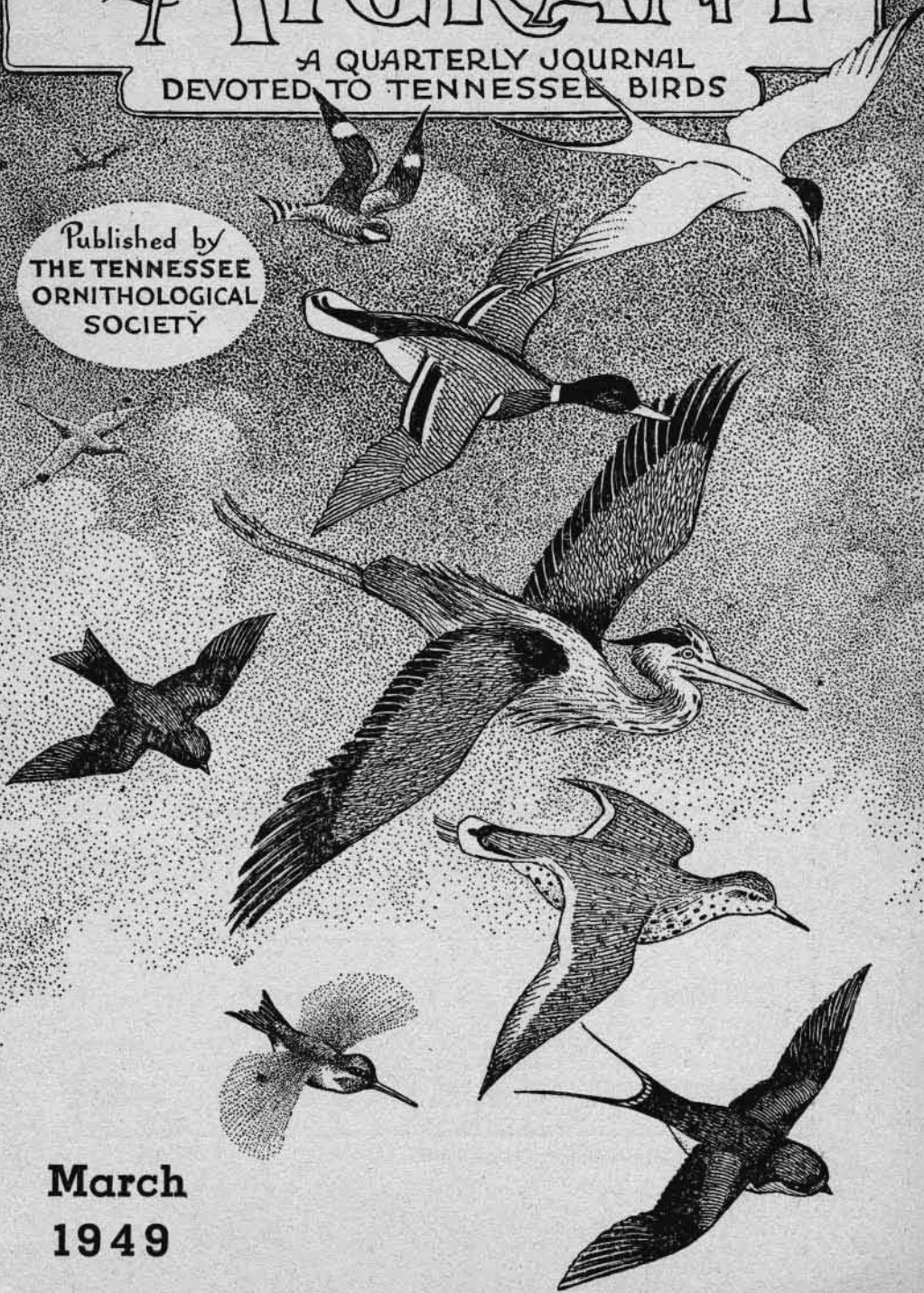


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No. 1

NESTING OF THE MOURNING DOVE AT NASHVILLE

By HARRY C. MONK

The Mourning Dove (*Zenaidura macroura*) has been a fairly common summer resident of the suburbs about my home, and in nearby Centennial Park, throughout the thirty-four years I have lived in the neighborhood. A few nests have been placed in our yard, with others in adjoining properties, while a small colony breeds on the Park hill less than a hundred yards away. The Doves are frequently observed in our yard, foraging or visiting the bird baths, and their cooing comes to us through the long summer days for months each year. In this long continued, close association many nests have been found, and intimate glimpses of the species' breeding habits afforded; this was especially true in 1948, when a pair built five successive nests in our yard and adjoining ones. These interesting experiences led to a review of all my notes on the subject, a summary of which is offered here.

I found my first Dove's nest in 1917, and have found at least one each year since; even in the war years, when I was infrequently home, one or more nests were found. In the period 1934-39 inclusive, when intensive field work was carried on in this home locality, an average of 26 nests per year were found. In the best year the total was 39 nests. My total for all years, 1917 to date, is 397; with those reported in THE MIGRANT, and the data made available by Mrs. Laskey, well over four hundred nesting records are at hand. Of course, notes made in my earlier years, when I was learning the trade, are not as complete and detailed as one could wish in every case. This factor has been kept in mind constantly in reviewing the data.

Dove's nests found anywhere in Davidson County are included in the total, but over ninety percent were located in my home territory, either in Centennial Park, or in the residential section adjoining the Park on the west. On the hill in the Park a somewhat stunted hackberry woods covering about fifteen acres (scaled from a map) has always been very attractive to this species, with as many as eight nestings being in progress there at one time. This restricted area, which would not be so much as a pin point on the map of our state, thus offers unusual opportunities for watching the breeding habits of Doves, but it should be realized that such conditions are not to be expected generally.

The Mourning Dove has one of the longest breeding periods of any of our birds. Students in various parts of its vast range agree on this point, and Bent (1932, pp. 415-16), summarizing continent-wide data,

gives egg dates for ten months of the year. In my own experience nests have been found from March into October, and I can show that eggs have been laid in seven months of the year in this locality.

The length of the breeding period in days, counting from the earliest to the latest dates of actual occupancy of a nest, averaged 158 days for the 23 years in which the Dove's nesting was watched through the whole summer. In one year it was 179 days. When nesting records reported by other observers are added to my own, thus giving earlier or later dates in some years, the average quoted above becomes 164 days, and the longest period is found to be 198 days. Overall length of nesting period, for all years, from the very earliest to the very latest date is 209 days. I have no doubt the Mourning Dove sometimes has a 200 day nesting period in this region. Bear in mind, the above figures concern occupied nests only; they do not take into account the period of dependency of fledgling Doves after they have left their nests, and during which they must still be fed, or starve. The length of this period is virtually unknown, and is quite difficult to determine under field conditions. I have known one case in which a brood was fed for seven days after leaving the nest, and in another instance had reason to believe a bird was fed on the ninth day after it had left its nest. The breeding period of the Dove does not end until the last fledgling has become independent, and this factor will extend the figures shown above.

Mourning Doves begin to show an interest in the approaching breeding season early in the year. They sometimes begin to sing in January; in my experience this happens about one year in four, and usually in the last week of the month. The earliest song date I have seen is Mrs. Laskey's record of January 16, 1949. One can depend on hearing the song in February in any year, except on days of severe weather. At the same time there is a marked tendency for the birds to associate together in pairs, whereas small flocks are the rule in winter. Such two-somes return to their breeding grounds in my home area in January about one year in three, and are always present in February. They readily take up their confiding door-yard ways, contrasting with the wildness of wintering birds noted farther afield. Return to breeding territory, resumption of song, and pairing thus point the way to a new nesting season.

Writers on the habits of Doves have commented (Bent, 1932, p. 403) on the lack of data on the courtship of the Dove, but may not this association in pairs itself constitute courtship? The hawk-like flight maneuver, so often observed in the breeding season, and generally considered a courtship display, has been noted as early as Feb. 13, 1949, Feb. 22, 1942, and Feb. 28, 1928.

In some cases pairs have shown an interest in nest sites quite early. On February 17, 1947, a pair was noted moving from tree to tree in a leisurely manner, walking along the limbs, inspecting crotches, and apparently seeking a nest site. One bird took the lead, the other followed some distance behind. When the first bird paused in one spot the other (male?) joined the first. On February 23, 1933, I was attracted to a pair

of Doves by the peculiar call notes which one of them was uttering. It sounded like "tuck" or "coo", but not the soft voiced song note. One bird was crouched on an old nest platform, turning slowly from side to side, the other being perched close by; I thought the latter was doing the calling. A pair had been in this territory about three weeks, and an early song had been heard a month before. The above dates are about a month ahead of the earliest egg dates. I do not know of any actual nest construction taking place in February, but believe prospective nest sites sometimes may be selected in this month.

My earliest date for an occupied nest is March 13, 1921. It was placed on top the broken stub left when a dead hackberry broke off about twelve feet above the ground. On this elevated stump a Dove was incubating two eggs on a well built nest; she was invisible from the ground beneath the tree. At this date all trees in the vicinity were totally bare. An occupied nest was found on the Peabody campus in 1922 about one week earlier than the above date, and Mrs. Laskey has one nest record which is a few days earlier than my own, but nests with eggs in the first half of March are very rare. In all, March nestings are known in twenty of the past thirty-one years, or about two out of three years. The great majority of eggs laid in this month are laid in the last week of March, and March 25 is a good average date for fresh sets of the first laying in this locality. No March nesting has been started sufficiently early to mature a brood of young to the age of fledging (leaving the nest) in this month, to my knowledge.

In following the progress of the Dove's nesting through the long summer I have tabulated the data for the years of the most systematic field work in my home area, namely, 1934-39 inclusive, 1942, and 1946-1948 inclusive. These ten years were selected solely because the field work was continuous through each season, making the records comparable from year to year, and because extensive notes on Dove's nests were set down each season, showing whatever breeding activity took place, month by month. Many nestings were observed daily through their entire cycle.

Nests are tabulated here by the month in which the eggs were laid for the ten year period above indicated, excluding nests found in outlying areas and never revisited, as well as data from other observers, which was also obtained in other areas. There were 235 nests found in my home locality in the period described, ranging from ten to thirty-nine each year.

Table 1. Total number of Dove nests built each month of the breeding season, in home area, in years 1934-39 inclusive, and 1946-48 inclusive, with percentage of total in each month.

Month	March	April	May	June	July	Aug.	Sept.	Total
Nests	12	46	49	34	46	47	1	235
Percent of Total	5.1	19.6	20.8	14.5	19.6	20.0	0.4	100

Aside from the low figure in June it will be seen that the nesting activity ran uniformly through the summer right up to September. I cannot now account for the apparent drop in mid-summer, and it must be the subject of further study. In almost all years fewer nests were built in June than in other summer months.

The above figures covering a period of years, and derived from the activities of as many as eight pairs in some years, fit in well with the nesting activities of one pair which lived in our yard and adjoining properties in 1948, and which built five successive nests, all but the last being at least partially successful. The first was built in March, the eggs hatching April 10th, and the last was built at the end of July. One followed another so closely that it was impossible to trace the adults from a nest in which fully fledged young stood ready to leave, or from the young which still remained in their nesting tree and were there occasionally fed, to the new nest already building. So, although the birds were not banded, nor otherwise marked, their connection with these successive nestings was clearly apparent.

After watching this pair at such close quarters (often from the house), and studying my other nesting records of past years, I am now convinced that Doves do make repeated nestings (or attempts) for months through the summer, to the amount of five or even more in some cases, and this explains the rather uniform data outlined in Table 1, above. Detailed study of the record of each nesting in the period described above, including plotting on a chart all dates of observation, clearly showed a steady sequence rather closely, as a rule. This strongly suggested to me a picture of a stable, highly prolific breeding population, remaining in their chosen territory through the long summer, and producing brood after brood, barring accident.

The same nests tabulated above were followed through their cycle to learn the percentage of success. In all cases where one or more young were reared from a nest, that nest was listed as successful, in the month in which the brood was fledged. A total of 122 of the 235 nestings were successful, or almost 52 percent. In a study of 592 nests in Alabama, Pearson and Moore (1939, pp. 468-73) indicate a closely similar result. This is a somewhat higher degree of success than is shown by some other studies of bird nesting, and suggests this area is well adapted to the Doves' requirements.

Table 2. Total number of broods leaving nests in each month of the breeding season, in home area, in years of 1934-39 inclusive, 1942, and 1946-48 inclusive, with percentage of total in each month.

Month	April	May	June	July	Aug.	Sept.	Total
Broods	7	26	24	22	22	21	122
Percent of Total	5.3	21.3	19.7	18.0	18.0	17.2	100

The percentages shown above parallel those shown in Table 1 fairly closely, except there is no mid-summer low point, as in the former table. I feel that speculation on this point is futile, pending further field study.

The above table indicates that the Doves' breeding season ends abruptly in September. When these last nestings are considered in more detail, and when additional data from other years is considered, it will be seen that the ending is a more gradual process, and is spread over the whole month.

There are records of the Mourning Dove nesting in September or later in twenty of the past 31 years. In the ten years of the most intensive study such nestings occurred in all but one year. Accordingly, it appears that nestings in September or later are the rule and not the exception in this section.

In the thirty-one year period covered in my notes there are thirty-three nestings of the Mourning Dove known to have been in progress on or after September first. In some years there was but one of these nests, but in 1934 there were six nestings in progress on September first, the latest brood leaving the nest on the 29th. In 1938 the month began with four nestings underway, the last brood leaving its nest on the 8th. In 1948 there were seven nestings at the beginning of the month, the last fledgling leaving on the 29th. Only five of the thirty-three nestings failed in this last month of the season. Of course, many of these nests already contained young on September first, and had already completed the major portion of their cycle. Even so, there has been a very high degree of success in these late nestings, which shows how advantageous they are to the species.

In the following table successful late nestings are arranged in ten day periods, with the broods listed by date on which the young left the nest, to show the gradual decline of breeding activity to its final end for the season. The data in this table are derived from all years, 1917 to date, and from personal records only. The total number of young in these late broods is also shown.

Table 3. Total number of broods of Doves fledged in September or later, in ten day periods, with percentage of total for each period, and total number of young fledged in each period. Personal records, 1917-38 inclusive.

	Sept. 1-10	Sept. 11-20	Sept. 21-30	October	Total
Broods	15	6	6	1	28
Percent of Total	54	21	21	4	100
Young	26	10	10	2	48

Over half of the late broods reared by Doves were fledged in the first ten days of September, and about one-fifth of such broods left their

nests in the second and third ten day periods of this month. One brood, which is about four percent of the total, left in October. These late broods were predominantly full-sized broods, as twenty of the twenty-eight contained two birds each, six others consisted of but one bird each, and the size of two was not definitely learned, but contained at least one fledgling. This gives an average of 1.71 birds per brood, which compares favorably with the overall average of 1.74 birds per brood for the 122 successful nestings listed in Table 2. Mrs. Nice, in her study of Doves nesting on the campus at Norman, Oklahoma, (1923, p. 54) found an average of 1.7 young per successful brood. There is no loss of reproductive ability in the Dove at the end of its long breeding period.

In Table 3 one October nesting record is listed; this occurred in 1932, and is not included in the ten-year period treated in Tables 1 and 2. The nest was found in Centennial Park on October 2, 1932, at which date it already contained large young. It was visited daily, sometimes twice daily, and I thereby learned the two young left about mid-day of October 7th. Mourning Doves were noted in the immediate vicinity of this nest until the 13th, when the family apparently left the locality. This is the latest date known to me for this region.

Summing up, about one-sixth (17.2%) of Dove broods noted in this study left their nests in September, this proportion agreeing closely with the figures for each of several preceding months (see Table 2), and these broods were full-sized, comparing favorably in size with the average for all broods reared. There was no sign of failing powers of reproduction at the end of the breeding season. These data make it clear that these latest nestings are a normal, integral part of the species' breeding cycle, and not a freak occurrence. As they were also markedly successful, we can realize the importance of these late broods in the maintenance of the species.

Only a few of the Doves' nests found have been examined at first hand, and no detailed descriptions have been set down in the notes. A very few were so poorly made as to attract attention by this fact, as the one which was placed on a limb over a road, and was so flimsy that the two eggs could be seen clearly from beneath. In another case a nest of the Yellow-billed Cuckoo was used by a Dove after adding a few twigs which did not cover the original lining. The great majority have been much better structures, and did not fit the dictionary definition of "frail" or "flimsy", which are the terms usually employed by writers in discussing the nests of the Mourning Dove.

I prefer to call the nest of the Mourning Dove a "simple" structure, for simple it surely is, but adequate for the purpose intended, and not to be despised. The success of the species over an extensive range proves its nest fits its needs quite well. I am convinced this very simplicity is a necessary factor in the breeding biology of the Dove. It must rear a number of its small broods, one succeeding another, with usually brief intervals between, and must therefore build a number of nests. The ad-

vantage of a simple, easily constructed nest, which can be quickly finished of materials readily found, and can be placed on a wide variety of sites, is readily apparent. Such a nest is all that it needs or has the time to build, if it is to fulfill its reproductive duty.

The lowest nest found measured 42 inches above ground, and another 46 inches. Several others were six feet or less, but of a number of other low nests which were measured, none was less than ten feet high. The great majority I have found were between fifteen and thirty-five feet above the ground, and I am certain none has been as high as fifty feet. Three nests placed in our yard in recent years, and available for close study, were between 25 and 30 feet up, in the upper portions of medium-sized hackberries.

A marked habit of the Mourning Dove is the use of an old nest structure for a nesting site. About 27 percent of all my nests were so placed. The most popular site is one of their own nests, either one remaining intact from the previous year, or one recently vacated by an earlier brood. When a nest is re-used within a short time after one brood has flown, one naturally assumes the same pair are the occupants, but this is not proven. At least forty of the 397 nestings I have listed were a re-use of a nest which had already served once the same season; while nine sites have been used three times in the same season. There is also one record of a nest being used four successive times in one year. I have not tried to count the nests placed on a site used in previous years, because of the element of doubt in identifying the exact site used in a former year; notes are not always sufficiently detailed, nor sites distinctively marked to be surely known. However, this trait is so marked in the birds I have watched that it has been necessary to check every known site, and unused nest on every field trip, in order to be sure no new nesting is overlooked.

A good example of this tendency to use nests more than once is presented by a summary of the record for 1934. Thirty-seven nestings took place on twenty-four sites; fourteen were used once, and eight used twice, while one was used three times and one other used four times. The largest number in use on any day was seven.

The nests of other birds or animals are also sometimes used by Doves. Twenty-three of the nests were placed on nests of the Robin, Brown Thrasher, Mockingbird, Wood Thrush, and Cuckoo. In using the high cupped nest of the Robin the Dove appears to fill the cavity, or bridge it, as the brooding bird seems to rest on top of the rim. In addition to the above, thirteen nests were placed on nests of the gray squirrel, which is common in the study area. Most of these were built in March or April, on old beaten-down nests which were mere platforms of twigs and leaves. A few were built on freshly constructed squirrel nests in mid-summer. One such nest was occupied each night by the squirrel, and the Dove soon deserted (or was driven off?).

Although many nests have failed, very little has been learned as

to the actual cause of failure. A nest occupied one day may be found empty the next visit, without a shred of evidence as to what happened to its occupants. Very few have been destroyed by man, either maliciously or by accident. Storms have taken a small toll only. An unusually severe thunderstorm occurred at sundown, July 22, 1948, and blew down two Doves' nests, but five other occupied Doves' nests survived the blow successfully. The weather bureau reported some gusts of 75 mile-per-hour force in this storm. On many other occasions I have known summer thunderstorms to destroy a few birds' nests, but most, if not all, Doves' nests came through them unscathed. On June 11, 1939, such a storm blew two squabs from a Dove's nest, killing both; but three other occupied nests were unharmed.

One of the nests destroyed last July was located in our yard and I watched with concern as the storm approached. The limb supporting this nest was about one inch in diameter at the nest site, and swayed wildly in each gust of the rising wind. The nest probably traveled ten feet each time the limb swayed from side to side. This movement had the effect of tipping the nest, and at the end of each sweep the brooding adult was seen flapping her wings strongly in order to maintain her position on the nest. In spite of her efforts, the nest was blown apart and the two squabs, already well feathered, fluttered to the ground unharmed, although there exposed to many dangers.

I followed their subsequent fortunes with much interest. Soon after the storm they were placed in a box, and kept in a secure place until the next day, when the box and birds were placed in the nest tree, and in due time visited by the parents. However, both young birds left the box during the day, and at sundown were back on the ground beneath their nest tree, as on the preceding day. They eluded me in surrounding shrubbery, and spent this night on the ground. One was not again seen, presumably being killed by cats. The other survived three nights on the ground, in a neighbor's garden as was later learned, until on the fourth day after its nest blew apart it was found on a perch ten feet above the ground. The adults were in regular attendance on this bird, and their care enabled it to survive.

Another instance of a brood surviving for five nights and days on the ground after a nest fell apart was observed in August and September, 1948. The nest occupied a very poor site and evidently fell apart on this account. The two well-feathered squabs were found on the ground at the base of the nest tree, where they were being closely brooded by an adult. They were not disturbed but were watched from a distance. They were closely brooded for the first several days, and later attended by one, or often both, parents. They remained close together on the ground as they would have done in the nest, but moved their position a few feet each day, so that they were about thirty feet from the tree when first observed to fly up from the ground. The nest collapsed on August 28th; on September 2nd one bird flew up to a limb about

ten feet off the ground, but its smaller (younger?) nest mate failed to reach the same perch. The next day both flew well.

I judge from these experiences that Doves succeed in rearing many young which fall or are frightened from their nests at a tender age. If the wings are strong enough to break the fall, the fledgling has a chance to survive. This means that a Dove's nest is actually exposed to the dangers that surround all birds nests for about three weeks only, as by this time the young are able to leave the nest in emergencies, and have a fair chance of survival. The Doves I described above were about ten days old when their nests failed; their nestling period was shortened about four days, maybe more.

If any reader has followed my remarks this far, I trust they will agree there is much we can learn by watching the habits of this familiar bird, which probably breeds in every county of the state, and join me in the realization there is a very great deal yet to be learned about it.

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406 AVOCA STREET, NASHVILLE, TENN.

THE ACCIDENT TO MIGRATING BIRDS AT THE NASHVILLE AIRPORT

By WALTER R. SPOFFORD

Approximately three hundred birds were killed at the Nashville Airport during the early morning of Sept. 10, 1948, and while the occurrence might seem not unlike many other well-known accidents to migrating birds, the situation in the present case has some features so unusual as to appear unique. The birds did not hit any obstruction, but appeared to fall out of the air close to the powerful light source at the "ceilometer", and probably the birds were killed by the impact with the ground.

The first report of the accident was made by Mr. Skinner, of the airport staff, to the Nashville Children's Museum. The following account is based upon the observations of Mr. Charles Linville, who was on duty at the ceilometer during the night of Sept. 9-10. He pointed out that the weather had been cloudy during the evening, with a ceiling of 2400 feet at 6:30 P.M., a ground visibility of six miles, a temperature in the sixties, and a four mile NW wind. During the night the cloud level

lifted to over 4000 ft., at midnight, and to 9700 ft. by 4:30 A.M. He first heard birds calling overhead at about midnight, and at 12:30 A.M. they were beginning to fall out of the air close to the ceilometer, most of them being dead when picked up, while a few were apparently only slightly hurt. Mr. Linville further stated that as he looked up the narrow beam of light, directed vertically upward from a base about eight feet above ground, he could see birds fluttering downward from as far up as he could see, many hundred feet up in the air. Although most birds fell within one hundred feet of the light, a few were found as far as two to three hundred feet away. Most of the birds fell in the first hour, but a few fell until almost dawn. Many of the birds were so badly damaged by landing on the runway that they were discarded, but a total of 248 were eventually collected, of which about a dozen were still alive. Several of these were later banded and released by Mrs. Laskey.

The surprising aspect of this situation was the fact that the birds were flying at some altitude, certainly at some hundreds of feet, and they hit no obstacle but merely flew into the beam of light (intense, but only a few yards wide) whereupon (becoming temporarily blinded?) they fell fluttering to the ground. Not only were small birds so affected, but a bittern and six grebes were also victims.

A second factor of importance is that there apparently was not low visibility in the atmosphere, as the clouds were at or above 4000 ft. and rising higher. Since the birds hit no obstacle in their flight, and since poor visibility can be ruled out, the more obvious remaining factor is the ceilometer. While this instrument sends a powerful beam of light directly up into the sky, registering the cloud ceiling up to 15,000 feet (and visible at 30,000 ft.), the light is not different from those in use at other airports, and has been used here at Nashville for several years with no previously known mishap. It is stated that at close range the light is sufficient to temporarily blind a person looking directly into it, and to cause severe burns, but this can hardly be true for any great distance, because the intensity falls off as the inverse square of the distance.

Certainly the light was a most important factor, as all the birds were relatively near it when picked up. Furthermore, Mr. Linville reported that birds entering the beam as far up as he could see were affected. Not all fell, however, as some regained control in the air and flew off. Since the light is a narrow vertical beam, it could not easily have attracted birds; rather, it may have partially blinded those that crossed through the illuminated column.

In a recent analysis of factors responsible for the accident the following night at the Empire State Building in New York City, Pough (1948) states that the birds were riding a southward moving cold air mass, and that as this approached lower New York it was forced lower by an overlying warm air mass moving northward. The birds were continuously forced to lose altitude to remain in the southward air-flow, and being below the top of the Empire State Building as they crossed the city,

several hundred were killed. While Pough suggests that such factors may play a considerable part in most migration accidents, such as those familiar at the Washington Monument, they can have played at best only a contributing factor in the Nashville accident, possibly bringing the moving wave of birds into "range" of some factor related to the light. Against this lies the fact that the weather records do not show any considerable changes in air temperature. The weather was clearing after several days of cloudy weather, with a small amount of rain during Sept. 3-9. Although various speculations may be made, the particular combination of factors responsible for the birds killed at the Nashville Airport remains a mystery. Mr. Linville has offered to let me know at once of any repetition of the occurrence, but the fact that there has been no other similar accident in the several years the light has been in constant use, and the fact that this light is used at other airports without incident makes it probable that unknown factors are actually a necessary precondition.

The birds killed present an interesting sample of a fall flight, and while a number of such examples have been published for the eastern seaboard (eg.: Overing, 1938), this appears to be one of the first reports from the central flyway region. The following list does not include some dozens of specimens disposed of before the museum secured the specimens which were in good condition:

Pied-billed Grebe, 6; American Bittern, 1; Sora Rail, 2; Wood Pewee, 5; **Empidonax** flycatchers, 20; (most were identified by Mrs. Laskey as Yellow-bellied Flycatchers and a sample of 8 sent to Dean Amadon at the American Museum were such, while one other specimen sent in a separate package was identified as probably an Acadian Flycatcher). Olive-backed Thrush, 2; Veery Thrush, 2; Yellow-throated Vireo, 1; Red-eyed Vireo, 95; Black and White Warbler, 9; Prothonotary Warbler, 2; Tennessee Warbler, 7; Nashville Warbler, 1; Yellow Warbler, 4; Magnolia Warbler, 5; Prairie Warbler, 1; Cerulean Warbler, 1; Blackburnian Warbler, 1; Chestnut-sided Warbler, 3; Ovenbird Warbler, 6; Water-thrush Warblers, 9; (seven appeared to be the Northern species, and 2 the Louisiana); Kentucky Warbler, 9; Mourning Warbler, 4; (two of these in the immature plumage appeared to be Connecticut Warblers, but on the basis of a difference in measurement, Mr. Ganier identified them as also Mourning Warblers . . . he preserved the skins); Yellowthroat, 4; Yellow-breasted Chat, 20; Wilson's Warbler, 1; Canada Warbler, 20; Redstart Warbler, 4; Bobolink, 1; Baltimore Oriole, 1; Savannah Sparrow, 1. Total individuals, 248. Species: 33; families represented: 9.

As a sample of the flight, it is not dissimilar in composition to those published by Overing (1938). The largest number of one species is consistently the Red-eyed Vireo, and Roger T. Peterson recently told me he believed it to be the most common eastern woodland bird. The two other numerous birds reported by Overing, the Yellowthroat and Magnolia Warblers, were represented here by only 4 and 5 respectively. On the other hand, whereas Overing reports no Canada Warblers (in three years, '35,

'36, '37) there were 20 in the Nashville flight.

Attempts to determine the general origin of the flight were unavailing, as the species included such Canadian Fauna as the Blackburnian, Wilson's and Canada Warblers, and such more southern forms as the Chats, Kentucky and Cerulean Warblers. It is interesting that Grebes, Rails and a Bittern were casualties falling from the sky over the Nashville ceilometer, while they are not mentioned in the casualty lists of Overing at the Washington Monument. Mr. Pough furnished me with a partial list (105) of the birds picked up at the Empire State building on Sept. 12, the day after the Nashville flight, and this group of 23 species showed no preponderance of Red-eyed Vireos, only 8, as against 16 Oven-birds and 10 Connecticut Warblers.

Although too much space would be consumed in giving a detailed account of the plumage of the birds represented in the Nashville list, the birds were studied at some length by Mrs. Laskey who preserved them for months in deep freeze. As a sample of what such a study shows, of the 20 Canada Warblers 3 had a prominent black necklace, and the crowns gray-blue with black shaft streaks, while the other 17 showed either a subdued necklace or almost no trace, while their crowns were plain olive. Of the 9 Kentuckys, 6 wore a black crown and 3 an olive crown; and of 6 Pied-billed Grebes, 2 had black throats, 2 grayish, and 2 white. It is clear that a student of the fall flight could gain a great deal from a careful study of the percentages of the various plumages presented by each species.

In conclusion, it may be mentioned that it will be interesting to find out if any similar observations have been made at ceilometers at other airports, but at present a short investigation of the literature suggests that the Nashville observation may be unique.

VANDERBILT UNIVERSITY, NASHVILLE, TENN.

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BIRDS COLLIDING WITH WINDOWS

By ROBERT J. DUNBAR

Birds, however keen-eyed they may be, apparently can not see the crystal clear glass of our modern picture windows. If they can see it, they do not seem to recognize it as a barrier, nor do they seem to sense any danger until too late. At least this has been our experience.

Presently there are being contemplated in Oak Ridge, Tennessee, 452

garden type apartments, which represent the first of a series of permanent dwelling units to be constructed here in accordance with the master plan. The design of these apartments follows the latest trend in that one wall of the living room in each apartment will be built almost entirely of glass. From within, most people like the broad expanse of floor to ceiling glass in the living-dining rooms of this type of home; especially when the living-dining room wing looks out on a pleasant garden or wood lot. Yet, for all the comfort and convenience we humans may derive from such ultra modern design, the spacious unbroken walls of clear glass (when placed in some environments) are sure to increase an already too great man-made hazard to bird life.

Although our own living-dining room does not have a glass expanse in proportion to that found in the bolder, more recent dwelling designs, it does have (as do many of the living-rooms in Oak Ridge) two picture windows facing away from the street. The picture window in our dinette is four feet square. Each picture window is framed solidly into the wall making screens unnecessary. However, a screened casement window flanks each side of each picture window giving accent to its width. These windows face North and overlook a grassy plot bounded on the back by a wood lot. From within one has an unobstructed view of the yard and much of the woods. Here we have spent many a pleasant hour with field glass and telescope watching the bird activities.

On several occasions during the first few months of our residence at 106 Glendale Lane we heard a thud or a thump on one or the other of our picture windows, without realizing the cause. Now we know! And whenever we hear the familiar sound we rush to the point of impact. Sometimes we are too late and the bird disappears unidentified, but all too often we find the mute evidence lying beneath the window.

It was in the spring of 1944 that a Hooded Warbler flew into our dinette window and broke its neck. This was not only our first known casualty of this kind, but it was the first Hooded Warbler we had ever seen. A few months later a Wood Thrush killed itself by flying head on into our living room window. This specimen was given to the late William M. Walker (then living in Knoxville, Tennessee) who in turn gave it to Dr. Henry Meyer at the University of Tennessee. About this time a friend, who resides at 106 Norton Road, telephoned a description of a bird that had met its death against one of her picture windows. We drove over to examine the bird and found it to be a female Rose-breasted Grosbeak. Since then we have received many reports of bird fatality caused by the picture windows in Oak Ridge.

During the past five years the death score for our two picture windows is: one Robin, one Flicker, two Wood Thrushes, one Myrtle Warbler, one Ovenbird, one Hooded Warbler, and one Slate-colored Junco. Perhaps there were other birds which met their death while we were away from home, for on several such occasions, when we returned, we found a smudge and bits of feathers upon one of our picture windows.

Since these smudges were similar to those made by birds known to have killed themselves we could only surmise the tragedy. The fact that we did not find the body of the dead bird under the window meant little, for its disappearance could have been attributed to a stray dog or cat or perhaps to the ability of the bird to recover and leave the premises under its own power.

Not all birds are killed by striking our windows! In fact more than a dozen birds fly into our windows for every one that is actually killed. Some strike the window a glancing blow, which merely changes the direction of their flight. Others are momentarily knocked down, but recover almost before they reach the ground. Still others are stunned and do not recover for many minutes. Of those that are stunned a few doubtless receive permanent injury, but of this we have no record.

Perhaps the most amazing thing that we have observed is the bird's exceptionally strong recuperative powers. Two excellent examples attesting this fact follow:

The first took place on July 15, 1948. We were eating breakfast at 6 A.M., when a Wood Thrush struck our dinette window with a loud thump, and dropped to the ground. For a moment it lay still and had every appearance of a dead bird. Then suddenly it began to breathe very deeply. Aside from the deep breathing there was no other signs of life. Twenty minutes passed, then the Thrush lifted its head and blinked its eyes. During the next five minutes it turned its head slowly, very slowly, from side to side as if trying to discover what had happened. Then it stood up on its feet, but made no other effort to move. Two minutes later it folded its wings to their normal place upon its back, after which the deep breathing stopped. Apparently the Thrush was regaining its strength, for it ventured to take one hop, then after a moment's pause another. Headed in a direct line for the nearest cover, at the edge of the woods, the Thrush took two more hops, paused and took two or three more. Repeating this performance over and over again the Thrush took a full seven minutes to reach the cover sixty feet away. Unfortunately any further observation was interrupted by the Thrush's disappearance into the shadows of the foliage.

The second example took place on November 29, 1948, the day I stayed home to nurse a cold. About 1:03 P.M., there was a loud thump on our dinette window and upon investigation we saw a Myrtle Warbler lying motionless on the ground. It had landed right side up, with its left wing spread, yellow rump fully exposed, and its head slumped toward the house, about one foot from the foundation wall. At first its breathing was so weak that it was hardly perceptible, but soon it became labored and rapid. Ten minutes later the Warbler drew its extended wing into its side decreasing the size of the yellow exposure on its rump. At the end of another twelve minutes the bird turned its head once more very slowly from one side to the other, then became still. During the next twenty-five minutes at intervals of from three

to eight minutes the Warbler would turn its head once from one side to the other. With each successive movement it seemingly took a greater interest in life. In fact toward the last of this period it showed nervous alertness when a squirrel dashed up the oak tree about twelve feet away. At 1:52 P.M., the Warbler rose to its feet and slowly moved close to the foundation wall, where it was no longer visible from the closed window. For further observation I opened the casement window every two or three minutes. Each time I did so the bird watched me with a critical eye, then it would inch its way along the wall toward the East corner of the house. One hour and six minutes after the Myrtle Warbler was knocked out it rounded the corner of the house on foot. When I opened the window on the East side of the house it took flight, landing in the branches of an oak on the adjoining lot. Here it flitted from twig to twig a few times, then was lost from view.

Why do birds fly into windows? We can not say, since our observations have usually been after instead of before the impact. In a few instances, however, we suspect that the bird was trying to make an escape and being hard pressed it was not too observant. In such cases no matter how close the pursuing bird may have been it always reacted in time to avoid a similar collision. On one occasion, without any indication that it was being pursued, we watched a Wood Thrush fly out of the woods straight into our window. Strangely enough, House Sparrows seem immune to such window accidents. Although they are at times very active around our house we have yet to see one fly into a window. Can this be accounted for as an instinct developed through countless sparrow-generations of association with windows or can it be that the House Sparrow is so slow on the wing that it has ample time to see and react?

OAK RIDGE, TENN.—Feb. 6, 1949.

THE ROUND TABLE

A FLOCK OF AMERICAN EGRETS IN OCTOBER AT ELIZABETH-TON, TENN.—About 6:00 o'clock in the evening of October 9, 1948, I glanced up from my gardening to see a flock of large white birds bank against the hillside across the Watauga River, about a half mile from my home, and alight in the tops of some Sycamore trees. With my 10x binoculars I could not be sure of their identity. My son Robert and I drove down behind the Franklin Club while Mrs. Herndon called Mr. Behrend and Mr. Browning. From the parking area we could plainly discern the yellow bill and dark legs which identified them positively as American Egrets (*Casmerodius albus*). Upon being approached closely the entire flock of eleven birds took off and began circling around over our heads, gaining altitude. We sat down to disturb them as little as possible, hoping that they might return. Very soon we saw a fairly large, dark-colored bird at a rather high altitude approaching the flock from the east. When almost directly over the flock, the dark-colored bird dived to-

wards the egrets which made them scatter, squawk, and lose altitude. It was not until this incident occurred that we realized that the aggressor was a Peregrine Falcon. The egrets reassembled in a wavy line formation while the falcon regained altitude. It made another feeble pass at the egrets, but they started off in a southwesterly direction and the falcon circled back and disappeared in the direction from which it came. Mr. Browning appeared on the scene about this time and observed them until they disappeared from view. When the egrets were over Rio Vista, a shot was fired in their general direction, which caused them to break formation and again lose some altitude. They soon recovered their formation, part of the time in V-formation and part of the time in a wavy-front formation. We watched them disappear in the twilight flying in a southwesterly direction to the south of Buffalo Mountain. This was much the latest record and the largest flock which has been observed in our territory.—LEE R. HERNDON, 1533 Burgie Place, Elizabethton, Tenn.

FALL FLIGHT OF HAWKS AT FALL CREEK FALLS STATE PARK—A large flight of hawks was reported to the writer by Mr. Bridge Bayliss, superintendent of Fall Creek Falls State Park, (near Pikeville, Tenn.) on Sept. 25, 1948. Mr. Bayliss stated that there were probably thousands of hawks there that day, some soaring overhead in small flocks, others at some altitude, while many more were flying close overhead. One man shot twenty-six of them with a shotgun, indicating that many were close to the shooter.

Presumably the main body of birds was the Broad-winged Hawk, *Buteo platypterus*, as it is well known that large numbers of this species pass southward in late September (Spofford, 1946, *Migrant*, pp. 14-15). In the present case, it is probable that some other species were also present. No main hawk flyway has yet been discovered in Tennessee, but the several long high ridges (Clinch Mountain above Knoxville, the eastern escarpment of the Cumberland Plateau, along the Sequatchie watershed, and also possibly along the western escarpment of the Cumberland Plateau, as well as the much higher southern Appalachians to the east of the Tennessee Valley) suggest the possibility of a regular flyway. It is noteworthy that the present situation was on the flat part of the plateau, but relatively close to both the western edge of the Cumberlands and the long continuous ridge on the west side of the Sequatchie Valley. It is possible that the flight was so wide as to encompass both, but the observation was limited to the park area. It is difficult to make a similar case for the 1946 flight at Nashville, except for the bare possibility that some of the Highland Rim is used as a flyway, but this would be of short use, and the already dense flock passed over Nashville (Oct. 1, 1946) before the ridge could have been of any assistance in supporting the flight. It seems more probable that relatively dense flocks pass over the southern states at scattered points, unassisted by topography. Mr. Bayliss, however, mentioned that he had seen such flocks once or twice previously, but many years ago.—WALTER R. SPOFFORD, Vanderbilt University, Nashville, Tenn.

GOLDEN EAGLE AT HUMP MOUNTAIN, TENN.-N. C.—While pursuing our hawk survey on Hump Mountain, near Shell Creek, Tenn., on October 10, 1948, Dr. A. R. McKinney, his daughter Lorna, my daughter Ann, and I had just finished eating our lunches on the summit when I saw a large bird approaching us from the southeast at an altitude somewhat lower than our position. I moved away from the group to improve my vantage point and saw the bird approach directly, drop its feet, and land on the ground several hundred yards down the mountain side. Its legs were comparatively short, and the bird looked as if it had breeches on. It remained on the ground only a minute or two before taking off for a short flight and then lit on the ground again a short distance from the first point. Its stay on the ground was again very short, and taking off into a strong wind from the south it gained altitude almost effortlessly and with a very few flaps of the wings. Its flight was very graceful and appeared light for such a large bird. It moved off in a southwesterly direction. It had traveled a considerable distance and gained altitude before it banked in the sunlight and revealed its golden brown neck and back, the white patch near the base of the tail and the white patches in the primary wing feathers. It was not until this last performance that I was sure I was observing a Golden Eagle (*Aquila chrysaetos*). It finally disappeared a little to the east of Roan Mountain, still going in a southwesterly direction.—LEE R. HERNDON, 1533 Burgie Place, Elizabethton, Tenn.

BLACK TERNS IN UPPER EAST TENNESSEE—On July 28, while driving alone along Highway 37 between Tri-cities Airport and the South Fork of the Holston River, I saw a flock of about ten birds that, to my inexperienced eye, resembled Nighthawks in shape and size. However, because of the number of birds and lack of identifying white bands or call notes, I stopped to look at them with binoculars. As they circled continuously not very high overhead, I noticed their swallow-like flight, but immediately eliminated the various species of swallows on account of size. They were grayish above and on the underside of the wings, had a dark body, and were white or very light fore and aft. I finally gave up hopes of identification and drove on to my destination, which was a private fish hatchery about five miles away. On arrival, I was presented with a headless bird that had fallen or dived in search of food into a fish pond, where its head had been cut off, apparently by a turtle. It was immediately apparent from the bird in hand that it was the same species as the flock seen overhead a few minutes before, and it was easily identified by the black body and small size, and by use of Peterson's "Guide", as a Black Tern.—ADELE H. WEST, 1007 Walker St., Elizabethton, Tenn.

MORE HOUSE WRENS REPORTED FROM NORTHEASTERN TENNESSEE.—After reading the account by Tyler and Lyle in a recent issue of THE MIGRANT stating that the House Wren has been known to nest

in East Tennessee and having heard this bird frequently as I drove through Bristol, Va., I undertook the following investigation.

On July 4, 1949, 6:00 to 8:30 A.M., the writer located twenty-six House Wrens singing in Bristol, Tennessee. In the evening of the same day six more were located there. At 227 Taylor Street four could be heard singing at the same time. Mr. William Turner, who lives at this address, stated that he has had House Wrens since 1935 when he built a house for them according to Boy Scout manual specifications. The original house is worn out and has been replaced. The new house was occupied by a pair of Wrens which reared eight young birds, which, according to Mr. Turner, left the nest June 28, 1949.

On July 5, 1948, early in the morning, the writer observed fourteen House Wrens in Kingsport, Tenn. Later Mr. Albert Wilkes informed me that House Wrens had nested on his property in Kingsport.

Mrs. Thomas of Elizabethton reported a pair of House Wrens nesting near her home. About July 25, Dr. Herndon and the writer undertook a survey of Elizabethton early in the morning and located Mrs. Thomas's bird but no others. At 9:00 A.M., we went to Bristol and located about thirty there. Most of these were singing. About half were birds I had located three weeks earlier, but the rest were in areas I had not covered. The Wrens were less active and sang less frequently than three weeks before. We left Bristol and drove to Johnson City where we located three more birds, all singing after 11 A.M., on a hot summer day. This makes a total of over sixty House Wrens, and, if only males sing, the number should be doubled. Another question is whether or not most of the Wrens heard singing were those which had just been reared. A survey June 1, followed by a survey five weeks later, should answer this question.—THOMAS W. FINUCANE, Route 1, Blountville, Tenn.

REPORT OF THE T.O.S. PLANNING COMMITTEE

In May 1948 Dr. Herndon appointed a Planning Committee and instructed the members of the committee to set up a research project for the T.O.S. We of the committee considered many types of projects. These were eventually narrowed down to the following: 1. Distribution: geological and seasonal; 2. Nocturnal migration: by telescope; 3. Breeding bird census: Audubon Society technique; 4. Banding; 5. Ecological, and 6. Song period: seasonal and daily. It was decided that it would be best to select one project as a start. We felt that a distributional project was the best type since it would have a wide appeal among the T.O.S. members, could lead to a terminal report, would be practical in that no special knowledge or equipment was needed, and the knowledge gained would be valuable.

As we considered specific problems we came to see the need for setting up a uniform system of records to be adopted by all the chapters of the T.O.S. Before the various chapters can efficiently cooperate they should have the same system of handling their data. The system we recommended to Dr. Herndon was that each chapter set up two files of

4" x 6" cards. One file would contain a brief statement of the seasonal and numerical statuses of each species of bird occurring in the chapter area. The second file would be devoted to individual records of birds which were for some reason unusual. Dr. Herndon has approved the printing of these forms and they will be distributed to the various chapters.

It is too early as yet to know how these forms may be used, yet for the sake of uniformity it is desirable to make some recommendations. First, each chapter should adopt some area with definite limits as their study area. The county in which the chapter lies, or perhaps a larger area also including certain nearby counties, should make a logical study area. The area selected should be small enough so that its bird life is well known to the chapter membership.

On the REGIONAL DISTRIBUTION CARDS under the heading "Seasonal and Numerical Statuses" should go a general statement of the relative commonness of the species during the year, if a permanent resident, or at some particular season if it is not a resident. The Cardinal might be described as a "common permanent resident", or the Canada Goose as a "rare spring and fall transient." The categories used to describe the relative abundance and seasonal statuses of the birds might well be those used by Mr. Ganier in his "Distributional List of the Birds of Tennessee," and the order of filing the species cards that of the A.O.U. Check List.

The determination of the seasonal and numerical statuses could be the subject of one or two chapter meetings.

The T.O.S. INDIVIDUAL RECORD CARD FOR UNUSUAL SPECIES is to be used to provide a permanent record for the occurrence of any species which is unusual in some way. A Grasshopper Sparrow in winter is unusual and a card should be filled in for such a record. The local nesting of a Dickcissel may be unusual. A Golden Eagle is unusual in Tennessee at any time. This card provides space for the names of both an observer and a recorder. The chapter secretary may be the recorder for all records, and such a fact should be a matter of note. For records that were made many years ago it is well to know both the observer and the recorder.

This system has numerous advantages. It should focus the attention of the chapter members on the state of their knowledge of each local species. The status of a number of species will probably be somewhat controversial and therefore worthy of particular study. If Mr. Ganier's list is used as a guide to what may be expected of each chapter, it will probably indicate a number of local peculiarities of distribution. These records will form a storehouse of data that can be used by the T.O.S. Chapters, by the Society as a group, and by national groups as well. As the data are accumulated over a period of years they can be used to indicate changes in abundance. To show such changes the status of each species should be reconsidered periodically, perhaps every ten years. If the abundance has changed, a new card might be attached to the original one for that species.

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*The simple truth about birds is interesting enough;
it is not necessary to go beyond it.*

Many of the chapters already have a system of records set up. Perhaps the information contained in these other systems can be transferred gradually onto these new forms. Certainly the new system will lose a great deal of valuable information if the unusual records from the past are not incorporated into it.

Later we committee members hope to call on the various chapters for distributional data for certain species. We have considered mapping the distribution of various species within the State of Tennessee and publishing the findings in THE MIGRANT. There certainly are many species within the State of Tennessee which present problems in distribution.

JOSEPH C. HOWELL
WALTER SPOFFORD
IGNATIUS VINCENT

NOTES HERE AND THERE

THE ANNUAL MEETING IN MAY

The Annual Meeting of the Tennessee Ornithological Society will be held as usual at Nashville, on Saturday and Sunday, May 7 and 8, 1949. The local committee advises that Saturday morning will be given over to visiting points of ornithological interest in and about the city. A regular meeting is scheduled for the afternoon, the first half of which will be a business meeting and the second half an innovation, the reading of papers by members. The annual dinner will be at 7 P.M. on Saturday, and will be followed by an illustrated talk and the usual informalities. On Sunday morning there will be an all-day field trip with lunch at mid-day, the lunch to be followed by the final business meeting, election of officers, and group photo. A full attendance of members is greatly to be desired. More information about the Annual Meeting and its program may be obtained from the president of the Nashville Chapter, Edward D. Schreiber, 2316 Dixie Place, Nashville 5, Tennessee.

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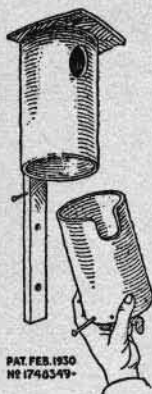
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