

THE NESTING HABITS OF THE EASTERN ROBIN

by

Americo A. Fiorucci

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The Nesting Behavior of the Eastern Robin

Introduction

The robin (*Turdus migratorius migratorius*) is a very common bird throughout the northeastern United States. This bird is very adaptable and, unlike most other birds, he has shown a very marked increase whereas, most others have been on a rapid decline as to number. The robin likes human habitation and has cast his lot with ours, for better or for worse.

The adult male robin can be described as having a black head interrupted by a white chin, and a throat streaked with white and black. The back, lesser wing coverts, rump and upper tail coverts are a plain, deep mouse-gray. The chest, breast, upper abdomen, sides, and flanks are a deep cinnamon-rufous. The lower abdomen and under tail coverts are white. The adult female differs from the male in that her head is veiled with brown.

Peterson (1939, p.111) gives the breeding range of the robin as extending from the limit of the trees in Canada southward to Kansas, Illinois, Ohio, Pennsylvania, and New Jersey. The robin winters in southern United States to the Ohio Valley and along the northeastern coast.

As to migration, Barrows (1912, pp. 722-727) states the robin make ob- travels in flocks of considerable size. It is known to pass the and the winter in flocks. The robin begins its southward migration in able for September, but the greater number seem to linger until October. and the These feathered friends, upon their arrival in the spring, begin their nesting activities. In southern Michigan this may begin during the last part of March or early in April. Such an early start, according to Barrows, makes it possible for the robin to have at least two and frequently three broods.

As spring advances the robins begin their wooing. Barrows (1912, p.725) describes this as consisting of battles between rival males. The female shows little interest in the activities of her prospective mate. The male is said to choose the general territory upon his arrival in the spring. The choice of the exact nesting site is left to the female. When the female accepts the territory she automatically accepts the male. Very frequently the nesting site chosen by the male is ignored by the female.

When the robins have chosen their nesting place for the season, the male assumes the responsibility of guarding the domain and does his best to keep away other robins which may seem to encroach upon his territory.

This study concerns the nesting behavior of three pairs of Eastern Robins. The three nests were observed from July 19 to August 5. Each nest under observation represented a different phase of the problem since each had progressed differently. The first, when discovered, had four newly hatched nestlings. The second had four eggs; the third had three eggs. Two of the nests were located to the right of the lower drive; the third was located in Manville between cabins 12 and 14. Since nest one was well along, the writer decided to make observations here relative to the behavior of the parent and the young under different conditions. The second nest was suitable for a study of incubation, hatching, feeding, development, and the leaving of the nest. The third nest was used as a check on nest two relative to incubation.

The season, being rather advanced, made it impossible for the writer to make any observations as to choice of territory, courtship, nest building or actual egg laying. The writer is indebted to the authors listed in the bibliography for the information needed.

The writer wishes to thank Dr. Pettingill for his excellent counsel in carrying out this study.

Location of Nests

The three nests under study were discovered on July 19. There were two nests in the fork of horizontal branches and one nest in the crotch of a tree. Two of the nests were in red maple trees (Acer rubrum) and the other in a beech tree (Fagus grandifolia). The distance from the ground was nine and one-half, eleven, and fourteen feet respectively. The nests which were in the fork of horizontal branches were five and eight feet from the main trunk of the tree. All nests were on the north side of the trees.

Size of Nests

The three nests studied were very similar in size. The following table presents the various measurements taken.

Measurements of the Three Nests

Nest	Outside Width	Inside Width	Outside Depth	Inside Depth
1	5 in.	4 in.	3 3/4 in.	2 in.
2	5 1/2 in.	4 in.	3 3/4 in.	1 3/4 in.
3	5 in.	3 1/2 in.	3 3/4 in.	2 in.

Nest Material and Building

The bulk of the material used in the three nests was very fine roots. These were interwoven and fixed firmly with mud. According to Forbush (1929, p.411) the robin prefers to use moistened coarse straws, twigs, and roots whenever possible. Forbush states that some birds moisten the material before using it.

There is a great variety of material used in nest making. In one nest, the writer found that paper was used; while in the others there was moss and lichen. Just inside the layer of coarse roots and twigs was found a distinct layer of mud. Forbush (1929, p.411) states that the female carries the mud to the nest by using her bill. The bird is said to drop the load of mud, and then plaster it loosely on the inside of the cup. Forbush then observed the female to hop into the nest, settle as low as possible and begin to kick or trample vigorously with her feet. This trampling, together with the working of the bill, does an excellent job of plastering the interior of the nest. The female is said to test the cup for smoothness and roundness by settling to it with her breast. A fine layer of grass is used just inside the layer of mud. According to Forbush, the time required to build the nest is from four to six days.

In the nest building activities Forbush believes the male assists in carrying the materials but does not take part in actual construction of it. (See plate 1)

Eggs: Number, Color, Size

The first two nests had four eggs while the third had three; the average number being given as four. The third nest, being the most retarded, would most likely be the one to have the three eggs rather than the usual four.

In color, the eggs can be said to be a beautiful blue-green. This coloration contrasts strikingly with the brown of the nest.

The size of the eggs varied. The following table gives the measurements for each of the eggs.

Measurements of the Eggs in Two Nests

Nest number	Length	Width	Average	
			Length	Width
1	29 mm.	20 mm.	30 mm.	21 mm.
	30 mm.	22 mm.		
	30 mm.	20 mm.		
	31 mm.	22 mm.		
2	30 mm.	21 mm.	28.3 mm.	20.8 mm.
	27 mm.	20 mm.		
	28 mm.	21 mm.		

It will be noted that the eggs in nest 2 were much smaller than those in nest 1. Besides differing in size they also were much more pointed than were the others. It is significant, too, that there were but three eggs in the last nest.

Egg Laying

Writings state that the first egg is laid as soon as the nest is completed. The eggs are said to be deposited during the afternoon.

Incubation

According to Bergtold (1917, p.98) the incubation period of the robin is fourteen days. Observations made at nests 2 and 3 show the female to do all the incubating. Schantz (Wilson Bull., September 1939, p.159) states that incubation begins after the second egg is deposited. This is borne out by the fact that in both nests 2 and 3 two eggs hatched together while the third hatched a day later. In the two nests having four eggs only three hatched.

Observations at nest 3 showed that the female left the nest most often before 7:30 A.M. and after 6:00 P.M. There was very little time spent away from the nest from 8:00 A.M. to 6:00 P.M. The average length of time away from the nest during the later period was nine minutes while that for the early morning and the late evening was twelve. The female left the nest less frequently on the days just preceding hatching. The shortest length of time off the nest was on the day that the eggs hatched, it being but two minutes. (See Appendix, Tables I, II, and III)

The male was seen but few times during the entire incubation period. At no time was the male seen to feed the female. On numerous occasions the writer heard and saw the male perching in a nearby tree. He frequently drove away other robins which came nearby. Other birds driven away were the red-eyed vireo, black-capped chickadee, and the purple finch.

There is little to report other than the mere sitting of the female on the eggs. The only things which the female did was to turn the eggs with her bill and preen her feathers. On hot days her wings were held away from the body and the mouth was held open.

Incubation ceased in both nests 2 and 3 when the fertile eggs had hatched.

Hatching

The hatching process was observed at nest 2. The young hatched on consecutive days, that is, two on July 21 and the third on July 22. The fourth egg in the nest failed to hatch. The average weight of the young soon after hatching was 6.45 grams.

There were no egg shells or pieces of shells around, an indication that they were either carried away or eaten by the

parent. On at least one occasion the writer observed the female eating a portion of the egg shell.

During the entire hatching period the female frequently lifted herself and looked down into the nest. She frequently moved the young as if to make sure that all was well. It was at this time that the male showed genuine interest in the goings on. His visits became more frequent and he stood nearer the nest than before.

At the time of hatching, the young appeared to be perfectly naked. After the down had dried it was noticed that the dorsal tracts were covered by very fine natal down. The viscera could be seen through the thin, pink skin of the abdomen. The bill was broad, the edges of both mandibles being bright yellow in color. The eye region was dark in color. During this early period there was little response to outside stimuli other than the feeding urge. The earliest attempt to feed was ten minutes after hatching. During the first day the head is kept up for a very short period. The nestlings used their wings continuously as supports and also to assist them to move about the nest.

Feeding

As was already stated, the first attempt made by the young to feed was ten minutes after hatching. The male carried most of the food to the nest during the first day. He did not feed the food to the young but gave it to the female to feed. The female was observed to eat very little of the food during the first day.

Both male and female approached the nest in exactly the same way. Two perches were used in getting to the nest. The first used was the middle crosspiece of the bird tower, and the second, the limb on which the nest stood. At no time was either parent

seen coming to the nest without using the two perches. There was a definite pause between the time the parent reached the nest and the actual feeding. The parent made sure that there was no danger around and also waited for the young to open their mouths for the food.

Observation showed conclusively that the nestling nearest the side of the nest from which the parent came was fed much more frequently than was the other. During a period of three and one-half hours during which feeding was carried on by both parents, it was found that the young nearest the parent was fed eight times while the one further away was fed but twice. In the afternoon the positions of the nestlings were interchanged and a checkup showed that the one which got but little food during the morning was now in the favored position.

The parents generally carried food for one feeding. If the morsel was large, that is, a caterpillar, earthworm, or grasshopper, then only one was carried to the nest. If, however, the food consisted of such things as spiders, mayflies, etc., then more than one insect was taken to the nest. When there was more than one item of food, both nestlings were fed. However, there were times when all the food was fed to the same one.

Another observation was that the size of the food seemed to increase as the young grew. Large caterpillars were fed during the last few days only.

In cases where such animals as the larger caterpillars were being fed, the young birds had great difficulty in swallowing them. In such cases the parent was aware of the situation. The parent frequently removed the worm from the mouth of the young and rearranged it, trusting that that would facilitate matters.

If several attempts were made and the worm couldn't be swallowed, it was fed to the other nestling.

The parents frequently came to the nest without food. It was at such times that the parent used the empty bill to pacify the young. The female did this more often than the male.

There was some brooding done during the feeding period but, when it did occur, it was spasmodic and of short duration. There was no brooding observed during the last two days.

The average interval between feedings recorded over a two day period was twelve minutes. The nestlings at the time of observation were four days old. The rate of feeding decreased during the warmest part of the day. Most feeding was done before 12:00 A.M. and after 2:00 P.M. There was very little feeding from 12:00 A.M. to 2:00 P.M. (See Appendix, Table IV) Rather than continue feeding during the extremely hot period, the female frequently stood over the young. It was apparent that she desired to protect them from the direct rays of the sun.

A definite check was made as to the frequency of feeding done by each parent. Figures show that the female was a persistent feeder while the male was far behind in performing the task. The ratio of feedings of the female to those of the male was 3:1. In day, there

The fecal sac was not excreted after each feeding. There was a definite indication that the parent waited for the fecal sac following each feeding. If discharged, the fecal sac was eaten by the parents in every case.

Growth of Nestlings as Indicated by Daily Weights

A record of daily weights was kept for the young of nests 1 and 2. The birds were weighed each evening at 7:00 P.M. If circumstances made it impossible for the writer to do the weighing in the evening, it was done early the next morning. The

following table shows the weights for the young in nest 2. This nest was chosen since it gives weights over the entire period of growth consisting of eleven days.

Growth of Nestlings as Shown by Daily Weights in Grams

Young	Number of Days Following Hatching										
	1	2	3	4	5	6	7	8	9	10	11
1	7.15	12.35	17.67	24.90	32.00	40.95	48.52	50.13	54.13	52.16	54.65
2	6.85	8.99	14.44	20.66	24.55	35.00	37.44	40.54	46.34	49.81	51.31
3	5.30	5.00	4.63	Found missing on fourth day.							

The figures in the table above reveal some interesting facts. First, the young which was last to hatch did not get the proper feeding and as a result there was a continuous decrease in weight rather than an increase. This shows that there is no attempt made by the parents to see that all young were fed.

Young number 2 was younger than number 1 by one day. It will be noticed that there is a difference in weight all the way along. The difference becoming smaller as the days pass, however.

Further inspection of the Weights show that the greatest increase occurs on the sixth day. There was an increase of 8.95 grams for young number 1, and of 10.45 grams for number 2. This increase is the greatest recorded over the previous day of the entire period of eleven days. This was also the case in the three young from nest 1. There was a distinct drop in the rate of increase when the feathers began to develop.

The average weight of the young birds at the time they left the nest was 54.14 grams.

Plumage Development

The young robin when born had the dorsal portion of the body

somewhat covered with natal down, the ventral surface being bare. On the second day the tips of the feather sheaths were visible just beneath the thin skin. This was particularly true in the region of the manus where the primaries were developing, and in the caudal region where the remiges are found. The feathers were coming out of the sheath on the seventh day. From this day on, feather growth was rapid. The feathers showing the greatest growth at the time the young was ready to leave were the primaries and the secondaries. The tail feathers, although far behind the wing feathers, were next as for development. (See Plates 2 & 3)

Reactions of Nestlings to Stimulations

There was little activity on the part of the young during the first five days other than the desire to be fed. A movement of the tree, limb, or even a slight noise caused the young to raise their heads and open their mouths for feeding. During this time the young could be removed from the nest, weighed and put back into the nest without any trouble.

The eyes began to open on the fifth day. They were not fully opened until the seventh day.

The first attempt to cling to the nest when being taken out for weighing occurred on the fifth day. Keeping the young birds in the nest and on the scale was a difficult task from then on. It was very apparent, however,

The well developed nestlings showed a definite response to the alarm call of the parents after the ninth day. It was found impossible to put the young back into the nest and have them stay there after the eleventh day.

There was a definite attempt to defend themselves shown on the day they left the nest.

Departure of Young from the Nest

The young studied left the nest on the eleventh day. In both nests 1 and 2 the nestling which was the oldest was the first to leave. On two occasions the young was placed back into the nest after having once left but it refused to remain.

When leaving the nest for the first time, the young merely climbed to the rim of the nest and fell. The second attempt found the bird using its wings and gliding rather than falling directly downward. The third and final attempt found the young actually flying for a distance of at least fifty feet. The young of the other nest acted similarly.

Care of Young After Having Left Nest

A definite check was made of the area where the nest was to determine the extent of care given the young by the parents after they had left the nest. It was noted that in both cases both the parents and the young remained in the area about the nests. Feeding was observed. Although the young were old enough to procure their own food, it was apparent that the young still wished to be fed by the parent. The young birds were seen following the parents about with their mouths open and wings quivering.

The adult robins were disturbed by the writer's presence on the fifth day after the young had left. On this day there were no young birds seen. It was very apparent, however, that the young were around since there was definite alarm on the part of the adult birds.

The robin is believed to be a retiring sort of bird, but in spite of it all he puts up a real fight when the young are disturbed. The parents frequently flew directly toward the writer as the young were taken from the nest for weighing. When alarmed

the parents seemed to fly about from tree to tree without knowing just where they were going. They frequently followed each other from limb to limb. There were times when they fought among themselves. At first the parents gave their alarm note for but a short period, but as the days went by, alarm was shown long after the intruder was out of sight. The adult birds followed the intruder by flying from tree to tree along the road.

The robin can be justly proud of himself as a real provider and a defender of his household. The mortality rate is very low among robins. Of the six young which hatched five developed normally and left the nest, but one being lost.

Summary of Conclusions

1. The robin prefers the crotch of a tree or the fork of a horizontal branch for its nest.
2. The nests are of about the same size -- averaging 4 inches inside diameter and 2 inches deep.
3. The nest is made of small roots and mud and lined with grass.
4. There are four eggs, usually. Uniform in color.
5. The eggs become smaller in later nests than in earlier ones.
6. The incubation period is 14 days.
7. The young hatch on consecutive days.
8. The incubation done by female.
9. Leaving the nest is very infrequent during the day.
10. The young are covered dorsally with natal down.
11. The nestlings are fed by the female during first day.
12. The female feeds the young more often than does the male on subsequent days.
13. The approach to the nest is same at each feeding.
14. The frequency with which each young is fed depends upon its position in the nest as regard to position of entry of the parent.
15. The parent bird carries one unit of food if organism is large, many if small.
16. The size of food morsel increases with growth of young.
17. The fecal sac not always excreted immediately after feeding. If expelled, it is eaten by parent.
18. The brooding is frequent during first few days, becoming spasmodic and of short duration later.
19. The greatest growth occurs on sixth day. The rate decreases as feathers develop.

20. The weight of young when leaving nest averages 54.14 grams.
21. The primary feathers show most rapid growth; tail second.
22. The eyes open on fifth day.
23. The young leave the nest on the 11th day.
24. The young are cared for after they have left the nest.
25. The young remain in territory after they have left the nest.
26. The parents feed and protect the young.
27. The robin is not hesitant to go the limit in defending his nest and young.
28. The young are definitely adult in behavior when time to leave the nest is near.
29. It is impossible to keep the young in the nest once they fly or fall out.
30. Robins will feed the young of another nest if they are placed in their nesting territory.

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Appendix



Plate 1. This shows robin nest No. 3 which was under observation for this study. Notice the fine grass used as a lining for the nest. There is one egg less than usual; the eggs being somewhat smaller than usual.

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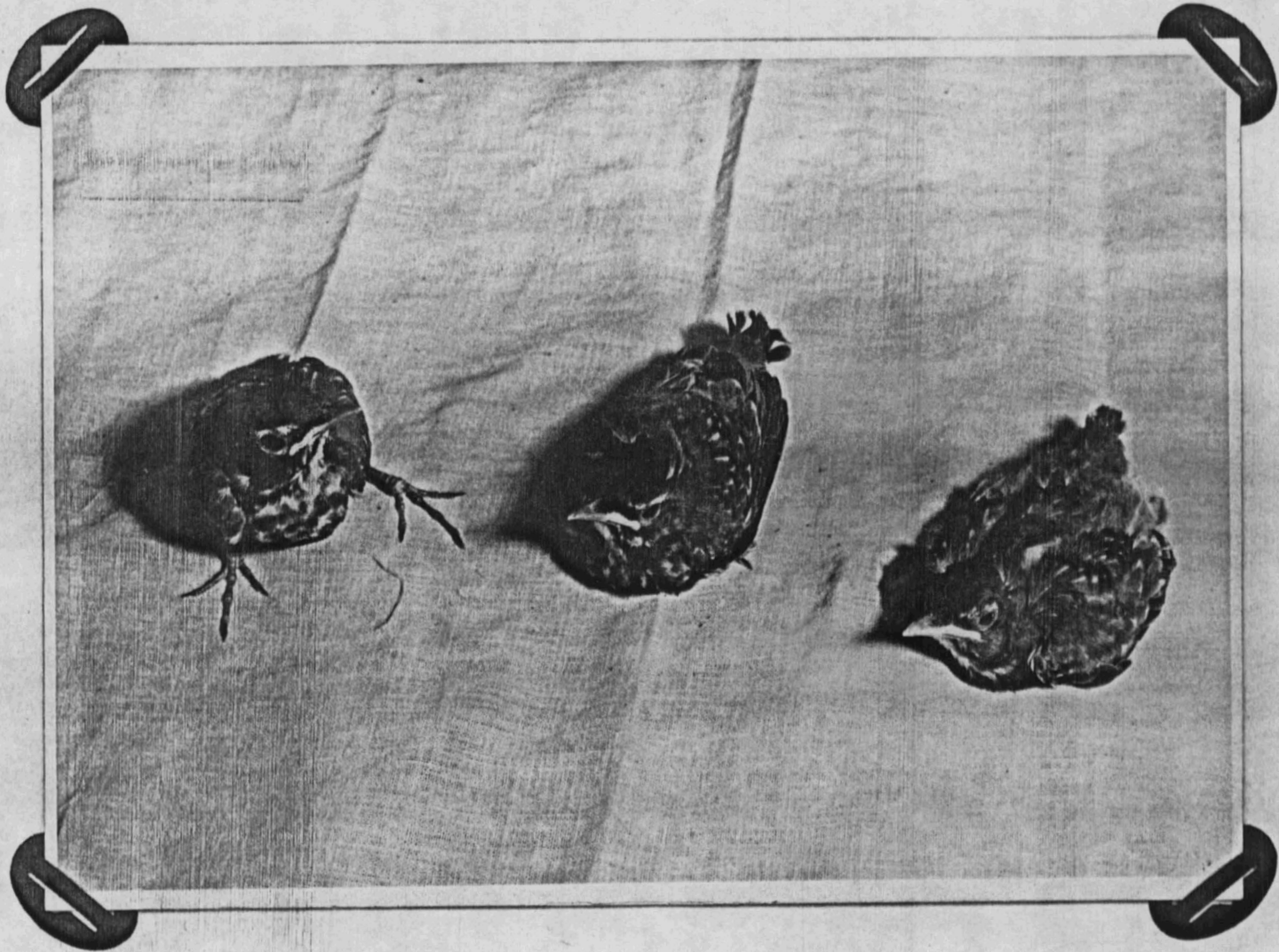


Plate 2. Three young robins taken from nest one included in this study. The nestlings arranged with the oldest nestling to the left; the youngest on the extreme right. There was a difference of one day in the ages of these nestlings.

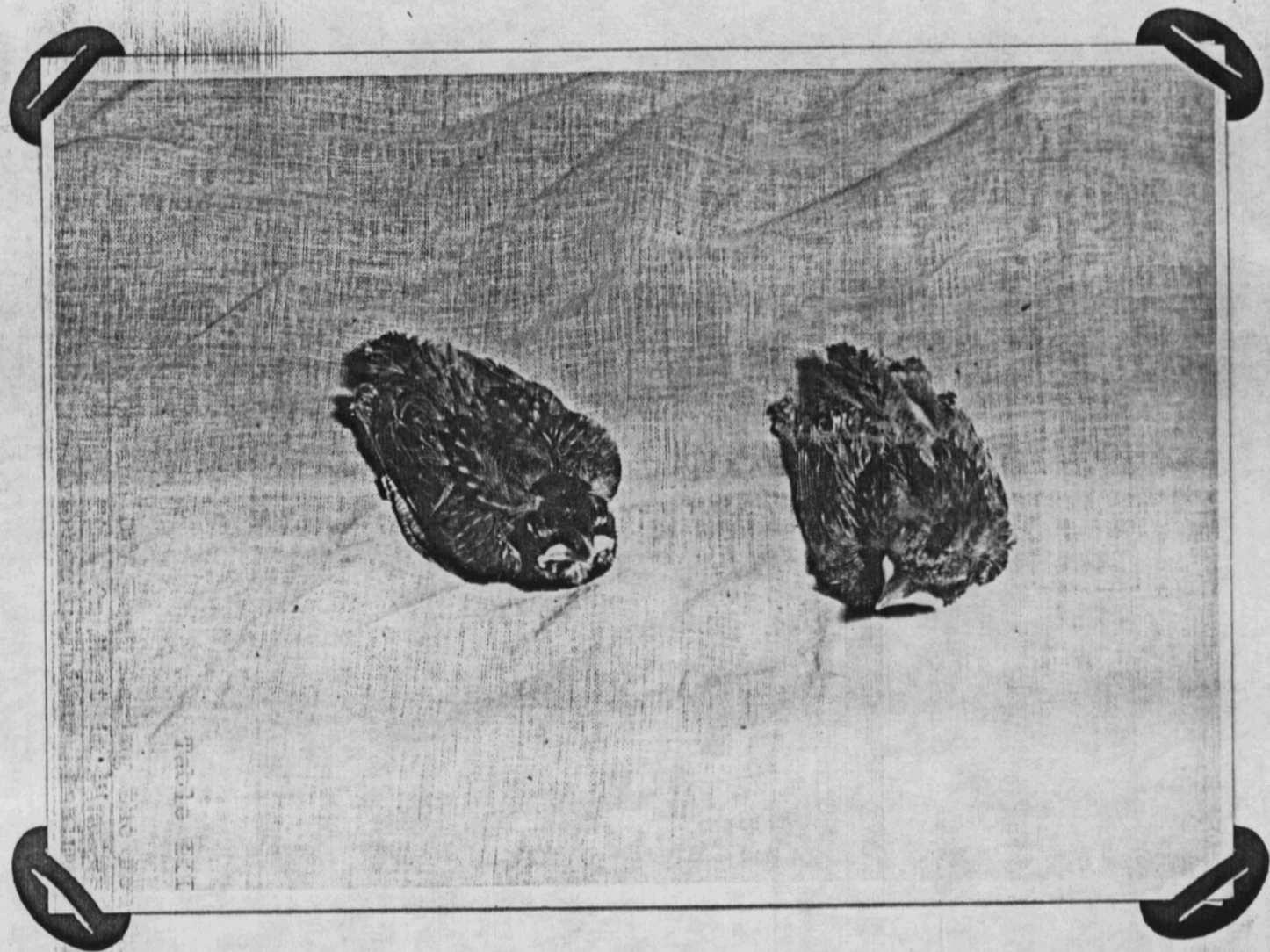


Plate 3. The two nestlings represented here are nine days old, Notice the difference in plumage development of these as compared with those pictured on plate 2. Notice the well developed primaries, the wide bill with its yellow edge, and the poorly developed tail.

Table I

Periods On and Off Nest During Ninth Day of Incubation

Time Interval	Time on Nest in Minutes			Time Off Nest in Minutes		
	Average	Minimum	Maximum	Average	Minimum	Maximum
A. M.						
6:00-8:00	25	21	28	12	5	19
8:00-10:00	49	43	56-	7	5	9
10:00-12:00	45	35	55	10	7	13
P. M.						
1:00-3:00	40	32	48	10	4	16
3:00-5:00	36	32	50	9	8	10
5:00-7:00	31	24	38	12	7	15
7:00-9:00	28	24	32	14	10	17

Table II

Periods On and Off Nest During the Eleventh Day of Incubation

Time Interval	Time On Nest in Minutes			Time Off Nest in Minutes		
	Average	Minimum	Maximum	Average	Minimum	Maximum
A.M.						
6:00-8:00	30	23	37	11	4	18
8:00-10:00	51	49	53	7	5	9
10:00-12:00	46	37	55	8	6	10
P.M.						
1:00-3:00	42	38	46	9	5	13
3:00-5:00	40	34	46	11	9	13
5:00-7:00	33	27	39	13	6	17
7:00-9:00	27	23	31	15	11	19

Table III

Periods On and Off Nest During the Fourteenth Day of Incubation

Time Interval	Time On Nest in Minutes			Time Off Nest in Minutes		
	Average	Minimum	Maximum	Average	Minimum	Maximum
A.M.						
6:00-8:00	40	31	49	8	3	13
8:00-10:00	59	54	64	5	2	8
10:00-12:00	56	52	60	7	5	9
P.M.						
1:00-3:00	52	48	66	6	4	8
3:00-5:00	50	40	60	9	5	13
5:00-7:00	44	41	47	11	4	17
7:00-9:00	31	20	42	11	8	14

Table IV

Times Each Parent Fed Nestlings During a Twenty-Six Hour Period

Time Interval	Total Feedings	Feedings by female	Feedings by male
A.M.			
5:30-6:30	4	3	1
7:30-8:30	8	6	2
8:30-9:30	11	5	6
9:30-10:30	9	7	2
10:30-11:30	3	3	0
P.M.			
12:30-1:30	2	1	1
1:30-2:30	9	7	2
2:30-3:30	12	9	4
3:30-4:30	16	13	3
4:30-5:30	13	10	3
5:30-6:30-	7	5	1
7:30-8:30	4	3	1
8:30-9:30	1	0	1

379. 4 days old.