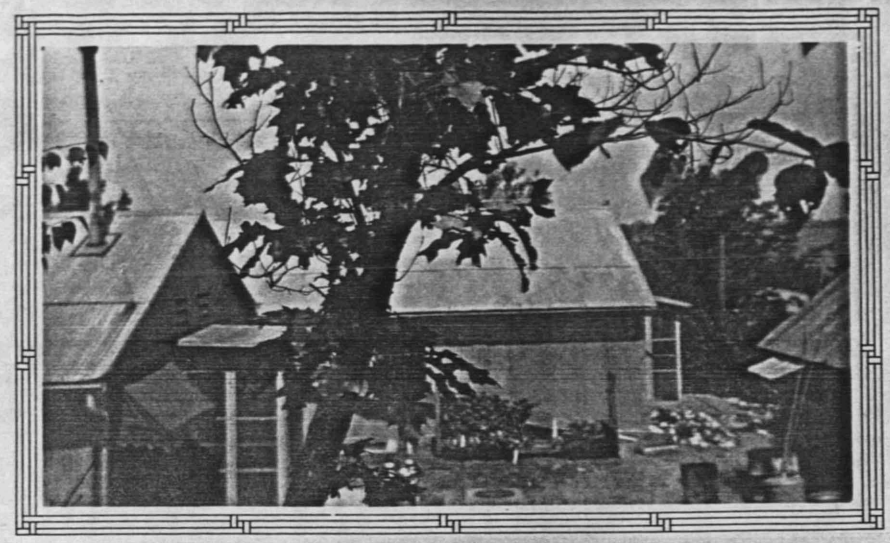
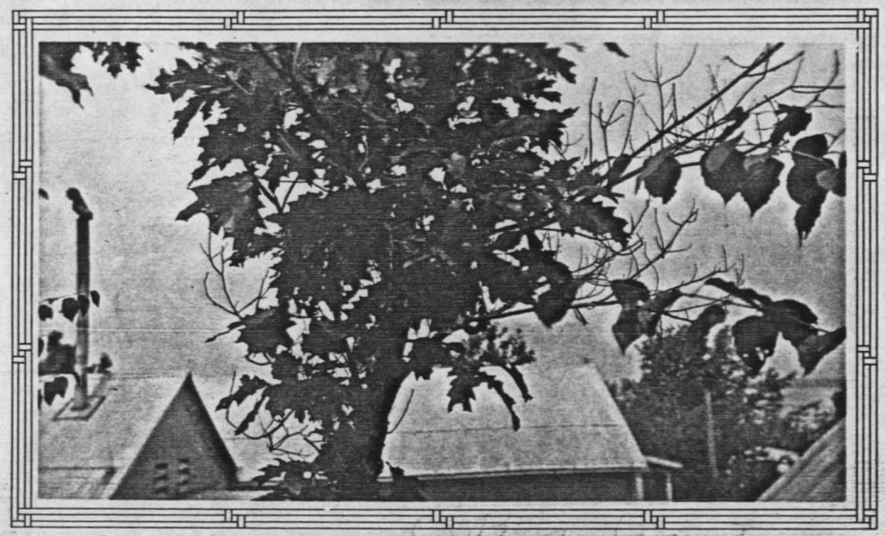
Observations on Robin's Nest

L. L. Zeigbner 1934.
6/27 - 8/9


B.
L.
R.
½ size



Nest.
Neighborhood



[illegible] Bee Hives

The [illegible] nest was well [illegible]

[illegible]

A study of Nesting Habits of the American Robin and other Birds.

The following is a resume of incidents pertaining to a problem on nest-study in which four nests were (partly) observed, to various (various) extents, including three species, the Least Flycatcher, Red-eyed Vireo and American Robin and a study of the nesting habits and young of an American Robin.

After many hours of searching for a Least Flycatcher's nest, it was discovered in the crotch of a small birch tree about 11 ½ feet from the ground, located at S.E. corner of Upper Drive and B Street on June 27, 1934. The small nest was well concealed by its protective trimming of wood fiber and fitted well into the crotch of the tree. It contained four white eggs, measuring 16-13.5, 17-13.5, 14-15.5 and 14-16 mm; ovate slightly pointed. By casual observation the female was not seen around the nest June 28. When the eggs were again examined, June 29 they were cold and were found in that condition for several days. At the time the eggs were measured no note was made of their condition.

At no time during the study of the nest was a female observed in the vicinity of the nest. A male sang daily in a tree just beyond the nest for twelve days and on until July 17. I never learned why the female deserted or what happened to her but later examination of nest found three of the eggs gone, the fourth broken and a cowbird's egg in the nest. The nest was dismantled by one of the members of the class as a part of his study on Least Flycatcher's nest.

Since the male continued singing in this vicinity it seemed probable that a new nest might be established and a further search was made for such. Incidentally on July 6, a nest of a Red-eyed Vireo was discovered directly across the road, (S. W. corner) from the Flycatcher's nest, in a small maple about 13 feet from ground, extending out about half way on a 20 inch limb. It also had a fine trimming of strips of birch bark woven in among grasses, but was destroyed before examined by chipmunks. Partly nest was found below the tree where it had fallen by weight of chipmunks. This nest was observed from July 6 to July 18. It contained four eggs 27 Red-eyed Vireo, 20.2 x 15.5 and 20.7 x 15.2 mm, white, pointed, obtate, small chocolate spots wreathed about the larger end, and two cowbird eggs, white, speckled with rufous, 22.5 x 18 and 22.5 x 17.5 mm. For fear this bird might also desert

the next two a close observation were not made. The female was always at home when such was planned. Consequently when the nest was examined further, the cowbirds had hatched, probably about two days old. On July 12, a Red-eyed vireo hatched between hours of 8 A. M. and 7. p. m. This bird and one of cowbirds was weighed measured and tagged with a strip of adhesive tape on leg the evening of July 12. On July 13 a chipmunk was scared from the tree after it has killed one cowbird. July 14, either the other vireo egg hatched or the tagged vireo lost its tag since the bird in the nest was not tagged and a greater half of the shell of vireo egg was found below the nest among the bushes. That evening the two remaining birds, cowbird + vireo were measured, no parents were around to call at time the young were removed or replaced in the nest. Both had been present at other times calling a nasal, catlike call "pleee" coming as close as six feet. The cowbird was so large that it alone filled the nest, the young vireo needed only a small fraction of space occupied by the former. The evening of July 15 an inverted, screen collar was placed about the trunk of tree 8 feet from ground.

chipmunk destroyed either a vireo egg or young

When the nest was examined the next evening it was empty. A nesting vireo was found in leaves below, its neck chewed. I saw a chipmunk jump from branches of a nearby tree, stop only a second when called at, and race on up into the next. I shook the tree till he came down but the damage had been done previous to that.

| P. E. Vireo | 7-12 | 7-13 | 7-14 | 7-15 | 7-16 | 7-17 | 7-18 | 7-19 |
|---|---|---|---|---|---|---|---|---|
| | 7:00 p.m. Hatched Between 5:00 & 7:00 p.m | | | | | | | |
| Length | 36 | 41.5 | 44.5 | 46 | | | | |
| Weight | 2.37 | 2.54 | 3.26 | 4.45 | | | | |
| Tail | none | 0 | 0 | 0 | | | | |
| Bill | 3.5 | 5.25 | 6 | 5 | | | | |
| Bill-Gape | 6.25 | 8.5 | 9 | 7.5 | | | | |
| Bill-Nostril | 2 | 4 | 5 1/3 | 4 | | | | |
| Eye Drain. | not open | 0 | 0 | — | | | | |
| Extent | | 0 | 40 | 44 | | | | |
| Wing Rt. | 7.5 | 19? | 9? | 9 | | | | |
| Primary | none | | 9 | 1 mm | | | | |
| Tarsus | 7 | 7.5 | 8 | 11 | | | | |
| Mid Toe (R) | 5.5 | 6 | 6 | 7 | | | | |
| " " nail | | 2 | 2 | 2.5 | | | | |
| Bill Eye | 6.5 | | 9? | 7 | | | | |

| Cowbird | 7-13 | 7-14 | 7-15 | 7-16 | 7-17 | 7-18 | 7-19 | 7-20 | 7-21 | 7-22 |
|---|---|---|---|---|---|---|---|---|---|---|
| Length | maybe 24 but 36 or 48 61 | 74 | 78 | | | | | | | |
| Weight | 16.18 | 21.99 | 26.92 | | | | | | | |
| Tail | frayed | 1+ | trace | | | | | | | |
| Bill | 7.75 | 9 | 10 | | | | | | | |
| Bill-eye | | 14½ | 12 | | | | | | | |
| Bill-nostril | 5.5 | 5.5 | 6 | | | | | | | |
| Eye Diam | | 2 | 5 | | | | | | | |
| Extent | | 122 | 148 | | | | | | | |
| Wing RX | 16.5 | 13 | 23½ | | | | | | | |
| Primary | 4.75 | 9 | 10 | | | | | | | |
| Tarsus | 28. | 17 | 27 | | | | | | | |
| Mid Toe R | 8.5 | 15 | 16 | | | | | | | |
| " " nail R | 3+ | 3 | 4 | | | | | | | |
| Bill Gape | 17 | 14½ | 14½ | | | | | | | |

Puffy eyes 2 days old when found
Wing gland

A third nest observed, robins' nest located on East side of C street between State and upper road was discovered 7/17 about 9:30 a.m. The nest, in a small tree, 3 feet from ground, contained two eggs which were reported to have been laid since 7:00 p.m. 7/15. These eggs were numbered 1 + 2 to distinguish them from any others that might appear in the nest. 7/18 9 a.m. another egg #3, was found in the nest. When nest was observed about 7:00 p.m. that evening, two of the eggs, #2 + #3 were found to be pierced, destroyed by some one. Since this nest was about 125' from a wrens house it was thought possible that the wrens had destroyed the eggs. I do not know who did it.

Robins had built a nest on upper drive about 30' across from the kitchen door-yard, in a small oak, on edge of hill-terrace, by the ash-pile about 5 feet from base of tree. One egg was laid before they deserted the nest. 7/18 the nest was reported in use, containing 2 eggs. A robin had adopted this old nest, plaited a new bottom of grasses in it, covering the egg of other occupant, and laid two eggs in it. 7/19 I placed egg #1 from the first robin's nest in which the other two eggs had been destroyed in this nest. The egg remained in the nest, the young hatched.

The nest was well supported by small branches of tree extending to left + right sides, saddled + fastened by mud on a small front branch reclining against the trunk. As a whole it was well shaded for about two hours. In general this was a very noisy, disturbing location, people coming + going from kitchen, along the road, delivering milk, wood-chopped, and ashpile used, especially noisy in early morning, noon and late afternoon. The eggs were measured and numbered B 1 + 2. measuring 31 X 21.5 mm and 31 X 22 mm respectively. Egg from first nest A 1 measured 36 X 21 mm.

The nest of mud and grass, feathers and [illegible]
inside depth 1½", outside 4¼"; inside diameter 4"
and outside 6½". No special observations were
made during incubation period for fear the
parent would desert the nest, unless the
♀ was absent from the nest as happened at
time eggs were measured. The male seemed
to be at hand in the territory sometimes. I
heard no singing and had not made any
note of such there necessarily prior to the
time of observation of nest. Last observation
of eggs made about 8 p.m. 7/27. Because of close
and fact that female s tayed on nest next
evening no observations were made until about
6:20 a.m. 7/29. Two young had hatched, one
decidedly older than the other, by weight
10.47 and 7.51 grams respectively, eggs of parent, B1 & 2.
7/30 the adopted egg hatched, A1.

A tent blind was set on hillside about 4:45
p.m. 7/31 about 8 feet from nest; the slant of the
hill was such that the eyes of an observer
setting in blind were practically even with
nest so that there was a fine view at that
distance of activities of nest. The opening in
front of blind was adjustable by flaps, around
6" or less if desired. The back was not entirely
closed and there was a small slit on right
hand side, not enough to see out to
observe neighborhood of nest.

Entered the blind for a few minutes 7/31 4:45
to trust out. A robin was much disturbed at
this new addition near the nest. Within 5
minutes the loud squeaking had given place to oc-
casional soft chuckling. Within ten minutes a
robin flew to the limb at right of nest for several
seconds investigating the blind, then flew away. At
5:00 the robin flew to the limb again but was frightened
away by a truck passing on the road below the nest.
5:15 a parent came with food, insect, looked like a
member of grasshopper family (legs & wings), looked at
the blind, flew away without delivering the food.
The blind was not comfortable and everything I
moved a robin in a tree at right of blind
squeaked. A number of times in that half hour
the young lifted their heads and opened their mouths.
At end of 35-minute period I left blind so that the
food could be delivered, also with idea of making
blind more comfortable. Between 6:45 & 7:15 p.m.
a comfortable seat was excavated in the hillside

with foot space and blind supported by
A frame thrown over it. The young were
measured and weighed that evening.

Notes. Observations 8/1. 7:45 - 11:30 -
The real observations of the robins' young &
nest activities began 8/1 7:45 a.m. The young
were 96 - 72 and 48 hours old respectively, the
difference noted in size to a great extent,
especially between the 96 & 48 hour young.
In addition to the usual morning disturbances
of the vicinity my presence in the blind did
not help matters any. Entered the blind 7:47,
neither parent was in vicinity from standpoint
of noise, not a sound was uttered. It was cool,
maximum & minimum temperature being 80°-50°,
no sun reached the nest; blind was not comfortable
without a blanket covering. The little mouths opened
when I heard no noise except my moving in
the blind.

1- 7:56 A parent came with food which she gave to one
(couldn't tell what it was, parent had back turned
toward me); disposed of food quickly, she picked at
nest, settled, I moved in taking a note; a minute later
she was gone, a noiseless flight, then a soft cluck,
cluck by side of blind.

For fifteen minutes a boy scrubbed windows
and much disturbance of people coming & going.

2- 8:22 I heard a soft cluck; young lifted body and
heads straight up, mouths wide open, a series of
"paper" bags" of three sizes. 8:30 a parent brought
food, flew to nest, hurriedly gave one an
insect (grasshopper?) placed bill into mouth of another
but gave no food that I could see; looked around
cautiously, turned, looked straight at me, flew
toward me, then darted & fluttered aside noisily,
a fine challenge I accepted.

3- 8:44 A parent came direct to nest from left, avoiding
seeing me, with poise placed food (roll of something)
in an open mouth, settled on nest at at angle
facing me and food (?), remained about 4
minutes, left when I wasn't looking & I didn't
hear her. (Too cold to sit comfortably in one position,
the wind blew the leaves and twigs about me.
The wind blew the leaves and twigs about me.

4- 9:04 A parent came directly to left side of nest
looked my direction a few seconds before placing
food in a mouth; all mouths open, the highest
one received the food. Settled on nest for a minute,
pecked at me, then left from right side of nest.
Didn't hear any sound from parent but noise of
a fighting on edge of nest caused heads to pop up
and spin like so many Jacks-in-a-box.

5- 9:23 A parent came to limb on right of nest,

paused a second, then to a branch behind, partially hidden by leaves, then to left edge of nest to place a large insect sp? into smallest mouth which happened to be open. Removed excreta from one, picked at nest, settled at an angle →, rested 10 seconds or so, stood over nest, picked at it again, settled with back to me; left quickly at right, visit of one minute.

6. 9:31 A soft cluck on right limb; the worm wiggled in bill, around to back, then to left; all heads up, mouths open, food into highest; placed bill in mouth 3 times; did not linger but hopped to right branch and away

7- 9:40 A parent brought food, sat on limb at right of nest, clucked several times, flew away; (someone talking at kitchen door for two minutes) Bird came back immediately after person left, by same route, clucked several times, paused; placed food in a mouth 3 times before leaving it, looked like a wrapped ?; likewise placed bill in mouth of another several times. I could see no food distributed that time; nearest received food, had mouth open; much disturbance at kitchen door. 9:49 heard cluck of a parent, also at 10:00; At 10:10 heard soft cluck of a parent, a head popped up, mouth open, but went down again.

8. 10:10+ Parent came in from left, entered, gave food to nearest. Picked insects from nest, picked up a black feather about 1" long, swallowed it; placed her head down in center of nest among young, bill in nest and shook vigorously. Immediately all the mouths opened about her; looked around, paused several seconds; someone came on porch; she made a hurried departure.

10:17 Much soft clucking from a parent nearby, but someone at door below.

9- 10:25 Parent came to right, flew away, back quickly 10:27 a grasshopper-like insect, placed food in mouth to her right; grasshopper went down throat middle first; did not take wings, just legs; removed one excreta, swallowed it, looked at me; flew a longer distance from nest; all in less than minute.

10. 10:34 Parent stole in quietly and quickly from left; saw an insect go down a throat; removed one excreta. I saw an ant on a leaf by nest; the parent must get ants sometimes when she picks about the nest; placed her mouth in a throat after picking around nest; inclined her head, listening like, picked, shook nest with bill 2 or 3 times; settled on nest, back to me for few seconds; flew as a truck came by. Nest still was well shaded & cool

11.
12. * 10:46 Heard cluck of parent. Between 10:46 + 10:48 both parents came to nest one after other, remained together, brought food, sat on edge of nest together. + first parent came to R - then B + L. paused between steps, placed an insect in one mouth, something in mouth of another and something green in the third; the other parent came in directly from left, placed an insect in mouth of nearest and flew away. First then removed one excreta, distributed, evidently removed vermin from nest, fluffed feathers, sat on nest facing me, then turned about facing the street - A noise below frightened her away; stayed 2 minutes.

13 - 11:04 Adult came to R branch with insect; car stopped, flew away with soft cluck - noise. another truck came up; 10:07 parent came without any noise paused a few seconds, then to left of nest; largest young got food (insect) - someone came to door below; parent hopped two steps out on branch, then away; size difference of mouths noticeable.

(note 10:40) I had wondered if both parents were feeding young or when or was since I couldn't tell whether parent coming to nest was either parent by color. Called one of females of maternal characteristics, the other which came + went a>. noticed a speck of white on forehead of one designated as ♀. Both parents are feeding one more often than other; maybe other watches, otherwise (who yells out when I sometimes make noise in blind!

14. 11:13 Adult came, placed food in mouth as I looked but couldn't tell what it was. Removed excreta, flew from largest "a". settled on nest 30 seconds; truck came, sat on nest with bill at quite an angle (Parent always sat on nest with head cheek at side of blind but men were talking down below. (head up).

15 11:17 Head down below.
11:29. Parent came from left noiselessly + was on edge of nest feeding when I looked up. I saw two fed but what's picked at nestlings + nest, hovered, got up, hovered again, removed two minutes (100 counts). Someone came to porch, she flew

16 11:32 Parent came R B2 with large green, rather hairy caterpillar. Tried it in one mouth about 3 times, tried another 2 times, finally got it in. Too large to handle well; removed one excreta, started to settle on nest when someone came from woods above, frightened her. 11:40 a ray of sun shone in. Had been very cool. 11:41 heard cluck of a parent.

17 - 11:49 a head up for food; parent came quietly, fed one, removed excreta, hovered for ½ second, out right side.
11:50 I left for lunch. No noise from either parent. I left to blind. Were they present?

2 Observations taken p.m. 8/31 12:20-

Returned to blind 12:25 after 35 minutes absence. No disturbance from either parent not there or did not recognize me. A chipmunk made a noise.

1- 12:26 ♀ came with food so quietly I did not know it until I heard cheep of young with mouths open. Fed one, removed one excreta, picked at young, placed her bill in one mouth picked at nest, settled at one side with mouth open. Remained 9 minutes standing to one side most of time; sun shone on nest.

2- 12:35 One parent left ♀, the other came in ½ minute; insect (maybe grasshopper, could not see well); chuck and a mouth came open; tried two times before placing food in throat; removed 2 excreta; waited by nest an instant, flew out on limb and away.
12:41 Sun shone on young; they did not seem to mind it. I left blind for 5 minutes 12:45-12:50. A robin passed. When I left and gone several chucks when I returned.

3. 1:07 Adult appeared at right, no noise, white larva; rested on farther branch, looked at me, flew to nest, deposited larva in a throat about 3rd trial, removed one excreta; picked at nest for insects; settled on nest for 2 minutes; I moved, she flew.

1:15 Heard chuck of an adult; came in R B L. paused each time, entered quickly, brought a dark insect, tried it in each throat 2 times finally placed it in that of largest, "A"; waited a second, hopped to right branch, waited again, looked about, flew around back to the left side.
1:28 One young was lying with head resting on edge of nest.

5. 1:30 Adult came to nest L, with grasshopper, tried it in each throat 2 times, finally deposited it in that of largest, looked around several times, out by right side.

6. 1:31 (another or same) parent came with worm, 2½" long, slender, resembled angleworm; placed it in throat of two finally left it in throat of one of smaller. Removed one excreta; picked at nest, stood at edge, watched me at blind; mouth open, so warm, but not much sun striking nest. Little ones cheep, mouths open for food; 1:35 dug in nest with bill, picked at mouth of one young; flew away 1:40; remained 9 minutes; left nest by left side with several chuck-cacks.

7- 1:41 Parent came directly to nest from left with a grasshopper, tried it in mouths of two alternately, finally left it in one; truck came up, bird flew away quickly. 1:55 I heard chuck of an adult in tree nearby.

8- 2:00 Adult returned, with two worms (look like angleworm from size & shape; tried one in mouths of different young several times, finally leaving it in mouth of another worm was placed in mouth of another, remained around a few minutes picking at nest, sometimes

standing over to shield from sun; mouth opened;
stood by nest with back to sun; at 2:20 kitchen door
slammed, bird left; 20 minutes visit.

2:25 Parent arrived with insect (can't see all of it); hit on branch R,
paused, B, paused, to nest, all mouths were open; tried it in
2 mouths alternately 3 or 4 times each, finally gave it to
"B"; removed 1 excretory sac; hopped to R limb, paused,
wiped bill, looked at blind, flew away - ½ min.

2:34 Parent came R, B, L, paused between steps, looked at blind,
deposited a worm in mouth of middle one; picked
around nest, looked it over; truck passed; bird
left about 2:41; 7 minutes.
2:55 No disturbance lately; nest well shaded.

3:03 Sound of wings - paused at R - left entrance,
(maybe a grasshopper from looks of legs); placed
food in mouth of largest without hesitating; re-
moved one excreta; inclined head to listen;
picked around the nest; 3:10 adult placed bill in
bottom of nest & shook it; 3:12 I wiggled, bird flew.

3:18 Flutter of wings, R, B, hidden by leaves, L. → brought a
grasshopper (maybe 2, can't see so well) at least he
fed 2 birds with parts of it; tried it in mouths
alternately several times in 2 larger mouths
when finally the insect broke apart; flew directly
away.

3:18+ While he was feeding ♀ came with insect and
gave it to one of smaller. Lingered about the
nest a while. (See time during day that both parents
appeared at nest, almost together.

3:25 ♀ came to nest from left, paused on a branch then
to nest with an insect or worm, (well mashed at least)
gave it to one of smaller. Pecked around nest, left
when someone went by below.
(The young moved about in nest, opened mouths
when the brushed against each other (no eyes open yet);
lay with head resting over rim of nest; I expected them
to fall out any time another wiggled vigorously) about 3:3
much noise in kitchen, coming out etc, 3:40 I heard
one "tut" from parent robin; 3:49 young restless.

3:50 ♀ came to nest, R B L, gave food to the "little" head up,
mouth open (not necessarily the highest this time). Removed
1 excreta, picked around nest; shook the nest with bill;
picked around bodies of young; sat on edge of nest, picked
listened, meanwhile the "cheeping" young held

heads up, mouth open. Left nest 3:57.

16. 3:58 ♂ came R B L. with 3 larvae or parts 1½", had trouble trying to fit into a mouth - tried ½ or 3 times each, of 2 largest mouths before coming in or then picked up a green one (dropped) and crammed in into a throat, then a brown one in same throat as far as I could see; little one not fed very often.

17. 4:15 ♀ came R B L; did not hesitate with disposing of food, larvae or worm 1½" l. (wiggled) placed it down throat of one of large; immediately removed excreta, settled on nest; left while I was taking notes; remained a minute +; (when parent lit on branch to enter nest I heard no vocal sound but all mouths popped open.

(Note - See page back Incubation E/5 con.

5:48 Immediately other parent came with mouth full of larvae. Cautiously - moved around to nest clucking; mouths opened, little and another; but food placed in mouth of other, a green larva + some inner parts of it; 1 excretum removed from young. Parent settled on nest 5:57 & sat on edge of nest then flew when door was slammed below nest. I left at this time for half an hour.

— Exit —

6:30 When I came to get birds to measure + weigh them a parent was on way to nest with a large green larva; much disturbed at my presence. I left smallest young, suppose it got the food. 7:10 the two larger birds were placed back in nest; & flew off nest as I returned birds, only made 2 low purts, purts, sounds.

7:14 ♀ went around nest left, back, right, come in looked nest over, hovered young, brought no food that I could see 7:20 ♀ gone without my knowing it, noise in kitchen, at door etc. 7:23 too much noise about the blind.

7:30 ♀ brought food to left side of nest, I got in on disappearance of food. Could not see who received the food. may also have disposed of fecal matter. Settled on nest, head so placed that she faced me + street at angle; stood on nest, pecked away.; 7:38 on edge of nest - hovering young. 7:41 I moved she flew - visited 11 minutes. 7:44 ♀ back again, no food, settled on nest. 7:54 noise above, ♀ flew; getting dark; 8:03 ♀ had no returned; 8:09 ♀ returned - no food; disposed of 2 excreta, settled on nest. 8:15 too dark to see, I left blind.

#

3-Observations continued Aug. 5 beginning at 4:25 a.m. It was still quite dark as I came thru woods 250' or so, approached and entered blind without hearing any disturbance or sign either parent in vicinity of nest. I flashed a light on nest, just nestlings there, no sound from a parent. It was cold - temperatures for that day, 7 37 - 5 27 max-min. I heard only a nighthawk calling before 4:30. About 4:30 heard a distant robin singing. 4:45 begun to get lighter, heard a chewink from hill. not a sound in vicinity of nest. Heard a distant whur of brown thrasher - 4:50 the robin, chewink, towhee and thrasher make noises or sing together. 4:50 heard first cluck of robin, flight of wings,

coming from direction of beach over the kitchen, then away again

1. 4:55 Both parents seen on a limb by the nest; Robin has food in mouth; moved around on limb looking toward me. called until a chewink came to join his noise. I closed blind except a crack; in several seconds the parent flew back around to left from right; clucked some, looking at me, hopped up to nest, placed insect (?) down a throat, removed a fecal sac - sat several seconds by edge of nest (noise below); hopped to right limb & chuckled several times, flew to a tree to right of blind + gave excited but lower tone calls.

2. (5:05) A whirr of wing across opening of blind, bird on back limb; no noise; disturbance below, bird flew back to left; another whirr of wing on another branch, looked toward blind. (Boy cutting kindling) the low

2. 5:16 A robin flew to nest with food; fed one young; waited about three seconds, flew away (Too dark to see kind of food) other robin - was still in tree at right of blind, could hear chuckling sound, softly, listening - like.

3. 5:12 Whirr, to edge of nest fed 1, removed excreta one, left. Liquid food once before having it in mouth of young. Not light enough to see kind of food.
5:18 I - moved in blind (cold) as noise came from a robin near the blind, watching.
5:25 I heard person entered kitchen in 2 minutes.

4. 5:22 Food brought, 1 excreta removed; all mouths opened; much chirping but parent placed food directly in one mouth.

5. 5:29 Other parent flew to nest with back to me; could not see the food; fed one; paused several seconds watching blind, flew to right, paused, looked toward blind, then away. The largest + middle sized young stood highest in nest, the higher head received the food.
5:32 I moved in the blind, heard several notes from a parent at right (a small hole in blind); so he is near. I can't see around the blind but I'm sure there must be one robin near the nest

5:42 Louisa or angleworm brought by ♀. Did not necessarily feed highest mouth this time, all mouths open, chirping; one head was never covered. ♀ hovered for several seconds; fully expected one to go overboard; ♀ did not attempt to tuck the one under but tried to cover by moving her body over it. Frightened away by some one below; left nest from left side - 5:48

Am. 8/5 cor

7 - 5:51 Where of wings directly to left side of nest, placed bill in a throat, could not distinguish the food; placed bill in another mouth; did not see any food; wondered if any were given. Removed, excreta; flew away at light 5:53 the sun coming up at night. Has been too dark to see food. I moved in blind, robin called cluck I outside.

8 5:59 ♀ came, fed longest, removed, excreta; picked at nest, shook ~~litt~~ with bill, settled on nest. Stayed one minute, frightened away by someone below.

6:03 Cool; some small young shivering.

Note (I wonder if all food so far has been larvae or worms. Too dark to find insects + not many out this time of day. I watched a robin get angleworms out of ground the other day. Hopped a few feet, cocked head, placed self and pecked vigorously at ground. Got one, I do not remember what he did with it (eat or carry away); did the same got another, hopped several feet away, got another; had to pull hard to get the third; had two at once and really did not seem to know how to handle them, each about 3 or 4+ inches long; he beat them against ground several times, tried to get both in his bill at same time. I'm not sure that he got any, far with both. This was about noon, air moist, ground also moist.)

? Where are earthworms here? What are they if not? They are long, slender, fairly large, curl much when held in mandible. Where get large bottle still dusky out?

6:11 Another bird discovered my blind and chipped awhile; kingfisher passed over; heard Ravines and wood pewee singing.

9 6:13 ♀ brought food (~~long & thin worm~~) think longest seems it; worm disappeared like lightning. Much chirping and opening of mouths; one excreta removed. Parent picked about nest, settled on it forcing mouths hovering open mouths. (I only know this to be ♀ from maternal characteristics; too dark by yet to see the identification marks I used to distinguish between parents.

Note - I moved about in blind, caused much disturbance to see what effect it might have in neighborhood. Not one recognition note such did I hear, no note from robins. There must be times when neither parent is in neighborhood. Maybe the parents linger about nest a few minutes after feeding only. I noted that when I came after birds (Thurs. eve.) and when I returned them after weighing, etc. there was no note from parents. Later I come + sit. Night one parent was there, giving two chucks; parents were around when I came back. Believe I flew off nest; they made very little noise. I think

Aug. 5 6:18 - attempted 5 minutes; bird hitched away by shouting 7 a.m. Later blind chuck? Robin by blind. Think she did not go for.

P.M.

18. 4:18 ♂ came in from left, clucked two times, mouths opened; he placed an insect (diptera) down a throat, not hesitating; looked around, paused and flew out from left side.

4:27 - 4:30 Two people talked below nest, on roadway

19. 4:31 ♀ came (RBL) with food, may have been a grasshopper without legs; clucked twice, mouths opened; the smallest first but she gave it to largest, head first removed, excretion; pecked at nest, hovered the young, 4:35 everytime I pecked she moved a little. 4:34 disturbance below, she left nest; stayed 8 minutes

A car stopped below (4:42) rattle ♀ came, young opened mouth 4:45 heard cluck-, ---,--- ♀ parently in slightly disturbed tone, truck and boys still below.

20. 4:47 Cluck - at left, ♂; 2 or 3 larvae (green (1 or 2) brown), two largest were fed; tried 8 times before releasing larva; parent had a mouth full; parent hopped to limb at right, paused, looked around, flew away 4:50.

4:52 - 5:04 Disturbance below, carrying cows, stoking, throwing into box. 5:06 Saw a robin hopping in road below nest; 5:08 little ones have been rather quiet in nest; cool!.

21. 5:10 cluck, ♂? came with angle? worm; little one opened mouth for it but he gave it to largest; one excretum removed; flew away at far right.

22. 5:11 Immediately a parent came with a cricket to left ♀ nest, which after 3 attempts was placed in throat ♀ (youngest) least; the parent placed insect in mouth ♀ least 2 times, in largest once before giving it to least. Cricket broke apart, parent fed both parts to same young. Picked up waste (?excretum) This parent hurried about work at nest so much that I suspected it was ♂ also ~~ok~~

5:14 - 5:19 Disturbance below; talking, rattling cows heard squeak ♀ a robin.

23. 5:20 ♀ came quickly, one cluck, a black larva given to one young; excretum removed; pecked at nest, settled on it in so many seconds. 5:25 still on nest pecking + digging, shaking with bill, moved about on nest, sat with back to me, then turned about facing me; shook nest again; never remained sitting on nest for a few seconds at a time; left nest 5:34 - remained 14 minutes.

5:40 heard a chewink near field and a robin scolding tu-tu-tu-tu-tu. 5:45 Heard excited squeaks ♀ parent

5:47 ♂ came with mouth full of food; little one + another got larvae, excreta removed; flew to a limb at right, then away

they have been predators
to young and remained quiet but there were
times when they made much disturbance
especially if young cheeped. 6:33 no sound of robin
6:42 disturbance below, no sound of parents
around; 6:48 heard sound from a parent.

10. 6:50 ♀ brought (worm tied) (angleworm) to one (smaller, farthest down);
removed 3 excreta from young; gently picked at
nest, looked around for few seconds, hovered on nest
→ (the parent came in so quietly, I wasn't looking
but heard cheep of young. I saw worm going into
the throat of young. Looked head at a sound from
chipmunk but went about business) Stood above
nest, picked again; shook it up with bill.

11. 6:55 ♂ brought food; back turned to me, I could not see what food.
♀ departed as ♂ sit. Believe "B" middle one got one food
in businesslike manner, no hesitating. Parent lingered about
two seconds, looked at me cautiously, I started to
write notes, he hopped to R limit, then into road, & away.
(Parents seem to have no trouble in disposing
of food this a.m. Only once did I see a parent
try food in a mouth 2 times to dispose of it.
7:12 I adjusted blind, parent squeaked 3 times

12. 7:15 ♀ came, fed 1, removed 1 excreta; picked at nest,
hovered the young; they were restless, she stood
over them.

13. 7:16 ♂ came, back to me, I could not see food; looked
toward me, flew out sight and around nest, looking
at me. ♀ still at nest - Restless; mites the answer; looked
toward me when she sat on nest; picked at young,
shook up nest with bill; hovered again; walked on;
(She knows every move I make. 7:20 a truck came
to kitchen; ♀ flew. (First time today that a parent came
R B L to enter nest. Both have entered from left, so
quietly that unless I was watching I only knew by
cheep of young after parent had reached of nest to give
food! Most of time parent gives no sound of voice
at approach to nest. Before I knew parent was
around once, I saw 3 heads stretched into air,
mouths open, then ♀ sit on edge of nest. Did they know
she was near? Did they hear a sound I didn't hear?
Very cool this am. young shiver in nest. The youngest,
adopted is growing slowly, not up with others
at same age.

7:40 heard cluck of a robin; truck still below; men talking

14. 7:41 As truck left a parent flew in with insect (grasshopper
maybe, just see legs; that it might be a June bug too). Tried it several
times before leaving it in a mouth, 2 excreta removed.

15. 7:41½ other parent came (♀); I did not see the food but I'm sure
there was some. 1 excreta removed; picked at nest & young,
young cheep much; hovered them; 7:47 I moved, she flew.

16. 8:10 ♀ came; one cluck and mouths opened; food to one

and 5/5 removed excreta from 1; peered around nest, hovered them for less than minute.

8:27 heard the chuck of a robin by blind; noisy rotat

17. 8:30 A parent arrived, at left, with grasshopper; body seemed to be placed in throat first; had a time getting it in; tried 3 or 4 times. think 1 excreta removed; bird had back to me, couldn't see so well. 07 has a habit of coming to nest in front of me so that I can't see; immediately turned around & flew out left.

18. 8:31 ♀ came; 2 brown woolly larvae; placed one in a throat; one spilled in nest, picked it up and placed it directly in another throat; removed excreta from 1; picked at nest, lingered, looked at me; hovered, stood on nest & pecked around. Hung in nest with bill, shaking it. 8:35 hovered again, setting at angle →; disturbance below - flew 8:35½.

19 8:47 Food came; didn't see until I heard young chirping; looked up and saw parent swallowing (?) picked at nest, hovered; 8:50 someone below, she flew.

9:00 Again I did not see the food; 2 excreta removed; picked at nest, remained a minute, gone, (someone came in driveway below)

9:03 07, 1 green larva; RBL not first had up got worm, but one of larger (a or B). One excreta removed from "C" gone; all this took place in about ½ minute.

(Eyes of two larger are open. They look around some) A was scratching breast with bill, becoming active; young wiggle about now; a beam of sunshine coming into nest; stretched out in comfortable position. Open their mouths at various noises made from parents lighting on tree. A scratched wing with bill. (One can-not look a young from nest without getting covered with mites!) Neither of other two young were active. 9:25 sometimes lap ~~body~~ over body of another, comfortable position. (Not as much disturbance this a. m. (Sunday) as Tues. a. m.) Little one kept mouth open. I'm sure the others are fed at least twice to its once, prob. 2½ or 3 X to 1. C hasn't had much food but smallest and doesn't need so much.

B scratched wing with bill, & leg with bill.

9:32 Food - insect I believe a bug, pale green, may have been larva;) A got - the food. How hungry "C" seems to be! 1 excreta removed; hovered, can't see all. ; gone.

A flapped wings; B opened eyes looked around. A turned in nest & looked around; young gr C dozes. 1+

9:40 I must go.

4 Observation (Tues) 8-7-34 (Norm)

Temperature max 86°7. Min 62°7.

12:30 hot, mouths open; no adults near when I came, that is no real disturbance

1- 12:31 adult flew up at R., 2 mouths stretched open, (worm?); bird looked at me, flew back again in few seconds R.B.L.; food resembled angle worm (too long & slender for most larvae); removed 2 excreta; one bird stood up and looked around; no signs of third; not in nest; I placed it in nest last last evening, maybe didn't get a foothold; nest was too crowded lately; everytime expected someone to go overboard. No signs of young below; don't know what happened to it, 7 days old yesterday; growing but of coarse not up with others.

12:35 Young quite active today. First time I observed them any length of time after eyes were open. Stand up and scratch with bills. Sleek of adult.

2- 12:50 adult came R B L, no sound; heads up, mouths open, many cheeps; fed one (?insect) removed 1 excreta, lingered while took 2 pictures & rolled up one - left while I rolled up second. (Young stood up around parent, gave excreta to parent, scratched self with bill) (Redstart and indigo bunting song)

3- 1:00 parent came directly from left; so quickly I did not see food delivered; picked at nest removed a minute or so; left when a truck came. (Young stood up in nest, scratched, neck breast doing; two occupy all the nest. (I believe the third fell out of nest but wonder about it.) One stood on ~~one foot~~, stretched leg & wings.

4- 1:15 parent came R B-L; placed insect in mouth of one, other continued to keep mouth open and cheep for ½ minute or so. Removed excreta from one fed; picked at other for awhile, which opened mouth for food.

The one fed, raised + stretched right wing + wing
Lay with mouths open. (Sym shown on them for half hour, so far.
One gave a little start at passing of a car.
other lifted head when I made a noise (with
tongue + teeth). Parent remained at nest for
5 minutes, leaving 1:20 when I moved.
1:27 One young stood and stretched wing; one
1: Both stood in nest + stretched first one
wing then the other + scratched breast with bill,
raising body high; scratched head with
foot, turned around in nest
1:38 young very warm, stood high in nest with
mouths open; can see spotted breast of one,
feathers growing rapidly. (No parent since 1:20)
1:46 young rested heads on edge of nest, on leaves,
cool; mouths open.
1:52 people around kitchen door lately.
1:58 young stretch, stand up, look about;
2:00 left blind.

5 Observations - Thurs. 8-9-34 - noon 12:30 - 3:00

Temperature - max 89°7; min 64°7.

12:25 As I entered blind, the eldest jumped from nest 12th day; the first great evidence of fear; this one had jumped from beside night or so before, for two nights had made bring to nest and carried out grass on feet.) I put him back in, he jumped again to a limb by the nest. Parents did much loud squeaking at call of young one (which cried out when I coughed it.) 12:37 parent came on R. limb, squeaked a few times, flew away; 12:41 parent came again, passed awhile, flew back of me; 12:55 parents passed for half an hour; I closed blind, they stopped; the young hopped back into nest, looked around, turned back to me; sat down, facing me; the next in size had flattened self in nest, maybe at call of parents, or from fright.

[redacted]

were below nest.) I moved a little; clucked. 1:00 Parent outside; agitly 3 times. Young were hot, sat with mouth open; sometimes tried to stand in nest, older one did so.

1:55 Parent came with larva but flew away with it;

2:00 Food - green larva; cautious about bringing it, R. B. L.; gave to larger of the two, "a"; parent flew directly away. (Both parents came with food, one delivered it, other flew away to a limb; both cluck occasionally.

(at 1:40 the larger young flew out on a limb at R. for 3-4 minutes, then back to nest.)

2:05 The eldest hopped to edge of nest from which point he received food.

2:12 Parent brought food, small green larva - to smaller young. (Much disturbance in + around kitchen.

2:20 Young stand up and stretch often; notice all notices about. The string I placed on leg of ~~[illegible]~~ was gone.

2

one

2:25 Had been there 2 hours. (one hour much excitement, parents approved at meal with food 3 times, 100 minutes on scoport + each through food once (Young try to sleep.

6 Observation Thurs. 8/9 4:30 p.m.

4:30 arrived at blind, everything quiet, no note from parents who were so excited 3 hours ago; (truck passed); young scratched and stretched.

4:40 I didn't see food dibbed; gone when I looked, just saw end of performance; parent came so quietly; heard cheep of young; 2 excreta removed; flew in from left, discovered me, cautious; stayed less than a minute.

5:12 I heard a noise of wings, little one was stretching and flopping wings.

4:52 heard cluck of parent outside; young standing scratching self; one stood in nest most of time, mouth open. I believe a young and parent at a distance, began to cheep before arrived.

5:04 Parent arrived; I looked as it hopped on nest; mouths open but I saw no food. 2 excreta swallowed. parent looked at me, flew, stayed less than one minute.

5:12 Saw young flop wings hard while in nest. (watch stopped a few minutes ago.

Heard cluck of parent, wind blew, blind frightened young.

5:32 Parent in not from R (first time); food quickly placed in a mouth; parent picked at nest several times; went out quickly at right. (I heard parent 6 minutes ago. Wary of me & noise of kitchen.

5:39 Parent may have brought food - I saw only open mouths; parent came so quietly; one young did much begging; removed, excreta & flew out at R. (could not see whether or not parent swallowed excreta; all other removed at any time observed, - young or older was swallowed (feel rang watch few minutes slow).

6:04 Parent found food dropped quickly to younger; out at R. young make most noise.

6:12 must leave blind

Discussion I

Nest Activities from Observations

Chart I shows results of first observations of any length made on nest during brooding period. Observations made 8/1, from 7:45 am. to 11:50 am. Young were 96-72 + 48 hrs. old respectively, round numbers. No eyes open. Three stages of growth well represented, noted in size, + down and activity; 3 sizes of mouths to feed. No note from parent as observer entered blind. For more than an hour the parents went to nest directly from left without pausing; from 9:23 to 9:42 seemed to be investigating presence in blind, entered nest location from right, paused, to back limb, hidden by leaves, then to nest, continued the morning entering first one way then from another, both ♀ and ♂, as far as I could tell sexes. (Sexes distinguished for most part from maternal characteristics of one, associated with a white mark on forehead other did not have.). Female never seemed to leave nest of own will. How long would she have stayed? or were noises (people going + coming, other noises did not seem to make much difference) just associated with her leaving nest?

Seventeen feedings from 7:56 to 11:49, from ½ to 34 minutes apart, shared by both parents, 10 ♀, 4 ♂, 3 ?. Feedings averaged about 13 minutes apart. While they appeared close together, parents followed each other. One time 10:46 + 10:46½ both parents appeared at nest, one before other, remaining, answering question, did the ♂ help in feeding. One parent come, fed, maybe removed excreta and left directly his much less than a minute visit. The other always lingered a little while, sometimes picking around nest (mates, nuts, bits which I could see) often picking bill down in bottom and shaking nest vigorously. Length of visits from ½ minute, estimate to 4 minutes, about 16 minutes for total - ave. 1 minute per feeding.

Food could not always be distinguished. At times when parent entered from limb

# Observations of Robins Nest. 8/31/34 7:45 am – 11:50 am

| No. of feeding | Sex feeding | Time of feeding | Length of visit | Food | Young fed | Excreta | Entrance to nest | Physical condition (weather, disturbance, etc) |
|---|---|---|---|---|---|---|---|---|
| 1 | ♀ | 7:56 | 1 m. | — | 1 | ?? | h | {much noise people going & coming |
| 2 | ♂? | 34 8:30 | — | insect (grasshopper?) | 1 | | | |
| 3 | ♀ | 14 8.44 | 4 | roll (larva?) | 1 | | h | |
| 4 | ♀ | 20 9:04 | 1 | food? | 1 - # | | h | |
| 5 | ♀ | 19 9:23 | 1 - | ~~insect~~ food sp. | 1 - "C" | 1 | h | 8 |
| 6 | ♂ | 8 9:31 | — | larva | 1 - H | | | |
| 7 | ? | 11 9:42 | — | ~~food~~ mayfly? | 1 - N | | | Person at door & kitchen talking |
| 8 | ♀ | 28 10:10 | 1 | food | 1 - N | | | {Removed feathers Picked nest & shook it left door somewhat |
| 9 | ♂? | 17 10:27 | 1 - | grasshopper | 1 - R | 1. | | |
| 10 | ♀ | 7 10:34 | . | insect | 1 | 1 | | |
| 11. | ♀ | 12 10:46 | 2 | {insect green larva | 2 + 1 | 1 | | noise |
| * 12. | ♂ | ½ 10:46+ | — | insect | 1 | | | noise |
| 13 | ? | 23 11:07 | — | food (insect | 1 "A" | | | noise |
| 14 | ♀ | 6 11:13 | ½ | food | 1 | 1 A | | noise |
| 15 | ♀ | 16 11:29 | 2 | food? | 2 | | | |
| 16 | ? | 3 11:32 | ½ | green larva | 1 | 1 | | |
| 17 | ♀ | 17 11:49 | ½ | | 1 | 1 | | |
| | | | Lunch hour | | | | | |
| | | | | larva 3 | 20 | 7 | 10 | |
| | 10 ♀ | ½ - 34 | 76 m. | insect 6 | | | | |
| | | over 13 - | ½ - 4 | mayfly 1 | | | | |
| | 3 ? | | over 1 - | grasshopper 1 | | | | |
| | | | | food 6 | | | | |
| | 40 ♂ | | | 17 | | | | |

our right "R" - and hinged a second, one could see food; there were observed larvae, usually by color, longer worms, called earthworms, grasshoppers, mayfly + any special insect named. Other times legs were visible or much wiggling gave idea of larva, but not sure, once or twice a roll of something; other times just food. Male parent had a habit of delivering food, sitting with back to me - He flew in as quickly I had little chance to see sometimes too food tabulated for these 17 feedings included larvae, 3; insects sp. 6; mayfly 1; grasshopper 1; food 6 -. + Twenty young were fed -, two times, maybe three from two feedings, all others being single feedings. It was a puzzle to figure out feeding schedule; couldn't be done easily, sometimes one whose head was highest, other times, the nearest, sometimes one at right of parent, sometimes only one seemed to be ready when parent arrived. With three sizes of offspring to feed, it was a puzzle to me, maybe to parent (I don't know). It looked as though someone might be slighted and I was always anxious about little one, which had been rescued in egg when parent deserted nest.

Both parents removed excrement in sac from young, and throughout all observations till last, they swallowed it. In 17 trips, excreta was removed from 7 individuals. Young rested most of time, none had eyes open yet. ~~Tobias~~ /

Chart II shows observations of mating activities for same day, continued after 35 minute launch period. When observer returned at 12:25 no note to show either parent around. A minute later a parent came direct to nest with food. Twenty-five feedings in 5 hours and 35 minutes. Of these parents entered ~~nest~~ directly from left in 10, and in round about way, inspection in 10, Female fed 1 3 times, 0 7 8, and 4 a question as to parent.

Time between feedings averaged ½ minute. Again short period accounted for by appearance of both parents at nearly same time. Longer period accounted for also by fact that ♀ remained at nest much longer periods in p.m. than a.m. I wondered if that might not be due to necessity of stirring nest more often, for ventilation, vermin, etc., since it was warm and uncomfortable first 2 or 3 hours of afternoon. Periods averaged about 13 minutes apart. Time at nest some over 100 minutes, ranging from ½ to 20 minutes, longer periods of ♀ interspersed by shorter of both parents, 8 periods between 7-20 minutes each. Food identified as follows: (some, not well identified (distance 78 feet): 5 larvae, 4 worms, 1 cricket, 3 grasshoppers, 7 insects, 6 food. 31 young were fed., 5 double feedings. Excreta removed 16 times.

Nest was not observed for about 30 minutes between 6:15 & 6:45 p.m. when come to get young for daily measurements, a parent was near with a large green larva, somewhat disturbed. I removed two birds for measuring, but smallest, maybe it received that larvae. About 7:30 I went to blind to stay until too dark to see - about 8:20 - Female parent came to nest and brooded most of that period, frightened away several times by people going by, but no further feedings were observed.

Parents probably fed at some of longer intervals from nest. I believe male might have been watching territory for me by tree sometimes from calls received when I made a small disturbance in blind or other disturbances happened in the neighborhood.

Total observations for period of one day from 7:45 to 6:10 except two 35 periods around noon and between 6 & 7 p.m. were as follows:

Observations 7/1 noon - eve.

| no feeding. | part feeding | Time | Pulse | Food | Vomited | Excreta | Enthusiasm to Meat | Physical condition |
|---|---|---|---|---|---|---|---|---|
| 1. | ♀ | 12:26 | 9 | — | 1 | 1 | →9→ | warm |
| 2 | ♂? | 12:35 | — | insect & grasshopper | 1 | 2 | → → | |
| 3 | ♀ | 1:07 | 2 | white larva | 1 | 1 | G 2 → | |
| 4 | ♀? | 1:20 | — | dark insect | 1 a | | G | |
| 5 | ♂? | 1:30 | — | grasshopper | 1 a | | → → | |
| 6 | ♀ | 1:31 | 9 | worm 2½" & wrinkled earthworm | 1 | 1 | → 9 → | young nest with bird |
| 7 | ? | 1:41 | — | grasshopper | 1 | | → → | noise |
| | | | | 2 worms similar to earthworms | 1 1 | | → → | |
| 8 | ♀ | 2:00 | 20 | | | | G → | |
| 9 | ♂? | 2:25 | ½ | insect | 1 B. | 1 | | |
| 10 | ♀ | 2:34 | 7? | worm | 1 | | G → | noise |
| 11. | ♀ | 3:03 | 9 | insect | 1 A | 1 | ← 9 → | |
| 12 | ♂? | 3:18 | — | grasshopper | 2 | | G → | |
| 13 | ♀ | 3:18 | 1 | insect | 1 "C" | | → → | |
| 14 | ♀ | 3:25 | 1 | ? insect or worm | 1 | | → → | noise |
| 15 | ♀ | 3:50 | 7 | food. | 1 | 1 | G | |
| 16 | ? | 3:58 | — | 3 larvae green brown | 2 | | G | |
| 17 | ♀ | 4:15 | 4+ | food larvae or worm | 1 | 1 | G | |
| 18 | ♂? | 4:18 | — | insect | 1 | | → → | |
| 19 | ♀ | 4:31 | 8 | food | 1 a | 1 | G | |
| 20 | ♂? | 4:47 | 3 | larvae green brown 1-2 | 2 | | → → | |
| 21 | ♂? | 5:10 | — | worm | 1 | 1 | → → | |
| 22 | ♂? | 5:10 | — | cricket | 1 C | 1 | → → | above nest |
| 23 | ♀ | 5:20 | 14 | dark larva | 1 | 1 | → → | |
| 24 | ♂? | 5:47 | — | food | 2 | 2 | → → | |
| 25 | ♀ | 5:48 | 9 | larva gr. | 1 | 1 | → | |
| | ♀=13 ♂=8 ?=4 | -13 | 100+ ave 4 | 5 larvae 4 worms 1 cricket 3 grasshoppers 7 insects 6 food | 31 | 16 | ?=13 10=G | |

Parents entered nest directly of 42 times observed to extent of 25 times, long way around 17 times; of feedings 23 ♀, 12 ♂, 7 ?; average time between feedings 13 minutes, range of 1-32 minutes; length of time at nest ½ to 20, in p.m.; ½-4 in a.m.; total food: 8 larvae, 4 worms, 1 cricket, 4 grasshoppers, 1 mayfly, 13 insects sp., 12 unknown; 51 young fed; an average nest 14, but all were not fed some number of times; excreta removed 23 times, once for every two visits of parent, swallowed by both parents.

Observations were made of early morning hours 8/5/34 to find what took place at that time of day. A cool day max 73°F, min 52°F. Blind was not comfortable without blankets. Entered blind 4:25 a.m., still quite dark out. No sound of parents around when I arrived. I flashed a light on nest, but everything was as still as could be. Only sound was that of distant nighthawk. About 4:30 a robin sang in the distance; 4:45 began to get light, a towhee called from hillside, and a loon from the lake. 4:50 heard whir of a brown thrasher in thicket above the blind, then a robin singing & towhee song of chewink at same time. Getting quite light by that time. RBA.

4:55 both parents come, I entered nest with food, fed one, removed 1 excreta, then out. Twenty Two visits made between 4:55 & 9:32 with following results: (first, many people coming and going about kitchen door, first emptying ashes, chopping & kindling, till later morning activities took place) parents entered nest directly from left. 20 times of 22; maybe more used to me in blind, then too it was quiet time for me too, as long as I was warm; ♀ fed 9 times, ♂ 4, and 9 unidentified; feeding ranged from ½ to 30 minutes, average - ; length of visit from ½ to 6 minutes, average of 2; food consisted of 14 not identified, (too dark to see sometimes), 2 insects (bug), 2 larvae,

Observations for morning 8/5-34
4:25 – 9:45

| Nest feeding | Sex feeding | Time feeding | Length visit | Food | Young fed | Excreta | Entrance to nest | Physical conditions |
|---|---|---|---|---|---|---|---|---|
| Entered blind 4:25 am. dark. | | | | | | | | Dem. 73-52 |
| 1. | Both seen | 30 4:55 | — | food | 1 | 1 | G → | |
| | 1 | 15 | — | food | 1 | | G | |
| 2 | ? | 5:10 | 3 sec. | food | 1 | 1 | ↗ | noise |
| 3 | ? | 2 5:12 | — | food | 1 | 1 | → | |
| 4 | ? | 10 5:22 | — | food | 1 | | → | |
| 5 | ? | 7 5:29 | ½ | food | 1 H | | → down | cold truck |
| 6 | ♀ | 13 5:42 | 6 | larva or earthworm | 1 | → | 1 | → → |
| 7 | ? | 9 5:51 | — | food. | 1 + | | → → | shook nest |
| 8 | ♀ | 8 5:59 | 1 | food | 1 A | 1 | → → | hovered |
| 9 | ♀ | 14 6:13 | 5 | worm?- is it earthworm? | 1 A | 1 | → → | noise at door |
| 10 | ♀ | 43 6:50 | 5 | worm or larva | 1 C | 3 | → → | shook nest |
| 11 | ♂ | 5 6:55 | ½ min. | food | 1 B | | → → | food easily dropped ♂ so far |
| 12 | ♀ | 20 7:15 | 5 | food | 1 | 1 | → → | hovered |
| 13 | ♂ | 1 7:16 | — | food? | 1? | | → → | truck drove by. cool - yg shiver |
| 14 | ? | 25 7:41 | — | insect "bug" | 1 | 2 | → → | |
| 15 | ♀ | ½ 7:41½ | 6 | food | 1 | 1 | → → | hovered |
| 16 | ♀ | 29 8:10 | 1 - | food | 1 | 1 | → → | hovered 1½ |
| 17 | ♂ | 20 8:30 | — | grass. | 1 | 1 | → → | |
| 18 | ♀ | 1 8:31 | 4½ | 2 br. larvae | 2 | 1 | → → | shook nest hovered |
| 19 | ? | 16 8:47 | — | food? | 1 | ? | → | noise |
| 20 | ? | 13 9:00 | 1 | food? | 1 | 2 | → | noise |
| 21 | ♂ | 3 9:03 | ½ | 1 gr. larva | 1 | 1 C | G → | yg 2 old - yes 1 gen - look around. |
| 22 | ♀ | 29 9:32 | 1 + | insect? | 1 | 1 | | hovered |
| | | Left 9:40. | | | | | | |
| | 4 ♂ | Ave. | 43 | 14 food | 23 | 20 | 20 | 2 G |
| | 0 ♀ | | over 2 | 2 insect | | | → | |
| | 9 ? | | | 2 larva | | | | |
| | | | | 3 larva or worm | | | | |
| | | | | 1 grass. | | | | |

3 larvae or worms, 1 grasshopper;
2 3 young were fed, one double feedings, all
others single; lipsella removed 20;
♀ shook up nest several times that
morning. Food seemed to be easily
disposed of. As noted 8/1 parent tried
several times before disposing of food
on 2 number of visits to nest, later in
day but no as this morning. ♀ usually
hovered for ½ or more each time she
came to nest. Young were cold sometimes,
could see them shiver. Young were
beginning to note surroundings, eyes of 2
older were open; scratched their wings, legs,
breasts with bill; feathers were developing
rapidly; stretched in nest; older ones began
to get a red robin appearance as feathers unsheathed,
more velvety than before.

Observations were made at blind
for period of 1 ½ hours beginning 12:30 8/7,
to observe young in later development.
Only two young were in the nest. The young
adopted one had disappeared. It was the last
weighed and measured the night before,
maybe it wasn't tucked in closely. I had
watched mother hover the young several
times; she could not seem to cover all
of them; one time one hung out wing & head
on rim of nest, I expected it to fall
overboard. I do not know what
happened to this little one.

This afternoon was warm, in fact the whole
day, max 86° F, min. 62° F. The young day
with mouths open, sometimes stood in nest
and scratched; stretched wings & legs, both
together or one & then another. Young stood
high in nest, & scratched & stretched. Noticed
noise in blind and once especially the
slamming of kitchen door. They seemed to
cling more to nest when taken out to be

measured that evening. Parents visited nest 4 times, bringing food, 3 times in roundabout way, removed 4 excreta.

Further observations of young were made p.m. 12:30-2:25 8/9 - Young were 11+12 days old at this time, quite active. When I entered the blind, the older jumped from nest. I pleased him in and caused much disturbance by his calls + that of parents. Took one hour to settle down. The same young soon hopped on a limb a little above nest, remained for nearly 20 minutes, bobbing back + forth with weak foot hold as wind blew; hopped back into nest, rested for ten minutes, or so then hopped to right up nest for awhile and back in. During these minutes I often heard a soft chuckling noise from tree near-by. At least one parent was watching. Other young stayed in nest quietly. Parents were disturbed, fed once each in that period, came to nest 3 times to feed but flew away 2 times then came + fed the third. I left them 2:25 to give things a chance to get calm.

Returned at 4:30-6:04. Parents came to nest 5 times, 4 times directly from left-, did not remain at nest for activities so did not distinguish between them. 7 visits 2 times I did not see food delivered but 4 excreta removed. I saw food enter a mouth other 3 times - identified young it, parent was in such hurry.

These were last observations since both young hopped from nest between 7:15 + 9:15 p.m. that evening.

4 Observations 8-7-34 12:30 -

| No. of feedings | Parent Feeding | Time feeding | Length of visit | Food | Young fed | Excreta removed | Entrance to Nest | Physical condition |
|---|---|---|---|---|---|---|---|---|
| Observations 12:30 - 2: | | | | | | | | max 36.7 min 35.7 hot, mouths open |
| 1 2:30 | | | | | | | | |
| 1. 1 2 3 | ? | 12:31 | 1- | worm | 1 | 2 | ↻ | only young-1 going from nest to outboard: |
| 2. | ♀ | 12:50 | 1+ | insect | 1 | 1 | ↻ | active-standup, scratch with bills-stretch wings & legs. |
| 3. | ♀ | 1.00 | | food? | ? | | ↗ | |
| 4 | ? | 1:15 | 5 | insect | 1 | 1 | ↻ | Too many people about |
| | | 2:00 left bird | | | | | | young warm-blood in nest |
| 5 Observations Thur. 8/9 12:30 - 2:00 p.m. | | | | | | | | |
| 12:25 Oldest bird jumped from nest, much disturbance for ½ hour. other sq hitted close in nest | | | | | | | | |
| 1 | | 1:55 2:00 | — | green larva | 1 a | | ↻ ↗ | The larger of 2 put on limit, then into nest, then out again-10 minutes or so. |
| | | 2:12 | — | green larva | 1 B | | ↻ | noise at door |
| | | | | | | | | setting on leg of larger is done identification mark. |
| Left 2:25. | | | | | | | | |
| 6 Parents appeared at nest thru times with food delivered at once. | | | | | | | | |
| Resumed at 4:30 p.m. | | | | | | | | |
| 1. | ? | 4:40 | 1- | didn't see food delivered | — | 2 | ↗ ↗ | |
| 2 | ? | 5:04 | 1- | did not see food | — | 2 | ↗ ↗ | |
| | | 5:32 | | food? | 1 | | | |
| | | 5:39 | | food? | 1 | 1 | | one begged much for food. |
| | | 6:04 | | food | 1 | | ↗ ↗ | was excreta swallowed, always has been. |
| Left bird 6:12 | | | | | | | | |
| Last observations. Both young hopped from nest between 7:15 - 7:15 p.m. | | | | | | | | |

Growth of young. II chart V.

When hatched the lower mandible extended beyond upper but by 1st third day, this difference had about disappeared. The egg tooth disappeared soon. Bill had a more less gradual growth from 7 mm first day to 17.5 mm the last measured.

Extent measurements not gradual but increased much when primaries began to grow, 50 first - 150 mm the 6th, 284 mm at 12th measurement. First primary was not measured from very first, 9th day measured 15 mm., 12th 19.5 mm. In robin first is not longest primary. No trace of primaries first day, trace 2nd-, 3rd measured 1 mm., 12th day measured 62 mm. Right wing measured from 17.4 mm, 39 the 6th; 77 the 12th.

Length increased as to appearance of tail & growth of bill - 56, first - 97, 6th, 144.5 the 12th. Tail had a trace 5th day, .5 mm 6th, to 26.5, 12th. Mid tail feather 2.5 7th day to 24 the 12th.

Tarsus toe grew from 18 to 55 mm.
mid-toe of right foot - 6.5 to 23.5
Nail of mid toe 1. to 5.5

It was not always possible to stretch the bird for length, extent, tarsus-toe.

Eyes opened about 6th day, then young became observant of environment, self first, then vicinity.

Feather development began from few streaks of down on head, mid-dorsal line, and scapular region. Fifth day showed change in feather tracts, new on sides, at tail, more at scapulars, very dark around top of head, above eyes, base of bill. Underparts show growth along sides, slightly across base of throat.

Sixth day, ventral surface began to show rufous, black & white distinction; back sides showed black & white, traces of feathers on legs; primaries unsheathing rapidly; trace of under tail feathers.

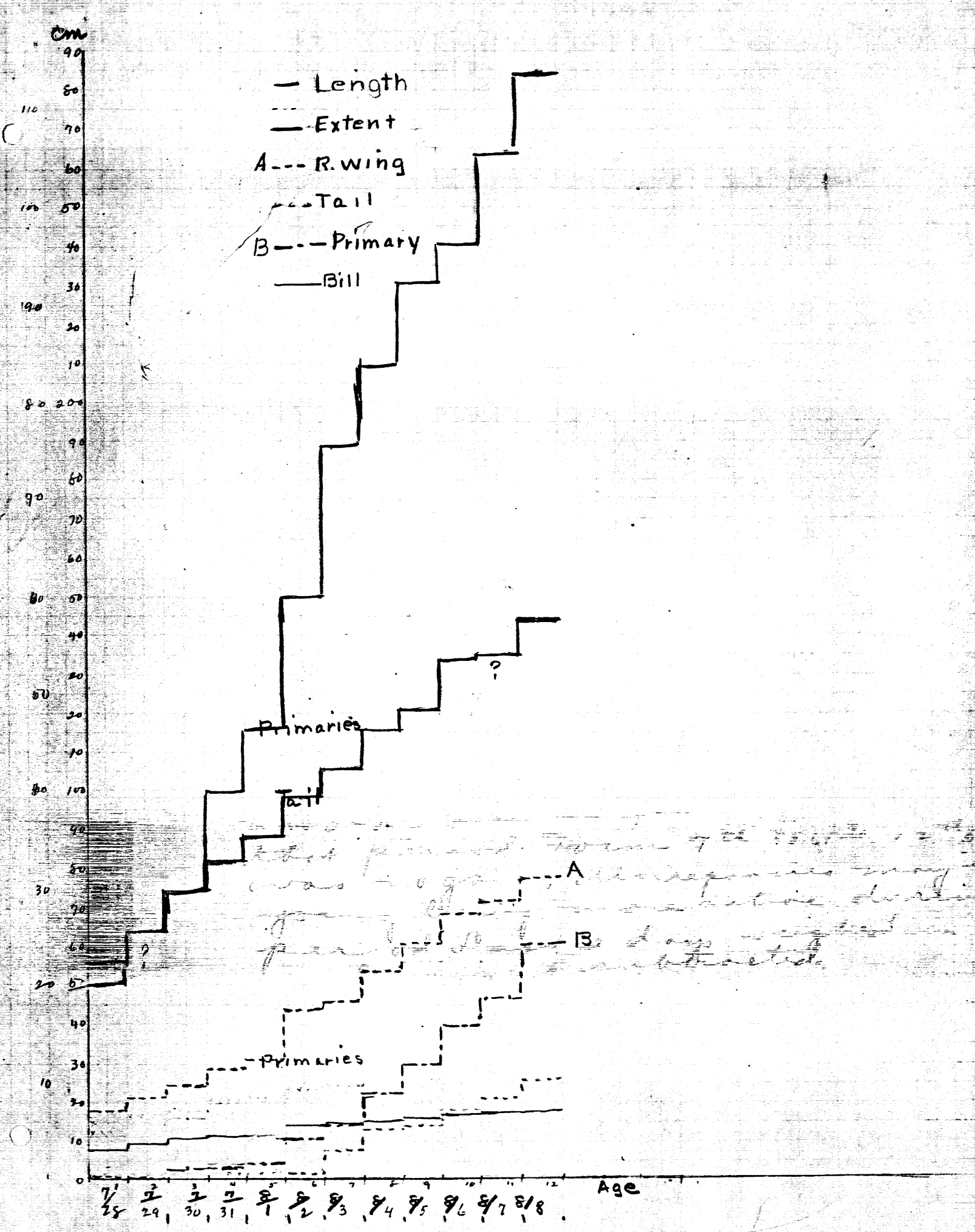
7th day the principal feather tracts unsheathed 2 mm. - over head, mid-dorsal, upper sides, legs, under throat, neck and under sides.

8th day, a real robin appearance; becoming

# Growth chart V

| Robin "B." | Hatched before 6:30 P.M. weight 7:00 P.M. 7/29 | 7/30 | 7/31 | 8/1 | 8/2 | 8/3 | 8/4 | 8/5 | 8/6 | 8/7 | 8/8 | 8/9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight | 7.5 | 14.475 | 21.32 | A 36.47 29.18 | 36 | C 32.596 45.57 | 55.61 | 55.96 | C: 47.30 A = 58.30 55.13 | A 56.27 54.965 | A 55.72 55.63 | 55.51 |
| Length | 56 | 64 | 74.5 | 82.75 | 87 | 97 | 105.5 | 116 | 122 | 134 | 135 | 144.5 |
| Tail | – | 0 | 0 | 0 | true | .5 | 7 | 13 | 14 | 18 | 21.5 | 26.5 |
| Mid T.F. | 0 | 0 | 0 | 0 | 0 | – | 2.5 | 13 | " | " | " | 24 |
| Bill | 7 | 9 | 11 | 11.5 | 9? | 14 | 14.8 | 15 | 16 | 17 | 15.5? | 17.5 |
| Bill-eye | 11.5 | 14 | 16.5 | 20 | 20 | 21 | 22.5 | 25 | 26 | 27.5 | 27.5 | 28 |
| Bill-gape | 12 | 16 | 17 | 20 | 21.5 | 23 | 24 | 25.3 | 25.4 | 26.5 | 26 | 26 |
| Bill-nostril | 3.5 | 4.91 | 6. | 6.25 | 6.5 | 7 | 7 | 7 | 8 | 9 | 8.5? | 9 |
| Eyeclear | 3 | [illegible] | [illegible] | [illegible] | 5.5 | open 6 | 7.5 | 7 | 7.5 | 9? | 8.5? | 8 |
| Eyelid | 50 | – | 74.5 | [illegible] | 117 | 150 | 189 | 209 | 239 | 241 | 264 | 284 |
| Primary (longest first) | – | true | 1 | 2.5 | 4.9 | 10.2 | 14 | 23 | 15 30.5 | 16.5 40 | 19 46 | 19.5 62 |
| Right leg | 17.4 | 21.5 | 24 | 28.5 | 32 | 39 | 46 | 54 | 61.6 | 69 | 72.5 | 77 |
| Tarsus | – | – | – | – | 23 | 21 | 29.75 | 30. | – | 33.5 | 34 | 34 |
| Tarsus-toe | 18 | 22 | 25.5 | 33.2 | 40.5 | 47.5 | 50. | 55 | 56.1 | 56.5 | 56 | 55 |
| Mid toe R | 6.5 | 10 | 12 | 16.5 | 18.5 | 22.1 | 23 | 24.2 | 24 | 25 | 22 | 23.5 |
| Tail " " " | 1.2 | 1 | 2.5 | 2.2 | 3.1 | 4 | 4 | 5 | 5.5 | 6 | 6 | 5.5 |

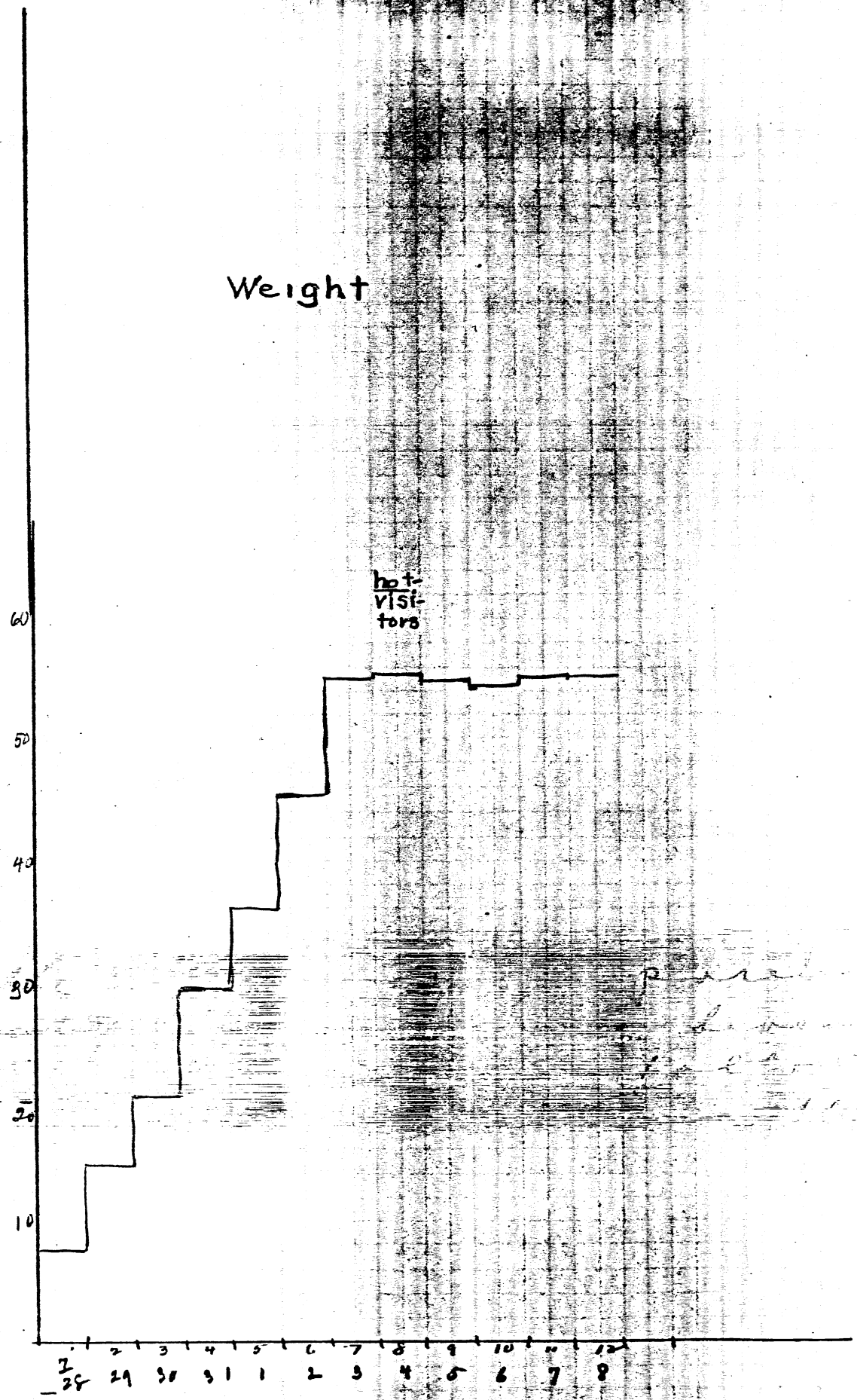
Left wing 8/9 [illegible] 1 7/8 days old, a, one day old, b, two days old
Left wing [illegible] 8/9 [illegible] superficial wing; B [illegible]
Flat Tail [illegible] [illegible]


cm
— Length
Extent
A --- R. wing
Tail
B --- Primary
Bill
Primaries
Tail
A
B
Primaries
Age
7/28
7/29
7/30
7/31
8/1
8/2
8/3
8/4
8/5
8/6
8/7
8/8

velvety; down sticks to ends of feathers, head, scapulars, mid dorsal down tracts - wing coverts appearing.

12th day - feathers short & velvety; others at wing & tail well feathered; breast & belly almost overlap to cover the skin; no tracts behind legs and under wings; 7 feathers had down attached; mid-tail feathers show up shorter than others, tail 26.5 mm long; outer show white on inner vane and others beneath are white; rump fuscous with faint streak of buff on inner vane; back fuscous with a strong vein of buff at center, some splending around the sides; head, black; tan over-eye; wings fuscous, tan on margin; lesser wing coverts fuscous with tan streak thru center. throat with light buffy line thru center, fuscous or black at each side; buffy deepens into light rufous breast & underparts; breast spotted with black & sides also for first half; belly white; legs dark gray, with light rufous on flank.

Weight of young increased from 7.51 gr. to 55.51 grams. Gradual gain to 7th day, 55.61. 8/5 there was a little gain 55.96, may be accounted for by undue noise, too many visitors, less chance for feeding. May also be due to faster growth during that period. From 7th 55.61 to 12th 55.51 there was no gain; discrepancies may be due to young being more active during weight period. Last 2 days weighed in sack and weight subtracted.


Weight
hot-
visi-
tors
60
50
40
30
20
10
1 2 3 4 5 6 7 8 9 10 11 12
7/28 29 30 31 1 2 3 4 5 6 7 8

# Summary

Nesting activities

1. Parents had a definite way of entering and leaving this nest. Entered directly to left to avoid me at blind; less than half time in a round about way to watch me while entering. 50 → ↰; 24 ↱; of 75 trips I observed only once did a parent go in and out on same side. R ↩. The longer path was used in becoming used to blind.
2. Both parents assisted in feeding young of 75 feedings ♀ 34, ♂ 16, 25 unidentified.
3. Both sexes removed excreta. Of 52 removals ♀ 26, ♂ 10, ? 16.
4. Female stirred up nest with head, picked mites etc from nest & young, & hovered young.
5. I'm most sure the male did most or all of guarding of nest though at times I'm sure neither parent was around.
6. Seventy-five feedings included the following forms: larvae 13, insects sp. 17, mayfly 1, grasshoppers 3, worms not larvae, 5 cricket 1, unidentified food, 32.
7. Young fed included nearest, mouth highest, mouth open, others not; at right; since there were three sizes of young 3 ages, largest probably received most, more active; but one two days younger seem to increase in size.
8. Often times, most times, parent gave no sound on entering nest; sound of

feet on nest enough to cause heads to come up, mouths to open.

9. Food was not always quickly disposed of; sometimes necessary to make a number of trials either to get young to accept or to go in mouth in right position. Not much attention given to latter point that I could see.

10. Young become more active after eyes were open. Exercised wings and legs by stretching. One hopped out of nest to limb 2 different times and had the experience of trying to balance self against wind.

11. Development of young seemed normal. Length, in relation to growth of bill and appearance of tail, extent in relation to development of wing and primaries.

12. Weight developed normally until young became quite active; seemed to reach a definite point which varied little for several days. Weight developed more slowly last six days. Second young almost up with the first.

13. Adopted young not equal to "B" the other, specially observed at same age, but grew gradually until it disappeared from nest on 8th day.

14. Feathers developed normally, ~~very~~ tracts of down (3) to juvenile plumage of robin, so velvety in young.

15 Enjoyed the acquaintance of robin very much-