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MOCKINGBIRDS, THEIR TERRITORIES AND INDIVIDUALITIES

WITH ONE ILLUSTRATION

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INTRODUCTION

This is a history of individual birds, of mated pairs and of the relationships between holders of adjacent territories and between these territory holders and the large floating population of the fall and winter. Our study covered the period from January 1, 1933, to February 15, 1934. All the observations on mockingbirds (*Mimus polyglottos leucopterus*) were made in the immediate vicinity of our home in Pasadena, California.

Now, having watched and recorded for more than a year, we feel that much still remains to be learned about the lives of our mockingbirds and how their behaviors correspond to those observed by other workers. Our own work, thus far, seems to have brought out as many differences as likenesses among the different individuals. The only record of observations closely paralleling ours that we have seen is the article by Mrs. F. C. Laskey on territory and mating of mockingbirds (*Migrant*, 4, 1933, pp. 29-35).

Reason for use of colored bands.—By the fall of 1932, after we had been operating our banding station for eight years, we were convinced that our trapping records were not giving us much information about the mockingbirds that frequented our region. It is true that a few came to our traps enough times that we learned something of them, but these birds were not sufficiently numerous to account for the number about us most of the time. In reporting on one of these birds which had been in our traps from one to three times during the spring and summer of each of eight successive years (and has since been trapped on May 11, 1933, making it then at least nine years old) we expressed the question in our minds in the following words:

What deductions in regard to this bird's life can be drawn from these records? Probably none with any assurance of approaching the truth, except that it was here during the mockingbirds' nesting season on from at least one to three days of each of the eight years. Did it nest on our station grounds? Did it nest in the near vicinity? Did it merely stop here on its annual movements? Does it have any annual movements? Why can we answer none of these questions? The traps have been operating almost continuously all these eight years. What could have been done eight years ago or since then to have obtained a more nearly complete life history of this bird? But how is one to know which bird to mark with a colored

band? Most of our mockingbirds did not come to our traps a second time and one of them was in our traps 262 times in two years (erroneously given as 298 before) It would have taken a very elaborate system of colored bands to mark distinctively each one of the 241 that have been banded during the eight years. (An Eight-year-old Mockingbird and Thoughts on the Use of Colored Bands, by Harold Michener: News from the Bird-Banders, W. B. B. A., 8, Jan., 1933, p. 8.)

Our interest in watching the mockingbirds come to the various feeding stations throughout the yard, especially in the past year, and the setting down of these thoughts, led us to the determination to mark them with colored bands.

Method of using colored bands.—Beginning in December, 1932, the few trapped up to early the following May were banded with a single colored celluloid band in addition to the numbered aluminum band. By the end of this experimental period we had concluded to follow the advice of Erickson and Boulton in the use of the same number of colored bands on each bird in order to avoid misidentification in case a bird should lose one or more bands. (Notes on the Use of Colored Celluloid Bands, by Mary M. Erickson: News from the Bird-Banders, W. B. B. A., 8, Jan., 1933, p. 9: A Program of Banding for Sight Identification, by Rudyerd Boulton: News from the Bird-Banders, W. B. B. A., 8, Apr., 1933, p. 20.) A total of four bands, three colored and one aluminum, with two on each leg, was chosen and a list of combinations prepared according to Boulton's formula which gives 671 combinations when five colors are used. Whenever a combination was used the number of the aluminum band on that bird was entered in this list, opposite that combination.

A few of the butt-joint size 2A colored bands furnished by the Biological Survey were used, and after that supply was exhausted nothing but size 2 spiral bands was used. These spiral bands were amply large when recoiled around the bird's leg with the original outer end on the inside. These sizes of celluloid bands correspond to sizes 2 and 1 respectively in the aluminum bands. Some of these were furnished by the Biological Survey but most of them were made by ourselves out of Ten Cent Store celluloid windmills. On comparing with Butts it appears that our method of making these bands follows his in a general way but with definite improvements, we believe. (A Study of the Chickadee and White-breasted Nuthatch by Means of Marked Individuals. Part I: Method of Marking Birds, by Wilbur K. Butts, Bird-Banding, 1, 1930, p. 149).

Number of birds studied and relative numbers of adults and immatures.—By the end of 1933 we had placed colored bands on 197 mockingbirds, 20 of which had been banded by us previously with the Biological Survey numbered aluminum bands. Nineteen were observed sufficiently to warrant special mention and 11 of these make up the really important characters of the mockingbird drama of the year which centered on our yard. For many of these birds the sight records became voluminous and could have been increased almost indefinitely by the simple expedient of looking more times and writing more records.

Of the 177 that were first banded during the year, 41 were adults and 136 were immatures. Counting the 20 adults which had been banded in previous years, there were 61 adults present and banded with colored bands during the year.

Duration of stay of mockingbirds at our station.—A study of the length of time that the various birds remained with us, based on the combined trapping and sight records, shows that 62 (17 ad. and 45 im.) were recorded on only one day; 8 immatures over a 2-day period; 13 (3 ad. and 10 im.) over a 5-day period; 8 immatures 7 days; 33 (4 ad. and 29 im.) 15 days; 23 (4 ad. and 19 im.) 1 month; 12 (9 ad. and 3 im.) 1½ months; 13 (5 ad. and 8 im.) 2 months; 5 (4 ad. and 1 im.) 3 months; 9 (6 ad. and 3 im.) 4 months; 2 (1 ad. and 1 im.) 5 months; 2

adults 6 months; 1 immature 7 months; 1 adult 9 months; 2 adults 10 months; 1 adult 11 months; and 2 adults 12 months.

This does not mean that there is a record for each bird on every day of the period stated but in most cases the records are such as to make it reasonably certain that the bird came frequently to our food supplies from the first to the last day of record. However, there are a few cases in which it is indicated clearly that the bird left our observational area and later returned. Of the 25 birds having record periods of three months or more, 13 were recorded in every month of their respective periods.

Trapping records.—We have prepared an analysis of our trapping records of mockingbirds covering the slightly more than nine years, November 2, 1924 to December 31, 1933, during which we have been banding birds. Since this paper is primarily a report of information on individual birds marked for sight identification this analysis of trapping records is presented as an appendix and is thus included to show, for this species, what has been learned by trapping alone and how little that is compared with what can be learned by observation of individuals marked with colored bands.

Sex identification.—We refer to our birds as males and females. It will be apparent that we have no positive proof of the sex of any of them since they are, in most cases, alive and wearing their bands. We have not yet recognized any sex indicators in the plumage although there is great variation in the amount of white in the wings and tail. We have used behavior characteristics to differentiate between the sexes and, although we wish to emphasize the fact that there are strong individualities in mockingbirds which might in certain cases make such differentiation incorrect, we do know that there are both sexes among our birds and we believe that the differences outlined below distinguish the sexes in the group we have had under observation. These differences are:

MALES

Hold and defend territories during the entire year.

Sing during spring and summer; stop during the molt, sing again during the fall gradually decreasing as winter advances.

Fight in defense of territory at all times of year except during the molting season.

Participate more freely in waves of sound that are heard during fall and winter.

Resent the invasion of male mockingbirds in spring and early summer but are more tolerant to females coming in at this time of the year.

Have a decided liking for high perches.

FEMALES

Hold and defend territories during fall and winter only.

Sing comparatively little and only in the fall and early winter.

Fight in defense of territory only in the fall and winter.

Participate less freely in waves of sound that are heard during the fall and winter.

Do not usually resent other mockingbirds coming in during spring and summer.

Rarely go on high perches during spring and summer.

Much quieter than the males during spring and summer and tend to be much more retiring.

Description of the area under observation.—Our banding station, at which this work was done, is situated within a mile of the center of Pasadena. The lot is 100 by 317 feet. There is a busy street one block east of us and we are surrounded by the city on all sides.

Near the center of the yard are three old eucalyptus trees and at the west end of the south side are three old grevilleas. To these we have added an informal collection of shrubbery and younger trees. No part of the ground has regular care.

It is rather a feral garden, the plants taking care of themselves in a large degree until necessity compels some vigorous pruning. Patches of thickly tangled shrubbery result with small open spaces between. The selection of plants has been governed to a large extent by the tastes of the birds. Water is available in many places. In five places fruit for the mockingbirds has been kept constantly for the last two years. This consists primarily of small seedless raisins at all times of the year supplemented by other fruits, such as cherries, grapes, persimmons and apples, in their seasons.

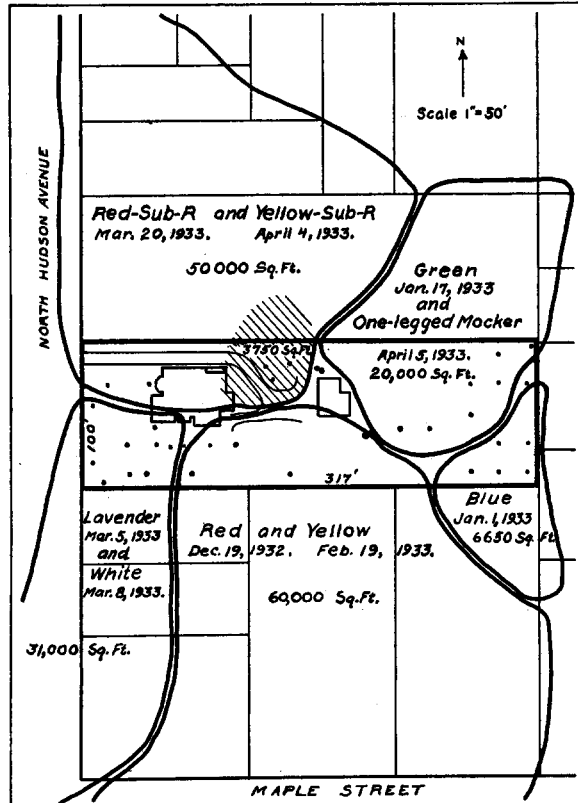


Fig. 23. Map of mockingbird territories showing approximate areas and dates on which territory holders were given colored bands. Shaded portion is winter territory of Yellow-Sub-R and later of AB-RG.

Surrounded, as we are by a city, our yard is nevertheless shut off from it. South of us are two bungalow courts which have their garages along our south fence making an almost continuous wall on that side for the extent of the courts while the remainder of the south side adjoins a vacant lot. Our west faces a quiet street lined with large elms. North of us is a lot the size of our own with a dwelling near its front. There are several trees on it and a large space of bare ground. The house is occupied, but the yard, one might say, is not. Our east adjoins the rear of deep lots which contain a number of trees. From the space back of our house we can see none of our neighbors and rarely hear them.

The total area under observation is approximately 400 by 600 feet.

Boundaries and extent of territories.—The boundaries of the territories touching our lot became apparent to us soon after placing colored bands on the owners of those territories. There were no noticeable minor changes in these boundaries but

there were some combinations of two, and even three, whole territories and some temporary transfers of ownership of appreciable portions of territories. All these changes cannot be shown well on a map so the map has been drawn to show in full lines the territories as we first knew them. From these and the descriptions, the changes can readily be visualized.

The territories occupied by the five mated pairs were of approximately the following areas in square feet: 60,000 (Red and Yellow), 50,000 (Red-Sub-R and Yellow-Sub-R), 50,000 (Barg and Blue), 31,000 (Lavender and White) and 26,650 (Green and the One-legged mocker). The winter territories occupied by the four lone females were of approximately the following areas in square feet; 26,650 (later reduced to 20,000) (Gabb); 3,750 (later increased to 11,000) (AB-RG); 6,650 (later increased to 26,650) (Blue); and 3,750 (Yellow-Sub-R).

HISTORY OF INDIVIDUAL BIRDS

We began our study on December 19, 1932 by placing a red band on the left leg of a mockingbird which was already wearing an aluminum band on the right leg. However, our sight records were not started until January 1, 1933. The trap records of this bird up to that time were as follows: banded as an adult, May 17, 1932 with aluminum band A283229; recaptured December 16, 18 (3 times), 19 (3 times), 20 (2 times), 21, 22, 24, 25 (2 times), 26 (4 times), 27 (4 times), 28, 30, 31. These records offer us only the information that this bird was in our yard in May and had been with us and using our traps for feeding places from December 16 on. One more thing we did know. These December captures were all in the same part of our yard.

Wearing a colored band we could now recognize him at sight and it soon became apparent that he did not go into every part of our yard but was repeatedly seen in one small portion of it. There were occasional exceptions to this which we shall discuss later. He lived in an area which apparently belonged to him. The part that extended into our yard was only a fraction of the total area but an important fraction because it contained a constantly replenished bowl of raisins and a water supply. In the months since then we have seen him almost every day, often many times a day, within our yard, on the radio poles of the adjoining courts, in the trees and on the parkings of the street south of us. His territory was determined by hundreds of observations of him. To us he is known as Red and we shall refer to him by that name in this paper. It was and is still a marvel to us that he lives his life in so restricted an area but it contains abundant food consisting of our raisins and fruits as well as crataegus berries, cascara berries, figs and small plums, ground that is watered and cultivated, shelter and nesting sites as well as high perches.

Our notes on Red during the last year fill many pages and include observations on his mating and nesting activities, the molting time and his winter habits. Indeed, we feel we know as much about him as we could know about any next door neighbor whose activities were one of our main interests in life.

Similarly, on January 1, 1933 we banded another mockingbird with a blue band on her left leg. This bird was captured at the east edge of our lot. She had been banded as an immature with aluminum band C103140 on July 21, 1932 and had repeated October 31; November 1, 8; December 4, 15, 16, 19 and 20. She will be called Blue.

Blue's territory was very small compared with Red's as will be seen on our map. This bird was so tame we rarely needed glasses to identify her and we saw her repeatedly. Her restricted territory lay almost wholly within our yard. In addition to the food we provided, her territory contained cotoneaster berries, elderberries and a tree of pearmain apples.

Another mockingbird occupied the territory immediately west of Blue's and extending beyond our lot to the north. This one came into our story on January 17, 1933 when he was given a green band on the left leg and christened Green. He had been banded with aluminum band B223633 on October 23, 1932 and had repeated December 9.

Gradually, as the result of many observations Green's territory was found to include the area shown on our map. It contains a persimmon tree, crataegus berries as well as peaches and apricots and we kept raisins at the faucet where Green drank.

The territory of another mockingbird extended into the southwest corner of our lot. We banded this bird with a lavender band on his left leg March 5, 1933. He had been first trapped and banded as A288770 on December 20, 1931 and had repeated on April 25, June 15 and December 12 in 1932. The part of Lavender's territory that extends into our yard is small. It contains a food table for our raisins and fruits, a toyon, a camphor tree, a eugenia tree, two bottle trees and a grevillea. All of these trees furnished food for Lavender and there are several small pools in this part of the yard.

Although we now had four mockingbirds wearing colored bands there was one whose territory extended into our yard. This was a very quarrelsome bird who drove all the others from the food shelf at our kitchen window. He also guarded a bush of crataegus berries that was near the northeast corner of our house. We knew him as the window mocker for a long time before he was trapped on March 20, 1933. He was already banded on his right leg with an aluminum band, numbered 582178, which had been placed there by us on July 19, 1929. He was an adult at that time and was now, therefore, at least five years old. We put a red band below the aluminum one on his right leg and we named him Red-Sub-R. He had previously been recaptured on April 24 and on April 26, 1930. His territory is outlined upon our map. He has been trapped only these four times and prior to placing the colored band on him we know little of his history. Since March 20, 1933 he is very prominent in our notes and we see him frequently. In addition to our raisins and the crataegus previously referred to he eats cotoneaster berries, feijoa petals and persimmons from the trees and shrubs in that part of his territory within our yard. In the lot next door a date palm and a mulberry tree lie in his holding. He drinks from a small pool in our front yard and can doubtless obtain water in the yard north of us.

These five were our first mockingbirds marked with colored bands. The year 1933 proved to be by far our most successful in trapping mockingbirds. This was doubtless due in part to our constant food supply for them during both 1932 and 1933 but we think it was an exceptionally good year for mockingbirds from the reports of other bird observers in the vicinity.

We have gone somewhat ahead of our story to present the map of the territories of these birds. We would like to state that the major outlines of the territories were established early in the progress of the work.

We shall now return to the beginning of the year and give the history of our work with the hope that we may, in a measure, develop our account as it was unfolded to us.

January.—Beginning on January 1, 1933, every time one of these birds was identified by its bands we recorded its location, its activities, its reactions to other mockingbirds and to us. In fact, we recorded everything concerning it that seemed of interest.

During January all five of the mockingbirds whose territories we have described were, we believe, in our yard. But only Red, Green and Blue are in our records

for they were the only ones wearing colored bands. During this month none of our birds was heard to sing. Red and Green with the other neighboring mockingbirds often entered into the waves of mockingbird notes that seemed to spread out from a center in all directions. Any one of them might start this, giving a few chips or occasionally a loud, harsh squawk or several well separated chips. Then the others would answer in any one of these ways. Generally this would last only a short time and might occur a varying number of times each day, depending, we believe, on the number of times unwanted mockingbird visitors appeared, for this was always, so far as we know, the cause of the disturbance.

The appearance of these visiting birds was at first a puzzle to us. With our own so confined to the restricted limits of their territories why were others wanderers? We believe these visitors during the winter were in search of food. They were often in small groups and were obviously hungry. By our planting of food plants and by our constant supply of raisins and fruit we made it possible for our territory-holding mockingbirds to stay within the limits of their territories. During the winter months some sources of food must become exhausted and the mockingbirds relying on them must be forced out. When this happens they doubtless wander far, for our birds were constantly on the alert for them and drove them off viciously, while the harsh calls and chips warned other mockingbirds in the vicinity of the presence of the intruders.

We noticed even at this time the very distinct individualities of different birds. Red was not especially tame but neither was he frightened when we approached to watch him. He spent much time in our yard and we could find him practically every day in our walnut tree above his raisin bowl or in the shrubbery near it. Many of his actions we recorded at that time without any interpretation of them and as we reread our early notes we find he was often giving the sharp, harsh note that means invaders and that was answered by all the others or was an answer to their calls, that he often sat where he could look at the food we placed for him or that he was sitting quietly in rather secluded shrubs. By the end of January we had seen him in many parts of his territory and for the following year its limits were not in any way changed. He showed for a short time a curious liking for our traps and from December 16 to February 12 he was caught 42 times. It was not necessary for him to enter the traps for food because the same food was always plentiful outside. Suddenly he ceased to enter them except at rare and widely separated intervals.

During January, Blue was more often in our records than either of the other birds. This was due to her extreme tameness as well as her small territory. She was very quiet. During this month we heard her answer other mockingbirds only once. Often when we went to look for her we would find her sitting on some low perch apparently watching us. Between December 4, 1932 and January 22, 1933 Blue entered our traps nine times. Our notes refer repeatedly to her tameness and to her habit of apparently coming to watch us at times and for this reason we became much attached to her and felt very strongly that accident had befallen her when our records for her ended suddenly on January 30. In this surmise we were quite wrong.

Green was given his colored band on January 17, 1933 and during the remainder of the month we identified him many times but learned little about him. One of our notes refers to him as always silent and always hiding. He doubtless evaded us many times. He was, in our opinion, excessively timid and during January we were not able to get very close to him. He was trapped only once during the month.

February.—Blue was gone and February opened with only two of the mockingbirds in our yard wearing colored bands. We never learned where Blue went when she left us on January 30 and on February 1 we found Green occupying her

territory as well as his own. There had been no hostility apparent between them and we do not believe Green drove her out although at first we were inclined to think this possible.

Green now became a prominent figure in his territory. He was seen singing for the first time on February 1, and from this date he sang with increasing frequency. Until the middle of the month his songs were not very loud and were usually sung from low perches. After this time they became much louder and more varied. They were often given from some tree top and he frequently flew, singing from one high perch to another. There were several of these perches from which he sang and after the middle of the month almost every note on him records singing. On February 22 after a large flock of robins had been in our yard all day we heard Green give a fairly exact imitation of a robin's notes.

During February we noticed a great change in his attitude toward us. On February 4 our notes say he was almost as tame as Red. By February 20 he would come to us and hunt earth worms when we were digging. He seemed almost fearless and was from this date on, except for his future mate, our tamest mockingbird.

The day after we first heard Green singing we found Red singing softly in his territory. Like Green, during early February, his songs were soft and like Green also, about the middle of the month he began to sing louder and from higher perches. We described some of his first songs as whisper-songs. Then we sometimes heard the soft, faint song with bursts of louder song and by the middle of the month he was singing on a high radio pole in the court nearest to our house.

On February 16 an unbanded mockingbird appeared in Red's territory. Her breast was unusually dark when she first came—perhaps darkened by smoke from smudging—but it was so unusually dark that we were able to recognize her at sight. On February 19 we caught her and banded her with aluminum band C103226 on her right leg and a yellow band on her left leg and she became known as Yellow.

Red showed no hostility to this bird which we almost immediately concluded was a female. Several times he chased her a few feet but it was quite unlike fighting. She as well as the other females we have watched were quiet at this time of year. They did no singing and took no part in fights between the males. They tended to stay lower in the shrubbery and were more retiring. We very soon realized that she stayed in Red's territory except on rare occasions. If Red left his territory and went into that of another bird he was immediately chased out by the owner of the territory into which he went. If Yellow went into the territory of another bird she was chased a little but really allowed to remain. It was quite unlike the reaction that ensued if a male bird were the intruder.

During the first week of Yellow's presence she and Red were frequently seen sitting together in a shrub or low tree—Red two or three feet above Yellow. Although at other times of the year they frequently sat in this manner it was more conspicuous during the first week. At such times they were usually entirely quiet.

When Yellow came Red's singing decreased although it did not stop. When he was singing Yellow was not near him. His song had not reached the stage that we described for Green at this time—singing loudly as he flew from one high perch to another, or jumping into the air as he sang. Now he sang even less than he had before Yellow came.

At this time we first heard a soft little *hew, hew* repeated many times from the low parts of the shrubbery where both Red and Yellow were sitting. Although this sound is not entirely confined to the spring we have never heard it except from a pair of birds together. By the end of February we were sure that these two were mates and Yellow remained quite as strictly within their territory as Red.

March.—We have said Red's singing decreased after Yellow came. However, he still sang during the first half of March but after that his singing practically ceased and he was frequently seen going into one of the courts south of us. At this time also we noticed his anxiety about the California Jays (*Aphelocoma californica californica*). One of these jays was lame and so recognizable to us. It was frequently seen sitting near a mockingbird. When the mockingbird would fly the jay would follow and again sit near him. At such times Red sometimes made a noise we had not heard before from him. It resembled the *hew-hew* given when a pair of mockingbirds are together but was louder and had a worried quality. We afterwards heard this noise when Red's baby was in our hands and we concluded it indicated anxiety although at such times other mockingbirds commonly expressed anxiety by another note. We particularly watched Red's actions in regard to jays and although at this time we did not see him chase them he showed he was worried when one was near, if not by his notes by his movements. We believe that by their watchfulness the jays learn the vicinity of the mockingbird's nest and that in most such cases at least some of the eggs or young fall victims to the jays.

From the time Red's song ceased so suddenly about March 13 we had few records for Yellow until the end of the month, and we saw her rarely with Red during this time so that March ended with both Red and Yellow rather inconspicuous in our surveys.

As to Green in March, we are quite unable to describe his song adequately. He was frequently seen at the tip of the cypress in our back yard singing, flying up and singing again, singing on the wing from perch to perch. Our notes for the month are full of such remarks as the following: "Identified ten times today—singing always." "Singing almost all day." "Singing all morning." Such records occur for every day and we can never forget the melody in our back yard during those days. Several times when Yellow was near the border between the territories of Red and Green, Green was seen to come near Yellow singing his best continually and even to enter Red's territory. At such times Red wasted no effort in song but growled viciously and attacked Green sending him immediately to his own territory. Green was at this time one of our great delights. He almost seemed to come to hunt us when we went into his territory and our notes on him are voluminous. When we went into the back yard with raisins we often held a few out to him, then put them down and he went at once to eat them although they were never absent from his food tray. At the end of March his song was still flooding our yard all day and every day.

The plot now thickens a little. On March 5 we trapped and banded Lavender. For some time before he was actually banded with the colored band we had known that a bird occupied his territory and we were glad to have him labeled so that we could identify him positively at sight. Before this time we had heard him singing considerably. At some time between the time that Yellow came into Red's territory (February 16) and the date when he was given his lavender band (March 5), his singing decreased presumably because a female had come in, for at the time he received his colored band we knew there was an unbanded mockingbird in his territory. On March 8, she was banded as C103227 and given also a white band and we called her White. We knew less about this pair of mockingbirds than about any other pair in our yard. The lavender and the white bands proved to be difficult to see. Both birds were also excessively timid and only a small part of their territory was in our yard. Both, when approached, would immediately fly some distance and, if possible, get on the opposite side of a limb or trunk of a tree from the observer. After they were banded Lavender was seen singing a number of times but he did not sing steadily as he had earlier in the year.

There are three bottle trees in the territory of Lavender and White. The seeds of these are dry, hard, and covered with stiff prickly hairs. We were surprised to see Lavender and White eating these seeds, not once, but several times. Once, one of them was observed to eject from its mouth, one of these seeds and on examination the seed was found to have the outer, thin, dry papery layer and the hairs removed. This pair of mockingbirds was seen many times when no records could be made because they were so persistently evasive that we could not positively identify their colored bands.

Even before January we had noticed a mockingbird, wearing an aluminum band but no colored band, guarding the food on a window shelf at the northeast corner of our house. He drove away any bird that came there to eat. It was not until March 20 that he was captured and a red band placed below the aluminum band on his right leg and he was named Red-Sub-R. He had watched over a crataegus near the corner of the house all winter with the same diligence with which he had guarded the window shelf, but by the time he was banded with the colored band he no longer drove off any birds other than mockingbirds. He had been singing during February and continued through March but he never sang as constantly as Green. None of his singing perches were in our yard but the chimney of the house north of us and two deodars north of that were favorite places with him. We could see all of these perches and could identify him on the chimney but only with difficulty on the deodars.

By March 29 another mockingbird had come into Red-Sub-R's territory. This bird already wore an aluminum band. And now Red-Sub-R's singing decreased rather sharply just as Red's had done when his mate arrived. Both Red-Sub-R and his mate were very suspicious of us. They never ate when we were near and never came to the window shelf if they could see us. This was so noticeable that we rearranged the food placing the raisins and fruit upon the ground where the birds would not see us so easily.

April.—We now began April with three of our territory-holding mockingbirds having mates. By using a very large cage with no treadle and making a rapid run to close its door we succeeded in trapping Red-Sub-R's mate on April 4. Her aluminum band bore the number A261627 and we put a yellow band beneath it and called her Yellow-Sub-R. She had been originally banded August 8, 1930 as an immature. She had repeated December 29, 1930 and December 22, 1931 so we had captured her only three times previous to the time when she was banded with the yellow band. It will be noted that both she and Red-Sub-R were rather old birds although she was at least two years younger than he. This may account for their caution which is a noticeable characteristic in both of them.

Yellow-Sub-R had a habit of lifting her wings very often. This is a common action of mockingbirds but Yellow-Sub-R did it so frequently that it was often possible to guess her identity correctly by observing this mannerism. We have watched this habit of lifting the wings a great deal in three baby mockingbirds reared by us at different times. We found with all of these babies that any new or strange object put into the cage caused this action. When released we observed one of them going about the yard lifting its wings over and over as it looked at eucalyptus caps, pebbles and all sorts of objects. This certainly was not an indication of fear because when afraid they behaved very differently. We can only describe their actions when alarmed by saying they went wild. This was a reaction caused in one of them by going near it with a coat with large fur cuffs. With one of them a blue glass marble caused this same response. Whenever it was shown to him he seemed to lose all self-control and we could never tell why. As long as we kept him he retained his fear of the small sphere of blue glass.

To digress still further from our topic we would like to tell here that one of these babies always recognized the voice of the person who fed him and would begin to beg for food as soon as he heard it. One member of the family often teased this baby by scratching on the screen door of his cage. The little mockingbird would fly at the finger going up and down and make a queer scolding noise and fluff up his feathers. After being released he remained in our yard for some time and when the teaser appeared the young bird would fly near him with fluffed up feathers making the noise he had made when the door of his cage was scratched.

To return to Yellow-Sub-R, there is rather little to say of her April activities except that she often came for food. Like Yellow she was quiet and retiring *at this time*. In the light of knowledge of Yellow-Sub-R later in the year we use italics.

During April, Red-Sub-R and Yellow-Sub-R behaved much as Red and Yellow had behaved during February. They were observed sitting quietly in the shrubbery and Red-Sub-R was at such times apt to be above Yellow-Sub-R and he was seen to chase her for a few feet sometimes. Our opportunities for observing this pair were not especially good at this time of the year for they spent little time in our yard.

The story of Red and Yellow for April is very different from that of Red-Sub-R and Yellow-Sub-R. It will be recalled that Red's singing had decreased during March. In April there are no records of any song from him until April 13. This was not, however, because he was not seen, for he was a prominent figure in our yard during April. He was seen often in the tree above his raisin bowl and if his supply became exhausted he was apt to go to Red-Sub-R's from which he was promptly chased by Red-Sub-R. This tendency to visit the other food shelf was temporary and ceased before the end of April.

Red and Green continued to behave as they had in March. Green often approached the part of the territory where Yellow was and was as often forced to return to his own territory by the ever-watchful Red.

During April, Red's jay problem became acute. Beginning about April 8 he was often seen chasing jays when they entered his territory. He would give a harsh growl-like cry and follow them till they left. But at other times they followed him and we felt sure it was difficult for him to visit his nest unseen by them.

In addition to guarding Yellow from Green's attentions and keeping jays from his nest, other mockingbirds gave him much trouble. Even when one was flying over and quite obviously going past Red's territory he would fly up to a considerable height to meet it and speed it on its way. He spent much time sitting on high perches from which he would immediately fly to meet the approach of either a jay or a mockingbird.

On April 8, about the date when he was first seen chasing jays so diligently, young mockingbirds were heard in the more easterly of the courts south of us and this offered an immediate explanation of the scarcity of records we had for Yellow and of Red's failure to sing during the latter part of March. On this same day Yellow was seen carrying an earth worm in the direction of these babies. At this time the young were evidently in the nest for in the few days that followed the sound always came from the same location. On April 12 we heard them at some distance from the original location.

To show how extremely busy Red was at this time we insert here a note made at 7:00 a. m. on the morning of April 13.

Red growled at and chased a jay from the immediate vicinity of his young. Then he chased another mockingbird into the south eucalyptus. Green came into the eucalyptus and Red growled at him. The strange mockingbird flew north and Green

returned to his territory. Red flew to one of the radio poles in the court. A jay then came to the south eucalyptus tree and then went to the walnut. Red drove him out of the walnut to the north eucalyptus then followed and drove him from it. Red flew to the walnut, went down and ate a raisin and flew again to the radio pole in the court. A jay came to the south eucalyptus. Red drove him out, then flew to the east grevillea tree to drive out another jay and again to the radio pole. A moment later a jay flew from the maple trees on the street south of us to our eucalyptus at quite a high elevation. Red flew up to meet him and chased him past our lot and then went to our walnut tree. A jay now flew from our grevillea trees to the maple trees on the street south. Red followed and drove him on. Every time he chased one of these birds he made a growl-like noise.

The end of such notes marks the limits of our time rather than of Red's activities.

But on the day the preceding note was made Red flew to the radio pole and sang for the first time heard since March 29, and after this his song increased as the need of fighting jays decreased. There are few records of him following jays after April 16 when the young one (for only one was reared) was probably too large to be longer of interest to them.

Because of the appearance of the young one at this time we shall carry on the account of Red beyond the month of April in order that we may connect it, without any break, with what we saw of the baby.

During the remainder of April, Red was seen almost daily caring for the baby. He was often seen to feed it raisins and often it was with him near the bowl where the raisins were kept. In all cases our mockingbird parents brought the young to the food supply before the young were able to eat alone and we have no records of young birds being kept from the food by adults for more than a brief moment while an adult took food himself and in no such case was a parent the one to demand such precedence.

Red's troubles in early May concerned other mockingbirds rather than jays. The immature birds were not yet about and all adults were regarded with suspicion. There are repeated records of his hostility to all of them that entered his domain. On May 7 and 8 a particularly prolonged fight occurred. It started when an unbanded mockingbird appeared in the northwest portion of Red's territory and gave every evidence of intending to remain and establish a territory of his own. He sang from low in the shrubbery and Red immediately responded by pursuing him. Instead of leaving Red's territory as a mockingbird with a territory of its own would have done, in all probability, this bird flew around and around in Red's territory. As soon as he had eluded Red by hiding low in some bush, he began again to sing but always a very faint song and always from a low, thick, leafy hiding place. As soon as he began to sing Red was after him. Sometimes in the heat of pursuit Red went beyond the limits of his own territory but always returned immediately. This fighting recurred over and over on May 7 and on the morning of May 8 Red was too busy chasing the intruder to start a song of his own. At noon he was heard singing in the top of a small tree. In a trap below this tree was the intruder. He was banded with both aluminum and colored bands. As soon as he was released Red went promptly after him and possibly the trap experience helped turn the tide of battle in Red's favor for the newly banded mockingbird disappeared from our yard and records.

The scarcity of notes on Yellow during the last of March continued till April 10. After that she was often seen. She was observed carrying insects. Once she had a large moth in her bill as she sat in the walnut tree. A jay sat watching her. She gave little worried chips and moved nervously about. We chased off the jay with rocks and she went immediately in the direction of her nest. Like Red, she carried

raisins away and it seemed to us she took a larger share of the actual care of the baby than Red whose efforts went largely to the protection of his nest and territory.

This baby was seen for the first time on April 15. He was 250 feet from the nest and was seen to fly about three feet. His tail appeared to be about an inch long and both Red and Yellow were with him. After this time he was frequently seen in different parts of Red's territory. His ability to fly increased daily and we often watched him beg for food and saw both parents feed him. On April 24 we recorded his tail as between one-half and three-fourths the length of that of an adult. On April 25 we caught him by running him down. A rain had made his feathers wet and hindered his still weak flight or we could not have captured him in this way. He was banded as B223660 on his right leg and both a red and yellow band were put on the left leg. We were now able to identify him without his parents. On May 6 we watched a curious performance on the part of this baby. He was in a grevillea tree and was twice seen to carry a dead grevillea leaf to a crotch of the tree where he placed each leaf and then appeared to tramp on it. On May 7 we saw Red feed him. On May 8 we heard him begging for food with tiresome frequency. This was the day Red was so unusually busy with the intruding mockingbird. On the 9th we suspected the baby was feeding himself and we never saw him fed after this date. It was, therefore, just a month after the time we first heard him that he ceased to beg for food. On May 15 he was seen eating raisins, quivering his wings at each bite but making no noise. On May 16 he was seen at the southeast corner of our lot in Green's territory, well outside of Red's territory. He was not molested by Green, and indeed we found the young are rarely chased by any adults. This was the last time we ever saw him. We use the masculine pronoun merely for convenience.

Yellow's activities after the middle of April will be described later.

We now return to an account of Green for April. During the first four days of the month he sang almost without stopping. On April 5 he was seen several times with a one-legged mockingbird. We immediately guessed her identity because she wore a band. This was later verified when we caught her. She had been banded on April 25, 1929. She had returned January 25, 1932 and was found in a badly crippled condition. After operating to the best of our ability on a wounded leg she was released unbanded but recaptured on January 28 and again banded as A288773 and was not again seen until 1933.

She had been seen at various places in our yard and in the vicinity earlier in the year. On February 2 she had been in Green's territory. On March 22, 27 and 31 she was in Red's territory and we thought her a female because Red did not molest her. She seemed to go where she pleased. On April 3 she was with an unbanded mockingbird in Green's territory. Green watched them but did not molest them. On April 5 this bird and Green were seen several times together and from this time they were obviously mates. Both were very tame. The one-legged mockingbird was repeatedly found within a few feet of us when we worked in Green's territory and when we were digging the two were almost at our feet.

Like Red and Yellow during February, Green and the one-legged mockingbird were frequently seen sitting silently close together and Green's singing decreased suddenly and greatly after April 5. He still sang but the song was of an entirely different quality, softer, given from lower perches and rarely given during flight.

Green and his mate were seen very often. We looked for them at every trip to our bird traps and rarely failed to find them. They were an appealing pair to us. As we passed a shrub where they sat we often held out a few raisins and then put them down. Both would immediately go to eat them. Green entered a trap on one occasion. On being released he began to sing in flight when a few feet from us and

perching in a bush very near continued his song. Once the one-legged mockingbird was given a mole-cricket. Green came and stood near while she ate it but made no attempt to take it.

All our territory holders now had mates and it is of interest to us that each pair had its own personality. The two birds in a pair behaved similarly. We do not wish to say this is always true but it was so in these four pairs of mockingbirds. Red-Sub-R and Yellow-Sub-R were suspicious of us and very cautious. Lavender and White were so timid it was difficult to observe them. Green and the one-legged mockingbird were extremely tame. Red and Yellow lacked any such distinguishing trait. They would go for food if we were near but not if we were too near. They neither avoided us nor seemed to have any interest in us.

The ability of Lavender and White to avoid us is evident from the few records we have of them for April. Both were often seen but we wrote no records unless we actually saw their colored bands and this was often difficult to do. Lavender sang during this month but we cannot say how steadily. On April 25 White appeared in our yard with a small baby. She was identified only four times during the month and Lavender only six. We never saw the baby again and never saw White after April 28 and later Lavender appeared with another mate but we do not know the story of this pair.

During April one additional mockingbird was given colored bands. It was trapped April 28. It disappeared from our records after this for several months.

May.—Although we have endeavored to tell the story of our mockingbirds month by month we carried the April account of Red on to May 16 because it was then the baby of Red and Yellow left his home territory. We also discontinued the account of Yellow on April 16 because she was then showing signs of renewed nest building. On this date Yellow was seen carrying nesting material to the south edge of their territory where we later knew she had a nest. On the 19th, however, she was twice seen taking care of her first baby and did so afterwards. On the 20th she and Red were seen sitting together and we heard the soft *hew-hew* notes that we had heard from them in February. After this we scarcely saw Yellow for a few days. On the 29th she was seen sitting near Red and after May 6 she was back in our records every day. She was seen on May 17 carrying food and on May 27 was with Red hunting for food on the lawn of one of the courts facing the street south of us while young were heard squeaking in a small Italian cypress tree close to one of the bungalows. Our records of her are too meager for us to know the exact history of her family affairs. We leave her now at the end of May busy with the single young one of her second successful nest of the season.

The account of Red has been previously carried to May 16. From that date until May 25 there are records of song from him and of his diligence in driving out other mockingbirds. He was, during this time, busy with his second brood of young which were at some distance from our lot and we now report the successful invasion of Red's territory at the time when his family cares were too heavy for him to defend the distant edges of his domain.

On May 25 at 9:00 a. m. a mockingbird was heard singing low in the walnut tree above Red's raisin bowl. Red himself was in a nearby tree looking intently in the direction of the sound. He went immediately to the walnut and chased out the singer and then went to his high perch on a near radio pole where he sang for some time. At 10:15 the same thing happened again. After this Red took a position on a high perch in a eucalyptus tree overlooking the walnut tree. At 11:30 the episode was repeated. At 1:10 a spotted towhee scratched vigorously among the dry leaves under the walnut near the raisin bowl making a considerable noise. Red came instantly

but left immediately without disturbing the towhee. Just after this the intruder came to the walnut tree but before he could sing a note Red chased him out. At 1:30 the new mockingbird was seen by us hiding low in an old fig tree overgrown with a cascara. He was quite tame and we watched him looking at the raisins in a trap in the fig tree. Once he sang a few faint notes which Red, singing loudly himself, apparently failed to hear. The next day the new bird continued to sing in Red's territory. It was an easily recognized song of a few faint notes with little variation and always from low, leafy hiding places. The song would stop as if the bird were listening and then start again. As soon as Red heard the song he would come and hunt out the intruder who always flew but just as regularly returned. His method was different from that of the bird we recorded in early May as attempting to gain a foothold in Red's territory. That bird would fly on Red's approach but keep going around and around within the limits of Red's territory. This bird would immediately leave and remain outside till Red was quieted and then would return.

On May 27 we banded the intruder as C103313 and with the color combination AR-RB for now we were using three colored bands and one aluminum band on each mockingbird. This formula means that Red-Blue, for so we named him, wore an aluminum band with a red one below it on his right leg and a red band with a blue one below it on his left leg. Much as it must have troubled Red he was not able to dislodge Red-Blue. Red was never excluded from this part of the territory. Red-Blue simply stayed in it also and Red arrived with a fierce growl every time he came to the raisin supply. We shall tell more of their behavior in June.

By May 31 Red's second baby was out of the nest. Red was extremely busy again. He was seen chasing jays and he helped procure food and sang his claim to his territory more often than he had with the first brood. This may have been on account of the persistent Red-Blue.

The records of Red-Sub-R and Yellow-Sub-R for May seem to center about their food shelf. They were both there regularly and often. Yellow-Sub-R was seen frequently on some large rocks in the yard north of us where she frequently stood raising her wings over her back and apparently looking down into the grass. Sometimes she would jump down and apparently obtain food. Red-Sub-R never frequented these rocks. He was often singing on the chimney of the house north of us. His song often contained a perfect reproduction of the squeaking notes of a baby mockingbird. Red-Sub-R had battles of his own. He successfully drove out Red-Blue who, however, was much more interested in Red's territory. In the southeast corner of Red-Sub-R's territory is a feijoa tree. The mockingbirds are extremely fond of the sweet petals of its flowers and strange mockingbirds began drifting in to eat them. At first Red-Sub-R drove each one out but it was soon clear to us, and apparently to him, that he could not keep them out. These were not territory seekers. They came only for food. They ate and left.

The young mockingbirds in the feijoa were the first young of the year to visit us. We saw no evidence of the adult territory holders trying to drive them out. They wandered at will through our yard. Four of these young ones stayed together for several days. We later concluded this did not mean they were of one brood because we frequently could see that the members of such a group were of different ages. They seem to want the companionship of other young mockingbirds and they go about in small groups sometimes, probably, a family but not always. Most of these visiting mockingbirds returned only for food and none of them figures prominently in the rest of our story.

Lavender was seen driving intruders from his territory during May; he was observed watching a fight between other mockingbirds and he came to the feijoa for

petals and returned immediately to his own territory when he had eaten. We have no records of song from him during May. Only a small portion of his territory was in our yard and therefore we do not wish to say he did no singing but we do not believe he sang much. White, Lavender's mate, was last seen during April. On May 6 another mockingbird was banded as C103261 and given a green band above the aluminum one on her right leg. From this time this bird was a rather regular visitor at our kitchen window shelf. She came from and went toward Lavender's territory. We did not then suspect she was Lavender's mate but our June records indicate that she was. We called her Green-Super-R to distinguish her from Green.

It will be remembered that Green's singing had decreased during the latter part of April and that he and the one-legged mockingbird were mates. During the first five days of May, Green continued to sing a little and his mate was not seen. She, we believed, was building a nest. On May 5 we suddenly faced one of the disappointments of this new and intimate knowledge of our birds. Near a tree where she had often come to get the raisins we held out to her was a little pile of feathers and the band of the one-legged mockingbird. A cat had killed her and Green was left without his mate. Almost immediately he began to sing incessantly as he had done before she came and this continued with scarcely a break for four days. On the fifth day he sang only a little and after that not at all. He was absolutely quiet and very tame and would come immediately for the food we held out to him. On May 15, ten days after his mate was killed, he disappeared until June 2 when he was seen eating from his raisin dish. On this occasion he was tame as usual and perfectly quiet. He went through the shrubbery and flew off to the south and we have never seen him since. The uncompleted nest of Green and the one-legged mockingbird, just a rough but shaped platform, has remained in a small spiny acacia ever since to remind us of them. It was probably made during the first five days of May while the one-legged mockingbird was so inconspicuous and is, as far as we know, the only mockingbird nest built on our lot during 1933.

We now introduce a new bird. On May 17, two days after Green left his territory, an unbanded mockingbird appeared and began to sing. At first he was rather quiet but after a few days he had taken complete possession and was singing on all the high perches Green had used. But for our bands we would most certainly have concluded that Green had again started to sing, so identical were their actions. On May 23 we banded this bird with aluminum band C103302 on his right leg and a yellow band below it and on his left leg a yellow band with a green one below it. Thus his symbol was AY-YG and we manufactured the name Yellow-Green for him. He was promptly and completely at home. He visited Red-Sub-R's feijoa for petals; he went to Red's walnut and was sent instantly home. He sang all day and every day and we thought at night as well. He seemed to delight in all the well-known antics of mockingbirds—flying up from his high perch and singing as he flew from tree to tree and filling the days with song as Green had done and as Red and Red-Sub-R had not done at all during the spring. We believe this was not an individual difference but that it was due to the fact that Red and Red-Sub-R almost immediately acquired mates. We never saw Yellow-Green fight other mockingbirds that went through his territory and we saw no possible mate lingering in his vicinity, and May closed with his song almost obliterating other sounds in his territory. Through June this constant song persisted. During very hot days he sang less; on the return of cooler days his song was renewed. Other mockingbirds could enter his territory, eat his food and sing there, but his song went on. He was, like our other mockingbirds, fond of the honey in grevillea blossoms and while they were in bloom his face was yellow from their pollen. At one time when a mockingbird, presumably a female,

with a brood of young entered our yard Yellow-Green left his own territory to follow her. She paid no attention to him and he soon returned. During the first four days of July he continued to sing but we noted that his song was decreasing. After July 4 he was never seen in his territory but on July 11 he was seen eating with the numerous mockingbirds that came to us for food at that time. Our belief is that having failed to attract a mate he abandoned his territory and the attempt and we reluctantly read not excessive joy but something approaching despair in the mockingbird songs that seem most thrilling. No other mockingbird took possession of this territory until fall and after Yellow-Green left, it was a quiet spot. Only young birds of the year and adults coming for food were there and no song was heard in it.

It will be remembered we left Red at the end of May struggling with the intruding Red-Blue and caring for his second baby of the season. The presence of Red-Blue in Red's territory led to a peculiar situation. Red now chased Red-Blue only at times. At other times he allowed Red-Blue to sing unmolested for a considerable period. Red-Blue always sang from low in the trees or in bushes but the longer he stayed the higher he went to sing. Both Red and Red-Blue chased out other mockingbirds. Red-Blue never chased Red; Red chased Red-Blue intermittently. Red could and did go, without trouble, into the corner where Red-Blue lived. We never saw Red-Blue attempt to enter the other part of Red's territory. Red-Blue never, therefore, really owned this small part of Red's territory and he won no mate in it. He was last seen singing on June 13 having been in it 19 days. He was again seen on August 4 preening himself. He had doubtless come for food like the many others that came then.

June.—We never caught Red's second baby and it was last heard on June 8. Red sang during the entire month of June spending much time on radio poles and other high perches. He quite certainly sang more during June than at any time since February. He came often for raisins, even when we were near, and preferred the raisins to the seedless grapes and cherries for which the other mockingbirds showed such preference. Like the others he was much quieter on hot days.

Yellow's appearances during June were few and practically every record is merely a statement that she was getting raisins. She was more timid than Red when we were near. She was very quiet. There is no record of a sound from her during the month.

We have many pages of notes on the Sub-R's for June. It was their busy month. Until June 22, most of these are merely that they were getting raisins. On June 17 Red-Sub-R was seen to drive a cat out of his territory. It first took refuge under a house and when it came out he followed it till it was beyond his border. Early in the morning of June 23 Red-Sub-R and Yellow-Sub-R brought a baby mockingbird to our yard. When we went into the part of the yard they claimed, they made a great fuss. On our approach Yellow-Sub-R swallowed an insect she was carrying and both parents came very close to us scolding and chipping. They would take no food to the baby while we were in the yard. We had to go inside and watch through a window to ascertain its whereabouts. At least one of the parents was always on guard on an overhead wire. In changing places the one coming would fly toward this perch growling slightly and the one on the wire would leave. As soon as one of us approached the location of the baby the bird on guard would chip. The other parent would immediately come and both would scold at us. A little later in the day Red-Sub-R was singing on various high perches and Yellow Sub-R was near the baby. If we went near it while he was singing Yellow-Sub-R would begin to scold and Red-Sub-R would stop singing and come to help her.

At about nine o'clock that morning we caught and banded the baby. It was

still too young to escape us when we knew its position. Both parents came close to us, scolding and chipping and making queer gurgling noises. This gurgling note is the one usually given by the parent mockingbird when the young are in danger. Red was an exception to this. The baby (there was but one) was banded as C103390 and given the color combination RY-AY. As long as we knew him we called him only "the Sub-R's baby." During the afternoon the baby was in a tree exactly opposite a window. The adults would feed him five or six times in the same number of minutes. Then he was fed nothing for nearly an hour when he was fed several times again and then made to wait an hour for more food. Sometimes, if a parent came near between these meals, the baby would squeak a little but he was not fed and he begged very little all day. All that day and early the next morning one of the adult birds was on guard. Probably on the 25th and certainly by the 26th the baby had been moved to the north side of the house north of us. On the days that followed the parents were seen carrying food over that house to the baby and June ended with both of them closely occupied with its care. We think we saw no other mockingbird parents quite as capable as Red-Sub-R and Yellow-Sub-R.

It will be remembered that Lavender's first mate, White, had disappeared and that a mockingbird banded as Green-Super-R had been seen in his territory but not definitely associated with him. On June 6 Lavender scolded us when we took two young mockingbirds from a trap. These were both quite well grown. They were not his babies, however, for the next day he and Green-Super-R were in his territory caring for a much younger baby which he was repeatedly seen to feed and which he protected. We knew less of the domestic affairs of Lavender than of any of our other territory holders, but we know that during the summer of 1933 he had two nests and that one young bird grew up from each.

We may pause here to survey the results of the other nests of the summer. Of the birds we have studied Green lost his mate and left, and no young ones were reared. Yellow-Green obtained no mate, Red and Yellow raised two babies from two nests, Red-Sub-R and Yellow-Sub-R reared but one baby that summer, and Lavender with two different mates reared two young. Red-Blue did not obtain a mate while holding a territory in our yard but we do not know positively that he, Yellow-Green and Green did not later claim territory elsewhere, find mates and rear young although in our opinion it is extremely doubtful. We do know that the three pairs we could follow produced only five young birds for the summer of 1933.

There were many visiting mockingbirds present in our yard in June. We have previously spoken of the numbers that came for feijoa petals. This influx of adult visitors for food and of immatures that stayed with us for a longer or shorter time assumed interesting proportions. We placed food in two places easily seen from the house. This consisted of cherries, which we found the most attractive thing we could offer, and later, when these were gone, we used seedless grapes. The traps, in which we captured many of these visitors, were placed near these piles of fruit and baited with the same fruit but the supplies outside the traps were never allowed to become exhausted. With glasses we could easily identify visitors wearing colored bands. During June, 42 mockingbirds other than ones holding territories within our yard were caught and banded with aluminum and colored bands or were seen, already wearing the colored bands given them in May. Of these 25 were adults and 17 were immatures. Many of them were seen only a few times.

In the case of our territory holders we noticed that the parents did not leave their young nor did they drive them out. The immature birds left home quite soon after they were able to feed themselves. Groups of young, often perhaps the young of a brood, but sometimes certainly not of the same brood for we knew their approx-

imate ages, would appear in our yard, stay for a few days and then move on perhaps to reappear singly or in the same groups later. During the early summer the young apparently wandered with no aim other than food. They were unmolested by our territory holders although they might be driven from the food momentarily by either an adult or another young bird.

There were a few that stayed long enough or visited us often enough to be of more than passing interest. A288779 was an adult given colored bands during May. She was here occasionally during May and the first week in June. On June 26 she came with three babies keeping them in our yard all morning near the food. She was seen to feed them several times. The next day she brought them again. We would see them flying back and forth between our yard and the yard east of us which was quite likely their home territory. On June 29 she was still feeding them and was seen without them on June 30. We insert this one record of what was a common occurrence—adults bringing their young to our yard to feed them. The immatures were apparently brought to the food supply. When they were able to eat they stayed near it or wandered as they chose. We believe that by the end of June there is some decline in the strong instinct of the territory holders to drive out invaders. They are less inclined to fight and there are at this time almost no birds establishing territories. It is perhaps the first hint of the approach of the most peaceful season, the molting period. One adult that came to our yard for food on June 13 was banded and on June 24 was seen, apparently in its own territory, about a quarter of a mile south of us. A number of these adults came from some distance, flying high and making a straight line to our yard. They dropped down, ate, carried food away, rising high in the air and going over, rather than through, territories. They never lingered and were here only on legitimate business. No greater contrast to these birds could be found than Red-Blue who, stealing in under cover and singing as much as he dared, staying, although repeatedly driven out, was quite truly a disturber of the peace. One young bird banded on June 13 as C103376 and given the color combination GA-BB later became an important figure in our yard. We refer to her here only because she was then first in our records and we name her in this place, Gabb. She was again in our yard on June 28 and 29.

July.—We now come to July and find Red-Sub-R and Yellow-Sub-R still caring for their one baby. They kept him on the north side of the lot next to us, where he had been taken from our yard, until July 4. Red-Sub-R came frequently and carried off raisins and cherries in the direction of his baby. Yellow-Sub-R seemed to come less frequently but Red-Sub-R's habit of singing a few notes from the roof just above the raisin dish before he dropped down to the food may account for our greater number of records for him because, hearing the song, we always looked to see him. Many other mockingbirds were now eating at this food tray. He did not attempt to drive them away as he had done during the winter but we felt this brief song on the roof above them was his notice of ownership. At this time he began to sing often on a deodar in the lot north of us. After July 4, about twelve days after it left the nest, the baby was flying quite well and it traveled to all parts of Red-Sub-R's territory although we did not see it beyond these limits. As it grew older the parents seemed to give it a little intentional neglect in regard to food and between July 4 and July 14 it seemed constantly begging for food at our back door. It would sit where it could see the raisins and cherries and beg. Red-Sub-R often sang while it was doing this. Sometimes he would stop suddenly, feed it several times and then apparently allow it to go unfed for a long time. At different times on July 14, both Red-Sub-R and Yellow-Sub-R were seen to bring the baby to the food at our window. Yellow-Sub-R was particularly interesting at this time. She came with

the baby, both flying along our driveway just above the ground. The baby came to the raisins but Yellow-Sub-R only paused and went on into the shrubbery near, staying on the ground. The baby squeaked once or twice and did not seem to know quite how to proceed but after a moment or two ate a cherry. His mother then turned and the two went away together. This was the first time he was seen to eat alone and the last time he was seen with his parents. On July 17 he was found in a trap quite outside of his home territory. Another young mockingbird was near and doubtless the two were going about together but they were certainly not of the same brood. The next day he was in a trap in Red-Sub-R's territory. This was the last time he was seen.

Red-Sub-R continued to sing during the rest of July and also to give the short song on the chimney or edge of the roof before he came for food. Yellow-Sub-R was seen rather seldom. Both she and Red-Sub-R became as suspicious of us as at first, now that the pressing need for food was over, and if we were in sight they would not come for it.

During July the records for Red and Yellow were few compared with earlier months. Their family cares for the year were over. Red was not singing, to our knowledge, except for one record on July 15. We do not know that he would have stopped normally at this time. In some way he hurt his right foot during the early part of July. We never knew what happened to it, but it was permanently crippled so that it is now quite useless except as a prop. This was a severe injury and may have been the reason for his silence and our scanty records. However, we may have failed to see him when he came for raisins, for we left his raisin bowl where it had always been but the cherries and grapes were in another place and our attention was so focused on the birds visiting this fruit that we probably failed to get some records of Red. We later noticed that he preferred the raisins to the other fruit. After we observed Red's injured foot we watched him anxiously, fearing a broken leg or a thread or hair wound about the foot. When he was at last trapped and examined, the trouble appeared to be confined to the foot, which was much swollen and quite useless with the toes turned under. We do not know whether it was due to disease or injury, but we were glad it was not in any way due to our bands.

Yellow was so rarely seen during July that we at times wondered if she had left.

Lavender, too, was not seen very frequently during July. His mate was never seen after June 24. Every record of Lavender during July reports him eating grapes, which he evidently preferred to raisins. We did not hear him sing at all.

The thought was now often in our minds that the real work of the year was over. In these days preceding the molt there is an indifference toward all other mockingbirds beginning to appear. The difficulty of watching our territory holders was increased by something approaching lassitude on their part. They came for food and left again but with the exception of Red-Sub-R there was little song during July. We do not mean to imply that all mockingbirds reach this stage at the same time for some certainly nest later than any of those directly under our observation did, but doubtless many that sang earlier were now, like Red and Lavender, almost silent.

However, our observations on these territory holders were prevented to a large degree by the ever increasing numbers of visiting mockingbirds coming to the food in our yard. We identified all that we had the time and good fortune to see sufficiently well, if banded, and we trapped and banded many others. Often while we watched one, others were here but not identified. One hundred and forty-seven mockingbirds in addition to our territory holders were identified in our yard during July. Doubtless many of the unbanded ones we saw failed to enter our traps but we feel that most that came with any regularity probably were trapped. Of the 147 which were

recognized one had been given its colored bands in April, 11 during May, 24 during June and the remaining 111 during July. Some previously had been banded with aluminum bands. Thirty of the 147 were adults, 117 were immatures.

It will be remembered that our territory-holders had ceased to object to other mockingbirds that came for food but did not stay and that the young had wandered at will at all times. In July there were no real fights. Occasionally a bird would drive another away from the food for a brief moment. Usually they showed an inclination to come singly to the food but often two, three or even four were eating at the same time and if possible most of them, especially the young ones, carried food away from the trays to eat it. It seemed to us that now the feeling of ownership of the territory holders was almost completely broken down although they remained within the limits of their territories. There were no conflicts. Again we comment on the individuality of mockingbirds. Another observer told us at this same time of a particular mockingbird still assiduously driving from its food supply not only other mockingbirds but all other birds that came near. Even had our own birds been inclined to keep out these visitors they could hardly have faced successfully the hordes that crowded to the food. Perhaps had conditions not been made so attractive to the intruders our birds would have been more apt to defend their rights but we saw no inclination on their part to drive out the mockingbirds, young or old, that came in during July.

While the adults sang little in July this was the month when we first heard the immatures' song and this was regularly heard after the middle of the month. Some were singing before they began to molt but in most cases the plumage of these baby singers was beginning to look worn. They continued to sing during and after the molt. This baby singing was given from low, thick shrubbery and they were very shy and would stop immediately when we went near. It was a faint, soft song quite without imitations of other bird songs but distinctly a mockingbird song. Some of them, usually the poorer singers and therefore presumably the beginners, quivered their wings while singing. They seemed absorbed in the production of the song and would sing on several days in the same place and then disappear. We repeatedly noticed that they sang most at noontime. Later they went higher to sing but never to a tree top or high perch and it was always the same soft, faint song. We also often observed other young mockingbirds near the singer giving every appearance of listening. Hunting these young singers was one of our late summer pastimes and we saw many of them, some with the dotted breast of the immatures and others that had molted. In the latter case both the character of the song and our record of the colored bands told us it was a young bird singing.

A few of the visiting mockingbirds were recorded often enough to have some interest to us as individuals. C103429 was an immature banded July 15 and was recorded frequently until August 10. This young bird sang the baby song in the same place for several days and would sing for almost an hour at a time.

Another interesting young bird was one that was much paler in coloring than is normal. Its bill and feet were pale gray and its feathers so much lighter than those of the others that it was quite conspicuous. Its iris was the normal gray of the immature mockingbird. Both parents were with it and both were normal in color. One of them comes into our story later.

Sometimes there were brief quarrels between the young birds. If two arrived at the food at the same moment they might eat quite peaceably together, or one might run at the other or fly a few feet in his direction. One would then retreat and wait till the other left before returning to eat. Occasionally they would fight and then go to the tray and eat together. The efforts of one baby to eat cherries on a sloping roof were laughable.

One pair of parents brought a brood of three to our food dishes. All were new to us. The parents approached the food first and both began lifting their wings repeatedly before coming quite up to the tray. From the window we watched all three babies begin lifting their wings as soon as the parents began doing it.

One adult came sometimes in May and June for food. When leaving, this bird always flew high above the trees and flew south for at least more than a city block. We never found its territory. On July 2 it brought a baby with it which it fed and it then flew away carrying food. On July 11 it was seen with a baby younger than the one seen on July 2 and was seen to feed it. We make no attempt to explain this. This bird continued to come until August. We often compared its cautious behavior in coming to the food and in eating with the care-free attitude of the young birds.

An immature banded on June 20 was with us so constantly for so long that we gave it a special name. It was C103387 and its color combination was YB-AY. We devised for it the name Ibbby. After July 11, Ibbby was here all the time apparently and seemed to be always in the lower branches of a walnut tree above the food where it ate. We came to regard it as a resident of our lot and this bird and Gabb referred to in June, were quite certainly residents, in a sense, during the late summer. Other young birds came and went but these two remained a much longer time. Gabb seemed to be gone for ten days during July but aside from that absence we knew her for many months.

Another immature banded July 14 remained with us until July 19. It was then absent till the 26th and was recorded four times on the 27th. The next day it was found dead a mile north of us at 2:00 p. m. just twenty-four hours after our last record of it. This indicates that these young birds travel about at this time of year, and our belief is that at about this time and during the succeeding weeks they are seeking their winter territories. Quite evidently that was what Ibbby and Gabb were doing, as we think later records will show. The period when the adults are molting is the time, we believe, when the immatures are making their first efforts to hold territories and they can, at this period of the year, practice this with impunity even within the territory of an adult although they will probably be asked to move on with the approach of autumn.

August.—August was the quietest month of the year. We heard no song nor, indeed, notes of any kind, from our adult mockingbirds. They were rarely seen moving about the yard. There was no fighting and they were seen only occasionally coming silently for food which disappeared from our trays very slowly. Our territory holders sat with fluffed-up feathers. Their plumage was worn and ragged. Our first record of a molting adult was August 8. Some of the older immatures were in new plumage before the adults began to molt. But the molt did not seem to affect the actions or song of these young birds. Our adults had completed the molt by September 16. The last bird seen in immature plumage was observed on October 8—but this was some weeks after the next to the last was seen. Thus the adults molted at a comparatively definite time of the year while the immatures, apparently, molted at a more or less definite age and not all at the same time.

Some years ago a young baby mockingbird was brought to us in late August with the report that it was orphaned. We reared it. It molted during the last of September and early October but did not molt its flight feathers at all. We did not release it until the following spring. Some of the young mockingbirds in our yard did molt the flight feathers. We have several definite records of this but they were all of birds hatched early in the season. We have no records except that of our captive mockingbird for birds hatched late in the summer. Possibly his normal development was retarded by his artificial care.

The two young birds that we saw most constantly during the molting season were Ibbly and Gabb and we give what records we have of them that might bear on this period. Ibbly was captured first on June 20 and considered young to be without his parents. On July 25 he was molting on head, throat and flanks and most of the dotted breast feathers were gone. The tail had not molted but the innermost greater coverts and some of the middle wing coverts were molting. July 31 he was still molting. On August 12 his neck was particularly noticeable, being partly new and partly old. On August 17 his tail and wing feathers were molting. By September 6 he was in full new plumage. These records are mostly sight records of a bird that sat perfectly still for long periods in the low branches of a walnut tree. Gabb was banded and called "very young" on June 13. On July 31 she was molting all over including the flight feathers.

The records for Red during August are few. On August 7 it was observed that he was using his injured foot as a prop. Until this date it had been held up all the time. There is no August record of song from him.

Yellow, also, was very quiet and rarely seen. When observed she was sitting quietly with fluffed-up feathers.

Red-Sub-R's story for August is almost identical with Red's. He did not sing.

There are only three August records for Yellow-Sub-R.

Lavender, likewise, did not sing. On August 3 we say he shows the fluffed feathers that seemed to precede the molt.

The two young birds, Ibbly and Gabb, have more space in our August notes than any of the old ones. Ibbly became very tame, sitting on a low branch and watching us as long as we wished to stay near. We could approach close to him. He spent nearly all his time on this one branch which was in Red's territory. About August 14 he began to chip, uttering a slow, monotonous series of notes lasting a long time and given many times each day. This was quite unlike the rapid chips given earlier in the year by adults and was a tiresome sound. This continued day after day. On August 7 Gabb was seen going about the yard with a young immature mockingbird. Gabb, herself, was at this time very ragged and was molting freely. On August 14 Gabb also started this slow wearisome chipping. She stayed in a definite part of the yard partly within Red's territory and partly within Red-Sub-R's and often near Ibbly's constant perch in the walnut tree. This steady chip was the only mockingbird sound heard in our yard and these two were the only immatures left of the many that had been with us in July. We wish to emphasize that when this chipping began these young mockingbirds seemed to take up these small areas in which to live. One can hardly call them territories yet they seem almost that. The decline in visiting mockingbirds came with startling sharpness about the middle of August and we think the young at this time were beginning to feel the instinct to settle down in one spot for the winter. We speculated frequently on the possibilities ahead. When Red and Red-Sub-R became again jealous owners of these territories what would become of Ibbly and Gabb or would Red and Red-Sub-R prefer to find new homes for 1934?

Excluding Ibbly and Gabb as well as our territory holders only 10 banded visitors were trapped or seen during the month after August 10 and only 2 after August 15. The total number of visiting mockingbirds for August was 52. Of these 18 were adults and 34 immatures. On August 18 we left to be gone until September 5 and during our absence had the food for our birds put out as usual so there would be no change in the conditions in our yard in that respect. We feel our absence made rather little difference in the figures for the number of visitors recorded during August because the sudden decrease in numbers was very noticeable before we left.

September.—On our return on September 5 we felt our choice of vacation time had been good. Iby sat in the walnut chipping in the same monotone. None of our adults was singing. We could not find Gabb but aside from this, all conditions seemed to be exactly as when we left.

We wish to state here that while none of our birds sang at this time we occasionally heard mockingbird songs elsewhere and have heard them every month in the year. We do see immature mockingbirds later in the year than this. We do not know whether the parents of these last young of the year molt at the time our adults did but some adults were singing when the ones under our observation were silent.

After our return we could have watched Iby almost all day, if we had wished, for he sat so constantly in the same place and chipped so incessantly. Sometimes, while Red and Yellow sat silently in a thick shrub of pittosporum, Iby was near them, often very near to Yellow. The account of him ended suddenly on September 23. We felt, but with no proof, that, when Red recovered from the listlessness of the molt, Iby left. In the case of Iby we have no basis for referring to it as a male.

Gabb, we found very soon, had during our absence moved to the large territory which had been first Green's and later Yellow-Green's. Here she chipped the same slow steady chip with which Iby had worn out our nerves nearer the house. On September 22 we first heard Gabb sing. It sounded like an adult song of no very high quality but was not the baby song to which we had listened earlier. The next day she was heard giving a few notes of song much like that of a California Thrasher. This song was interspersed with chips and was given while several other mockingbirds were chipping. From this time on she sang regularly and her song was always the queer thrasher-like one and for the rest of September there are many references in our notes to this, to her constant chipping and to her association with two or three unbanded mockingbirds which stayed in this territory sometimes and to which Gabb showed no hostility. It is almost impossible to overstate Gabb's prominence in this large territory at this time. She was always to be seen as well as heard. Hardly five minutes would elapse without a chip or song to show her presence and she was openly moving about the yard all the time. The raisins for her were kept at the extreme east of our lot and this was the east edge of her territory which included that originally occupied by Blue. Gabb never fought with the other mockingbirds which sometimes came in, but she stayed and they did not. Her actions were different from those of our older territory holders. She more often went past the boundaries of her territory and we read the assurance of youth in her every action. Indeed, we may as well admit, that at this time we referred to Gabb as a male and felt quite sure of our decision on this point. Sometimes she went boldly into the territories of Red, Red-Sub-R and once even flew to Lavender's territory and there took a high perch and began to sing. Red, Red-Sub-R and Lavender all began to sing on this occasion and Gabb was chased out without ceremony. As the season progressed she learned her place for she never overstepped without a lesson from her elders and soon she kept strictly to her own territory.

Our notes on all our territory holders show a great increase in volume for September. During the first of the month they were quiet. On September 12 we heard an adult mockingbird song. The immatures had been chipping for some time. Now both young and old were doing it. We found them now back, in a measure, where they had been when we began our work in January except that they were now singing much more. When one bird would chip or squawk or give a few notes of song all of the neighboring territory holders would do one or more of these things. At this time also there were evening gatherings of groups. These occurred to a lesser

extent in the morning also. These birds often flew about and gave a rapid succession of chips. It was extremely difficult to identify them while doing this but we do know that our territory holders were taking part in it. We do not know its significance. The rapid succession of chips that accompanied these flights was heard more often as the month progressed and the slow, single, separated chips, less.

After September 23 it was noticed that the mockingbirds were guarding their territories closely again, giving the rapid chips, the harsh growling squawk and a new type of song we had not before recorded. This was often given in place of the loud squawk or the series of rapid chips and it was a short and very loud song of a queer metallic quality and too penetrating to be pleasing. We think all these sounds, the rapid chips, the squawk, and this loud song, are the proclamations of ownership of a territory and that they are given when some intruding, strange mockingbird is near, or when one or more of the holders of adjacent territories gives them, in which case the total effect is that of a wave of such sounds of unknown geographical limits. The established territory holder gives one of these alarm calls on the first sight of a strange intruder and it is instantly repeated by all the territory holders near, each mounting guard on some prominent observation point, usually near his food supply which he is now ready to defend with all the ardor with which he defended his mate and nest earlier in the year. We feel that the constant, slow, separated chipping, which is used most persistently during the period of revival of territorial defense after the molt and to a lesser extent throughout the remainder of the year, also denotes ownership of territory but that it is given without the stimulus of the presence of wandering mockingbirds.

We called attention to the fact that each territory in our yard had a never-failing food supply. But many birds must hold territories, as indeed we have seen near us, in which all food failed during the winter days. We feel that birds forced out by such conditions constitute a large part of the invaders with which our birds battled during the autumn and winter. Some females, too, may be driven out and some of the birds of the year doubtless fail to obtain territories. In the largest invasion of the kind we studied, we noted that the four banded birds that we were able to identify were all immatures of the late summer which suggests that the last to hatch were the least able to establish themselves for the winter. Be that as it may, the invaders came often and the territory holders were ever on watch. The fall and winter days were punctuated by the waves of mockingbird notes which proclaimed danger, doubtless real somewhere, but carried on far past the point of origin. We never caught these invaders for they were driven on before they could enter traps.

We now return to the individual behavior of our territory-holding birds. Red's first song after the molt was heard on September 16. This was a faint, soft song given from a low bush. There were no imitations in it but it was not like the song of the immatures. After September 18 he sang his usual adult song regularly from high perches. However, almost every day at noontime he would go into a certain low shrub and sing the faint, whisper-like song. While giving this noontime song he would sometimes quiver his wings. The songs given from high perches at this season are very beautiful and often lack the imitations and flourishes of spring.

Yellow was of great interest during September. During the first of the month, like the other adults, she was quiet. A little later she was frequently seen sitting near Red and we heard the little *hew-hew* note which we had not heard since early summer. They were constantly together and we found them repeatedly in a certain shrub near their food. Beginning September 15 and continuing through the month Yellow sang in this shrub in which Red sang at noontime. She, like Red, sang dur-

ing the middle of the day. Her song was faint and hardly distinguishable from that of the immatures. At first she stopped if we came near and we almost despaired of the absolute identity of the singers. Later she let us watch her for minutes at a time and hardly stopped as we approached. There are a few records of Yellow giving the slow, separated chips. This was our first indication of the fact that the female in winter is as much a territory holder as the male. In the case of Red and Yellow there was perfect harmony and they held the territory together.

There is the same increase in our notes on the Sub-R's for September as for Red and Yellow. At first, like Red, Red-Sub-R was quiet and later in the month began chipping, singing and driving out invaders. Yellow-Sub-R was seen only often enough so that we knew she was here. She was twice heard giving the slow, separated chips. We did not see her with Red-Sub-R as we saw Yellow with Red.

Lavender, also began singing giving the chips, squawks and loud song as the others had done. By September 25 he had completely lost the timidity he showed during the mating season and his small section of territory in our yard seemed his constant abode. We found him there practically whenever we wished and this is explained by the fact that winter territory holders are food guardians and the part of his territory in our yard held his food supply.

September closed with our mockingbirds guarding their territories. All boundaries were exactly as they had been since Blue disappeared on January 30. The wave of mockingbird notes at intervals was the most familiar sound to us at this time of year. It was much as we had found it in January but these waves of protest were more frequent and more pronounced. We felt with a tinge of regret that our birds were established for the winter and that there would be little new to see until January—but this was because we did not know our mockingbirds.

The visiting mockingbirds of September number only six.

October.—October proved to be a month of exceptional interest. It began with really hot weather. On October 2 we noted that the singing of our birds was almost continuous. We also heard them at night. These were not, however, like the songs of the summer nights. Many times during each night a mockingbird would give a few quick chips and be answered by similar chips or a note or two of song from others and these in turn by others at a greater distance. At night there are no wandering mockingbirds. We feel that this is the ever recurring assertion of ownership by the birds carried on through the night at a time when the establishment of a territory is so important to them. It continued with decreased emphasis through the winter.

During early October the evening gatherings of a few mockingbirds chipping and flying about the yard and near vicinity ceased. By the middle of October each territory holder seemed chained to his territory.

Red-Sub-R sang a great deal in early October but never on the deodar top where he sang in early summer. Usually he was on the chimney of the house north of us. For some weeks preceding this we had heard soft, faint singing in a thick buddleia near our house in Red-Sub-R's territory. This was always during the noontime and would be heard when Red and Yellow were singing in their pit-tosporum. On October 1 we thinned out this buddleia and were rewarded by finding both Red-Sub-R and Yellow-Sub-R singing in it at different times. Their songs were the same soft, faint songs that Red and Yellow sang although both Red and Red-Sub-R sang the ordinary adult mockingbird song at other times of the day and in other places.

During October also we first saw groups of wandering mockingbirds coming in with apparently every intention of staying and quite certainly composed of hungry

birds. These visits we called raids and they merited the name. They occurred with what would seem nerve-racking frequency and intensity all through October and our birds were ever alert. A sudden harsh call, often two or three of them, followed by quick chips from near territories announced a raid. Red-Sub-R's territory with its date palm and cotoneaster berries seemed to be the favorite point of attack. His harsh cry would be followed by rapid chasing from tree to tree, the invaders hiding and staying low and our birds perching high where they could easily watch and where we could see them. The colored bands of the invaders were very difficult to identify. At the call our whole group—Red-Sub-R, Yellow-Sub-R, Red, Yellow, Lavender and even Gabb—sometimes responded and have at such times all been seen in a single territory where the swift flying and chasing continued till the invaders left. The largest and most violent raid of this sort occurred in Red-Sub-R's territory on October 6.

On this occasion twenty-five was a low estimate of the number of birds involved and the fight lasted over three hours. It was perfectly clear that the invaders were ravenously hungry. They snatched berries and dates at every instant lull and ate greedily almost on the wing. All our territory holders were in Red-Sub-R's territory. Some of the invaders were determined to sing and went low in bushes to do it, in some cases not two feet above the ground. Most of the actual fighting was done by Red-Sub-R and Yellow-Sub-R and at every slightest pause in the battle Red-Sub-R went to the date palm and gave a short song and Yellow-Sub-R went to the crataegus in their territory and sang. This was not the soft, faint song she sang at midday but the song of a male mockingbird and it was repeated over and over. She also gave the raucous squawks and rapid chips. Lavender and Red fought but tended to stay at the edges and give chase to any of the intruders that came in the direction of their territories although it was quite impossible at times to know much of what was happening. It was over by noon but the tension persisted all day and the air was filled with frequent harsh cries until night.

But the Sub-R's take space in our October notes for another reason. Red and Yellow it will be remembered, were always together and a picture of harmony. This was not true of Red-Sub-R and Yellow-Sub-R. They worked together when invaders threatened and at such times might be seen sitting near each other on a wire when the battle momentarily flickered out, but when other mockingbirds were not threatening him Red-Sub-R put in his whole time chasing Yellow-Sub-R apparently trying to drive her from the territory they had held together all summer. Even in a fight with other mockingbirds he had been seen to pursue her as if she were one of the enemy. She was not allowed to come near the date palm and in this she acquiesced. But the crataegus in their territory soon became the center of this family quarrel. It was at our door but they lost all suspicion of us at this time and we could watch from our back steps with the greatest ease. Their trouble continued day after day. Yellow-Sub-R never approached this bush without being driven out. Sometimes by entering from the ground she apparently reached it unseen and would hide briefly in the center, but invariably after a few moments she would go to the top and begin to sing. This song was always the same, a series of short, quick whistle-like notes of almost the same pitch, and it never failed to bring Red-Sub-R who chased her immediately out. She might give a low-pitched growl-like note instead of the song but the effect was the same. Then they would fly around and around for some minutes till she eluded him and hid in some thick shrubbery. In a few minutes it would be repeated. It was their only occupation till real danger called and we watched them for intervals of over two hours at a time knowing all the time where each one was. There would be only a short interval of quiet when Yellow-Sub-R's little

whistle-like song would be heard from the crataegus followed by Red-Sub-R's exasperated squawk and the pursuit was on. Our pages of notes on them for October are more than for all the other mockingbirds.

Red and Yellow behaved very differently from Red-Sub-R and Yellow-Sub-R. We would hear the little *hew-hew* and find Yellow sitting close to Red under the spreading branches of a large buddleia. Red watched his territory closely from high perches—particularly in the early morning hours—sitting almost motionless although the field glasses showed his head was moving slightly as he watched. He sang from these high perches and at midday from low in the pittosporum near his raisins.

Lavender, too, during October seemed to be always in our yard and always visible. Each bird was ever on guard over his food and Lavender was no exception. Remembering his timidity and our rare records for him in the early part of the year we would not now recognize him were it not for his lavender band. More than any of our other birds he sang what we called the loud song almost always answering the squawk or quick chips of others with it. He sang perhaps more than any of our other birds at this time and his song was, to us, an especially lovely one. The ordinary song was not answered by other mockingbirds; the loud song was always answered by chips, squawks or song of similar character. We noted at this time that when any of these alarm notes rang out each territory holder was apt to go to his food and eat rapidly.

Gabb, too, in October was found singing a faint song in the middle of the day in the lowest branches of an apricot tree. This song had in it no hint of the thrasher-like quality of her louder song. Our records for Gabb during this month were limited only by our time. She could have been followed about the yard for hours at a time. Her headquarters were in a crataegus bush and when she heard the harsh call of alarm she would go instantly to this and eat a few berries.

On October 10 Gabb was seen sitting in this crataegus singing over and over the short thrasher-like song and these songs were answered by another mockingbird on a tree tobacco in the southeast corner of our yard. They sang back and forth, first one, then the other. Red, Red-Sub-R and Lavender took no part. It had none of the sounds of a quarrel. Our field glasses revealed that the mockingbird in the tree tobacco was Blue who had been gone since January 30. She had now returned to her quarters of the preceding winter. To us this was very interesting. She now took up exactly her old territory and Gabb was restricted to the territory Green held before Blue left. How was this understanding reached? There was no quarrel. Blue took her old ground. Gabb withdrew from it. We put a pool for Blue in her part and a raisin table for Gabb in her part. Each kept entirely to her own ground. Neither was seen in the territory of the other for some months. Their calls across the yard to each other were somewhat similar in tone and were short songs of three or four notes and are to us a pleasant memory associated with warm October days. Blue immediately assumed her character of the preceding year. She was very tame. She was never seen to take part in a fight but at an alarm would fly to her elderberry bush and eat and then to her raisins. And so at the end of October we looked forward eagerly to November with no thought that any month would be dull.

November.—On November 8 our notes speak of our birds as growing quieter. They sang less but there was much evidence of their presence each day. Early dawn began with a wave of chipping and of song notes and through the day there were varying numbers of recurrences of this. Each bird, while quiet compared to earlier fall, was, nevertheless, alert and on guard in a secluded place near the food supply. At the first call of danger each was up on a perch where it could overlook its terri-

tory. Often there was only a single call from each bird but a real raid of any duration found each of our territory holders in its place, Red-Sub-R in the date palm, Yellow-Sub-R near the crataegus, Red in a young elm overlooking his raisin bowl and Yellow, if seen at all, below him, Gabb would fly immediately to her crataegus and Blue to her elderberry while Lavender perched on an elm overlooking the whole part of his territory in our yard. At such times the calls of our old male mockingbirds were distinctly the loudest, harshest, and most peremptory although Yellow-Sub-R had been heard to give a similar cry when battling invaders.

On November 1 we were able to keep a record of the number of times the wave of song or chips traveled over our yard. Between 8:30 a. m. and 4:00 p. m. this ripple of sound was heard ten times. A day or two later, while outside, Red was heard to chip sharply. Gabb flew up to her crataegus and called, Blue flew to a bush near her food and gave two song notes, a mockingbird southeast of our lot chipped and so did one directly east. Coming to the front we found Red chipping, Lavender singing his loud song over and over and Red-Sub-R chipping, while across the street to the west two other territory holders were excited. Thus, Red's chips had, to our knowledge, involved the birds in nine mockingbird territories and probably the disturbance went considerably beyond our ability to hear it.

During November the records of song went steadily down. The fall singing was ceasing and with it the few notes of loud song, which are often substituted for chips or squawks. The chips and squawks continued much as before. On November 26 two mockingbirds were heard singing. We noted the song because we had heard none for some days. Neither of these birds was one of our territory holders but one was an unbanded territory holder just east of Blue's territory. That was the last song heard in November and the night calls also were much reduced in number.

Red-Sub-R spent November guarding his date palm. His hostility to Yellow-Sub-R had subsided to some extent. He had been unable to drive her out but he now made no further effort to do so. If she went near his date palm he gave a note or two of song. She answered with a faint growl-like note. By November 8 we realized that, although he had failed to drive her out, she was really living in only a part of their territory which she kept as her own. This small corner was near their raisins and both birds ate them. Yellow-Sub-R did not, however, lead a peaceful life. If she approached the crataegus bush, so long a bone of contention, and which Red-Sub-R could see from the date palm, he squawked harshly. The fence beside this bush led directly into the thick shrubbery of her little territory, a tangle of buddleia, plumbago, the feijoa, persimmon and a fig tree. At Red-Sub-R's squawk she would run along the fence and disappear in the shrubbery.

But Yellow-Sub-R was not to keep this refuge long. On the morning of November 14 the raucous call of alarm was heard at 8:00 o'clock. The trouble centered on Red-Sub-R's date palm. He and Yellow-Sub-R, who went at once to the fray, fought in what had been their joint territory. Lavender and Red came to the edges of their territories. The invaders were not many and the battle was over in half an hour but Red-Sub-R and Yellow-Sub-R behaved strangely. He kept singing in the date palm. Then he would go to the cotoneasters and eat. Then both Red-Sub-R and Yellow-Sub-R would come to the crataegus they had fought over. Then she would go to the box elder near and he to the chimney. Both were in his territory and neither came to the corner that we had begun to call her territory. Now there came a harsh call from Red and he was found on the edge of his territory, and in the persimmon tree that belonged to the Sub-R's was an unbanded mockingbird. Red did not fight it but seemed rather to be setting the line it might not

cross into his territory. Yellow-Sub-R gave harsh calls from the chimney but did not come. Red-Sub-R sang from the date palm but stayed there. This unbanded bird flew to the raisins and grapes and ate ravenously and then ate persimmons. Then it flew to Yellow-Sub-R's little thicket and walked out along the fence as Yellow-Sub-R had so often done. Yellow-Sub-R now came to the fence and approached the unbanded bird facing it and bowing and bobbing. One would step forward and the other back and then they would reverse. Then Red-Sub-R took Yellow-Sub-R's place for a short time. Then she returned. We observed this performance to be repeated six times that day, sometimes on the fence, sometimes on the ground near the fence. Later Red faced this new bird in the same queer dance on the ground at the edge of his territory and he did not leave that edge of his territory all day as far as we knew. The whole affair ended by the new unbanded mockingbird keeping for her own the little territory of Yellow-Sub-R.

The next day it was apparent that Yellow-Sub-R was not going to give up her territory without a fight and she pursued the newcomer over and around the small territory always with the same result. The new mockingbird would succeed in getting under cover and Yellow-Sub-R would wait outside the shrubbery till the new one appeared again. What strange inhibition kept her from entering? She never did while the new one was here. As the battle in air was renewed the new bird made a twittering sound as she tried to escape Yellow-Sub-R. Several times they met and seemed to claw at each other in mid-air. After one of these encounters Yellow-Sub-R sat on the fence for 45 minutes. The new bird kept Yellow-Sub-R from the raisin dish that had been hers for many months. Red-Sub-R would not let her come to the date palm nor to the crataegus bush. We put raisins near her perch on the fence. As soon as she approached them, Red-Sub-R drove her away. When the new mockingbird sang a note or two of song Yellow-Sub-R at once flew to the top of the boxelder near the crataegus and sang and Red-Sub-R gave one harsh call but no other bird answered it. Again Yellow-Sub-R was driven from the crataegus by Red-Sub-R and ran along the fence and was met by the new bird and the ducking and bobbing of the queer dance began once more. On this day the new bird was trapped and banded as C103462 and with the color combination AB-RG. For some reason we failed to shorten her name and she is AB-RG to us still.

The next day the excitement had subsided. AB-RG had been seen in the dance with Red and Yellow, with Red, with Red-Sub-R and Yellow-Sub-R together and with each of them separately. Sometimes, thus, three birds were involved and sometimes two. On one occasion Red and Yellow were the pair concerned. Red and Yellow both faced AB-RG. Then Yellow withdrew and stood a few feet away from the other two. Red and AB-RG now took little jumps going back and forth and keeping approximately the same distance from each other. When one jumped the other did, too, and as one went forward the other went backward and so they stayed in a small space dancing for some time. This occurred in all cases with Red at the edge of his territory—practically on the line we would have drawn to separate his territory from that of the Sub-R's. When the dance concerned Red-Sub-R and Yellow-Sub-R, or either of them alone, it occurred on the boundary between the territory taken from Yellow-Sub-R and the territory held by Red-Sub-R. Is it probably a ceremony marking territorial lines? We have seen it before but never with marked birds except in these cases.

Strangely, Red-Sub-R soon permitted Yellow-Sub-R to return to his territory and November closed with no show of hostility between them. They were together in the date palm, at the raisin supply and in the much fought-over crataegus.

We at once decided AB-RG was probably a female because we thought Red and Red-Sub-R would never have permitted a male to come in as she did. AB-RG now was easily observed and interesting. At first she spent a large amount of time in giving the slow well separated chips. This we have described previously and, just as the immatures, Ibbey and Gabb, tried to claim their first small territories and as our adult mockingbirds after the molt had done, now AB-RG was doing. She promptly took complete possession of her new quarters. The raisins that had belonged to Red-Sub-R and Yellow-Sub-R were now hers and she drove all kinds of birds from them and from the persimmon tree. Last year Red-Sub-R was driving these birds out in the same way from the same place. Without bands we would have assuredly mistaken the identity of the bird doing it this winter. AB-RG drove jays from the persimmon with no uncertainty but she was seen to look at a thrasher without attempting to drive him out. Red watched her closely and she often attempted to enter the shrubbery at the edge of his territory. A loud squawk from him would send her hurriedly back and would be followed by his appearance.

The raisin dish of AB-RG and that of the Sub-R's were less than twenty feet apart yet she never went to theirs nor they to hers. At this season freshly cultivated ground and water running from a hose were great attractions to our mockingbirds. If such attractions were provided, as they often were, near the border, yet within the territory of AB-RG, Red-Sub-R and Yellow-Sub-R never came to them. If they were on the Sub-R's side of the boundary line, AB-RG did not go to them. Red and AB-RG were once seen at the water at the same time when it was running practically on the line between their territories.

The records of Red for November are numerous and uniform. He seemed always on guard. Perched in the top of a small leafless elm he seemed to be watching in every direction. AB-RG was at first ready to overstep and enter his territory but was rarely able to do so. After a few days her tendency to do this ceased but his watchfulness did not. He fought off many intruders during the month and his response to the trouble call from Red-Sub-R and Lavender was immediate.

In nearly every record of Yellow for November she was with Red and sitting below him. During fights she was always present.

Gabb was, as in October, easily found and there are records of her practically every day and as often as we wished to look each day. Early in the month she still gave a few notes of thrasher-like song whenever the other mockingbirds gave the quick chips or squawks but this decreased in both length and frequency and by the end of the month no song was heard from her although she gave a single call, in response to the others, which was different from that of Red, Red-Sub-R or Lavender, and similar to that of AB-RG, and of Blue. The crataegus near her raisin table was her favorite perch and she still went there as soon as the mockingbirds near gave their harsh cries. As a matter of fact her troubles were usually imaginary for we have no record of the crowds of invaders entering this part of our yard. On the day AB-RG took Yellow-Sub-R's territory the invaders were not near Gabb yet she was uneasy all day. When the birds in the front called she would hop nervously about. By the end of November she was quiet, but seen much more than Blue.

In November there are a great many records for Lavender. A few moments search seemed always to reveal his presence in the small corner of our yard near his food. He would watch us as we dug ground for his benefit below him but he never failed to show uneasiness if we stood watching him closely. He did not, however, fly or hide but began moving about. During the first half of November he sang rather often. November 15 is the last date of real song from him. The short, loud song given in response to the squawk or rapid chips of another bird now ceased

and he, also, responded only with the chips or harsh squawk. At the first sign of trouble in Red-Sub-R's territory, Lavender was on a high elm above his territory. He usually stayed there till it was over giving his harsh call now and then although as a bird came near he might actually enter Red-Sub-R's territory. No call of trouble in adjacent territories was unanswered by any one of these three old male birds. Lavender also still gave the slow separated chips at times.

Blue became quiet during November. Most records are merely that she was seen. Only twice during the month was she heard to make a sound. On November 21 she answered a call from Gabb with two song notes and later was heard to chip. She was tame but usually we found her hiding or saw her at her food tray. She generally failed to answer the calls of the other birds but instead went hastily to her food and ate when the cries of the other mockingbirds announced intruders.

December.—We now come to the last month of the year. On December 8 we heard a few notes of song and more on the days immediately following. Among our own mockingbirds this was all the short loud song given in response to the trouble call from other mockingbirds. This type of song was the last to cease and the first to begin. December of 1933 was remarkably mild and this may be one reason for as much singing as we heard. On December 10 the mockingbird holding the territory just east of Blue was heard singing a real song. We had noticed this bird all winter. He wore no bands and as far as we know never crossed our fence. Blue's raisins were within four feet of this line but he never responded to them either there or in a trap near. This bird was the first singer of the new season in our neighborhood and by the end of the month he had been heard many times. By December 27 we had recorded Red, Red-Sub-R, Lavender, and neighboring birds as giving the short, loud song. AB-RG, Gabb, Blue, Yellow, and Yellow-Sub-R had not been heard to give any song notes at all. During this month also the waves of chips and squawks so noticeable during the fall months decreased quite definitely. Sometimes invaders came but less often.

Red-Sub-R and Yellow-Sub-R were repeatedly seen together during December. They were in the date palm together, in the crataegus together, hunting insects together. During fights the two worked together and very effectively. Yellow-Sub-R did the things Red-Sub-R did but she was not seen singing at all.

AB-RG was the bird we saw most during December. In a very small territory she was extremely active. She spent a great amount of her time on a wire about half way between her raisin dish and the persimmon tree. She drove off all kinds of birds from both places. About the middle of December this activity decreased distinctly although she still drove them off frequently. On December 11, AB-RG was watched for two hours at one time to see if she really did remain in this small area as she seemed to do. During this time she never left it although she moved all over it many times never stopping except where she could see the food. When a bird would come to the persimmon tree or light near her raisins she watched it silently. As soon as it approached to eat she flew at it. One Audubon warbler, which we could recognize because it was banded, would behave very apprehensively as it came near the fruit stretching out its neck in the direction of AB-RG and rarely getting a taste before it was driven off. We saw AB-RG driven back by Red during this two-hour period but we could scarcely say she left her own territory, so quickly did he come. At other times, too, we watched and she was always in sight, so we feel that she stayed within this small area for some weeks. When there were invaders in Red-Sub-R's territory she took an active part in the fighting.

On December 29, however, we failed to find AB-RG in her small territory. The next day we found her in the part of Red's territory that was in our yard. This

was very disquieting to us because at the same time we could not find Red. By December 31 AB-RG was perfectly at home in this part of Red's territory and spent most of her time in it. She no longer chased birds away from the persimmon and she ate her raisins from Red's bowl.

During early December Red was as steadily on guard as at any time during the fall. In the early morning repeated, sharp warning calls came from the top of the small elm which was his favorite watch tower. AB-RG was a trial to him. Once she entered a trap in his territory and when she was released he started at her. At other times he drove her out sharply when she entered the edge of his territory. He was seen several times by us in December at the south border of his territory which faces the street south of us. There was a poor specimen of a date palm at the southwest corner of his territory on this same street and this contained a few most unattractive looking dates from which Red was seen to drive several other mockingbirds. When we could not find him on December 30 and when RB-RG was seen in his territory, we were suddenly sure we had lost him.

Yellow was not seen a great deal during December and was usually with Red when observed.

Lavender could be found at almost any time during December. We made a point of hunting him up and identifying him each day as a matter of routine, but his calls gave us frequent assurance of his presence. His activities were much as they had been during the preceding month although we felt that invading birds came less often and that the strident squawks were less frequent and possibly a bit less peremptory.

Blue was quiet but we have a few more records of activity from her than during November. This may be purely chance. She was seen chasing out two mockingbirds once during December and once when Red was driving birds from his territory she flew to a tree top. She would allow us to come close to her, but except for the rare times when she called or was excited by the calls of other birds it was difficult to find her even in her small territory.

Gabb also behaved much as she had during November. She answered when any of the other mockingbirds chipped or squawked and on such occasions often flew to the top of a small tree. She is recorded for practically every day and was so easily and constantly found that daily identification was a routine observed because we knew it was a necessary part of our work.

December had been, on the whole, a continuation of the conditions prevailing in November. The battles had grown less frequent and less violent and there were a few records of song with a hint of spring in them but these were rare.

January.—Red had disappeared. We recalled he had been seen in December driving out mockingbirds from a date palm in the southwest corner of his territory. We could see the house that hid this tree from us and, hearing the strident calls that meant invaders in that section of his territory, we watched the house top with our field glasses and saw there, for a short moment, a bird with a twisted foot. With this to aid us, from the street in front of the palm, we easily located both Red and Yellow defending the poor crop on the date palm. This happened on January 1 and so we began the new year knowing Red and Yellow were still in their territory together and that they had left our yard voluntarily and apparently completely. Did Red, needing to guard these dates, vacate the territory that lay in our yard knowing that AB-RG would occupy it and that she in turn would vacate it with the opening of the mating season and permit him to reclaim it? It was true that about January 1 every male territory holder changed his headquarters a little. There was no great change for that could not be in such small territorial areas.

It was now more difficult to get records for Red and Yellow yet we were able to learn something of their January life. We watched Red's date palm whenever we passed and we saw him in it or near it more than once. But our records for him were far apart. On January 15 he came with Yellow to his raisin bowl in our yard, ate and left, paying no attention to AB-RG. The next day his crippled foot again let us identify him singing in a small acacia in one of the courts. We can see the top of this little tree from our yard. Our records now became more numerous for we had this tree to watch and found also that he could usually be found in the late afternoon on a wire in front of the courts where we also saw Yellow and we felt sure the bird that sat below him as he sang in the acacia was she.

At about the first of the year Red-Sub-R and Yellow-Sub-R ceased spending a large part of their time in their date palm and often seemed to be on the north side of the lot north of us. On January 3 a faint, whisper-like song was heard near a clump of giant bamboo at the front of our house and the singer proved to be Red-Sub-R. It was, as far as we know, his first song of the year and it was faint, but varied and from a short distance it sounded far away. He sang by this clump of bamboo all through the rest of January and while his song became louder it did not, at any time, approach the ecstatic song we so commonly associate with the mockingbird. Yellow-Sub-R was nearly always near him. Late afternoon found him always perched on the chimney of the house north of us, often with Yellow-Sub-R near him on the roof or in a tree near at hand.

Lavender left the privet bush in which he had been constantly found for many weeks and was, after January 1, generally in the lower branches of a grevillea tree at the south edge of our lot. On January 12 he had a prolonged battle with three unbanded mockingbirds which insisted on coming to his camphor tree. This was not the violent fighting of early winter. His calls were less harsh and less frequent and his fighting consisted only of flights at them as they took the berries. They kept returning and no other mockingbird answered him or paid any attention to his predicament. It indicated to us that the winter battles were over and spring almost at hand, that the time had come when few males were wandering and when the females were not molested. On January 16 Lavender chipped at some strange mockingbirds but did not pursue them at all. He began to sing on January 5 and sang all through the month, singing more on warm, bright days.

Gabb, we have previously confessed, had been regarded as a male in her early days with us. Her intrusions into other territories, her constant song in the fall months, her interest in fights at the same time, had indicated to us that she was of the masculine persuasion. But before January we began to question this because she became quiet and spent so much time sitting in one place almost without moving. When the males began to sing she did not sing.

On January 5 interest in Gabb went high. Another bird came to her territory and stayed close to Gabb. The two flew from place to place—the stranger, usually, but not always, following Gabb. They kept up a little rasping sound which both made and which was usually heard as one approached the other. This was a prolonged sound, rather growl-like, perhaps. Once a few notes of song came from the visitor when Gabb was on the ground below him. This visitor was BB-GA and it was one of the parents of the pale immature we had banded the preceding summer. It had visited us then a number of times. On January 6 he was still with Gabb, and again on January 7 and January 8, on which date we saw him fly off to the southeast where Gabb followed. On January 9 Gabb was back. While we watched her she suddenly again flew southeast in the exact direction she had gone the day before. She was not seen again till late afternoon. On January 10 and 11 she was in our yard.

BB-GA was here again on January 12 and we heard the same notes and BB-GA followed her about the yard again. On the next four days, January 13, 14, 15 and 16, Gabb was quiet and sat in the crataegus. On January 17 she could not be found at all but was here on January 18 and on that day was again seen to fly southeast but was back in her territory in the afternoon. The next four days she seemed to spend here sitting almost motionless and making no sound. On January 22 and 23 we could not find her at all but she was here January 24 and on that day BB-GA was again here. We saw him come, eat some crataegus berries, and go. Gabb was here when he left but we have never seen her since. We hope she left for the territory of BB-GA and that we shall see them both later in the year bringing a brood of young to our food.

During January we watched Blue with especial care. We were expecting her to leave as she had the previous year. Like Gabb, she spent much time sitting quietly in one place and seemed almost unbird-like in her silence and immobility. About the middle of the month we twice saw her appear to show some interest when a mockingbird near began to sing, turning her head as if looking in the direction of the song. On January 24 and again on January 25 we did not find her in her favorite dead tree tobacco. Gabb had left us so when on January 26 we saw a bird sitting quietly in the top of her crataegus we looked at it with care and were surprised to find that it was Blue. Evidently Blue had gone into Gabb's territory almost as soon as Gabb left. At first it seemed a waste of energy, on her part, to us. We saw her eat the berries, however, and felt perhaps they had tempted her to move into the vacant territory.

On January 29 we were amazed to see Red in this crataegus with Blue. He was making the little rasping noise we associate with the beginning of the mating season. But he left for his own territory, which is adjacent, as the unbanded mockingbird from the territory east of Blue's came into the yard. This bird had held his territory all winter. He had sung later in December and earlier in January than any of our banded birds. We felt sure the bird now coming into Blue's territory was this singer. He came straight to Blue making the same little rasping noise Red had been making and followed Blue from place to place all about her new territory as well as about her old one. They both made the rasping note, apparently, but he much oftener than Blue. Red came again and was chased back by the unbanded bird. We were, at the time, much puzzled by Red's actions for we knew Yellow was in his territory. We suspect it was nothing more than interest in other birds' affairs for we have since seen male mockingbirds quite surely mated, leave their territories for a moment to approach a pair which were making these rasping notes. Red did not come again and the unbanded bird spent, as far as we could tell, the entire day in Blue's territory. He ate raisins and pomegranate at her table and bathed in her pool and sang all over the yard. Blue would fly to him as soon as he sang a little whistle-like song of enticing quality. As they approached each other they always made the rasping note.

The next day was a repetition of this. We would see them sitting together in the crataegus. If he flew away a short distance he gave the little whistle-like song and she flew to him. The next day he took her to his territory, just east of hers, part of the time but they were often in her territory. We now felt almost sure they would be mates and we noticed at once how definitely his song had decreased. It was not at all what we had heard for some days from the chimney of the house in his territory but was the little whistle-like call to Blue or the more mockingbird-like songs sung at intervals in many places in our yard as well as in his own territory. We heard the little *hew-hew* note. We noticed when Red sang in the court next to us

that the new male promptly began to sing, too. We hoped he would soon be wearing our bands.

AB-RG, like Gabb and Blue, had become quiet. In mid-December, it will be remembered, we watched her at one time for two hours without once losing sight of her for more than a brief instant. On that occasion we attempted to write down everything we saw her do in the two hours and it was extremely difficult to write rapidly enough to follow her quick actions in her very small territory. Now in January we saw her four or five times a day but we had to take every opportunity offered to do this. She was now in the combined area of her former territory and the part of Red's territory that was in our yard. If she went beyond this into the rest of his territory, we did not see her do it. If there was any disturbance among the mockingbirds AB-RG gave a single call and by locating this sound we often found her. About the middle of January she began to sit in the walnut tree above Red's raisin bowl practically all the time with the same fixed air of immobility that we had watched in Gabb and Blue. From this place we heard her single call at dawn when the early morning round of mockingbird notes was heard. This now (January 15) consisted of song from both Lavender and Red-Sub-R and these similar single calls from AB-RG and Gabb and probably also from Blue. Red and Yellow were too far away and we were never able to hear any notes we could recognize as Yellow-Sub-R's. She did not give the call given by Gabb, Blue and AB-RG. On January 29 and on January 30 we realized AB-RG was more active. She moved about her whole territory again with some freedom and seemed more alert.

It will be apparent that the end of January left us in suspense. Would Red and Yellow return to us? Would they be mates? Would Red-Sub-R and Yellow-Sub-R be mates? Would Blue and the unbanded mockingbird mate and would Blue leave her territory in this case for his? What would AB-RG do? We hoped February would answer all these questions.

February.—It was apparent by February 3 that Lavender was showing an interest in AB-RG. He was seen in her territory on that date and she in his. These two territories were now adjacent. He explored every part of her territory and stayed in it for short lengths of time but never remained in it for hours as the unbanded mockingbird had remained in Blue's. She often went into his territory and we heard the rasping note as they flew about the grevillea trees together and Red-Sub-R showed the same interest in this that Red showed when the unbanded bird visited Blue, coming over into Lavender's territory for a moment when he heard it. On February 8 we spent much time watching AB-RG. She was not seen in her own territory at all that day. Lavender sang early in the morning in our yard and he and AB-RG were flying about over his grevillea trees often. While they did this a mockingbird that holds a territory directly west of us and across the street came, singing as he flew, to our yard and went back singing and flying from one high perch to another. We think he thwarted our hope that AB-RG would mate with Lavender, for she is the mate of this bird, AY-YB by color combination and Yellow-Blue by name. They have since then come together to steal Lavender's camphor berries. On this occasion we described the sounds Lavender uttered as fierce hisses although they might be described as intermediate between the winter squawks and their summer equivalents, the growls.

Lavender left our yard for the part of his territory across the street when AB-RG left him and for the rest of the day from a tall cypress, an elm and the house chimney sang the most ecstatic song we have heard this spring. We watched him coming to our yard twice and knew it was surely he and we were much puzzled, not knowing then that AB-RG had left. This lasted only that one day. The following day he

was almost silent and we were more perplexed than ever. The solution came quickly. He had found a mate and they were soon often together in our yard, she wearing a single aluminum band but no colored bands and therefore she is probably a bird banded by us more than a year ago.

We felt that Lavender almost at once again showed an aversion to our curiosity concerning the activities of himself and his mate but that it was less pronounced than during the preceding year. He sang a little song, or repetitions of two notes, to which his mate responded by following him. He perched above her quite constantly the first few days they were together and gave anxious sounding notes and queer little trills if we went near. On February 15 he was seen perched only one foot above the ground in a thick tangle of shrubs singing a faint song while she moved about on the ground beneath him. This song was a low whisper and very beautiful. Until Lavender was actually seen as the singer it was thought of as at some distance instead of only ten feet away.

It was February 8 when AB-RG left Red's territory. On the morning of February 9 we heard singing on the radio pole of the court near us where Red sang so much last year. Delighted, we identified the singer as Red. Soon after from his own old place in our walnut trees he floated gracefully down to his raisin bowl and ate. Then Yellow came and ate. He gave little double call notes from the fig which was his and she responded by following him. He went to the top of his little elm to sing and has, since that morning, behaved as if he had never left us. He and Yellow were found together on February 13 within a foot of each other in the branches of a thick drooping buddleia where he sang a faint, soft, whisper-like song. He sang daily in our yard and was repeatedly seen, sometimes singing, sometimes quiet, with Yellow sitting below him in the bare branches of the small elm tree. He sang late in the afternoons quite regularly in the south part of his territory where he was seen on February 14 with Yellow going into the thick plumbago covering one corner of one of the bungalows.

Red-Sub-R and Yellow-Sub-R were also obviously mates. His song, like Red's, and Lavender's, was that of the mated bird, heard often, but always controlled and only at times sung from some high perch. Later when nesting has begun we shall expect these mated birds to sing from higher perches where they can be better watchers for all the intruders that may mean danger to the brood. On February 9, the same day that Red reclaimed the territory AB-RG had used, Red-Sub-R perched low in the thick shrubbery of the little corner which AB-RG had stolen from Yellow-Sub-R and gave some extremely strange notes, single calls, and as he did so he kept looking up above him. Then, still low in the shrubbery, he sang. Then he went higher and sang and at different times that day he sang in every part of that area, apparently reclaiming it as the property of the Sub-R's. On February 15 he sang in it the same sort of faint, soft song that Red sang with Yellow beside him and that Lavender sang just above his mate. Yellow-Sub-R then ran along the fence and into the thicket where he sang. We had hollowed out this thicket below and from beneath we watched them there together while he sang. He seemed far less suspicious than he was a year ago and let us watch this singing, surely knowing we were there.

We feel sure Blue is mated. Her mate is banded with our bands now and his combination is BA-RG, which makes his name Barg. He has annexed Blue's large territory to his own and sings the happy-sounding song of the mated bird in Blue's favorite tree tobacco or in Gabb's crataegus as well as on his own side of what has been the dividing line between territories for more than a year. This is our only instance of the male bird taking the territory of the female. In this case he also retains his own.

We have many neighboring territories occupied by birds we banded with colored bands during 1933. We are unable to make more than occasional notes on these but as far as possible we locate them. Every territory in our yard, with the exception of Barg's and Blue's, is exactly as it was a year ago at this time.

At night we now again hear a few occasional short song notes in the place of the rounds of chips, squawks and loud songs that occurred at night in the fall and that reached a minimum during December and January and we have once already heard a mockingbird practicing imitations during the night—each different note or group of notes repeated two or three times with no other song intermixed.

A survey of our yard as we conclude at 9:30 a. m., February 15, 1934, shows Red singing in the top of his small elm with Yellow a few feet below him. Red-Sub-R is singing on a wire by the giant bamboo into which Yellow-Sub-R was just seen to go. Lavender is singing the little whistle-like call for his mate, and Barg is singing on the line that marked the boundary between his territory and Blue's, while Blue sits in a box elder well within Gabb's old territory. This round of song often permits us to find all these birds at one time although each one often sings independently and will, as the season advances, pay less attention to the songs of others as the work and worry of the nesting season increases.

CONCLUSIONS

Although our birds have exhibited great individual differences, we venture to state the following conclusions which we believe are well founded for the birds and for the time interval under discussion.

Territories: Summer and winter.—We have come to think that our birds have two general types of territories, summer territories and winter territories. The terms summer and winter should be understood to be somewhat flexible in time duration for the different birds, for by summer we mean that part of the year from the time that the males begin their mating season song until the revival of activity after the molt, and by winter the remainder of the year. For our birds during the year under discussion these division points are some time in December or January and mid-September. The summer and winter territories of an individual or a pair may or may not be identical areas.

The summer territory is the family home, held and defended by the male and occupied solely by him until the female joins him, unless his mate of the previous year has remained with him. The female rarely takes part in the defense of the summer territory.

The winter territory centers about the food supply and is defended by both the male and the female, in case the pair remain together, or by the lone male or female occupant. The winter territory of the male may be only a part of the summer territory either because of a withdrawal to the area close around the food supply or because he apparently willingly gives up a part of his territory to a female for her winter territory. This last mentioned habit must be an important factor in the distribution of the females when the mating season begins.

Defense of territory.—The defense of the winter territories seems much more vigorous than that of the summer territories. This may be because the invaders in the winter are much more numerous than in summer and because the territory holder has many other things to do in the summer while in winter the defense of the food supply is the only important activity. During the molt there is a general and decided slackening of territorial defense, a listlessness on the part of all the adults, followed by the building up of the winter type of defense as the revived activities of the wandering, supposedly territoryless, mockingbirds progress. During December

and January the males change gradually from the winter to the summer types of defense while the females pass through a period of great immobility, seeming to forget almost entirely about territorial defense, from which they revive, each soon to join the male of her choice. This period of immobility was not noted in the females of the two pairs that stayed together all winter but they did discontinue all participation in territorial defense.

Occasional overstepping of territorial boundaries and changes in territories.—It is rare that mockingbirds, once established in their territories, go beyond these boundaries, except at the two transitions between the summer and the winter seasons. However, they have been observed to do so under a number of circumstances. The mere mention of these circumstances gives them almost too much importance compared with the dominating tendency that causes the mockingbirds to stay within their own territories. On the other hand, at the beginning of both the summer and the winter seasons, and under some circumstances during those seasons, territories may be abandoned or annexed in whole or in part. The detailed conclusions from our observations are:

A male driving an intruder out of his territory may pursue it into the next territory or even all the way across that territory and then return immediately to his own.

Either sex may go into unclaimed areas or into another occupied territory to obtain food for themselves or for their young, returning immediately to their own territories.

Either sex, the male in the summer and either in the winter, may enter an adjacent territory to take part in a fight with intruding mockingbirds. Such occurrences in summer are rare.

A male, even though mated, may visit an adjacent territory apparently to watch a newly mated pair, or either sex may go temporarily on the occurrence of an unusual circumstance that excites its curiosity, such as a mob protest against a hawk or an owl.

An unmated male may enter the territory of a lone female or of a mated female in an attempt to win her as a mate. We know of no case of his abduction of a mated female.

At the beginning of the summer season the female may: abandon her winter territory, or be driven out of it by the previous male owner of that territory, and wander until mated; leave her territory with a male who has come to court her from a more or less distant territory; remain in her territory as the mate of a male from an adjacent territory who then annexes hers, or as the mate of a male without a previous territory.

Either sex may become lax in observance of territorial boundaries at the end of the molting season and the birds are sometimes observed short distances outside their territories. Usually the territorial bonds soon tighten and the birds remain at home, but we surmise that these bonds may sometimes break and the birds leave either to establish winter territories elsewhere or to wander all winter.

A male may permanently desert a territory upon the failure to obtain a mate, either a first mate for the season or another mate after having lost one.

Either sex may permanently desert a territory because of failure of the food supply within it.

Either sex may annex, more or less permanently, an abandoned territory or an abandoned portion of a territory.

There is a great difference in individuals in ability to abide within their own territories in peace and harmony with their neighbors. Most of them intrude little or not at all while the rare individual or pair continually oversteps its boundaries and has to be chased home.

Size of territories.—The approximate sizes of the territories under observation vary from 3,750 to 60,000 square feet and are indicated on the map. It is probable, in fact it seems certain, that the average size of mockingbird territories must be much greater than these because the food and water supplies and the combination of trees, shrubs and lawns in our vicinity are such as will support a large mockingbird population.

Songs and notes.—The songs and other notes of mockingbirds offer a large field for study which would contribute materially to the understanding of bird psychology. We do not feel that we have gone far with this work but we do recognize different songs and notes as belonging to different times of the year and as being used for different purposes, or at least on different types of occasions.

Songs of the males in summer.—The males have a set of summer songs and a set of winter songs and some songs that seem to be the same in both summer and winter. In the early part of the summer season the male that has not retained his mate from the previous year or has not obtained one at the very start of the season, works up his song of advertisement or of territorial proclamation until he obtains a mate. This is usually sung from high perches. We suspect that this may be, in reality, two songs, one for the purpose of advertising himself to any female that may come within hearing distance, and another to advise all males in the neighborhood that he is the owner and is ready to defend his territory.

On the arrival of the mate these songs almost entirely cease. After the arrival of the mate the male often sings a short call song consisting of two notes of different pitch repeated several times, or a series of notes on the same pitch, to which the female often responds by flying to him. During this period the male sings also a typical mockingbird song, though much subdued compared with the advertising song and having little or no imitation in it. We speak of it as a happy, contented-sounding song. Also, he sings a faint whisper song during mid-day while sitting close to his mate in low shrubbery.

During this time one or both birds are prone to give a rasping note when one approaches the other, and when they are sitting together quietly they sometimes give a faint *hew-hew* note. During this time also, and throughout the summer season, a note much like the rasping note spoken of above but much louder and harsher, is often given when a male is chasing an intruding mockingbird out of his territory. We have referred to this note as a growl or as a fierce growl.

When the nest building begins all the songs of the male become much diminished and this state is maintained in most cases during incubation and until the young are old enough to allow him more leisure from his family cares. Then his singing increases and continues until the molt. The volume and frequency of his singing during this latter period depend upon a number of circumstances such as additional broods of young, the presence of annoying jays, the presence of other mockingbirds and the amount that they may be singing as well as the individuality of the male. The songs of this period merit much study.

If the male does not succeed in getting a mate his advertisement song continues with increasing fervor until late in the season when, having failed, his song ceases and he leaves his territory. Or, having obtained a mate and having lost her, his song immediately jumps to its maximum and continues, almost without cessation, for several days. If no mate responds, his song ceases and he leaves. In both such cases the song reaches its maximum brilliancy.

A male trying to steal a territory from another male has a characteristic song which he sings from low in the shrubbery. This is a whistle-like song without much variation and is of short duration. At first this song is rather faint, but if not driven

out he sings with increased loudness and from higher in the shrubbery until finally he is singing the typical territorial song from high perches. The progress of these events depends upon the relative successes of the defender and the intruder.

The males often introduce into their songs good imitations of the notes of other birds that are common about them. Our birds imitate principally the California Jay and the California Woodpecker with which they are associated almost constantly. But their best imitation, if it is in fact imitation, is that of the squeaky, begging note of the baby mockingbird. As soon as the female is incubating the eggs and before any baby mockingbird notes are heard in the vicinity, at least some of the males introduce a series of this baby squeak into their songs and continue to do so until the babies are big enough to do their own squeaking. Is it imitation or is it anticipation?

Extreme anxiety about the young when a jay, cat, human, or something else is menacing the young, is expressed by a loud, harsh chip which slurs off into a gurgling noise of somewhat lower pitch. For want of a better term we have called this a gurgling note.

Songs of the males in winter.—As probably the first indication of revival of activity after the molt, about the middle of September, the males at mid-day from low thick bushes sing a soft, faint, varied and beautiful song having no imitations in it. Each male, so far as we have observed, sings this song from the same place and it may be sung only by the males that still have their mates with them since we have observed it only in them. This is the same faint mid-day whisper song observed to a much less noticeable degree in the early summer.

At the same time and in the same place the pair may give the little *hew-hew* notes which are given in the early summer.

About this time the males begin their quick chips, harsh squawks and short, loud songs, all of which increase rapidly in vigor as the need for defense of territory and food supply from wandering mockingbirds increases. We regard these notes as the winter equivalent of the summer growls. During November the song subsides but the chips and squawks continue much as before. These latter decrease markedly during December as do also the raids of the invaders.

During the winter season, with the exception of a short time at the beginning and at the end, and at times when there is no stress of battle in the air, the males may sing a softer more subdued song which probably should be considered the same as the happy, contented-sounding song of the summer.

Night songs.—During the summer the males, presumably, often sing at night. Some of this is the typical daytime song but much of it consists of short phrases repeated several times as though they were being practiced. Sometimes these short phrases are imitations of the notes of other species.

During the winter each bird may give a series of loud chips or a short, loud song several times during the night. These outbursts are often answered by the neighboring birds and thus extend outward in waves as they do in the daytime. The birds can be identified, of course, only by the positions from which their notes come.

Songs of the females in summer.—The females are quiet in the summer season. They join in the *hew-hew* notes and the rasping notes of the pair in early summer.

Songs of the females in winter.—Beginning about mid-September, as the depression of the molt wears away, the females sing a soft, faint song which can scarcely be distinguished from the song of the immatures. It is sung during the middle of the day from within low, thick shrubbery, each female always singing from the same place which also, in the case of a mated female, is the place that her mate sings a similar, faint song at this time.

About this time the females occasionally give slow, separated chips, evidence of intention to defend their territories, which soon give way to the rapid chips, harsh squawks and, with some of the females, short, loud songs as previously described for the males at this time.

Songs of the immatures.—The young birds sing a faint, soft song quite without imitations of other bird songs but distinctly a mockingbird song. They seem absorbed in the production of song and sing, usually at mid-day, for several days and then disappear. While singing the birds perch in low, thick shrubbery, mounting higher as the days go by but never do they sing from tree tops or other such high perches. At least some individuals sing before, during, and after the molt.

The immatures that want to take up a territory begin, about this time, a monotonous, seemingly everlasting series of slow, separated chips, always given from the same place. If the ownership of the territory is successfully established, the immature, even though it may be a female, takes up the rapid chips, harsh squawks and loud songs about the same time that the adult birds do so.

Why do mockingbirds sing?—It is customary to think and speak of birds singing because they are happy as we understand happiness. This may, in part, be true but as we become better acquainted with our mockingbirds we have a growing conviction that little if any of their singing is merely for the pleasure of creating the song or is an expression of peace and contentment with the surrounding world, but rather that all songs, or at least most songs, are uttered for vital, practical purposes.

APPENDIX

Analysis of trapping records.—During the nine years and two months (Nov. 2, 1924 to Dec. 31, 1933) since bird-banding operations were started at our station 421 mockingbirds have been banded. Of these, 268, or 63.7%, were never recaptured and 153 were recaptured a total of 870 times. One was recaptured 261 times

TABLE 1
MOCKINGBIRDS
Summary of Ten Years of Banding

Number of Birds	Calendar Years										Total
	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	
1. Banded	1	10	31	9	44	79	39	15	16	177	421
2. Recaptured from birds banded in previous calendar years	0	1	3	6	5	9	10	5	8	20	67
3. Total captures (items 1 + 2).....	1	11	34	15	49	88	49	20	24	197	488
4. Captured as immatures.....	0	1	12	2	29	58	22	4	3	136	267
5. Captured as adults.....	1	10	22	13	20	30	27	16	21	61	221
Number of Captures of Birds											
6. Recaptures of birds banded during the year.....	4	9	17	8	192	55	15	5	58	144	507
7. Recaptures of birds banded previous years.....	0	5	4	31	27	167	29	7	25	68	365
8. Total captures (items 1 + 6 + 7).....	5	24	52	48	263	301	83	27	99	389	1291
9. Recaptures of no. 357909.....	..	..	..	..	159	102	..	..	..	..	261
10. Total captures excluding item 9 (8-9).....	5	24	52	48	104	199	83	27	99	389	1030
11. Average captures per bird trapped (10÷3).....	5	2.2	1.5	3.2	2.1	2.3	1.7	1.4	4.1	2.0	2.1
Birds Banded in Year Indicated and Recaptured as Shown Below											
12. Never	0	4	24	6	33	56	23	9	6	102	268
13. At least once during period (12 + 13 = 1)....	1	6	7	3	11	23	11	6	10	75	153
14. Percentage never recaptured.....	0	40	77	67	75	71	72	60	38	58	64
15. During calendar year of banding.....	1	5	6	3	9	18	10	4	7	75	137
16. Only during day of banding.....	0	0	0	0	0	1	1	0	0	3	5
17. Only during first week after banding.....	0	2	0	1	1	7	5	0	1	34	51
18. Only during first month after banding.....	0	3	1	1	3	10	6	0	2	64	90
19. Only during first three months after banding....	0	3	1	2	5	10	7	0	2	73	103
20. Only during first six months after banding.....	0	4	1	2	5	12	8	3	3	75	113
21. Only during first twelve months after banding...	0	4	2	2	5	14	8	3	6	75	119
22. After first twelve months after banding.....	1	2	5	1	6	9	3	3	4	0	34
23. Only after first twelve months after banding....	0	1	1	0	2	3	1	0	2	0	10
24. Once during period covered.....	0	1	1	1	1	9	5	3	2	40	63
25. Two to five times during period covered.....	0	4	2	1	6	7	5	0	3	33	61
26. Six to ten times during period covered.....	1	0	1	0	1	5	1	2	2	2	15
27. Eleven to fifteen times during period covered...	0	1	0	0	1	1	0	1	2	0	6
28. Sixteen to twenty times during period covered...	0	0	2	0	1	1	0	0	0	0	4
29. Twenty-one to thirty times during period.....	0	0	1	0	0	0	0	0	0	0	1
30. Thirty-one and more times during period.....	0	0	0	1	1	0	0	0	1	0	3

in 21½ months, another 47 times in 16 months and another 46 times in 25 months. No other was recaptured more than 30 times and only 29 were recaptured more than 5 times. Excluding the high three, 150 were recaptured 516 times, an average of 3.4 times each. Taking into account the total number banded and the total recaptures the average number of recaptures is 2.1; but if the high three are excluded as exceptional, this average drops to 1.2 recaptures per bird. One hundred and nineteen were recaptured only during the first twelve months after banding, 34 were recaptured after the first twelve months after banding, and of these, 10 were recaptured only after the first twelve months after banding. Table 1 gives these and many other figures both for the total period and for the individual calendar years.

The first five items of Table 1 show the following story in regard to the calendar year 1928, and parallel stories for the other years. During that year 44 mockingbirds were banded and 5 which had been banded in previous years were recaptured, making a total of 49 individual birds that were trapped that year. Of these, 29 were immature and 20 were adults. Items 6 to 11 show that some of the 44 birds banded during the year were recaptured a total of 192 times and during the same time some of the 5 that had been banded during previous years were recaptured a total of 27 times making a total of 263 captures for the year. (The sum of items 1, 6 and 7.) Since mockingbird number 357909 was retrapped an unusually great number of times its recapture records, item 9, are excluded to avoid the decided hump in the curve of total captures which they would otherwise make and then item 11 (item 10 divided by item 3) shows that the average for the year was 2.1 captures per mockingbird trapped during the year. Items 12, 13 and 14 show that 33, or 75% of the 44 birds banded, were never recaptured after banding and that 11, or 25%, were recaptured at least once during the period covered by this analysis. Item 15 shows that 9 birds banded during 1928 were recaptured during that year. It was these 9 birds that were recaptured 192 times during the year, as shown by item 6 or, excluding number 357909, 8 of them were recaptured 33 times during the year (item 6 minus item 9). Items 16 to 23, inclusive, give the numbers of those birds banded in 1928 that were recaptured during different intervals of time. By referring to items 1, 12, 21 and 22 it is seen that of the 44 birds banded 33 were never recaptured, 5 were recaptured only during the first twelve months after banding and 6 were recaptured after that twelve months period, and item 23 adds that 2 of these 6 birds were recaptured only after and not during the twelve months. Items 24 to 30, inclusive, give the numbers of those birds banded in 1928 that were recaptured various numbers of times during the total period covered. The sum of all these items is equal to item 13, the number of birds banded in 1928 and recaptured at least once during the total period.

Table 2 shows the number of mockingbirds banded each year, the number recaptured from each year's banding during that and subsequent years, the individual identity by letters of the various birds within the group recaptured from each year's banding and the total number of recaptures for that group during the banding year and subsequent years. Thus in the year 1925 ten birds were banded, five of them, individuals a, b, c, d and e, were recaptured a total of 9 times during that year. During 1926 three of these original ten individuals, a, b, and f, were recaptured a total of 4 times and during the seven subsequent years individual "a" was recaptured 3, 1, 2, 2, 1, 1, and 1 times, respectively. The interesting information here given for this group of birds is that individual "a" was captured a small number of times each year for 9 years. This is the bird referred to in the introduction. Our records show that this bird was an adult when banded and hence it was at least 10 years old when captured in 1933. Further, they show that the captures of the various years all occurred

TABLE 2
MOCKINGBIRDS

Summary of Trapping Records of Birds Banded Each Year Including the Recaptures of these Birds During the Year of Banding and Subsequent Calendar Years

Year banded	Number banded	Recaptures During Calendar Years										Totals subsequent to year of banding		
		1924	1925	1926	1927	1928	1929	1930	1931	1932	1933			
1924	1	1a	1a	1a	0	0	0	0	0	0	0	0	0	1
		Total Recaptures	4	5	1	0	0	0	0	0	0	0	0	6
1925	10	5abcde	3abf	1a	1a	1a	1a	1a	1a	1a	1a	1a	1a	3
		Total Recaptures	9	4	3	1	2	2	1	1	1	1	1	15
1926	31	6a..f	5abdfg	3abf	3acf	1a	0	0	0	0	0	0	0	5
		Total Recaptures	17	28	15	12	3	0	0	0	0	0	0	58
1927	9	3abc	1a	1a	0	0	0	0	0	0	0	0	0	1
		Total Recaptures	8	11	32	0	0	0	0	0	0	0	0	44
1928	44	9a...i	4abik	2ah	0	0	0	0	0	1j	6			6
		Total Recaptures	192	121	2	0	0	0	0	2	125			
1929	79	18a..r	6aqrstv	1t	2at	6abjuvw	11							11
		Total Recaptures	55	16	1	6	13	36						
1930	39	10a..j	3aij	1i	3hik	4								4
		Total Recaptures	15	5	2	4	11							
1931	15	4abcd	4cdef	3cdf	4									4
		Total Recaptures	5	16	6	22								
1932	16	7a..g	6efghij	6										6
		Total Recaptures	58	42	42	42								
1933	177	75	75	75	75	75	75	75	75	75	75	75	75	75
		Total Recaptures	144	144	144	144	144	144	144	144	144	144	144	144

Each bird recaptured from the group banded in any one year is given individual identity by a letter after the number of recaptured birds in that and subsequent years. The individual represented by a letter in the group banded in one year is not the same as the individual represented by that same letter in the group banded in any other year.

between April 13 and July 3, inclusive. In this same manner the years of recapture of all the other individuals can be read from this table. Of course, the individual represented by a letter in the group banded in one year is not the same as the individual represented by the same letter in the group banded in any other year.

Pasadena, California, February 15, 1934.

THE BREEDING STATUS AND MIGRATION OF THE CASPIAN TERN IN UTAH

WITH TWO ILLUSTRATIONS

By C. LYNN HAYWARD

While scattered references to the breeding of the Caspian Tern (*Hydroprogne caspia imperator*) in Utah are to be found in ornithological literature, little definite information has, to the knowledge of the writer, appeared in print concerning the nesting status and migration of this species in this intermountain region. Bent (1921, p. 210) refers to this bird as breeding "in North America in widely scattered areas," but makes no specific mention of the Utah nesting colonies. It is for the purpose of bringing together such of these scattered references as the writer has been able to locate, as well as to place on record some more recently acquired information, that this paper is written.

Credit is due Mr. Robert G. Bee for much of the contained information as well as for the use of the photographs which were taken by him. Other individuals have also supplied information which is duly acknowledged in the course of the paper.