead of 1888) and in remarking that it has had an existence of "over 70 years". Such an error is easily accounted for in the transcription of figures.

The work is a splendid and useful contribution to the literature of vertebrate zoology. It will be indispensable to institutional libraries and will be very desirable in private libraries where the cost is not prohibitive. Works of this kind are always labors of love, and the scientific world owes its gratitude to the author and publisher.—T. C. S.


Previous to this publication the only current world check-list of birds has been Sharpe's "Handlist of the Genera and Species of Birds"; and this is a generation old, while many changes have developed in the science of ornithology during that time. The basic scheme of classification in this work is that of Gadow, and promises to follow closely the arrangement as outlined by Wetmore in the "Proceedings of the United States National Museum", in 1930 (Vol. 76, pp. 1-8). Since the new A. O. U. Check-List is based on the same scheme of classification there will be essential harmony in these two important lists.

The entire work is projected in ten volumes, of which the first is now ready. Volume I, following the new classification, covers the first eighteen orders, through the Falconiformes. Very brief statements of distribution are given for all forms listed. Only Latin names are given; vernacular names are omitted, since no single set of vernacular names would be acceptable in all languages. A work of this kind is a big undertaking, for the publishers as well as for the author. The need of it and the convenience of it are apparent. It is to be hoped that ample support will be given to the publishers in order that succeeding volumes may appear as rapidly as the author can produce them.—T. C. S.


Quantitatively, this paper is about evenly apportioned between taxonomy with distribution (112 pp.) and natural history (108 pp.). Two forms of Lanius borealis are recognized, viz., borealis and invictus, and in this paper specifically called excubitor; the former has an eastern and the latter a western range, separated roughly by the Mississippi Valley. The variable species is L. ludovicianus, of which this author lists eleven races. Of these eleven, six are recognized by the 1931 A. O. U. Check-List, viz., ludovicianus, migrans, excubitorides, nelsoni, gambeli, and anthonyi. L. l. mexicanus and L. l. grinnelli do not occur in the Check-list because they are extralimital. L. l. sonoriensis and L. l. nevadensis are new forms proposed in 1930 by Alden H. Miller. L. l. mearnsi is a permanent resident of San Clemente Island, California, and was proposed in 1903 by Robert Ridgway.
The natural history of shrikes is discussed under the following topics: molt, migration, habitats, territory, courtship, nest building, eggs, incubation, growth of young, second and third broods, food, foraging, impaling instinct, digestion, preening and bathing, modes of progression, vocal notes, causes of death, age. A great amount of interesting "life history" material is gathered under these heads. We believe that this second half of the paper, especially, would be of great interest and value to most of our readers, who are primarily concerned with the life and habits of the bird. The illustrations are numerous and consist of halftones from photographs, maps, ideograms, and graphs. A bibliography is appended, but there is no index.—T. C. S.

Vergleichende Untersuchungen über das Gonadensystem weiblicher Vögel.

Part I includes a general introduction, a review of the literature, an outline of materials and methods, and the results of personal investigations of the development and anatomy of the female reproductory system in Columba livia domestica. The presentation includes a number of excellent figures.

In the introduction Kummerlöwe states that we can separate birds into two groups with respect to bilateral development of the female reproductory system: (1) A large group, which according to our present experience includes the majority of species; in which except for possible exceptions the development of the female reproductory system is unilateral (absent on the right side of the mid-line). (2) A relatively small group in which bilateral development of the ovaries is at least not exceptional.

The results of personal investigations are presented in the form of records involving cases of individual pigeons indicated as A to N inclusive. These varied in age from a six day embryo to an adult eight years old. The six day embryo showed bilateral development of the young ovaries, as did an eight day embryo. Two days after hatching another individual exhibited a rudiment of a right ovary. This rudiment disappears as a macroscopic structure in the older specimens.

Part II includes a general introduction, a review of the literature, a description of materials and methods, and the results of personal research. An excellent bibliography of the subject is appended.

The species reported in Part II is Passer domesticus (L). Specimens A to Z inclusive are described. These range in age from a nine day embryo to the adult female. A rudimentary ovary is present on the right side of the mid-line during the earlier stages, but it tends to disappear as the individual grows older. In the adult female macroscopic evidence of the right ovary is absent, but a few follicles appear in cross-sections.

Both papers discuss late embryonic development as it concerns the female urinogenital system. The development of several structures not mentioned in the review is included. In the opinion of the reviewer these two papers constitute an interesting and an important contribution to the literature of embryology and the literature of ornithology.—F. L. Fitzpatrick.

This critical work deals mainly with the systematic account of the 108 forms of bird life now known to inhabit the Galapagos Islands, and is based on a collection of 5800 skins obtained in 1905-06 by an expedition of the California Academy of Sciences; though in this connection it is necessary to state also that the author made a trip to England in 1930 for the purpose of examining the large collections in the British Museum and the Rothschild Museum at Tring. The leading collections in this country were also examined. Under each species we find, besides the synonymy, a specific description and a discussion of the habitat (local distribution). The first thirty pages are devoted to a philosophical discussion of systematic relationships. A useful bibliography of 138 titles is appended, with a complete index. The illustrations consist of distributional maps, and graphs and outline drawings dealing with the beaks of the numerous birds.

The animal life of the Galapagos Islands has been of general interest ever since Darwin's visit to the Islands in 1835. Perhaps the most interesting feature of Mr. Swarth's paper is the discussion of the new family Geospizidae, proposed two years ago by the same author, which unites several genera of ground finches with the Certhidea, the latter usually being assigned with the Mniotiltaidae. Mr. Swarth says that the Certhidea are well distributed throughout the Galapagos Archipelago, and that, "Island variation affects color and pattern almost entirely, structural differences being very slight." There is not only individual intergradation, but also complete intergradation between Certhidea and Camarhynchus, or small finches, so that the author confesses "an almost total abandonment on my part of any attempt at expressing relationship through names". This is splendid evidence for evolution. This paper is another example of Mr. Swarth's remarkably careful and analytical faunal studies; it is more than a check-list.—T. C. S.


Mr. Taverner has made a very careful study of the Canada Goose in its various forms. He concludes that there are five namable forms, in three species and three subspecies, viz.,
Branta canadensis canadensis (Linnaeus), the Common Canada Goose.
Branta canadensis occidentalis (Baird), the Western Canada Goose.
Branta canadensis leucopareia (Brandt), the Lesser Canada Goose.
(=B. c. hutchinsi of previous authors)
Branta minima (Ridgway), the Cackling Goose.
Branta hutchinsi (Richardson), Richardson's Goose.

This group of geese has proved to be a very difficult problem for systematists, and probably has not been solved yet.

In the Wilson Bulletin for 1926 (pp. 181-183) a survey is given of the diverse views of Messrs. Figgins, Swarth, and Brooks on the matter. The new A. O. U. Check-List (4th ed.) has continued to assign subspecific rank to the four forms listed in the Third edition, and has added one more, viz., leucopareia. Mr. Taverner points out that the bird now called leucopareia is the one which
by many recent authors has been called *hutchinsi*, and that the bird which Richardson described in 1832 as *hutchinsi* is a very small one, and one not now commonly referred to under this name. The latter should be given the vernacular name Richardson’s Goose, Mr. Taverner thinks, in order that the vernacular name Hutchins’s Goose may be dropped.

If we understand the matter, then, Mr. Taverner’s paper is in agreement with the new Check-List (4th ed.) as to the identity of the five forms, but disagrees as to their specific and subspecific rank. These five forms are two large ones, two small ones, and one of intermediate size. The two large ones are *canadensis* and *occidentalis*, the former migrating chiefly through the interior of the continent and the latter being found on the west coast with very restricted migration. The small ones are *minima* and *hutchinsi*, the former migrating along the Pacific Coast and the latter migrating through the Mississippi Valley. The form of intermediate size is *leucopareia* (=*hutchinsi* of previous authors), whose migratory route seems to spread from the Great Lakes to the Pacific Coast. The migratory routes of all these forms converge in the far north, and a more precise knowledge of the boundaries of the breeding ranges may have a definite bearing on their systematic arrangement. Copies of this report, Bulletin No. 67, may be obtained on application to Dr. W. H. Collins, Acting Director, National Museum of Canada, Ottawa, Ontario.—T. C. S.

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If we have counted correctly this treatise describes 176 different measurements of the bird’s external body form and structure. Of the bill alone 51 measurements are described. It is not claimed that all these measurements are essential in the description of any single species, but merely that all of them are useful for one purpose or another in various kinds of birds. Of the 176 measurements, 151 are illustrated by figures, drawn by J. M. Valentine: each figure shows the body (or part) of the bird with dividers in position to indicate the method of taking the measurement. While a great many of these measurements will be seldom used, it is important that when used they be used in a uniform way. The present work seems to be a successful attempt at standardizing bird measurements. To indicate the importance of uniformity let us consider whether a measurement of toe-length includes the claw, or not. Or, in measuring the length of a nuchal hair, should one select the longest, the shortest, or one of medium length? Or, should the length of a feather be taken from its point of emergence from the skin, or from the inferior umbilicus of the extracted feather? Etc., etc. We hardly know what to expect of the splitters now, with this encyclopedia of new measurements at hand. Standardization is, however, a good thing under most circumstances. A bibliography and a very complete index are provided.—T. C. S.

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Mr. Baldwin gives some practical suggestions in the management of bird sanctuaries, in which work he has had a wide experience.—T. C. S.

The authors record various detailed observations on the behavior of the two sexes in nest building, and on the position and structure of the nest. One female Cardinal was observed to pick green leaves and use them in nest construction, and the authors believe that this aided in the concealment of the nest. A male once assisted very slightly in shaping the nest, but did not bring any material. It was found that a pair of Cardinals often build five nests, and successfully rear four broods during a season. This probably helps to account for the marked success of the Cardinal in new territory.—T. C. S.


The first installment of this report was published in 1929 (op. cit., XXIV, 457-499), and treated the water birds, birds of prey, ending with the woodpeckers. The present installment deals with the Passeriformes, including the Tyranni (Flycatchers) and the Oscines, or singing birds. This paper presents a record of the author's extensive field work, and brings together many local notes scattered in the ornithological literature. Two hundred and sixty-five species are listed, including four that are accidental or extirpated.—T. C. S.


This Bulletin presents a report of the fourth meeting, at Amsterdam, of this International Committee, together with numerous reports by members of the Committee on the status of bird protection in their respective countries. Twenty portrait illustrations help to make us visually acquainted with the European workers in this field.—T. C. S.


Dr. Blatchley is well known as a writer on the natural history of Indiana—his books on the weeds and on the beetles of Indiana are widely used. While his specialty is entomology, he is a naturalist of the old school, which means that he is acquainted with the fauna around him. His latest book, under the title given above, recounts his observations on the natural history of his winter home on the west coast of Florida, in Pinellas County. The book is written in diary form, and while the author rested in the crotch of a great oak tree—his "nature nook". The record starts in 1913 and ends in 1931, but the entries after 1921 are few and far apart. It is very significant that when Dr. Blatchley selected his home site in 1913 he purposely chose a virgin wilderness, not too far from the city markets. Within a very few years his property was surrounded with the bustle and activity of a real estate boom. We are sorry that he did not add a chapter summarizing the changes consequently brought about in the plant and animal life. His story may be read not only for the natural history which it holds, but also for the human interest.—T. C. S.

In this short paper Mr. Sutton gives the first account of the discovery of the eggs of Harris's Sparrow. This discovery was made by a party sent out by the Carnegie Museum and led by Mr. John B. Semple; it included Mr. Sutton, Mr. Olin S. Pettingill, Jr., and Mr. Bert Lloyd. On June 16, 1931, at 8:35 a.m., the first nest was found by Mr. Sutton in the vicinity of Churchill, Manitoba. The nest was located in a mossy hummock surrounded by water, in a spruce woods. The four eggs were fresh, and pale, blue-green in color, spotted and blotched with brown. All told, ten nests were found. The materials collected are to repose with the Carnegie Museum.—T. C. S.

The Cardinal for July, 1931 (III, No. 2) contains an article by Carl W. Sehlag on “The Struggle for Existence”. It deals with a pair of Tufted Titmice which nested in a Bluebird box. After the birds had started incubation they suddenly deserted the nest. Investigation revealed an empty nest and egg shells on the ground. Then the author goes on to say: “While the building of the nest was still in progress, and again after the nest had been deserted, House Wrens (Troglodytes aedon) were observed throwing out tufts of material; and on both occasions we drove the wrens away.” Of course, this is circumstantial evidence; but it will be of interest to many.

The Indiana Audubon Year Book contains a paper by Dr. Amos W. Butler on the history in Indiana of the Carolina Paroquet and the Passenger Pigeon; and a valuable bibliography of early writing is subjoined. Reminiscences of days afield with Fuertes are given by Alden H. Hadley. Dr. Earl Brooks has been giving special attention to the Robin, and in this number of the Year Book he presents a very interesting résumé of miscellaneous information about this species. Some of the questions discussed are, unusual nests, albinism, can the Robin hear a worm?, banding, migration, enemies, slaughter in the south, etc. A number of rare birds for the state are listed in various articles. Fred Hall reports several for the Crawfordsville region. The Blue Grosbeak is reported near Mooresville, while a flock of Lazuli Buntings is reported near Terre Haute. A good report on banding operations shows that the thirteen most active banders in the state have banded, up to December 31, 1930, a total of 18,210 birds of 144 species. Numerous illustrations help to make this a most interesting annual, and larger than its predecessors.

Bird Banding Notes (Aug., 1931, II, No. 4) of the U. S. Biological Survey shows many interesting facts relating to banding. The reports from about 400 banding stations show an investment of $20,000 in equipment, and an annual expenditure in time and bait of $44,000. The amounts for time and bait should have been itemized separately, since the reader will suspect that the overwhelming proportion of the amount is for “time” in watching the traps. During the fiscal year ending June 30, 1931, 169,279 birds were banded: 12,329 returns were reported; and 1869 cooperators were licensed. The total number of birds which have been banded in this country up to this time exceeds 900,000.
The July number of the *Florida Naturalist* holds an article by S. A. Grimes on the nesting of many species in the Jacksonville region. One interesting note tells of the cutting of two trees so they would fall against a large cypress tree in which was located a Barred Owl's nest. By means of the smaller trees it was hoped to secure a view of the contents of the nest; but success was not attained. A Blue Jay is also reported to have destroyed the nest of a pair of Blue-gray Gnatcatchers. We need an up-to-date appraisal of the good and the bad of the Blue Jay. The issue for October contains an appreciation of Mr. William Dutcher by Mrs. Kingsmill Marrs. We have never heard or read anything of Mr. Dutcher but the highest of praise. His great work in organizing the National Association of Audubon Societies and directing its policies for twenty years is well known. Too much praise can not be accorded to his memory.

The August number of the *Gull* contains a very useful list of "plant indicators" for the life zones of the San Francisco Bay region. "Bird Habitats" is a topic discussed in the September number. The leading article in October is an analysis of Barn Owl pellets. The *Gull* is a printed four-page leaflet issued by the Audubon Society of the Pacific, 1695 Filbert Street, San Francisco.

The *Raven* is mimeographed on letter-size paper, and issued monthly by the Virginia Society of Ornithology. The June and July numbers contain ornithological notes from localities of the state. The August and September number contains the membership roll and local notes.

The *Migrant* is the quarterly organ of the Tennessee Ornithological Society. The number for September, 1931, contains an article on the sparrows of Tennessee by Dr. George R. Mayfield, and several observations by F. M. Jones on the breeding of the Parula Warbler in the mountains of eastern Tennessee.

*Inland Bird Banding News* (III, No. 3, Sept., 1931) indicates that an effort has been made to have a line printed on state hunting licenses requesting that all banded birds killed be reported to the Biological Survey at Washington. Many states received the idea favorably, others want the report to go first to the State Fish and Game Department, to be forwarded to Washington. Possibly the latter desire arises from curiosity. An effort is also being made to have ammunition manufacturers place in each box of shells a similar request that all banded birds taken be reported to the Biological Survey.

*News from the Bird Banders* (VI, No. 2, July, 1931) contains a remarkably clear and forceful editorial on the relation of the Western Bird Banding Association to the U. S. Biological Survey, and to the latter's campaign of exterminatory poisoning. Its conclusion is that "we have no choice but vigorously to condemn the ten million dollar program and to strain every effort, corporately and individually, through our correspondents, our congressmen, our local influence and the societies to which we belong to bring about a fundamental reorganization of the methods, plans, and viewpoint of the Survey in respect to the branch in question."
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The New Orleans Meeting

We take this last opportunity to remind our readers of the annual meeting at New Orleans, December 28 and 29. Headquarters will be at the DeSoto Hotel. Meetings will be held in Gibson Hall of Tulane University. Many other meetings of the Sections of the American Association for the Advancement of Science and its associated societies will occupy the entire week beginning on Monday, the 28th. A large number of special excursions have been planned for your pleasure and instruction, for example:

1. The W. O. C. trip to Avery Island, famous for its bird life, will be held on Saturday and Sunday, December 26 and 27. Leave the DeSoto Hotel early Saturday morning.

2. Two bus excursions, sponsored by the Ecological Society, will be given on Thursday and Friday, the 31st and January 1st leaving the St. Charles Hotel at 8:30 A. M. to Pass Chef Menteur and Pass Rigolets, through the marsh and bayou country, returning via the five-mile concrete bridge over Lake Ponchartrain. Return about 5:00 P. M.

3. The geologists have planned an excursion to New Iberia Parish for the salt mines and the bird sanctuary of Avery Island. Leave New Orleans on Southern Pacific Railway at 10:40 P. M., January 1st (Friday), remaining in berth until morning. All day Saturday spent in the salt mines and on the bird sanctuary. Leave New Iberia at 3:13 P. M., and arrive at New Orleans at 7:35 P. M., Saturday. Total cost, $10.80, including lower berth.

4. The American Foresters offer an automobile trip to Bogalusa, in the lumber region, and where Kraft paper (like that used for the mailing envelope of the Wilson Bulletin) is made.

Numerous other trips have been announced, by rail, bus, and airplane; one by boat over the 110 miles down the Mississippi River to the mouth; one to Grand Isle, former rendezvous of French pirates; one to the Evangeline country of the Acadians, made known by Longfellow's poem; one to the Chalmette battlefield where General Andrew Jackson repulsed the British invasion in the battle of New Orleans. Longer trips to Havana, the Panama Canal, and to various points in the Caribbean Sea are available. Consult your railroad ticket agent for the 16-day excursion tickets on sale on December 25, 26, and 27th.
Dues for 1932
Annual Dues for 1932 Are Now Payable

This is the Treasurer's first notice to all members that dues for 1932 are now due and payable to the Treasurer

MR. W. M. ROSENE,
City State Bank,
Ogden, Iowa.

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
Active Members .................................. 2.50
Associate Members .............................. 1.50

The Club values the continued support of every member, and every resignation is received with regret. In spite of the depression and a very great loss in membership, we have published a larger volume this year than in any preceding year of the organization—and without a deficit; though, of course, we do not expect our bank balance to be as large as at the close of last year. During 1931 the Club received about one hundred new members and lost about double that number. If there are any members at present who feel inclined to raise their membership status from Associate to Active, or from Active to Sustaining, it will help materially to maintain the number of pages in the Bulletin for the coming year.

In behalf of the Officers of the Club, the Wilson Bulletin extends greetings of the season to its readers, and wishes to thank them for their loyalty and generous support.
THE
WILSON BULLETIN
A Quarterly Magazine Devoted to the Study
of Birds in the Field
and the Official Organ of the
WILSON ORNITHOLOGICAL CLUB

Edited by
T. C. Stephens, Editor-in-Chief
Myron H. Swenk    Albert F. Ganier
Alfred M. Bailey   R. D. Hissong

Volume XLIV
1932

Published Quarterly
by the
WILSON ORNITHOLOGICAL CLUB
at
Sioux City, Iowa