HISTORY OF THE NESTING OF AN ANNA HUMMINGBIRD

By JUNEA W. KELLY

When on the afternoon of January 4, 1954, I saw an Anna Hummingbird (*Calypte anna*) investigating the very slender twigs of an evergreen tree (*Azara microphylla*) growing in the corner of my garden in Alameda, California, I hoped she was planning to nest in this location. Several times she flew to a *Tamarix parviflora* a few yards away and returned to the *Azara* as if she were carrying nesting material. Three days later I again saw her, and a minute swelling was apparent on a vertical twig. The site of the nest was 25 inches from the sleeping porch wall, which consists of translucent windows, and 4 feet from the bathroom window from which most of the observations had to be made. The nest could also be observed from a garden walk 6 feet distant. In order to obtain a clearer view of this spot I parted the sash curtains 2 inches while she was away; upon her return she appeared to notice this change and left immediately. When the gap was closed, she returned. As there are enough natural causes that could spell failure for a nest, I did nothing that might discourage her, especially during the early stages of building. I realized that the short winter days would make it possible to watch the nest from dawn to dark. Also the season of the year with its abrupt weather changes would give an opportunity to see the bird's reaction to frosty mornings, strong winds, and heavy rains.

The weather was favorable for a successful nesting. Rainfall was below normal—2.85 inches in January and 1.93 inches in February. Temperatures were above normal. The average maximum for January was 55.4°F. and the minimum 41.5°. The highest temperature for January was 64°, the lowest 32°. For February the average maximum temperature was 61.1°, the minimum 41.5°. The highest February temperature was 77° and the lowest 36°. The figures for temperature and rainfall given here are those recorded at the Oakland Airport (U. S. Weather Bureau, 1954).

Although the Anna Hummingbird is a common permanent resident of the San Francisco Bay region and frequents human habitations, as far as is known there is no account of a complete history of the nesting of this species. This is surprising when one considers the long nesting season from early December (Bent, 1940:373; Dawson, 1923: 944) through August (Trousdale, 1954:110) and the fact that there are frequently two broods. This is still more surprising in view of the fact that Grinnell (1924:201) found the Anna Hummingbird ranked eighth among the ten most celebrated birds in California in the number of times its name had appeared in the titles of published articles.

NEST CONSTRUCTION

The nest tree was situated in a corner of the garden, recessed 10 feet from the west end of a sleeping porch and 7 feet from the north side of the house. No direct wind from the south or east could strike the nest. The top of the slender, 17-foot tree had upright pinnately-branched shoots. These projected above the porch roof so that they caught the wind from all directions except the east. Along the trunk the branches were pendulous. The trunk of the tree was only 8 inches in circumference at the ground and 5 inches in circumference 9 feet from the ground; at this point the nest branch curved out from the trunk. The branch was ¾ inch in circumference. Thirty inches from this junction the nest was built, and the branch was only ⅜ inch in circumference at the top of the nest. All the pendulous branches curved toward the trunk of the tree at their lower extremities. As she built, she incorporated on either side two smaller twigs of this vertical branch and built down to the bottom of the curve, giving the nest three

ribs for support. Usually this species begins nest building with a platform. After she reached the bottom of the curve, she built the rest of the cup. No matter how much the tree trunk and the pendulous branch swayed, the nest never tipped but swung in an arc like a pendulum. Even at night I could watch the pendulum-like swing of the nest as a streetlight shone upon the nest tree and branches, which cast shadows upon the windows of the sleeping porch.

The bottom of the nest was 7 feet from the ground. The outside dimensions of the nest were: top, 1¾ inches in diameter; depth, 1⅝ inches. The end of the little branches on which the nest was built projected 7 inches beyond the bottom of the nest. From above the nest was completely exposed. The leaves of the *Azara* are shiny and narrow, ¾ inch long, with stipules half as long. Fine leafy twigs screened the nest from west and north so that the free approach to the nest was from the corner of the house.

When completed the nest looked like the typical nest of an Allen Hummingbird (*Selasphorus sasin*). Aldrich (1945:137) mentions that in eucalyptus trees, nests of the Allen Hummingbirds are usually near the tips of drooping incurved branches. This Allen-type nest was another example of the great variation in nests built by Anna Hummingbirds as reported by Bent (1940:373), Dawson (1923:944), Pitelka (1951:201).

The following are a few remarks on the actual nest building. On January 9 the female was first observed at work in the morning at 9 a.m. By the 13th she started at 8:40 and was busy off and on all day. Thinking to make life easier for her, on the 15th, a hummingbird feeder and also a previous year's unfinished nest were placed near the path of her travels to and from the nest. Only once did I see her take down from the nest, and never, even when the feeder was draped with fuchsia blossoms, did I observe her using the artificial food supply. After a windy night followed by rain on the 16th she came at 8:50 a.m. Her arrival in the morning evidently depended somewhat upon the weather. On the 18th she arrived at 7:50 and worked all day. She often returned so quickly on this date that the building material must have been obtained nearby. She was frequently seen working halfway up the periphery of a 70-foot redwood tree (*Sequoia sempervirens*) in an adjoining garden where she was probably gathering nesting material as well as food. These observations were made from a second-story window. The distance from the redwood tree to the nest was 65 feet. On the 19th she was not seen. I looked into the nest and saw it was well lined. In order to look into the bottom of the nest I had to put up a short ladder against the wall of the house. The nest seemed finished. Perhaps she was not ready to lay eggs.

Because the nesting was so early in the year before vegetative growth had had an opportunity to start, I was interested to know what materials she had used in building the nest. When the nesting was over, I took samples of the trimmings, the binding material, and nest lining to the Botanical Department, University of California. After determining that the trimmings were fuchsia bark covered in many cases with a green alga, *Protococcus,* and that the lining consisted chiefly of torn-up feather down, the Department sent the binding materials to the Criminology Department. Many of the threads were identified as rodent hairs. Aldrich (1945:142) mentions that hairs of horses, dogs, and ground squirrels were contained in Allen Hummingbird nests. The down was identical with the down feathers from the quilt on the sleeping porch. I found a small amount of plant down in the nest lining that I could identify as coming from an exotic shrub (*Senecio petasites*) flowering in my neighbor's garden. Seth B. Benson of the Museum of Vertebrate Zoology also determined some of the threads as being spider webs with egg cases. Early in the season when plant down of willows (*Salix* sp.) and composites is not available, feathers are used for lining (Dawson, 1923:945).

I appreciate the identifications of nesting materials made by Helen K. Sharsmith of the Botanical Department, by Paul S. Kirk of the Criminology Department, and by Seth B. Benson of the Museum of Vertebrate Zoology, all of the University of California.

EGGS AND INCUBATION

On January 20 there was a heavy frost. The female returned at 7:45 a.m. and saw a Hermit Thrush (*Hylocichla guttata*) on the low branches of a tree two yards away. She hovered above the thrush, and it moved on. The hummingbird darted back to the nest, and later the first egg was discovered. On the 21st she was seen off and on occasionally, but still there was only one egg. The next day at 9:20 a.m. I found the second egg. She then began incubating and at 5 p.m. settled down for the night. At 7:17 a.m. on the 23rd, she left the nest for her first feeding. For the last feeding of the day she left at 5:10 p.m. and returned in 6 minutes.

When leaving the nest, she always flew into the neighbor's garden where the redwood tree grew. Never during the entire nesting period did I see her feeding in my garden except when catching insects in the air near the nest tree. A similar observation of the female feeding away from the nest area is reported by Howell and Dawson (1953:96). On the 24th it rained from early morning until into the afternoon. She would leave the nest as the rain slackened or stopped and then would return quickly. This same behavior pattern was followed all during the incubation and later when young were in the nest. If the morning were dull, cold, foggy, or rainy, the time of her departure from the nest for the first feeding was later than on clear mornings, and she came back more quickly. The weather also regulated the time of her last feeding.

HATCHING AND CARE OF YOUNG

On February 6 there was a heavy frost in the morning, and the hummingbird sat steadily on the nest with such short intervals out for feeding that not until noon was I able to look into the nest without disturbing her. Then I found one egg beginning to hatch. At 5:40 p.m. when I looked into the nest again, the first bird had entirely emerged from the egg, and no fragments of shell were visible. The 7th was another frosty morning. She left the nest at 6:37 for the first time. At 3:30 p.m. when I looked into the nest, the second egg had hatched, 16 days after incubation began.

The gray color of the young birds' down and of the nest lining was relieved by their small triangular, bright yellow bills. In feeding the young at this time the female seemed barely to touch their bills. Again a Hermit Thrush appeared, and she made it move. When the young were 6 and 7 days old, respectively, they were well covered with down and had grown so large that they could be seen from the window. The 13th was a stormy day; about an inch of rain fell. The female remained on the nest during the heavy showers and spread herself over the birds like a tent, leaving the nest only for a few minutes when the rain slackened. February 15 was clear and mild, with some clouds. The female left the nest at 6:55 a.m. and was off the nest most of the day. The gray appearance of the birds had changed to a brown, and feather tracts could be seen on their backs. Their bodies were now rounding over the nest. A light rain fell during the night of the 16th. Heavy rain accompanied by strong wind fell on the 17th. This was the last day of rain while the young were in the nest. On the 16th and 17th she did not brood during the daytime, and on the 18th she did not come back for the night. At no time after this date, when the young were 11 and 12 days old, did she brood them. This observation agrees with the findings of Howell and Dawson (1953:94).

The first time that the young were observed to try their wings was on the 20th. By this time all the feathers were developing very rapidly, and the feather tracts on the

heads were pronounced. The feather development of the young practically paralleled the development given by Orr (1939:21) for the young of the Allen Hummingbird in a May nest. All parts of the young birds did not develop with equal speed. One day the wings would make more progress, then the tail. Toward the end of the nesting the bills began growing more rapidly.

Beginning on the 19th, observations were made several times nightly with a flashlight. During the early part of the evening the young were sitting high, but as the night grew cooler, they would settle farther and farther into the nest until they had snuggled down as far as was possible. Pearson (1949:147) describes the temperature control and metabolism at night of two nestling hummingbirds and states that when 11 days old "they disclose no drop in metabolism at night."

At 7 a.m. on the 21st the young were asleep. By 7:15 they were beating their wings and were fed at 7:45. Similar behavior occurred on the following mornings. The female was becoming more alert. She now always approached the nest from above in a series of jerks as if descending an imaginary flight of stairs, constantly turning her head from side to side. She left with a long steep upglide until she cleared the wall of the house. She was now feeding the young more frequently and often took a perch on the tall bare tip of a nearby tree.

Daily the young were becoming more restless. After feeding they backed to the edge of the nest and discharged the feces by a powerful squirt, then settled in the nest for a rest. By this time a greenish cast had appeared on their wings. They were constantly changing their positions in the nest, preferring to face away from the house.

The maximum temperature on February 24 was 74°, and mild weather continued until the birds left the nest. By the 25th the female was feeding more frequently in the early morning and after 4 p.m. The young were growing so large that one bird was often lying on top of the other with wing outstretched. On this date at 5 p.m. a wing of one of the birds was hanging straight down outside the nest. At 7:30 this wing had been retracted, but the other wing was pointing upward between the two birds. At 8:30 the wing was down, and the birds were facing in opposite directions. Always as night came on, there was plenty of room in the nest because, apparently with the lowered temperature, the birds snuggled down.

It was becoming more difficult for the adult to feed the young. When they faced away from the corner of the house as she approached to feed, she would stand on the free edge of the nest, stretch her neck unbelievably long, and pull the heads of the young back with her bill. Then she would have to feed from that position.

The 25th was the date of seeing them extend the tongue for the first time. It appeared like a glistening thread. Orr (1939:24) mentions that a young Allen Hummingbird used its tongue to touch surrounding leaves. This was the only reference to the tongue that I found in the literature. On the 26th the young projected and retracted their tongues steadily for 30 minutes. It was also on this day that they began preening vigorously while on the edge of the nest.

The time was rapidly approaching for the birds to leave the nest. It seemed advisable to have someone constantly observing from daylight to dark in order to record how the young would leave the nest and to protect them from the Scrub Jays (*Aphelocoma coerulescens*) that had been seen flying past the corner. Since it was impossible for me always to stay at home, I asked several of my friends who were good bird watchers to "baby sit" during my absence. Beginning at 6:45 a.m. on February 27, and until both birds had left the nest on March 4, the nest was almost continuously under observation during the daylight hours.

At 6:50 a.m. on the 27th the young were fed. They were sitting very high in the nest and became extremely restless, scratching and preening with feet and bills. At 12:50 p.m. one young was observed for the first time standing on the edge of the nest and fluttering its wings. Shortly after, a young began reaching out with its tongue along an adjacent twig, leaning out over the edge of the nest. When at 4:25 the young were fed, the reflected sunlight through the sleeping porch windows showed orange-red bill linings. After the last feeding at 5:35 p.m. both birds settled down. Between 1:22 p.m. and 5:35 there had been 15 feedings; the longest interval between feedings was 29 minutes, from 3 p.m. to 3:29. Although there was no exact pattern, the intervals became shorter in the late afternoon with three feedings between 5:10 and 5:35. The nest began to sag on the edge where the adult was forced to stand in feeding the young. The general behavior was the same for February 28 and March 1 as on the 27th.

The activities on March 2 were much the same, only accelerated. On one occasion the adult stood on one young while pumping food into the other. On another occasion she fluttered in front of them when there was no place to alight, hovering as hummingbirds do when they are feeding before a flower. The female had repaired the sagging edge of the nest. The young used their tongues to lick all the foliage that they could reach. Jays were calling, and two came near the corner. In addition one House Finch (*Carpodacus mexicanus*), three Robins (*Turdus migratorius*), a Spotted Towhee (*Pipilo maculatus*), and several unidentified sparrows came into the corner. None was in sight when the adult returned, but a little later she chased a Spotted Towhee away. In the early afternoon one bird fluttered backward off the nest and then settled into the nest again. Both birds stood on the edge of the nest facing inward as they exercised their wings. The last feeding was at 5:25 p.m. At 6:00 all was quiet.

On March 3 both of the birds had been fed early in the morning, had been going through their usual exercises, and had then quieted down on the nest. I was away from my observation point two minutes, and in that short time one young had left the nest and perched on a nearby branch. This bird will be designated as "A" hereafter, and the bird remaining in the nest will be designated as "B." At 7:50 the adult fed both birds. At 9:27 it was observed for the first time that B noticed insects flying near the nest. Orr (1939:23) recorded a similar occurrence. During the morning A gradually became more venturesome and began flying longer distances from the nest.

From its perch A must have heard the ticking note of the female as she was coming in with food because its bill was already open before she was seen by the observer. This was the same *tick* that she had so frequently given when feeding the young. Bird A flew to within 6 inches of the nest, giving thin, uncertain notes. B gave a little cry which was followed within 5 minutes by a single, high-pitched note from A.

Early in the afternoon B was on its toes fluttering hard, and raising off its toes; it hovered a half inch above the nest for a second or two, heard the female's call note, and settled back into the nest for a feeding. Shortly afterward, B was standing on the edge of the nest reaching out to poke at twigs, and it moved its tongue over all the leaves within reach. Both birds were fed seven times between 1:17 and 3:30 p.m. and three times between 4:47 and 5:45. At 6 o'clock B settled into the nest facing the porch.

On March 4 at 6:30 a.m. B was still quiet on the nest. At 6:50 it preened and stretched its neck, then settled back. Five minutes later it fluttered, lifted itself off the nest several times, sat on the edge, then settled into the nest. At 7:00 it lifted itself 1 inch and started to back off into space. Two minutes later it was resting in the nest. At 7:10 it was just sitting; at 7:17 it was fed. At 7:20 B raised itself about 3 inches and backed off the nest toward the corner of the house, flew around the trunk of the tree

toward the sleeping porch, and perched on a limb above and in front of the nest. It then preened itself, flew up on a higher branch, and was fed five minutes later. It then flew over to the porch roof. At 7:36 the female fed A which had come in five minutes earlier. B flew around and tried several times to alight before it found a branch strong enough to support its weight. A came to the same limb, almost sitting on B; then it perched alongside of B. The female feeding the two could hardly keep a position on the limb because of its small size. The young sat only two inches apart and finally took positions on two separate limbs. I would lose them and then they would appear again, but I could no longer distinguish between A and B. I lost them at 10:50. At 5:15 p.m. one young bird was sitting on a limb near the nest and was fed at 5:25 and 5:35. It was still sitting there at 6:15. At 9:45 it was settled on the limb for the night.

On March 5 the bird was still sitting in the same place at 6:50 a.m. Five minutes later it flew to a higher perch, and at 7:45 it was gone. During the afternoon of the 5th all three birds were seen and heard in the garden. Much to my surprise, at 5:40 there was a young bird on the same twig where one had spent the night of the 4th. It was fed at 5:45 and again at 6:00. I could see it by flashlight in this position at 7:30 p.m. At 6:30 the following morning, March 6, it was gone. The garage door had been open for a few minutes late the previous afternoon. When I opened the door at 8:45 a.m., I heard a persistent squeaking in the garage and looked up at the rafters, and there sat a young hummingbird. I opened the door all the way; the bird flew out and perched low on a nearby shrub still squeaking. It then disappeared in the shrubbery of the garden. At 9:45 the adult was seen feeding one young. That was the last time I saw the birds.

I am greatly indebted to Helen Anthony, Ethel Case, Linda Knudsen, and Elsie Roemer, for their diligent recordings of the activities at the nest in my absence.

OTHER OBSERVATIONS

On April 3, 1954, my neighbor discovered an Anna Hummingbird's nest built 20 feet from the ground in a live oak (*Quercus agrifolia*). By means of ladder and mirror I saw two young birds probably a few days old in the bottom of the nest. We watched the female feeding the young for two weeks. All during this time Scrub Jays were in the tree. They could look through the branches and see the nest, and the female repeatedly drove them away. On the 17th at 10 a.m. all was normal. At noon when my neighbor looked at the nest, she saw that the young were gone and that the nest lining had been pulled up. Although the jay was not actually seen taking the birds, as there were no other predators in the garden, it seemed certain that the jay had destroyed the nest. In the same garden at the end of May another Anna Hummingbird's nest was discovered well concealed in a mirror plant (*Coprosma baueri*). It was a successful nesting.

Three Anna Hummingbird nests were observed in 1955 in the same neighbor's garden. The first one was discovered on April 6, 20 feet up from the ground in the small leafy branches of a birch tree (*Betula alba*). On May 12 a second nest was discovered about 17 feet from the ground built on the tip of a redwood branch. Both of these nestings were successful. On June 27 a third nest was begun in the same birch tree, but this time on the tip of a pendulous branch 9 feet from the ground. I cannot help but conclude that nests built on leafy branches too weak to support the weight of a large bird are less likely than others to be destroyed by the jays. Edwards (1919:67) reports four nests destroyed by jays.

Again referring to the nest in the *Coprosma*, on July 4 the second bird left the nest but returned and spent the night in the nest. This was interesting because for two nights a young one had spent the night in the *Azara* near its nest.

In view of the fact that the hummingbirds in the *Azara* so continuously used their tongues and only one reference could be found in the literature regarding this behavior, I feel it is worth recording that the nestlings in the *Coprosma* also made use of their tongues.

The female from the *Azara* nest was never observed gathering food from flowers although there were many fuchsias in bloom. It had always been seen catching insects in the air and foraging in the redwood tree. This does not seem so strange when Beal and McAtee (1922:17) state that in examining the stomach contents of this species, 99 per cent of the food of Anna Hummingbirds was animal matter. Of course, the stomach contents would not show how much syrup might have been consumed. Grinnell and Storer (1924:353–354) mention that Anna Hummingbirds fed around the golden oaks in the neighborhood of El Portal during the months of November and December.

SUMMARY

An Anna Hummingbird began nest-building on January 4. The weather was favorable for a successful nesting. The nest was completed on the 19th and the first egg was laid on the 20th. The second egg was laid on the 22nd. The first hatching occurred on February 6, and the second on February 7; the incubation period was therefore 16 days. The young left the nest at the age of 25 or 26 days. They had not been brooded after the 12th day. The young birds were observed for two days after leaving the nest.

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