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NESTING HABITS OF THE CEDAR WAXWING (*BOMBYCILLA CEDRORUM*).

BY JAMES E. CROUCH.

Plates I-II.

This paper is based largely upon studies of the Cedar Waxwing made in the vicinity of Ithaca, New York, in 1930 and 1931.

These birds may usually be found at any time of the year about Ithaca, though they sometimes disappear for a month or two in winter. This we can blame on their very erratic nature. They are most frequent in open country, in gardens, orchards, and along roadsides where the supply of small fruit is plentiful. It is a common experience to find them along streams catching insects in the manner of Flycatchers. They are common within cities and towns where they feed on the fruits of various ornamental shrubs.

They breed mostly in open country, in orchards, or in the borders of woodlands. They are also found near habitations where they will make use of nesting materials put out for them.

Unlike the vast majority of species the Cedar Waxwings wait until late in the season to start nesting. In Ithaca this is usually about the first or second week in June. I am not prepared to say why the breeding season is delayed. Perhaps it evolved in the far north where it was impossible for them to start earlier, and the habit has been retained.

Their late start results in a rather drawn out season which extends well into September. There is one record in Massachusetts¹ of a brood hatched September 19.

The literature is mute concerning the nesting territory of the Cedar Waxwing. I would judge that it extends no farther than a few feet from the nest itself. At a nest located near the shore of Cayuga Lake, near Ithaca,

¹ Forbush, Edward H. Birds of Massachusetts and other New England States Vol. III, 1929, p. 167.



Photographs by J. E. Crouch.

CEDAR WAXWING.
BOMBYCILLA CEDRORUM.
MALE FEEDING LARVAE TO FEMALE.

N. Y., I observed a Cedar Waxwing come within fifteen feet of the nest where it was received kindly by the nesting pair. No attempt was made to chase the intruder away, but the nesting male flew and perched with it on a branch of a nearby tree, and they finally flew off together.

It is doubtful if the Cedar Waxwings have any well-defined feeding territory. If they have, it must be extensive and not defended. Their food supply being either lacking entirely or else abundant, they have never, apparently, developed the instinct to drive out others of their kind. If the food supply is scarce, they move on to other regions.

Although they are sociable birds, it would be wrong to infer that they do not seek any seclusion at all during the breeding season. I have never found two pairs nesting in the same tree, but it is not unusual to find a number of pairs nesting in the same orchard or grove.

The courtship of this species is not as conspicuous a process as it is with many. They develop no striking adornments of plumage, nor do they sing. They have a number of call notes, the most common one, a sort of lisp or hissing note which is used as a signal either to check or initiate the flight of a flock. It may be used as a warning or to attract the mate's attention during the breeding season. There is also a call note described as a "beady" or "blurred" note which is often used. A captive specimen which I had for a year had a very faint attempt at a song of several low notes. This was so low as to be almost inaudible at a short distance. Possibly they do use it in their courtship.

If Cedar Waxwings sing at all, it is not the most conspicuous part of their courtship. We are more likely see a pair chasing each other in wide circles through the air and calling loudly. I have noticed this performance most frequently during the nest-building period.

The so-called "Waxwing dance" is a common courtship activity. Two birds perch close together on a branch and then each hops to the side and then back again. Each time they come together they usually touch bills. This is repeated several times in succession.

Similarly they often pass a berry back and forth between them. The male gets the berry and then comes down by the female. He passes it to her, she gives it back, he usually takes a hop to the side, and then returning passes it to her. I saw this repeated twelve times in succession. At the end the male takes the berry and either drops it to the ground or eats it. I have never seen the female either get the berry or dispose of it. Sometimes we may find several Cedar Waxwings lined up passing berries up and down the line. This is done several times before a berry is eaten by one of them. I have never seen this performance myself, and doubt if it belongs strictly to the courtship period.

During incubation these birds display much affection for each other. In

my studies of the incubating birds at a nest on Turkey Hill, east of Ithaca, I saw them in many cases go through a very interesting performance. It took place when the male had finished feeding the female, whether at the nest or away from it, on a branch of a tree. In some instances the female would pass the last berry or other food back to her mate and he would eat it. Then they would pick at each other's breast feathers with their bills, clack their bills together, or just sit side by side with their mouths wide open. On one occasion the male placed his bill into the mouth of his mate.

The nest is in the majority of cases saddled on a horizontal limb, or less often in a fork. The height varies from four to fifty feet from the ground. It is more usual to find them from five to twenty feet high. Although there are records of Cedar Waxwings nesting in Woodpecker excavations and on lamp posts, these are exceptions rather than the rule.

Nest building is an interesting process. I watched the construction of one nest placed in the forking branch of a willow tree. The birds worked very vigorously both in bringing material and in shaping the nest into form. Although they both carried materials, one bird seemed to do most of the shaping and weaving together of the nest. As nearly as I could tell, it was the female which did this shaping. However, because of the similarity of plumage, it may be that I was mistaken in this observation. Inasmuch as there is contradiction in the literature on this point, it must be studied further. The birds work very close together. They both come to the nest with their bills full of cattail down or small twigs. The male deposits his on the nest and the female then follows with hers. She stays and by much twisting and turning of the entire body and use of the bill, the material is woven into the nest. When this is finished, she calls and is joined by the male, who usually waits nearby, and they then fly off together for more materials.

These birds did not travel far for nesting material, and returned in a minute or two to the nest. The twigs were broken from the branches of a neighboring tree, while the cat-tail down and grasses came from a nearby marsh. When a Catbird and an American Redstart came close to the nest they were promptly driven away by the male bird.

The birds are very noisy at this stage, calling almost continuously to each other. Every so often they would take wide circles into the air and chase each other around, always staying near the nesting tree.

Their approach to the nest was very definite. No matter which side of the tree they happened to enter, the pair would always enter the nest from the south-east side. Cedar Waxwings will desert their nests quite readily during this stage in their life-cycle.

The materials used in Waxwings' nests vary, depending largely on what are available. String, long grasses, and plant downs of various kinds are

almost always found. Other materials such as cotton, rootlets, weed stalks, pieces of cloth, twigs, plant fiber, horsehair, dead leaves and shredded bark are also common. Very often long pieces of string will be attached to the nest. (Plate I, fig. 1.)

The measurements of a typical Cedar Waxwing's nest are as follows: outside depth, $4-4\frac{1}{2}$ " ; inside depth, $1-1\frac{3}{4}$ " ; outside diameter, $4\frac{1}{2}-5$ " ; inside diameter $3-3\frac{1}{4}$ " ; and thickness of walls $\frac{3}{4}-1\frac{3}{4}$ " .

The nest is completed in five to seven days and egg laying starts immediately. The number of eggs varies from three to six, the usual number being four or five. I found five in each of the nests I studied. One egg is laid each day until the complement is completed, and incubation starts at the laying of the first egg. Regardless of this fact they all hatch at the same time.

The birds are usually very silent during the incubation period. They call very seldom, and come and go from the nest without notice.

On July 23, 1930, I located a nest at Turkey Hill, east of Ithaca. It contained two eggs, and the bird was incubating them. I visited it each of the next three days, being careful not to alarm the bird. Each morning I found one more egg in the nest, the total being five. These eggs were laid before eleven in the morning.

This nest was located very conveniently for photography. It was placed on a horizontal limb of an apple tree about six feet from the ground. Therefore I was very careful in my observations not to alarm the birds and cause them to desert. From the start they were not very timid.

I erected a platform and on it placed a blind. This was about four feet from the nest, and was readily accepted by the birds. Everything was ready now for close observation. I was able to distinguish the sexes without much trouble. The incubating bird had much less black on the throat than the other, which meant that without doubt it was the female.

The ready acceptance of the blind by the birds and their disregard for what might take place inside made photography and observation comparatively easy. The male bird was more timid than the female. He would not approach the nest unless I was silent, while the female came even though I was moving about and making considerable noise. This difference in the development of instincts in the two sexes was interesting.

Incubation was performed entirely by the female. The activity during the entire period did not change to any great degree. The female was fed by the male for the most part. (Plate II, fig. 2.) Sometimes he came directly to the nest, but more often he appeared in the top of a dead tree about one hundred feet from the nest. He would give his call and she would go quickly from the nest, sometimes uttering a peculiar peeping call. At other times she would look nervously around, give her peeping call, and either go off or



Photographs by J. E. Crouch.

CEDAR WAXWING.
BOMBYCILLA CEDRORUM.

UPPER: YOUNG BIRD AWAITING PARENTS WITH FOOD.
LOWER: MALE FEEDING BERRIES TO INCUBATING FEMALE.

stay on. If she stayed on the nest, the male would at times come there and feed her, or else fly off and not appear for a period of ten or fifteen minutes. When he came to the nest he was very cautious. He usually came to the opposite side of the nesting tree, hopped from branch to branch, and finally up to the nest, where he fed her. The food given at this time was in the majority of cases choke cherries and wild black cherries. Once in a while as shown in Plate I, fig. 1, insects were fed.

After feeding the birds would very often show their affection for each other by touching bills, ruffling each other's breast feathers, sitting with their bills wide open, and clacking their bills together. The last cherry given to the female was sometimes passed back and eaten by the male, as mentioned before.

The method of leaving and entering the nest was very definite. In leaving, the bird often went so suddenly that one hardly knew it. In coming back she had a very definite route coming through the trees, hopping from branch to branch until she reached the nest.

The length of time which the female stays off of the nest varies from three to ten minutes, normally. More often she comes back in less than five minutes. If she stays away more than ten minutes, it is usually because she has been startled.

The position of the bird on the nest is very definite. She keeps her back to the sun. In the morning when I would first visit the nest she would be facing the northwest. As the day progressed she would keep turning, and at night one would be almost sure to find her facing north or northeast. This was true at Camp Barton also, where I made observations.

On very warm days the Cedar Waxwing pants persistently. It does not fluff out all of the feathers of the body to the extent that many birds do, but merely lifts the crest. The body feathers lie loose. If one should make a noise in the blind at this time the feathers would be pulled tight to the body, the bill closed, the crest lowered, and the head lifted straight into the air. This position would be held until danger passed. I once made a noise in the blind just as the male had reached the nest to feed the female. He stopped perfectly still, fluffed out his feathers, erected his crest, and leaned on a branch by his side. He held this attitude until I had taken three pictures, and then flew away. Here we have two means by which this bird attempts to blend itself with its surroundings. (Plate I, fig. 2.)

On August 7 the female's incubating instinct was at its height. She flew off the nest when I tied the limbs back for photographing, but came back almost immediately. I wanted to photograph the eggs, and so I waved my hand out of the front of the blind and had almost to touch her before she would leave. Again she came back without hesitation. From this day until the eleventh of August her instinct waned. The male came even less frequently to the nest, and on August 12 I found the eggs cold and deserted.

Another nest at Camp Barton, a boy scout camp near Ithaca, also presented interesting information. It was located in the center of a clump of sumach about ten feet from the ground. The particular sumach in which the nest was built was dead, but covered densely by grapevine. The nest site was almost entirely surrounded by paths which were used by the scouts. The birds, however, did not seem to mind this in the least.

The story of what took place here was much the same as with the Turkey Hill nest, but there were a few points in addition which are worthy of mention.

The relations of the Cedar Waxwing to others of its species and to other species was interesting. They always seem to be friendly. While I was watching the birds on July 15, another Waxwing made its appearance. It happened that the female was off the nest at that time, and instead of there being a fight, as one might expect, there was nothing of the kind. The female merely flew quickly to the nest and covered the eggs, while the other two birds sat on a branch about eight feet away. This same procedure is followed when other species come close to the nest. A Catbird approached to within two feet of the nest one day. There was no fight. They merely flew at him, and one bird went on the nest. The other sat close by for a few minutes and then flew off. Similarly, a Chickadee visited the nest and hopped right into it and picked around. The owner came onto the nest directly, but did not chase the Chickadee away. He stayed within a few inches of the nest, peering about with curiosity.

Most authorities state that incubation is shared by male and female birds. While this is undoubtedly true in many cases, it is not always so. In both nests which I studied the female did the incubating. Mr. William Gross, who studied the Cedar Waxwings in Michigan,¹ found that the female did all of the incubating at one nest, while both birds incubated at another.

The eggs hatch in twelve to sixteen days. The birds deserted the nests which I studied, so I have no data on this part of the life cycle. Desertion is very common and easily brought about in the Cedar Waxwings. This is especially true at the beginning of any one phase of the life-cycle, such as at the beginning of nest-building. With my birds the eggs did not hatch on time, probably because they had been chilled at some time. When the normal period for incubation ended, the instinct to incubate waned, and therefore desertion followed.

The Cedar Waxwings being altricial birds, they are hatched blind, and helpless. They develop very rapidly, their eyes opening on the third day. Their senses of hearing and touch are apparently well developed, as shown by their response when you touch the nesting tree or make a sound near the

¹ Gross, William. *Bird Lore*, Vol. 31, 1929, p. 178.

nest. They raise their heads and open their mouths wide in their desire for food. In a period of two weeks the young have increased twelve-fold in weight, and have developed keen senses and instincts. While they are naked at hatching they have now become fully feathered, and are ready to fly.

My only first hand observations on young Cedar-birds in the nest were at Camp Barton. I found this nest on July 11, 1930. At the time one of the old birds, apparently the female, was sitting on the edge in a very erect position. She retained this pose when I sat on a ladder about five feet below her. Finally, however, she flew into some tall weeds about ten feet away. She then fluffed out her feathers and with a queer zig-zag motion flew along the ground and went into a nearby willow. She seemed to be trying to lead me away from the nest.

The birds refused to come back to the nest until I had hidden myself about fifty feet away under a large willow. They then came and fed the young. They fed first one and then another at one visit, and the average length of time which they were away after food was twelve minutes. They always brought back about eight or ten berries.

At each feeding the nest was usually inspected and the little sacks of excrement were removed. Sometimes the bird dropped them over the side of the nest, but more often swallowed them.

On July 13 the young were becoming very active. They would stand up on the edge of the nest and flap their wings vigorously, preparing themselves for their first flight. The next day they were taken from the nest and banded, but when put back again they stayed and made no attempt to leave. On the fifteenth I took them from the nest and attempted to photograph them. I placed them on a stick and made a couple of exposures. I then tried to get the parents to come and feed them, but in this I had no success. They would fly up very close to the young and call, thus leading them away, and it was impossible to take any more pictures.

I put them back in the nest again, but they would not stay. They flew in various directions, and I did not see them again, although I am quite sure they stayed close by and were fed by their parents for several days. I could hear them calling as I passed near the nest.

The Cedar Waxwing usually has two broods in a season. It is quite probable, however, that they may sometimes have as many as three.

After the nesting season is over they form large flocks. These are made up of old and young alike and go about the country searching for food. In the vicinity of Ithaca we are most likely to find them where the wild black cherries or choke cherries are abundant. Or they may be found along the streams where they fly out and catch the insects which swarm over the water. Later they are joined by other Cedar Waxwings which have prob-

ably nested farther north, and they wander about in these large flocks until October and November, when many or all disappear. It is not unusual however to see flocks of Waxwings, during the winter months, feeding on barberries or other berries even though the ground be completely covered with snow.

San Diego State College, San Diego, Calif.