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DEVOTED TO TENNESSEE BIRDS

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# THE MIGRANT

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## Bird Mortality During Night Migration OCTOBER 1954

On the nights of Oct. 5-6, 6-7, and 7-8, 1954, a tremendous number of migrating birds were killed at a minimum of 27 localities scattered thru-out the eastern and southeastern states. The accidents occurred around airport ceilometers, brightly lighted areas, and at television and radio towers. Similar accidents have occurred in previous years, those at ceilometers prior to 1952 being summarized by Howell, Laskey, and Tanner (1954) and one involving buildings being described by Ganier and others (1935), but never to our knowledge has there been such a widespread series of accidents on three successive nights. The causes of the accidents were not unique, but the widespread occurrence and the large number of birds killed at some places were unparalleled. There is presented here a general summary of these events followed by more detailed accounts of the accidents that happened in Tennessee. The details of most accidents in other states are being published in other journals. The information presented here has been compiled with the cooperation of J. W. Aldrich, A. F. Ganier, D. W. Johnston, F. C. Lincoln, C. S. Robbins, and others, including those who have supplied the detailed accounts that follow.

The "villain," if there was such, was the weather. In general, fall migration is stimulated by a drop in temperature and winds from the north, i.e., by a cold front. A moving cold front frequently produces a solid overcast with low cloud ceiling which forces the migrating birds to fly at levels lower than usual; the article on previous ceilometer mortality (Howell, Laskey, and Tanner, 1954) showed that these conditions have always prevailed at previous accidents. In 1954 the daily weather maps of the U. S. Weather Bureau show that from Sept. 24 thru Oct. 4 there was generally fair and warm weather over the country from the Great Lakes east and south. On the night of Oct. 5-6 a cold front moved across the northern states reaching a line from southern Illinois to southern New Jersey shortly after midnight, and the sky was overcast in the region just behind the cold front from Ohio eastward. A number of birds were killed at the Empire State Building in New York City, and, on Long Island, several hundred birds of at least 34 species were killed at the ceilometer at Mitchell Field, Hempstead, and over a thousand birds of at least 50 species at the Suffolk County A. F. Base ceilometer (G. S. Raynor). At least 210 birds of 38 species were killed at the ceilometer at Allentown, Pa. (J. E. Trainer).

At midnight of Oct. 6-7 the cold front had reached a line extending

approximately from Jackson, Miss., to just north of Charleston, S. C., and the overcast covered northern Alabama, the eastern half of Tennessee, and the western half of North Carolina. In Tennessee on that night, birds were killed at Nashville, Smyrna, Shelbyville, Hohenwald, Tullahoma, Chattanooga, Oak Ridge, Knoxville, and Johnson City; detailed accounts of those accidents that have been investigated are presented below. Outside of Tennessee, on Oct. 6-7, a number of birds were reported killed in Kansas (newspaper reports), about 30 at the Greensboro, N. C., ceilometer (T. E. Street), and 300 at a television tower in Atlanta (D. W. Johnston).

The next day and night the cold front moved on into Florida, and on the night of Oct. 7-8, the overcast covered Alabama, Georgia, and lower South Carolina. It was on this night that the greatest number of birds were reported killed. Accidents occurring at ceilometers were: Winston-Salem, N. C., 190 individuals of 21 species (Chamberlain, 1954); Birmingham, Ala., 1600 individuals of 36 species (T. A. Imhof); Montgomery, Ala., at least 150 individuals of 10 species (O. L. Austin); Maxwell Air Force Base, Ala., 18 to 20 thousand individuals of 22 species (R. L. Edwards); Macon, Ga., about 25,000 individuals (D. W. Johnston); Savannah, Ga., an estimated 25,000 at one field and 2000 at another, a total of 19 species (W. P. Baldwin). Television or radio towers caused the death of about 200 individuals at Augusta and several hundred at Savannah, Ga. (D. W. Johnston), and of about 900 individuals of 31 species at Camp Cornelia, Ga. (Manager, Okefenokee Wildlife Refuge). At Charleston, S. C., a large but apparently undetermined number representing 24 species were killed around buildings (Chamberlain, 1954).

While the weather conditions can be said to be the cause of the accidents in the sense that they precipitated a large migration and, because of the low ceiling, forced the migrants to fly low, the weather was not the actual cause of death. It is obvious that at television and radio towers the birds were killed by colliding with the towers. The birds killed at ceilometers were, almost always, clearly victims of collision, for their bodies showed bruises, hemorrhages, or broken bones. There has not been evidence from accidents prior to this year to indicate whether the birds collided first with each other or with the ground. Observations bearing on this were made this year by Capt. R. L. Edwards at the Maxwell Air Force Base, near Montgomery, Ala., on the night of Oct. 7-8, and the following is from his report: "It was light enough that night so that the birds at the lower levels could be seen outside the beam. A few mid-air collisions were observed, following which one or both birds involved were sometimes seen fluttering groundward. A few were seen "spinning in" that might not have been involved in collisions."

After the accidents to migrating birds at the Nashville and Knoxville ceilometers in 1951, the U. S. Weather Bureau notified its stations that ceilometers could be turned off if birds started concentrating in the light. The men on duty the night of Oct. 6-7 at Nashville and Knoxville were aware of this directive. At Nashville, some members of the T.O.S. had anticipated the situation, because of the appearance of the cold front, and went to the airport (see A. R. Laskey's report). When they found

many birds circling the beam, they notified the operator who turned off the light. At Knoxville, the operator himself noticed the birds and turned off his light. These actions undoubtedly saved the lives of many birds; the total number killed at Nashville was 315 and at Knoxville was 267, while at Chattanooga and at Smyrna where the lights burned all night the numbers killed were respectively 681 and about 650. It seems clear that much of the mortality around ceilometers can be prevented by turning off the light, and interested individuals can help by observing the ceilometer light when the dangerous conditions prevail; these are a cold front with an overcast during the season of fall migration.

If mortality does occur, avoidable or not, the opportunity to learn about birds should be taken. If possible, a complete count of the individuals of each species should be made, because in this way much can be learned about the migration routes of birds. For instance, the number of Philadelphia Vireos at Knoxville and Chattanooga came as a surprise to observers who rarely see these birds in fall migration. If complete counts are made for several localities, it will be possible to trace the preferred route of certain species. These accidents also provide opportunities to get much needed data on the weights of birds; if birds, while still fresh, can be weighed to the nearest gram or its equivalent, the data should be sent to the U. S. Fish and Wildlife Service, Patuxent Research Refuge, Laurel, Md. Sex and age ratios may be obtained by examination of the reproductive organs and the skulls; the skull of a juvenile bird is softer and more transparent than that of an adult, and this may be easily seen by slitting the scalp and separating the skin over the top of the skull. Most of the specimens picked up at Knoxville were examined for parasites by Drs. Ciordia and Jones, to whom the accident was a unique opportunity to obtain a mass of data. By efforts similar to these, we can turn an "ill wind" to some good.

Details of most of the accidents occurring in Tennessee are described here. Following the separate descriptions is a list of the birds killed at the different locations. — JAMES T. TANNER.

#### BIRD MORTALITY

**NASHVILLE AND SMYRNA** — The third major disaster to night migrating birds at the Nashville airport ceilometer occurred on October 6, 1954, when 255 birds of 21 species were killed. An additional 60 birds were gathered that regained flight by early morning. They were banded and released at my home. At Sewart Air Force Base, Smyrna, only a small number of the casualties were gathered, but the 100 delivered to me brought the total number of species to 24.

At 10:30 p.m., when my husband and I arrived at the airport, there was a great mass of small birds flying in the ceilometer beam, estimated at approximately 3000. From the highway, three-tenths of a mile away, the ceilometer beam appeared as a great, sparkling column of light. The reflections from the beam flashing on the breasts and wings of the milling birds produced this glittering effect. Walking across the runway toward the ceilometer, I found dead birds there. With a handful of them, I hurried to the Weather Bureau building to ask that the beam be

temporarily turned off to allow the birds to disperse. This was in compliance with instructions from F. C. Lincoln of Fish and Wildlife Service, Washington, D. C. His letters of March 19 and April 17, 1952, appointed me to keep in touch with our local weather bureau (as others were appointed in other cities), to inform the weather stations when migrations were in progress so that stations may turn off the ceilometers if necessary and feasible before a large number of birds are killed. Weather stations where ceilometers are located were also advised. Our meteorologists complied immediately which doubtless reduced considerably the death toll.

On this occasion the same general weather conditions prevailed as on the two previous disaster nights (September 9-10, 1948, and October 7-8, 1951). A cold front reached Nashville that morning after a week or more of unusually warm weather. The U. S. Weather Bureau had reported a high of 92° on the previous day (October 5). The cold front brought overcast skies, cloud formations of stratus and strato-cumulus type, a trace of rain with lowered temperatures of 78° to 57° at night. Wind veered to the north with gusts up to 20 mph. By 6:30 p.m., the cloud height was only 900 feet (rising gradually to 2300 by 10:30 p.m.).

Miss Ruth Castles and Miss Jennie Riggs arrived at the airport around 9:00 p.m. and found birds flying in the beam. Miss Riggs estimated that there was about a quarter as many then as at the 10:30 peak. A. F. Ganier arrived about an hour later. At that time apparently, no birds had fallen. The first were found about 10:30.

For an hour or more, we five persons, using flashlights and aided by several of the airport personnel, worked fast, collecting birds from the runways, thus saving many from the wheels of planes and service trucks. One Tennessee Warbler was asleep on the runway with head tucked into its scapulars. All birds were found south and southwest of the ceilometer and within 250 yards of it. At 11:15 p.m. the cloud ceiling rose to "unlimited," the beam was turned on and there was no further gathering of birds about it that night. ,

The following morning, I went to the airport and picked up the few birds that had been overlooked. One of the employes told me that during the early part of the night such large numbers of birds flew into the brightly lighted hangar that the doors had to be closed. Several warblers were still flying high in the building at 10:00 a.m. One flew out as we watched.

The dead birds examined were fat. They showed skull and bill injuries. Magnolia, Tennessee, Chestnut-sided Warblers and Ovenbirds lead in numbers of casualties at Nashville and Smyrna.

The following night, October 7-8, 1954, similar weather prevailed except that the wind was north-east and the cloud ceiling remained consistently about 4000 feet. A report came to me that birds were in the beam, that it was turned off temporarily, and there were no casualties. On October 15, another cold front arrived with overcast and a trace of rain at 6:00 p.m. with north-west wind. Miss Castles, Mrs. Goodpasture, and I arrived at the airport about 8:00 p.m. Birds were flying through the higher section of the beam, heading south and south-

west. In a ten-minute period, we counted 50 passing through. Only occasionally was one seen to re-enter the beam from the south as if attracted to the light. The cloud ceiling was not below 4000 feet at any time and by 10:30 p.m. the sky had cleared. No birds fell that night.

Last year on October 5, 1953, when the type of weather seemed to foretell a birdfall, Mrs. Goodpasture and I found many hundreds of birds in the beam about 1:30 a.m. when the ceiling had risen to 3700 from the 1100 feet recorded earlier that night. Several birds dropped to the grassy plot around the ceilometer. One struck me, then dropped to the ground, but all were able to fly off. A thorough search with flashlights revealed none on the ground. As the clouds lifted, the birds followed the brilliant reflection made by the beam on the under side of the cloud, flying about in this bright spot as long as it was visible. At 2:15 a.m. all was clear and birds passed through the beam at a high altitude in normal migration. The only casualty at the airport that night was a Tennessee Warbler found on the concrete driveway. From these observations, it appears that the greatest danger to night migrants occurs when a strong, gusty northerly wind and a cloud ceiling of less than 2000 feet prevail during the pre-midnight hours when the migrants are attracted to the beam in the low flights prevalent at such times and then build up to great numbers.

The Sewart Air Force Base ceilometer at Smyrna is located 10 miles southeast of the Nashville airport so the same weather conditions prevail. Each time that birds have been killed at the Nashville ceilometer, this ceilometer has taken a heavier toll of the migrants. As military installations have a special "hood" attached to their ceilometers which eliminates the bright beam and allows the cloud-height recordings to proceed as usual with the invisible ultra-violet rays (black light), these catastrophes could easily be avoided if the operators at Air Force Bases were alerted on the danger nights. This year on the night of October 6-7, 1954, an estimated 600 to 700 birds fell. Dr. O. C. Ault and Dr. G. R. Mayfield visited the base on the following morning, bringing back a few living birds (12 were banded and released) and 88 dead birds, all of which were delivered to me for identification and listing. As numerous large vehicles had passed over the runways and grass plots by that time, most of the other birds had become more or less mutilated and were not gathered.—AMELIA R. LASKEY, 1521 Graybar Lane, Nashville.

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SHELBYVILLE — On the night of Oct. 6, 1954, an estimated 300 birds fell to the street about the Court House square at Shelbyville, Tenn. This was briefly reported the following day in the Nashville "Tennessean," with the theory that they had been killed by the cold. Shortly after, G. R. Mayfield and the writer went to Shelbyville to investigate and there we talked to George Harrison, local game warden, who had looked the premises over early on the morning of Oct. 7. Mr. Harrison still had two of the victims, a Yellowthroat and a Magnolia Warbler, and said most of the other birds appeared to him to be similar. When asked to make a very conservative estimate of the number on the street he said "at least 300." We are inclined to think this estimate was high. He said that a

dozen or so were picked up alive, apparently numbed by the cold, and when placed in the sun in a window they flew off after they had warmed up. Most of the birds, he said, fell to the pavement on the west and southwest sides and some were on the sidewalks against the store fronts. The large courthouse has a grass plot all about it with two or three medium size trees on each side. Brilliant street lights on poles have recently been installed, so that the square is brightly illuminated at night. The night of Oct. 6 being damp, chilly, and windy, few people were probably on the square at late hours and Mr. Harrison did not know when the birds fell.

The most probable explanation is as follows. A vast migration is known to have moved southward that night, riding the N-W winds of a cold front. As is usual in migration, birds rise for their flight after dusk and begin to come to earth again shortly after midnight, to rest. Such birds approaching Shelbyville and seeing the brightly lighted condition of the square would have been attracted to it as a place where they might be able to see how to effect a safe landing. Once there, and not being inclined to leave light for darkness, they eventually fluttered, fell or even dashed themselves against the pavement, or against obstructions, where they were found next morning. Those which had settled on the cold pavement might easily have died from several hours exposure to the cold wind. It will be remembered that birds accidentally left overnight in bird-banders traps will often die from exposure on a chilly night. We were told that a number of birds were killed about the U. S. A. wind tunnel building near Tullahoma on the same night. Mr. Harrison told us that the premises there are also brightly lighted.

In connection with bird-falls not occurring at ceilometers, there is an account of such an occurrence in THE MIGRANT for Dec. 1935. At that time, Oct. 23, 1935, John Bamberg wrote of seeing hundreds of birds fluttering about the water tower at Wheeler Dam construction village; the white tower being lit up by four flood lights. He picked up 50 of the victims. A cold front and low ceiling prevailed. At neither of these places were the birds attracted by the "light mushroom" on the under side of low clouds, such as is produced by ceilometer beams.

On Oct. 8, I visited the Camp Campbell Airport, 50 miles west of Nashville and could find no dead birds about the ceilometer. The observer on night duty told me that he had seen none and his record showed that the sky had cleared by 8 P.M. I also visited the W.S.M. television tower at Nashville and the powerful floodlights at Radnor railway switching yards but could find no evidence of birdfalls there.—ALBERT F. GANIER, Nashville 12, Tenn.

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CHATTANOOGA — Early in the morning of October 8, 1954, after reading a news report of the bird fatalities in Knoxville, the writer first telephoned the Weather Bureau at Lovell Field, Chattanooga, and then went to the airport. Finding too many dead birds on the field for me to handle, I obtained the help of Mrs. Walter Forbes and a servant. The three of us collected 578 birds that morning, of which 36 were alive, from the vicinity of the ceilometer. After dinner that night several



members of the Chattanooga chapter, including Dr. Wilbur K. Butts, came to the house to sort the species. The next morning my husband and I returned to the area and picked up an additional 103 birds that were lying outside the eastern boundary of the airport; 6 of these were alive. A total of 35 species was identified.

After further investigation, it became obvious that the accident had occurred on the night of Oct. 6-7. Mr. Sam Delay, Weather Bureau employee on duty that night, stated that there was much chipping at his office (1000 feet from the ceilometer) and many "things" flying in the beam. The greatest concentration was at about 4 a.m. (Oct. 7); the weather data for that time follows: ceiling 1700 to 2300 feet; ground visibility, 20 miles; wind velocity, 3 mph at 1000 feet, 12 mph at 2000 feet, 16 mph at 3000 feet; wind direction, from NW.

Of the total of 681 birds picked up, 430 were found north and northwest of the ceilometer, 112 were south and southwest of that point, 103 were east of the airport, and the location of the remainder was not noted. The birds that fell south of the ceilometer were within 500 feet of that point, while of those found to the north, a number were as far away as 1500 feet. In addition to the birds recovered, a number of live birds could not be caught and a few flew away as if they might make a complete recovery.

No data were kept on the positions of the dead birds, but certainly a great number appeared to have flown into the ground, striking bills and heads, and in some cases breaking wings. Among those living, broken wings were the most common injury; only a few showed broken legs. ADELE H. WEST, Chattanooga, Tennessee.

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OAK RIDGE—At 8:00 a.m. on Oct. 7, 1954, I received a report that hundreds of dead birds covered the K-33 parking lot in the Oak Ridge Area, Tenn. I confirmed this report a few minutes later when I visited the area briefly. About two hours later I spent a full hour in the area counting and picking up representative specimens. Mr. William T. Miller, Biologist at the Oak Ridge National Laboratory, also collected some of the dead birds.

High tension power lines bound the parking area on the north, south, and east sides, and four lines of lighting poles with wires are within the lot. To the east across the road is a large transformer station and fifty yards beyond that is the K-33 building. The parking lot is lighted at night as is much of the area between the lot and the K-33 building, a total area of about 12 acres.

Dead birds were everywhere, but the largest numbers were found around and between the cars parked directly under the parking lot lights. Many of the dead birds had head injuries such as broken bills. Some had broken wings, others had broken legs, and others had breast bruises. The nature of some of these injuries suggests collision with wires, towers, car bodies, and pavement.

Mr. Miller had collected 121 birds before I made a count. I counted 454 dead birds, including 126 crushed beyond identification by car wheels. There were many birds within the transformer station area, to which I

did not have access, and time did not permit my covering more than a small part of the edge area. I estimated that about 1000 birds were killed. Some living birds were still present. Mr. Miller and I each identified 17 species, but not all were the same so that the total number of species was 22. Dr. J. C. Howell confirmed the identification of the Savannah Sparrow, Acadian Flycatcher, and Swainson's Warbler.—ROBERT J. DUNBAR, 106 Glendale Lane, Oak Ridge.

KNOXVILLE—At the McGhee-Tyson Airport, near Knoxville, Tenn., there was a solid overcast almost all night of Oct. 6-7, 1954, with the ceiling mostly at 2500 feet. Winds were from the north and north-northeast, about 17 mph with gusts up to 25 mph. At midnight the Weather Bureau operator phoned me and reported that an estimated 2000 birds were circling around the ceilometer beam. When I arrived at the airport, the ceilometer light was turned off, so I asked the operator to wait until I could get out to the light and then to turn it on.

At 12:40 a.m. the ceilometer light was turned on. One bird immediately passed thru the beam, flying south at an elevation of about 1500 feet. Others followed rapidly. In a minute or two some appeared in the light around the beam, circling and hovering. The number doing this increased; five minutes after the light was turned on there were about 30 birds; ten minutes, about 300; twenty minutes, an estimated 1000; thirty-five minutes, an estimated 1200 to 1500. The number later fell, then rose, then fell again, ranging from 800 to 1500. Almost all of these birds were in the dimly lighted area surrounding the intense beam, and in this inverted cone were fairly uniformly distributed from 2000 feet down to 20 feet, with a few coming lower. Most of them appeared to be passing back and forth across the direction of the wind, staying in the lighted area only about 15 seconds before disappearing in the darkness; the longest I could follow one bird was 30 seconds. Birds that entered the beam itself passed thru very quickly. Many calls were heard, including those of Black-crowned Night Herons and Green Herons.

The build-up in the number of birds during the first half hour after the light was turned on was similar to that described by Bartlett (1952). For the first twenty minutes the number increased at an ever increasing rate, exponentially. This indicates that the migrating birds are attracted not only by the beam itself, but also by the light reflected from the birds flying in and about the beam; as more birds get in the light the region of light and lighted bodies becomes more conspicuous and attracts birds from greater distances.

Attempting to determine what actually causes birds to fall or fly into the ground around a ceilometer light, I watched carefully for mid-air collisions, but without success. I also tried to see birds coming down, but could not even tho I occasionally heard one hit the ground. The light was turned off at 2:05 a.m. and was used only for short periods during the remainder of the night.

The following day the area around the ceilometer was covered by Honrico Ciordia, W. J. Cloyd, J. C. Howell, A. W. Jones, Geneva Lance, and myself. All dead birds were counted and identified if possible. A

total of 267 individuals of 26 species was found. Most of the birds lay south of the ceilometer, the pattern of distribution being almost identical to that of the 1951 accident (Howell and Tanner, 1951). There were a few living birds still present, some able to fly.—JAMES T. TANNER.

NOTE—When the numbers of birds killed in 1951 were compared with those of this year, an error was found in the 1951 published report (Howell and Tanner, 1951); the numbers of Tanagers should have read "Scarlet Tanager, 33; Summer Tanager, 4."—J.T.T.

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JOHNSON CITY—About one thousand birds were killed on the night of Oct. 6-7 at WJHL television tower in Johnson City. This tower is located near the summit of Tannery Knobs at approximately 1850 feet elevation, about 200 feet higher than the business section of Johnson City and about three-fourths of a mile distant. Tannery Knobs rise rather abruptly 200 feet from the surrounding plain. To the northeast, broken ridges rise less abruptly to slightly lower elevations. A narrow valley of about 1600 feet elevation separates Tannery Knobs from the ridges to the northeast.

WJHL-TV tower is triangular in cross-section with metal pipes at the corners. For about 500 feet the tower appears to have little or no taper except the main framework of metal piping which forms the three corners of the triangle. Six inch piping was used for the bottom sections and progressively smaller pipe for sections further up. The topmost section of perhaps seventy-five feet in length is reduced appreciably in size and tapers to a point 632 feet above the ground. A metal ladder and a few cables and wires run the length of the tower within the triangular area. The tower is held securely erect by four sets, three each, of one-half inch steel cable guy-wires. Red lights are located at five levels and about equally spaced from the top down. Only one bulb is at the top and at the second location from the bottom, the latter being the only light within the framework. These two lights blink intermittently. At each of the other three levels, three lights are mounted on arms extending about eight inches from the corners. All of these lights are operated from dusk to dawn. None of the lights appear to be shielded or protected in any way.

Broadcasting is discontinued at 12:30 a.m. on week-day nights, which was the time of closing down the transmitter on the night of October 6-7, 1954.

The temperature in the area on October 4 and 5 had ranged between 60° and 91° F. On the night of October 5, the sky was clear, the moon approximately half-full, the atmosphere calm and the temperature ranged from 75° to 70° F. between the hours of 7:35 p.m. and 11:00 p.m. While observing the moon through a 35X telescope during this period, birds passed across the face of the moon at an average rate of one every 2.2 minutes. The preponderance of them were traveling in a south-westerly direction. The maximum temperature on October 6 was 82° F. at 2:00 p.m. The temperature dropped 18° F. in six hours, then 12° F. during the next eleven hours to a minimum of 52° F. by 7:00 a.m. on October 7. The night of October 6-7 was cloudy and unsuitable for moon-

watching with a strong wind blowing from the northwest during the early part of the night and shifting to the north and northeast later in night according to the Tricities weather station. The maximum temperature on October 7 was 67° F. and the sky had cleared so that moon watching was again possible and during the period 8:40 to 9:15 p.m. birds were observed at a rate of one bird each 1.4 minutes. The rate for the corresponding period on the night of October 5 was one each 3.1 minutes. The wind was blowing at an estimated 25 miles per hour with occasional gusts up to 50 miles per hour. The temperature at the beginning of observation was 51° F. and continued to decline to 42° F. by 6:00 a.m. on October 8.

Late in the afternoon of October 7, Professor Richard Stevenson called me and told me of the disaster and stated that he and Professor Perry Holt had picked up about fifteen species which they had taken to East Tennessee State College. Mr. and Mrs. J. C. Browning and the writer proceeded to the scene, and in the fading twilight with the aid of a flashlight picked up specimens. Subsequent trips were made to investigate more thoroughly and under more favorable conditions as much as four days later, by which time practically all of the specimens were highly decomposed.

A survey of the situation revealed that fully 90% of the dead birds had fallen southeast of a straight line drawn through the tower from southwest to northeast and at varying distances from the base of the tower but densest within fifty feet of the base. The density decreased as the distance from the tower increased. The distribution of the birds would indicate that as they collided with some portion of the tower they were critically injured and were carried to the ground some distance from the tower by the wind. If there had been no wind, all which were killed by the impact would have dropped to the base of the tower and the preponderance would have been found on the side facing the direction from which they came. This was not the case and the distribution would indicate that the destruction continued throughout the night and shifted with the wind. Since the dead or dying birds were borne by the wind, the distance from the base of the tower at which they came to rest would be approximately proportional to the point of impact from the ground. In other words the higher on the tower the point of impact the farther the bird would be borne, by the wind, from the base of the tower. Several factors would determine the point of landing of each bird.

Since the tower would not present a solid front in any direction, some birds could have passed through the structure unscathed unless they were attracted by the red lights or some other invisible phenomenon such as electrical disturbances in the vicinity of the tower caused by broadcasting. It seems highly improbable that the birds would have been blinded by a single red light bulb as no two lights were closer than six feet of each other. If the birds had been attracted by the lights alone it is likely that dead birds would have been found near the base of the three WJHL radio towers which are equipped with red intermittent lights at three levels. These towers are located 2.6 miles northwest of WJHL-TV tower at an elevation of about 1600 feet in a fairly level

area of farm land and they extend 200 feet above ground and are plainly visible from the WJHL-TV tower. The WETB radio tower is located about 1.75 miles to the south, is equipped with red lights at three levels but only the top one flashes and it is also visible from WJHL-TV tower. If red lights alone had been the cause of the mortality some dead birds surely would have been found in the vicinity of the other radio towers as lighting conditions were similar, especially at WETB, except they were at lower elevation and located in relatively flat terrain. Although it was rumored that birds had been killed at these towers and at the Tricities Airport, a visit to the areas proved the rumors baseless. There is no ceilometer at the Tricities Airport and when it is necessary to determine the ceiling it is done by turning on lights only while taking a reading.

The birds which were picked up were brought in to good light, identified and listed. Later on the birds picked up by Professors Stevenson and Holt were delivered to me by Professor Bailey of East Tennessee State College. This group contained three species which we had not found and John Luker added still another making a total of thirty species. The Oven-bird was most numerous with more than 100 individuals with Magnolia Warblers running a close second, with Tennessee, Chestnut-sided and Bay-breasted Warblers in about equal numbers and not far behind the Magnolia Warbler. Red-eyed Vireos were quite numerous followed by American Redstarts. Other species were in relatively small numbers. The rarest bird in the group was the Olive-sided Flycatcher. It had been recorded in our area on only one previous occasion which was on the date of our fall census on the preceding Saturday, October 2. All of the members of the Elizabethton Chapter of T.O.S. were notified of the collection and given an opportunity to observe and examine a greater variety of warblers than can ordinarily be seen in a full day of field observation, as well as several other species which are relatively rare in this area.—LEE R. HERNDON, 1533 Burgie Place, Elizabethton, Tenn.



**LIST OF BIRDS KILLED** — The number of birds killed of each species is listed for each locality where the birds were identified and counted. The following symbols are used: S—Smyrna, N—Nashville, C—Chattanooga, R—Oak Ridge, K—Knoxville. At Johnson City it was impossible to make a count, so the symbol J is used, without any number, for the species identified there. The numbers in parentheses for Smyrna and Nashville are the number of birds banded and released at those places.

Sora Rail—N, 1; K, 4; J. Black-billed Cuckoo—C, 1. Crested Flycatcher—N, 1. Acadian Flycatcher—R, 1. Least Flycatcher—C, 2. Yellow-bellied Flycatcher—C, 4. Wood Pewee—C, 5. Olive-sided Flycatcher—J. Catbird—S, 1; C, 37; J. Wood Thrush—S, 1; C, 23; R, 1; K, 1; J. Olive-backed Thrush—C, 45; K, 11; J. Gray-checked Thrush—C, 19; K, 5; J. Veery—C, 1. White-eyed Vireo—K, 1. Yellow-throated Vireo—S, 1; C, 11; K, 3; J. Blue-headed Vireo—C, 2. Red-eyed Vireo—S, 3; N,

7 (3); C, 22; R, 37; K, 26; J. Philadelphia Vireo—S, 4 (2); N, 3 (1); C, 27; K, 5. Black and White Warbler—S, 6; N, 13 (3); C, 25; R, 35; K, 8; J. Swainson's Warbler—R, 1. Worm-eating Warbler—J. Tennessee Warbler—S, 14 (1); N, 50 (11); C, 35; R, 45 (estim.); K, 25; J. Nashville Warbler—C, 1. Parula Warbler—J. Magnolia Warbler—S, 17 (3) N, 66 (15); C, 88; R, 163; K, 15; J. Cape May Warbler—C, 1; J. Black-throated Blue Warbler—J. Black-throated Green Warbler—S, 5; N, 12 (3); C, 10; K, 6. Blackburnian Warbler—S, 2; N, 4 (3); C, 1; R, 11; K, 7; J. Chestnut-sided Warbler—S, 6 (3); N, 30 (11); C, 15; R, 46; K, 18; J. Bay-breasted Warbler—S, 5; N, 8 (7); C, 10; R, 20; K, 13; J. Pine Warbler—R, 1; J. Palm Warbler—C, 2; J. Ovenbird—S, 12 (1); N, 37 (3); C, 92; R, 37; K, 81; J. Northern Waterthrush—N, 1; K, 2. Kentucky Warbler—C, 2; K, 1. Mourning Warbler—N, 1. Yellow-throat—S, 3 (1); N, 1; C, 14; R, 9 (estim.); K, 2; J. Yellow-breasted Chat—C, 5; R, 1. Hooded Warbler—C, 10; R, 7; K, 6; J. Wilson's Warbler—R, 2; J. Canada Warbler—N, 1; C, 2; K, 2. Redstart—S, (1); N, 3; C, 14; R, 2; K, 3; J. Scarlet Tanager—S, 1; N, 1; C, 14; R, 1; K, 14; J. Summer Tanager—S, 1; N, 1; C, 2; K, 2; J. Rose-breasted Grosbeak—C, 2; R, 20; K, 2; J. Indigo Bunting—S, 5; N, 12; C, 64; R, 13; K, 4; J. Dickcissel—N, 2. Savannah Sparrow—R, 1. Swamp Sparrow—C, 7. Song Sparrow—R, 1.

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#### PASS THE AMMUNITION

Keep the T.O.S. going by promptly paying your 1955 dues. If you are a chapter member, chapter treasurers will collect your dues and send them in. If not, send them directly to the T.O.S. Treasurer, Lawrence C. Kent, 1896 Cowden Avenue, Memphis 4, Tenn. Dues are \$1.50, which includes subscription to *THE MIGRANT*. Library and out-of-Tennessee subscriptions are \$1.00. Please inform the Treasurer of any change of address.

#### IMPORTANT NOTICE TO T.O.S. MEMBERS

It has been suggested that a change be made in Article V, Sec. 1, of the T.O.S. constitution which now reads: "The Society shall hold an annual meeting each spring at or near Nashville . . ." Because of the growth of the Society it might be better to omit the words "at or near Nashville." This proposed change will be considered at the Annual Meeting in May.—MURIEL MONROE, President, T.O.S.

# 1954 Fall Migration Count of Hawks

By FRED W. BEHREND

It is pleasing to report that all chapters of T.O.S. participated in the 1954 Fall migration count of hawks conducted under the auspices of the U. S. Fish and Wildlife Service. First-time participation by the Bristol, Chattanooga, and Lebanon chapters resulted in an increase in the number of observers to approximately fifty.

Substantial territory in the central part of the Southern Appalachian Mountain System in Tennessee, all the way southwestward to near the Alabama and Georgia borders, and in neighboring North Carolina, Virginia, and Kentucky, was covered. Incidental to trips into Mississippi and Arkansas, Mrs. Ben B. Coffey, Jr., of the Memphis Chapter watched briefly for hawks at Blue Mountain in Mississippi and in territory in Arkansas approximately 125 miles northwest of Memphis.

This year's count turned out to be more successful than hoped for in view of unfavorable factors such as west wind (not conducive to Broad-winged flight) on weekend target dates (September 19 and 26), consecutive days of rain and low clouds (September 20 and 21) in at least the northeastern part of the territory, unseasonable thunderstorms and showers at various times (September 29, 30, October 1), and, last but not least, coverage of a good many attractive localities on the target dates not quite coming up to expectation. Had the weekend dates of September 18-19 and 25-26 solely been relied upon as observation periods, the count would have been a failure. Observation in between weekends, especially by Greeneville, Knoxville, and Nashville chapter members and the writer, under more favorable wind and weather conditions, counter-balanced the aforesaid unfavorable factors.

The total number of Broad-winged Hawks listed during the period of August 29 to October 3 amounted to 1920, more than double the number of the preceding year. On two days the total of Broad-wings counted exceeded 400 and on one day each 300 and 200. Other species of hawks were listed from August 15 to November 7 as follows: Sharp-shinned, 49; Cooper's, 34; Red-tailed, 69; Red-shouldered, 13; Bald Eagle, 2; Marsh, 14; Osprey, 6; Sparrow Hawk, 17; Duck Hawk, 2; unidentified accipiters, 16; unidentified buteos, 110; unidentified falcons, 11; unidentified as to family, 41; a total of 384. This number, combined with that of Broad-wings listed, accounts for a total of 2,304 predators observed during the 1954 Fall migration season. The accompanying table of observations and lists of localities and observers contain complete information with respect to the Broad-winged count. It is regretted that lack of space prevents publication here of detailed information concerning the other species listed.

Appraising the total of observations during the past five Fall migration seasons, it is the writer's definite conclusion that migration of Broad-winged Hawks along practically all the major ridges of the central part of the Southern Appalachian Mountain System, and secondary ones





as well, takes place regularly to a very much greater extent than is manifest, and that the number of these birds coming our way each Fall probably amounts to several times that reported on the present count.

Appreciation is expressed here to all members of T.O.S. who took part in the count, to the guests who assisted, to Mr. Chandler S. Robbins, who, ever helpful, lent a hand in its preparation, and to Forest and Park Service supervisors and personnel in Tennessee, Virginia, and Kentucky, who obligingly supplied information solicited by participants in the count.

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### KEY TO LOCALITIES

- A—Foothills of Holston Mountain, n. e. of Elizabethton, Carter County, Tennessee.
- B—Holston Mountain Fire Tower, n. e. of Elizabethton, Carter County, Tennessee.
- C—Highway No. 213, n. e. of Marshall, Madison County, North Carolina.
- D—Deep Gap—Mt. Mitchell in Black Mountains, Blue Ridge Parkway, Yancey County, North Carolina.
- E—Hills northwest of Elizabethton, Carter County, Tennessee.
- F—Camp Creek Bald Fire Tower on main crest of Appalachian Mountains, Greene County (Tenn.) and Madison County (N. C.).
- G—Beech Mountain near Blue Ridge, n. w. of Grandfather Mountain, Avery County, North Carolina.
- H—House Mountain, n. e. of Knoxville, Tennessee.
- I—Clinch Mountain Fire Tower, n. w. of Mendota, Russell-Washington Counties, Virginia.
- J—Clinch Mountain, n. e. of Knoxville, Tennessee.
- K—Black Mountain, at The Double, highest point in Kentucky, Harlan County, Kentucky.
- L—Pine Mountain Fire Tower in Kentenia State Forest, n. of Putney, Harlan County, Kentucky.
- M—Sunset Rock—Cumberland Plateau, 2 miles w. of Bon Air, White County, Tennessee.
- N—Clinch Mountain Fire Tower, s. e. of Kyles Ford, Hawkins County, Tennessee.
- O—Powell Mountain Fire Tower, s. of Jonesville, Lee County, Virginia.
- P—Stone Mountain, w. of Pennington Gap, Lee County, Virginia.
- Q—Cumberland Mountain State Park, s. of Crossville, Cumberland County, Virginia.
- R—Iron Mountain and Gap Creek Mountain, s. e. of Elizabethton, Carter County, Virginia.
- S—Rich Gap on Walnut Mountain, s. e. of Elizabethton, Carter County, Tennessee.
- T—Cumberland Mountain (White Rock) Fire Tower, n. w. of Ewing, Lee County, Virginia, and on Kentucky (Harlan County) line.
- U—Pleasant Hill, Cumberland Plateau, Cumberland County, Tennessee.
- V—Bee Rock, Cumberland Plateau, 2 miles west of Monterey, Putnam County, Tennessee.

- W—Pine Mountain Fire Tower in Kentucky Ridge State Forest, s. w. of Pineville, Bell County, Kentucky.
- X—Hills above Tennessee River, s. of Knoxville, Tennessee.
- Y—Elder Mountain, divided from Signal Mountain by Tennessee River, n. w. of Chattanooga, Tennessee.
- Z—Cumberland Mountain (McLean Rock) n. of Speedwell, Claiborne County, Tennessee.
- AA—Rich Mountain Fire Tower on main crest of Appalachian Mountains, Greene County (Tenn.) and Madison County (N. C.).
- BB—Walden Ridge (Cumberland Escarpment)—Mt. Roosevelt Fire Tower w. of Rockwood, Roane County, Tennessee.
- CC—Walden Ridge Fire Tower, n. w. of Morgan Springs, Bledsoe County, Tennessee.
- DD—Cumberland Plateau, escarpment west of Sequatchie Valley, n. w. of Pikeville, Bledsoe County, Tennessee.
- EE—Cumberland Plateau Fire Tower in Fall Creek Falls State Park, Van Buren County, Tennessee.
- FF—Walden Ridge (Cumberland Escarpment) Fire Tower, n. w. of Daisy, Hamilton County, Tennessee.
- GG—Siam Valley, e.-s.e. of Elizabethton, Carter County, Tennessee (lower end of Iron Mountain).
- HH—Chilhowee (Beans) Mountain, Oswald Dome Fire Tower, east of Benton, Polk County, Tennessee.



### KEY TO OBSERVERS

a—F. W. Behrend, Elizabethton Chapter. b—Mr. and Mrs. F. W. Behrend, Elizabethton Chapter. c—Mrs. E. E. Overton, Knoxville Chapter. d—Mrs. Earl Bashor, Elizabethton Chapter. e—Mr. and Mrs. J. B. White, Mr. and Mrs. Richard Nevius, Greeneville Chapter. f—Mr. and Mrs. J. B. White, Greeneville Chapter. g—Roby D. May, Elizabethton Chapter. h—Edward Manous, Jimmy Tucker, Little Creek School, Concord, Knox County. i—Miss Marie Andes, Don Hurley, Edward Martin, Knoxville Chapter. j—Mr. and Mrs. J. B. White, Mrs. Chester Darnell, Mr. and Mrs. Richard Nevius, Greeneville Chapter. k—Mrs. W. F. Bell, Mrs. E. W. Goodpasture, Miss Jennie Riggs, Miss Ruth Castles, Nashville Chapter. l—Mr. Collins, Resident of Hunter Gap on Powell Mountain, Lee County, Virginia. m—Dr. L. R. Herndon, Roby D., Rickie and Tommy May, Elizabethton Chapter. n—Mrs. E. W. Goodpasture, Miss Jennie Riggs, Nashville Chapter. o—Mr. and Mrs. Dixon Merritt, Mrs. Tressa Waters, Mrs. Lula Mae Sellars, Lebanon Chapter. p—Mr. and Mrs. E. M. West, Mrs. Leon Cross, Mrs. June Hall, Dr. W. K. Butts, Mr. and Mrs. J. R. Barnwell, Richard and James Barnwell, Chattanooga Chapter. q—Mr. Raymond Nail, Fire Warden, Walden Ridge Fire Tower, Bledsoe County, n.w. of Morgan Springs, Tennessee. r—A. F. Ganier, Nashville Chapter. s—A. F. Ganier, Nashville Chapter, F. W. Behrend, Elizabethton Chapter. t—Dr. and Mrs. L. R. Herndon, Bill Herndon, Elizabethton Chapter. u—Mr. and Mrs. Richard Nevius, Greeneville Chapter.

# The 1954 Christmas Season Bird Counts

By T.O.S. MEMBERS

The outstanding points of this past Christmas bird count were the first record of a White-winged Crossbill in Tennessee and the largest total of species ever recorded in the State-wide reports of Christmas counts. The observation of White-winged Crossbills is described below in the notes from Memphis. The total number of species reported this year is 122, six more than the previous record of 1951. A wintering Louisiana Waterthrush at Gatlinburg made the first time for this species on Christmas Counts, and the following seven species were reported for only the second time: Green Heron, Black-crowned Night Heron, American Rough-legged Hawk, Sprague's Pipit, Evening Grosbeak, Smith's Longspur, and Snow Bunting.

The counts are summarized in the descriptions and the table. For lack of space it was impossible to include the full reports of two counts made by Fred W. Behrend, of Elizabethton. One of these was made on Roan Mountain, from 3750 to 6189 feet elevation, on Jan. 1, 1955, when he saw 10 species including 4 Evening Grosbeaks at 6000 feet and 13 Snow Buntings at about the same elevation. The other was made on Big Bald Mountain from 3400 to 5516 feet, on Jan. 2, 1955, when he saw 12 species including 2 Fox Sparrows at above 5000 feet and one Snow Bunting near the top of the bald. These were the only Snow Buntings reported.

Northern finches are coming south in unusual numbers and variety this winter. Fred Behrend has seen Evening Grosbeaks since the middle of November and Snow Buntings since early December on Roan Mountain. Evening Grosbeaks have been present in Gatlinburg (see the reports below for the Great Smoky Mountains). Evening Grosbeaks and a Snow Bunting have been reported from Nashville. Pine Siskins have been seen in several places and the Whitewinged Crossbill record at Memphis is a "first". It is impossible to give more details of these reports in this issue, so they will be summarized with more information, we hope, in the March issue of THE MIGRANT. We encourage as much field work as possible for the rest of the winter to learn more about these winter visitors.

In the table and descriptions that follow, the localities are listed from west to east. The details of the separate counts are included under the "Information on the Counts"; lack of space prohibited listing all of the participants. For additional information on records marked with an asterisk (\*) in the table, see the paragraphs containing the information on the locality.

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## INFORMATION ON THE COUNTS

MEMPHIS, TENN. — (1953 areas in general; wooded bottomlands 27%, deciduous woodlands including city parks 25%, pastures, airports and farms 25%, island river thicket and river's edge 3%). Dec. 26, 1954; 6:40 a.m. to 5 p.m. Cloudy; temp. 43 to 64, wind SE, 9-18 m.p.h. 26

observers in 8 parties. Total party-hours 98 (76 on foot, 22 by car, total party-miles 211 (69 on foot, 142 by car). Total, 75 species, about 170, 286 individuals. Mr. and Mrs. Ben B. Coffey, Jr., (compilers), 672 North Belvedere Blvd., Memphis 7.

The President Island blackbird roost was abandoned this year. An estimated 70,000 Starlings, 20,000 Red-wings, 70,000 Grackles and 2500 Robins were roosting in Elmwood Cemetery; these probably include all of these species seen during the day. 53 Cedar Waxwings were seen there on Dec. 31, but were missed on the 26th. The Sharp-shinned Hawk was identified by Ben Coffey; one American Rough-legged Hawk by Harry Landis and one by R. D. Smith and H. H. Wilcox; Fish Crows by Ben Coffey, Charles Marcus, and Edwin Poole; Tree Sparrow by E. M. King; the Sprague's Pipits and Smith's Longspurs by Mrs. Coffey, S. J. Rini, and Orval Wood at the Penal Farm where they returned this year in reduced numbers; and the Harris's Sparrow by four parties, including three 1953 locations. The number of White-throated Sparrows totaled 1737.

The two White-winged Crossbills were males seen along the bank of the small lake in Riverside Park. The first one was watched at the water's edge from about 75 feet thru 8 x 30 and 7 x 50 binoculars, with the coloring showing plainly on the rays of the early afternoon sun. As the three observers (Rose Woolridge, Lawrence Kent, and Nelle Moore) moved in for a closer look, the bird flew into a young oak beside the spillway. There it remained for more than five minutes, during which time the distinctive shape of the bill was carefully noted. It was soon joined by another male, and for a while the observers were able to get both birds in their glasses at the same time.

There is an old record of the White-winged Crossbill for Little Rock, Ark., but apparently this is the first Tennessee record.—NELLE MOORE.

REELFOOT LAKE—(Same area as in the past; open water 20%, marsh 15%, wooded bottoms 20%, wooded hillsides 15%, fields and farms 18%, roadside 12%). Jan. 1, 1955; 6:30 a.m. to 5:30 p.m. Intermittent rain a. m., cloudy to clear p.m.; temp. 57 to 64; wind south, 0-4 m.p.h. 12 observers in 5 parties. Total party hours 47 (foot 33, car 4, boat 10), total party miles 127 (foot 30, car 80, boat 17). Total 82 species, about 5 million individuals. Mr. and Mrs. Howard Barbig, Route 10, Box 424, Memphis, Tenn. (compilers).

The Blackbird flight to the roosting areas was greater than ever before seen by the parties. The estimates, which were all conservative, were: Starling, 250,000; Red-winged Blackbird, 4 million; Grackle, 800,000; Cowbird, 50,000. Other species seen in large numbers were: Mallard, 2100; Lesser Scaup, 1000; Crow, 1100.

JOHNSONVILLE, TENN.—(Centering at Johnsonville and including parts of the Duck River and Kentucky Lake in the Tennessee National Wildlife Refuge; open water 50%, woodland 5%, brushland 5%, open field 38%, urban 2%). Jan. 2, 1955; 7:30 a.m. to 4:30 p.m. Extremely foggy until 9 a.m., clear afterwards; temp. 39 to 63; wind E to NE, 0 to 5 m.p.h. 18 observers in 5 parties. Total party-hours 33 (28 on foot, 4

by car, 1 by plane) total party-miles 160 (18 on foot, 72 by car, 70 by plane). Total, 79 species, about 35,250 individuals. Eugene Cypert, Tennessee National Wildlife Refuge, Paris, Tenn. (compiler)

The numbers estimated for the following species were: Canada Goose, 2500; Mallard, 12,000; Black Duck, 2000; Gadwall, 2500; Baldpate, 1500; Pintail, 2500; Ring-necked Duck, 1500; Hooded Merganser, 3000; Ring-billed Gull, 1500; Red-winged Blackbird, 3000.

NASHVILLE, TENN.—(Same localities and terrain as last 4 years plus Bush's lake). Dec. 26, 1954; 6:30 a.m. to 5:00 p.m. Clear and visibility good; temp. 30 to 60; wind very light; ground bare and frozen at start. No water except in creeks. 23 observers in 7 parties. Total party-hours 58 (48 on foot, 10 by car), total party-miles 120 (32 on foot, 88 by car). 78 species, 6109 individuals. Albert F. Ganier (compiler)

Water birds were seen on Cumberland River, Radnor Lake (85 acres), and Bush's Lake (20 acres). The Night Herons (1st winter record) and Least Sandpipers (2nd winter record) had been present at Bush's Lake some weeks. The Horned Grebes (1st winter record) were on Cumberland River below Clee's Ferry. Thrasher had remained at Laskey feeding station some time. Robins and "blackbirds" were just returning from southward. No large roosts in area as yet.

LEBANON, TENN.—(Same area as in previous years). Jan. 1, 1955; 10 a.m. to 12:30 p.m., 3 to 4 p.m. Cloudy, temp. about 60. Total 46 species, about 3224 individuals. The number of Robins reported was 1600. Dixon Merritt, Lebanon, Tenn. (compiler).

CHATTANOOGA, TENN.—(Same area as in previous years). Jan. 2, 1955. Foggy until 10 a.m., then clear; temp. 48 to 70; wind, 0-8 m.p.h. 12 observers in 6 parties. Total party-hours 32 (25 on foot, 7 by car), total party-miles, 124 (25 on foot, 99 by car). Total, 64 species, about 3,000 individuals. Mrs. Eugene M. West, 1624 S. Clayton Ave., Chattanooga 4, Tenn. (compiler). Seen the previous day at the compiler's home were 20 Pine Siskins.

GREAT SMOKY NATIONAL PARK, TENN.—N.C.—(Same area as 1937 and following years). Jan. 2, 1955; 6:30 a.m. to 6:00 p.m. Mostly clear; temp. 38 to 65; wind variable, up to 25 m.p.h. at high altitudes; ground bare in lowlands with some snow persisting in shaded places at higher elevations. 30 observers in 12 parties. Total party-hours 73 (62 on foot, 11 by car), total party-miles 154 (58 on foot, 96 by car). Total, 60 species, about 1,999 individuals. Arthur Stupka, National Park Service, Gatlinburg, Tenn. (compiler).

The 185 chickadees reported includes both Black-capped and Carolina Chickadees. The Louisiana Waterthrush, the first winter record for this area, has been observed almost daily since Dec. 8 along a small stream in Gatlinburg; on the day of the count it was observed by Joe Manley, Arthur Stupka, and James T. Tanner at very close range. Five Evening Grosbeaks were observed on Dec. 18 by Joe Manley; beginning Dec. 22 he and others have seen them daily, up to 100 in a flock.

GREENEVILLE, TENN.—(Same area as in previous years). Dec. 27, 1954; 7 a.m. to 5 p.m. Clear; temp. 28 to 60; wind 0-5 m.p.h. 9 observers in 4 parties. Total party-hours 36, total party miles 133 (107 by car,



Ring-necked Duck	35	95	*	18	20					
Canvasback	25	2	1	12						
Lesser Scaup Duck	250	*	6	2			9		2	
American Golden-eye				1						
Bufflehead			4							2
Ruddy Duck		49								
Hooded Merganser			*							4
American Merganser			100							1
Turkey Vulture	6	2		1	12	1	1	12	1	
Black Vulture				13	20	2		2		
Sharp-shinned Hawks	*1									
Cooper's Hawk	2	1	2	1				2	1	3
Red-tailed Hawk	17	8	16	7	2	4	3	1	1	1
Red-shouldered Hawk	7	12	4	4		2			2	1
Amer. Rough-leg. Hawk	*2									
Golden Eagle			1							
Bald Eagle		8	15							
Marsh Hawk	4		3	4		2	1			1
Duck Hawk			2		2			*1		
Sparrow Hawk	18	7	5	24		3	4	3	2	5
Ruffed Grouse							2			
Bob-white	78	1	1	21			4	4		1
Coot		15	4	2		1				
Killdeer	181	4	44	118	10	54	4	13	5	27
Wilson's Snipe	3	1		3				3		1
Least Sandpiper				*4						
Herring Gull		2	5			105				
Ring-billed Gull	40	1	*			20				
Mourning Dove	134	19	90	148	62	217	20	287	3	193
Screech Owl	1	1	1	1	1		2			
Horned Owl		1		2	2		2			
Barred Owl	2	3		1						
Short-eared Owl				2						
Belted Kingfisher	1	1	4	15		2	4	5	1	13
Flicker	79	57	7	70	2	17	5	13	6	19
Pileated Woodpecker	1	8	6	19	3	3	16	2	2	4
Red-bellied Woodpecker	26	50	7	46	2	17		5	1	1
Red-headed Woodpecker	10	6				9		3	1	
Yellow-bellied Sapsucker	9	3	5	13	1	4	4	1	1	4
Hairy Woodpecker	14	6	1	12	3	3	5			4
Downy Woodpecker	57	67	17	111	5	14	25	12	4	19

	Memphis	Reelfoot	Johnsonville	Nashville	Lebanon	Chattanooga	Great Smokies	Greeneville	Kingsport	Elizabethton
Phoebe	3		1	4	1	3	10	7	3	11
Horned Lark	193		12	235	35	20	7	30		7
Blue Jay	295	23	10	40	12	104	19	29	29	35
Raven							2			
Amer. Crow	47	*	500	256	150	111	123	*	24	767
Fish Crow	*14									
Black-cap. Chickadee							*			
Carolina Chickadee	181	169	20	224	13	48	*185	67	19	112
Tufted Titmouse	68	107	8	115	16	65	35	56	14	43
White-br. Nuthatch	2	13	2	2	1	19	5	5	2	
Red-breasted Nuthatch					1		15			2
Brown Creeper	2	3		9	1	1	15		2	1
House Wren		1								
Winter Wren	11	6	1	13		2	6	5		3
Bewick's Wren	2	1	2	5	5	1	1	1	1	
Carolina Wren	106	74	14	84	5	42	37	50	17	45
Long-billed Marsh Wren		1	1							
Short-billed Marsh Wren		2								
Mockingbird	119	21	12	95	20	46	6	53	5	40
Brown Thrasher	23	7		*1		11		*4		
Robin	*	43	8	541	*	103	138	12	2	16
Hermit Thrush	23	5		14		2	13			8
Bluebird	30	27	10	154	15	47	44	56	17	77
Golden-crowned Kinglet	14	38	2	17		3	19			
Ruby-crowned Kinglet	11	6		3	2	1	1			
Water (Amer.) Pipit	20		6	2		5				
Sprague's Pipit	*3									
Cedar Waxwing			46	22		282	31	35	32	46
Loggerhead Shrike	38	19	7	12	3	11	5	3	1	6
Starling	*	*	73	264	600	384	102	380	*	201
Myrtle Warbler	46	8	1	98	15	27	1	22	10	37
Pine Warbler						9	1	*4		1
Louisiana Waterthrush							*1			
House Sparrow	156	202	18	300	147	45	62	80	51	142
E. Meadowlark	196	30	38	156	40	161	25	34	9	78
Red-winged Blackbird	*	*	*	109			1			



Rusty Blackbird			5	2		6		100		
Purple Grackle	*	*	400	291	100	3		3		
Cowbird	153	*		26	150					
Cardinal	570	265	45	380	45	108	41	106	20	99
Evening Grosbeak								*33		
Purple Finch	64	9	3	13	20	19	55	10	2	12
Pine Siskin				10			7			
Goldfinch	348	178	152	775	4	54	254	330	56	181
Red Crossbill							1			
White-winged Crossbill	*2									
Red-eyed Towhee	44	4	12	103	5	84	12	26	21	26
Savannah Sparrow	88		25	49			8			
Leconte's Sparrow		2	1							
Vesper Sparrow		1	7				1	*1		
Slate-colored Junco	620	156	80	234	34	79	200	85	17	85
Tree Sparrow	*1	1		2	15					
Chipping Sparrow						5				
Field Sparrow	203	43	13	140	35	159	210	109	6	119
Harris's Sparrow	*11									
White-crowned Sparrow	99	20	24	80		6		76	6	23
White-throated Sparrow	*	528	130	230	3	170	89	66	22	93
Fox Sparrow	87	22	6	1			4	*1		5
Swamp Sparrow	146	104	120	35		1	2			3
Song Sparrow	431	36	125	205	2	55	70	84	34	79
Lapland Longspur	196									
Smith's Longspur	*5									
Total Species	75	82	79	78	46	64	60	55	43	59

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**CORRECTION**—The following corrections should be made in the paper by Katherine A. Goodpasture in the September 1954 MIGRANT. In line 11, page 44, "Yellow-throated" should be "Yellow-breasted" Chat, and the date Oct. 6 should be Oct. 4.

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