

MOCKINGBIRD LIFE HISTORY STUDIES.

BY AMELIA R. LASKEY.

THIS study of Mockingbirds (*Mimus p. polyglottos*) has been made by the banding method using Biological Survey aluminum bands and in addition colored celluloid bands for certain individuals. The study was centered about birds at my home but data were also secured from a number banded and observed at several other locations, the total number handled being 224.

Mockingbirds have proven most fascinating subjects for study as the species is not only noted for its colorful personality, but individuals display distinctive characteristics; behavior and reactions in two individuals may coincide in some ways but in other situations, are entirely different. This study has revealed why the song performance of the same individuals may vary greatly in two successive mating seasons.

My chief source of information was observations of the two color-banded males that are known to have been in our garden when bird banding operations started. How long before that time they lived there, it is impossible to say. One banded August 27, 1931, has been previously introduced as "B" because he was given a blue band; the other is known as "Y" banded October 12, 1931 and wore a yellow band (c. f. 'A Territory and Mating Study of Mockingbirds,' *The Migrant*, Vol. IV., No. 3.).

Movements.—My records indicate a definite movement, presumably migration, beginning in late August or September and continuing into November. During that period, daily trapping showed that the increased number of Mockingbirds about the banding stations was a shifting population, the banded birds repeating for a few days or not at all and new unbanded groups or individuals appearing. Among these transients, immature or female plumage predominated. At my home, by the end of November, most of these birds are gone. Remaining are the old resident males and one to three of the visitors that feel satisfied to stay for the winter if their efforts to establish territory are successful. Five individuals are known to have spent one or more winters at the banding station on their respective territories; one of these was a female, mate of "B."

During January and February there was considerable wandering noted among wintering Mockingbirds elsewhere. This was proved conclusively by deporting three individuals captured at the feeding shelf of a friend, banding them for sight identification, and releasing them three miles away in the suburbs. The first one, deported February 7, 1933, was not seen afterward, the shelf was again monopolized by an unbanded one within a week. A few days after he was deported, still another unbanded individual arrived. On March 12, 1934, the experiment was repeated. A bird already

in song was deported to the same location in a covered cage by auto and released after holding about an hour. This one returned, however, as his colored band identified him at the same feeding shelf 36 hours later.

In March and April, the returning females appear, with plumage fresh and clean, visiting territory where males, in sooty colored plumage are singing. They seem to move about until a home and mate to their liking are found. In 1933, several transient females were courted by "B" and "Y"; all left very shortly after they appeared except one which stayed with "Y" a week and then left. She was a nervous easily frightened bird which may account for her fickleness but both males finally mated in April.

In 1934, the female that mated with "Y" the previous year returned to the banding station March 27 joining him immediately.

Three males that defended winter territory at the stations left in spring without acquiring mates. Two left in mid-March. The other (called "L") remained singing zealously until the end of April then disappeared but was located in June about 500 feet south with an unbanded mate brooding three eggs. One Mockingbird appeared in "L's" vacated territory the early part of June sang lustily throughout the month, was unsuccessful in attracting a mate and he also disappeared.

No recoveries of my birds have as yet been made to verify the migration theory but one banded by Mrs. Arch Cochran in Nashville was trapped later in Corinth, Miss.

The following are my conclusions:

1. A migration in autumn of Mockingbirds, females and young predominating.
2. A return in spring of females, with the probability of some returning to nesting ground of previous year.
3. Dispersal of young an open question.
4. A wandering among winter residents.
5. Permanent or stationary residence of some males and fewer females.
6. Spring and early summer movements of singing males.

Territory.—Mockingbirds choose specific areas, usually, in Tennessee, during late autumn or early spring which they defend vigorously from their own and other species, particularly Robins, Brown Thrashers, and Cardinals. This pugnacity in defending territory is more noticeable in some individuals. The size of the area and its location varies somewhat in different seasons of the year apparently according to the needs of the bird. In winter "B" and "Y" occupied small areas close to the house, "B" on the east, "Y" on the west. In April 1933, when seeking mates, singing territory extended at least 100 feet farther. Each nesting cycle was responsible for a shifting of the boundaries to some extent. The middle rear section of our 200 x 300 feet lot was used alternately as part of the territory of each bird.

In three years' observations, both "B" and "Y" have confined all their activities to areas of about five acres each but the space occupied in any given time never exceeded half that size. Food supply, cover for roosting and suitable nesting sites seemed to account for this shifting.

Sometime in the period between late August and early November there is a readjustment in Mockingbird population about our home. Numbers of playful, immature birds are dashing about, their *chuck-chuck-chuck* calls are heard all day, sweet music delights one from singers concealed in dense shrubbery and there is some difficulty in determining whether some of these are "whisper" songs given by birds nearby or whether they come from a distant singer in a more energetic mood. Resident Mockingbirds are more or less inconspicuous during September. They are molting; family cares are over; and natural food is so abundant that it is not necessary for them to spend their energy in fighting. However in October and November belligerency is again asserted. By that time almost all the visitors have gone, the dense screen of leaves has thinned or fallen and again one may identify colored bands with accuracy. Each fall finds one to three of the visitors lingering on, each choosing a certain section. Then fights are frequent. Resident birds reassert themselves; dancing or sparring maneuvers on territory lines are of daily occurrence; vigorous pursuits are frequent as these new birds are chased from pre-empted ground; aerial fights are noted in which two or three birds may participate. By late November our lot is so well divided into Mockingbird territories that one could draw lines marking the garden boundaries established by these winter residents; the areas often extending somewhat beyond our lot into adjoining property.

In 1932, in addition to "B" and "Y," one of the new arrivals remained all winter. In 1933, a new male spent the winter in the same area occupied by the newcomer of the previous year. A female, "B's" mate, occupied one corner of our lot that had been part of "B's" section thus making a total of four wintering birds. Due to the death, in June, 1934, of "Y," "B" assumed charge of part of "Y's" regular wintering area. The female took her station just east of the house where "B" has spent three winters. Two strangers have remained, one in the female's former winter quarters; the other in the usual area occupied by the various newcomers each year, making a total of four for 1934. This last named area has been occupied in turn by six Mockingbirds in various seasons since the fall of 1932 but has never been used by any for nesting. It is planted in shrubbery and evergreens and has served during the past six years as nesting sites for Robins, Thrashers, Catbirds, Indigo Buntings, Chipping and Field sparrows.

Resident Mockingbirds continue throughout the winter and the spring

seasons to participate in dance maneuvers on their respective boundary lines. This dance has been described many times. The birds face each other, step backward, forward, sideways, usually ending with a sudden turn, each flying in the opposite direction on his own side. These maneuvers have been witnessed repeatedly and they have, within my experience, always occurred as manifestations of territory rights. Twice it has been seen with the female (B's mate) participating with an unmated male in spring. The attitudes of both birds were exactly like those of two males; none of the rasping *cha* notes, so characteristic of amorous advances were given. Again on September 9, 1934, she and "B" were seen in this maneuver on the old boundary line where "B" and "Y" had performed so many times in the past. "B" was attired in his new fall plumage but the female was still ragged, apparently in process of molting. At the conclusion she flew to the section she is now occupying as winter territory while "B" busied himself hunting insects. It seems their dance could be interpreted in one way only, an act of dismissal, a manifestation of the severing of ties that bound them during the reproductive season. Last year, from autumn until early March, they were indifferent to each other. Had the female not been distinctively banded on the left tarsus, she could easily have been mistaken for a wintering male holding territory. Observations this fall substantiate this, for in November, she and one of the new arrivals engaged in a boundary line argument as they met in a tree; she retreated, the new bird following; the affair terminated in an aerial fight, both combatants whirling over and over until they dropped to the ground and separated, the intruding male then leaving for his own side.

This new arrival has had to win his winter territory by sheer force as each of the other three residents has granted him space only after one or more fights and pursuits.

I conclude that:

1. Resident Mockingbirds must win territory but when acquired, their rights are respected by neighboring Mockingbirds.
2. Permanent residents change specific territorial areas to suit their needs.
3. A wintering female occupies separate territory. Though it joins that of her former mate and had belonged to him, he does not trespass.
4. The dance is a manifestation of territory rights.

Song and Mating.—After a period of silence lasting from December to late February or early March, "B" and "Y" began to sing soft little songs as they perched on low limbs. In 1933, the first song was heard February 26 but in 1934, a cold stormy season, the first was given on March 4, the birds beginning both years within three days of each other. The song performances of these two birds in the two seasons proved to be an interest-

ing study in contrasts. Both temperature changes and the mating urge were seen as factors affecting the songs of "B," "Y" and others under observation at the same time. In March particularly this was noted. A chart showing weather conditions and songs indicated that song performance synchronized to a marked degree with the rise and fall of the thermometer. Songs increased in length and volume on warm days, decreased when weather was chilly and unpleasant, sometimes ceasing entirely for several days. "Y" was less susceptible to early weather conditions than the others.

In 1933, the early March songs of the two unmated males, "B" and "Y," were of the soft toned type, often of considerable length, given as the birds perched low, either on fence post, in shrubs, or on lower branches of trees. By March 24, their zeal was expressed not only in the louder, faster songs but was emphasized by flight songs and by tossing into the air as they sang. For several days this ecstatic period continued. They sang from telephone poles, tree tops, and a peak of the house; gliding to the ground, flying the length of their respective territories, singing constantly. Each apparently tried to vie with the other and both gave their full repertory of imitations with spirited exuberance.

On March 28, the first female stopped in the garden. Her arrival was responsible for a new type of behavior which it was noted later was characteristic of the period from the arrival of a female until a mate was obtained. The ecstatic singing ceases, *cha*, hissing or rasping sounds are given by both sexes, the male pursues the female on his territory in swift flight. (Later a little ground pursuit among the shrubs may occur.) Then, when she stops to feed or perch or moves away from his territory, he with head down, tail and wings spread flies into a shrub, a vine, or runs along a tree branch into a fork, giving a coaxing *cluck-cluck*. He dashes to the ground, picks up a twig or other nest material and flies into possible nest sites with it. The female often accompanies him into the shrub or vine for a moment or two. If she stays on his territory hunting food, he remains near her as if to guard her for he perches high enough for a clear view and at the approach of possible danger, a little song is sung or a warning sound is given similar to that of the Brown Thrasher, as a danger signal. "B" used the song; "Y" the call.

If the female does not stay, the male resumes his tree top perch and zealous singing, possibly repeating this performance many times until mated. Several females came to the station before "B" and "Y" finally secured mates on April 8 and April 10, 1933, respectively.

There was considerable rivalry displayed by "B" and "Y" and a neighboring male over these visiting females as the visitor circled about. Usually each male remained in his own territory attempting to lure her to

his side by singing or by the nest building maneuver while she was being pursued by the other. Occasionally one male in his eagerness would trespass, resulting often in a fight, the trespasser being chased to his own realm.

None of the visiting females remained longer than a few minutes except one. This individual stayed a week and apparently had accepted "Y" as her mate, though occasionally she went into "B's" side of the garden. He would fly toward her but "Y" immediately appeared between them, sometimes driving "B" back and apparently chasing the female home. "Y's" solicitous care was most engaging as he sang sweetly nearby when she went to roost in shrubs near a window one evening. Before he had gone to his roost in another clump of shrubs, she became frightened and flew to him. He then returned with her and settled on a twig about a foot from her for the night. The following evening she roosted alone in the same place but about 9 P. M. she was again frightened, and with a few sharp *chucks* she flew away in the bright night. "Y" responded with a little song from his clump of shrubs. But she left and the next morning "Y" was singing madly from his favorite tree top, calling once more for a mate.

The situation in 1934 provided an entirely different background for song and mating observations. The female that had mated with "B" the previous year and raised two successful broods remained at the banding station throughout the winter in the north east end of "B's" territory. She stayed until February 14 when she disappeared from her usual perching places and no search was made for her in the vicinity of our home. However on March 4, a mild day, "B" was heard very early in a few notes of song. On the 5th, he sang intermittently throughout the day in moderate tones. On March 6 with the weather still mild, he began to sing early but at 9.30 A. M. rasping *cha* sounds indicated the arrival of a female. He was pursuing one on his territory, then in a few moments he began flying into the rose vines with the new arrival following. She was soon identified as his color-banded mate of last year and remained to remate with him. "Y" began to sing softly the day previous to this (March 5) and continued in the moderate toned type of song for several days. He was not at all concerned with the arrival of "B's" mate and ignored her presence entirely. On March 9, the weather changed, bringing snow flurries the following day and it continued unpleasant for a few days. During that time all singing ceased. "Y" alone began to sing a little on the 12th though it was still cold. He continued, gaining fervor, and by the 16th was using high perches for his vigorous singing. On March 18, humid and mild, at 8 A. M. *cha* notes were heard. "Y" and a female stood on a garage roof facing and *cha*-ing each other but standing perfectly still. They both flew into the garden and it was a most unexpected pleasure to find that she, too, was his color-banded mate of last season. It was interesting to note that her

plumage was considerably lighter than those that had wintered at the banding station so she must have spent her winter in a cleaner section than the Nashville area. Another siege of inclement weather with snow and ice enveloped this city but "Y" did not entirely cease to sing though some days his only effort was an evensong.

The behavior of "B" and "Y" in late March and early April of 1934 was markedly different from the corresponding period of 1933. The return of their respective mates of the previous year, while they were still in the early stages of the singing phase, doubtless was responsible for the contrast. The 1934 performance lacked the prolonged spectacular features, the wild frenzy, and the fighting of the 1933 period. There was no rivalry displayed between the two males over the females and each ignored the companion of the other. Neither bird was seen in pursuit of any other female and no visiting females were noted on their territories. The unrestrained ardor of 1933 was doubtless their announcement to passing females of their eagerness to mate but in 1934 they were joined by the females before the mating urge had reached its culmination.

There were some differences in the song habits of "B" and "Y" which seem to be accounted for by the difference in personalities. "B's" singing declined on the unpleasant chilly days of spring but in June and early July of 1933 and 1934 he displayed his singing ability both day and night, sometimes for no apparent reason relative to the nesting cycle. The egg laying periods were marked by some zealous singing from high perches with an occasional flight or tossing in song. "Y" almost ceased singing when the young hatched but "B" sang most excitedly at that time for a few days. "Y" never was heard singing at night and his zealous singing periods usually coincided with the pre-mating and the egg laying periods. However "Y's" devotion to mate and young was very highly developed while "B" assumed few responsibilities. Therefore when the lovely June nights came, "Y" was burdened with family cares while "B" felt free to serenade in the moonlight.

The female which mated with "B" in 1933 and 1934 remained through the winter of 1934-35. The temperature during January was unusually high and the excess for the month up to the 12th was 99 and reached 162 by the 19th. At 10 A. M. on January 10, "B" was heard singing a lengthy moderately toned song while two other males one about 100 yards distant, the other three miles away, began to sing about the same date. At 4 P. M. he met the female (which we may call "Bf") in the trees at their boundary line. The *cha* notes were heard for the first time. There was plumage display by "B" and pursuits by him from branch to branch "Bf" often flying to him. The wooing did not start with the preliminary swift pursuit through the air; the dashing into shrubs with nesting material and the

animated singing as in the previous years; but it must be remembered that "Bf" had been constantly in her territory all winter. On January 11 (temperature 45 midnight; 55 noon). Courting continued on combined territories of "B" and "Bf." Once when "B" was on the ground under shrubs "Bf" joined him and stopping about 18 inches away picked up a dead leaf and dropped it at her back, then picked up a small twig and flew to a nearby tree. This immediately provoked "B" to follow her and resume courtship. At intervals they fed on hackberries and apple and between pursuits a seed was regurgitated. "Bf" always evaded "B" when he came close or assumed a pouncing attitude and she used a *chuc* or *chick-chick* scolding note to repulse him.

January 12-13. Wooing continues with pursuits in the air and in trees with stops in the evergreens "B" always the pursuer "Bf" returning to him and perching near him but evading his advances. "B" sang a few little songs but so soft they were almost inaudible a few yards away. Little musical calls were used by him when perched on guard while "Bf" searched for food or rested; she was hard to locate between pursuits. "B" accompanies her each night to her regular winter roosting place about 5 P. M. He perched on trees sometimes with the little song, sometimes the musical notes, and at dark flew to his winter roosting place.

January 14 (temperature 29 midnight; 38 noon). No songs or musical notes heard; but *cha* notes heard in pursuit; soft toned by "Bf" and often louder by "B" like *zah* or *zee*. Similar courting actions continued at east to January 19.

The behavior of these birds in 1935 corresponds with that of the same pair in early March, 1934, for the first week after the female joined "B," but differed as described under January 10 while the behavior of "Bf" on January 11 was not observed in either of the preceding years. This does not mean that it did not take place since the shrubbery was often dense enough to obscure the birds.

I conclude that:

1. Both temperature and the mating urge influence the songs of spring and early summer.
2. The period of most ecstatic song with acrobatic accompaniments occurs when the mating urge is stronger.
3. When first joined by a mate, songs decrease, sometimes only short morning and evening songs are given.
4. The egg laying period is marked by some zealous singing from high perches with an occasional glide or tossing.
5. Singing continues through the brooding period in a more tranquil manner.
6. When young are hatching individuals react differently.
7. Some individuals sing in winter as late as December 25.

NEST RECORDS.

"B."

April 8, 1933. Joined by mate.

Nest No. 1. In rose vine. No eggs found.

No. 2. In young cedar. 2 young left nest.

No. 3. In maple tree. 3 young left August 17.

March 6, 1934. Rejoined by same mate.

Nest No. 1. In neighbor's arbor vitae. Only 1 egg found later.

No. 2. In rose vine. 4 eggs—first laid April 21. Robbed of young.

No. 3. Shrub at neighbors. 3 eggs hatched May 31. Robbed.

No. 4. In hackberry tree. 3 eggs hatched about July 6. One bird banded July 11.

No. 5. In maple tree same as No. 3 last year. 3 young banded and left nest August 11.

"Y."

April 10, 1933. Joined by mate.

Nest No. 1. Built under projecting creek bank on exposed roots. Fledged 4.

Nest No. 2. In sycamore tree. Three young left about August 15.

March 18, 1934. Rejoined by same mate.

Nest No. 1. Built in same place as No. 1 last year. 4 eggs. Hatching April 24 but killed by something.

Nest No. 2. In honeysuckle vine. 5 eggs. Hatched 4. Three young left nest May 29.

Nest No. 3. In privet shrub. 4 eggs. Set complete June 8. Robbed June 13.

Nest No. 4. Nest built in hackberry tree but "Y" was found dead June 18. No eggs found.

Nesting.—Although earlier mating may account for the increased number of nesting attempts in 1934, it is quite possible that the unsuccessful nests of 1933 were not all located. Mockingbird habits were not so well understood that year. They have one habit that was very misleading at first. They continue to investigate nesting sites even while their eggs are being brooded elsewhere. Consequently while the observer is watching for building activities in one place, the nesting procedure is far advanced elsewhere. Sometimes these other sites are used for later nestings; other times they are not used. For this reason the nests of the "B" and "Y" families were seldom located in 1933 until the whining of the young or the feeding activities disclosed them.

In nest building the mated pair work together but brooding is by the female exclusively. "Y" was most assiduous in guarding the nest during

the brooding and feeding of the young. He was persistent in his fussing and pugnacity when one approached the nest or its vicinity. Nest No. 2 was built in a honeysuckle vine on the garage near a walk that was the center of our outdoor activities. He resented our sitting in the garden or working in it. His harsh *chucks* evinced his displeasure and he frequently attacked me as I examined the nest, attended banding traps, or worked among the flowers. He would pounce on my head or back, striking with both feet, scolding loudly. He would follow me from front to rear of the 300 foot lot, sometimes flying ahead, with strident *que-ah* scolding notes, striking repeatedly. That he recognized me as the intruder who visited his nest was quite evident for all his attacks were directed to me while for others scoldings were deemed sufficient. "Y" hunted food for the nestlings but he spent so much time fussing at presumed enemies that usually the greater part of the feeding was done by the mother bird. She scolded if one came near her nest but never attacked. When she left the eggs on one of her frequent absences, they evidently watched from some distance for, at the approach of someone to the nest, both came scolding. After the young had left the nest, "Y's" pugnacity decreased and he assumed the greater portion of their care as well as assisting in building the new nest.

On the other hand "B" was not at all pugnacious toward human beings, offering no objections when his family was visited. The only sign of interest he showed was to fly to a nearby perch and watch silently. Only once was he heard scolding as the young were banded in the nest. Both last year and this when a ladder was placed at the later nests in high trees, all the scolding was done by the female and "B" either did not appear at all or kept his distance. In the "B" family, apparently all the feeding was done by the mother and she assumed the care of the fledglings.

As it was not deemed feasible to visit all nests daily, data were obtained from the one very close to the house in the honeysuckle vine. On and before April 9, "Y" and his mate had been interested in this vine, going into it occasionally although she was at that time brooding four eggs in Nest No. 1 at least 200 feet west. Again on the 20th, she was seen entering. Her young began hatching on the 24th. On the morning of April 26, there was a commotion in the vicinity of her nest, involving Mockingbirds, Jays, and others. That afternoon the "Y" pair were seen carrying nest material into the honeysuckle. Investigation revealed two dead young on the ground near the empty nest. On April 29, Nest No. 2 was lined and the first egg laid May 2, and on May 6, the set of five was complete. On May 18, young were hatching. Their "whining" was heard first on May 24. They left the nest May 29 and that night roosted in the vicinity of the honeysuckle vine. Nest No. 3 of this pair was started about a hundred feet south on June 1; finished June 3. First egg laid June 5 and the set of four

completed June 8. The young of Nest No. 2 were still nearby on June 5 for their whines were heard and "Y" was seen carrying food that day and they were not located again. However on June 22 (after the death of Y) the female was seen feeding a full grown begging youngster wearing a band, which must have been one of the No. 2 brood for that was her last successful nest. She disappeared soon afterward.

It has been difficult to get information relative to the length of time the young are fed by parents and mine has been only casual. A color banded female nesting in the neighborhood came to the banding station for apple and on June 18 was seen feeding some to a youngster of a former brood about one month old. Her present brood had just hatched (June 17). On the 20th when he followed her again, she repulsed the begging youngster without feeding him at all.

As to nest life I conclude that:

1. A Mockingbird may lay 5 sets of eggs in a season.
2. Nest is built by the pair together.
3. The female does the brooding.
4. Eggs are hatched in approximately 12 days.
5. Young leave nest about the 11th day.
6. Some males assume the responsibility of feeding the young.
7. Degree of pugnacity in protecting nest varies among males. Females scold but do not fight human intruders.
8. Early nests are built at low elevations. Late nests usually in trees.

Plumage.—Sight identification of the sexes by means of plumage in Mockingbirds is impossible though the female is known to average smaller in size and to have more restricted areas of white in wings and tail. While walking or perching, the amount of white displayed by any Mockingbird varies according to the position in which the wing is held and no sight comparison is dependable. Any individual may appear to have a prominent white wing spot and at other times none at all.

To distinguish sex of the bird in hand, examination of the rectrices has proven most successful thus far in my experience. All birds known to be adult males have had no dark areas on the outer pair of tail feathers while the several females examined have a plumbeous area on the inner web, like the immature birds. In very young birds these dark areas are relatively large.

A number of Mockingbirds have been seen in early spring with the outer pair of tail feathers in process of replacement. Whether this is an accidental or a natural occurrence has not yet been determined.

In adult birds the iris of the eye is usually orange or yellowish orange, but juvenile Mockingbirds have gray eyes, gradually changing from the center toward the rim of the iris. During the autumn influx of young birds

many are noted in all stages of transition from gray to yellow but no bird banded from the nest has remained long enough to determine the exact age at which the adult color of the iris is attained.

Postscript.—On January 22, 1935, after twelve days courtship of the "Bs" the temperature dropped in one day from 59 to 14, followed by snow. Each bird retired to its own territory and they took no further interest in one another until March 3 which was almost the same date "Bf" had joined "B" the previous year. "B" started to sing again and courtship began once more but unfortunately he disappeared soon after, evidently the victim of some predatory creature and "Bf" mated with a year old male occupying territory about 75 yards distant. "L" immediately returned, settled on "B"'s old territory, mated with an unbanded female and they raised their first brood early in May.

Graybar Lane, Nashville, Tenn.