# OBSERVATIONS AND SKETCHES OF THE GOLDFINCH (SPINUS TRISTIS)

Required by Zoology 231

by

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at

University of Michigan

Biological Station

Douglas Lake

Cheboygan, Michigan

July 22 to August 18, 1945

TABLE OF CONTENCTS

PURPOSE:

My purpose in carrying on this nesting study of the Goldfinch was to accustom myself to the technique of observation and notetaking in a blind, to learn how to interpret the notes I took, to become acquainted with the behavior of a normal adult bird during the breeding season, and to observe the development of a normal altricial bird. Because this was my first experience in nest study, I did not concern myself with scientific data on temperature, weight, measurement, and so on: I am reserving that for succeeding studies. Instead, I obtained practice in drawing birds. By having access to a blind, I had the opportunity to watch a bird at close range under almost normal conditions. I practiced catching the color, lines, and poses of the parent birds. The results of this practice are not supposed to be profoundly scientific, nor are they especially artistic. Some of them consist of the few lines necessary to catch a particular pose. With patience, any artist can draw each feather and reproduce its color, but the basic lines beneath determine whether that drawing will be lifelike and truly accurate in its representation. Skill can be acquired only through detailed study of individual species. I have included some of the sketches from my practice sheet as part of my report on the nesting of the Goldfinch.

INTRODUCTION:

During the summer of 1945, I carried on a study of the Goldfinch (Spinus tristis) at the University of Michigan Biological Station at Douglas Lake, thirteen miles from Cheboygan, Michigan. As the first nest met with disaster before the young were completely developed, I continued study on the nest which was also being observed by Mr. Erickson of the Advance Ornithology class. For convenience I shall refer to the first nest as nest number one and to the second nest, Mr. Erickson's, as nest number two. Central War Time was used.

LOCATION OF NESTS:

Nest number one was located about ten feet from the shore of South Fishtail Bay of Douglas Lake. It was in a maple tree in the backyard of the faculty cabin belonging to Dr. Pettingill and his family. The undercover of pteris and blueberry was quite sparse due to the numerous paths and playlots. To the southwest of the nest tree was a pine. To the north were numerous small aspens. There were several more aspens to the east. These became progressively thicker and eventually developed into part of the maple, aspen and scattered pine of the open secondary woods typical of the region. The immediate territory around the nest was open and sunny.

The territory of nest number two was much more open in comparison. This nest was located in a

maple which stands on State Street about 20 feet from the shore of South Fishtail Bay. Along the bank there are several trees and numerous others are scattered along the lawn and the north side of Sate Street. Across the street there are more trees and to the south-east is a small block of trees. About 70 feet back is a rise in the terrain and most of the laboratories are situated here. Beyond that is an abrupt rise in the elevation and open maple, aspen, pine association on the hill.

NEST CONSTRUCTION:

I was not fortunate enough to see either nest in construction.

Both nests were built well out on the branch, about three feet from the end. They were supported from below by a large branch and on the sides by smaller branches. Nest number one was almost covered with leaves until Dr. Pettingill cleared the leaves away in order to take photographs. Nest number two was easily in view, although many of the leaves had been removed before I had the opportunity to observe the site. Both nests were compactly constructed with soft vegetative material. Nest number two had a wad of string on one side.

OBSERVATIONS ON NEST NUMBER ONE:

On July 22, 1945, when I first observed nest number one, there were six bluish-white eggs arranged in the floor of the nest. The female was on the nest during

most of the incubation period. She usually was fed by the male bird. Very often he would call from the territory east of the nest, announcing his arrival. As soon as the female heard him, or saw him coming, her entire body began to vibrate and she would emit a soft twitter. When he arrived the twitter became louder and faster. Her head would be thrown back and her neck vibrating from the sounds she was making. Amidst the twittering and fluttering the male would put the semi-liquid white substance, which he had regurgitated, into her open bill. Usually as he left the nest he would call a short "per-chic-ory!."

Four of the five young were hatched by 8:00 a.m. July 29. The nest had been observed the day before at 4:00 p.m. and no young as yet had hatched. The female brooded most of the day. The male fed her regurgitated food and then she in turn regurgitated and fed the young. The young looked like a red mass of protoplasm with dark bulges where the eyes would eventually appear. They had a few white bits of fluff on the feather tracts of the anterior part of their bodies. Their gape was pinkish-orange. There were no egg shells present so the adult birds must have either eaten them or carried them away. The female was observed to eat the fecal sacs. The first day of hatching was very warm and the female was on the nest most of the afternoon. Her bill was open much of the time and her wings slightly spread apart in order to give the young more shade. She usually appeared to have her back

against the strongest sun rays, although I discovered later that this was her usual position, even in the morning. When I observed the nest the evening of July 29, the fifth egg had been moved to the northwest corner of the nest away from the hatched young which were huddled near the middle of the nest. The following day the sixth young hatched. The first five seemed to have more energy than they had the previous day for they would hold up their heads to receive the food from the parent birds. The young still looked quite bare. Their flesh was transparent yellow-orange with big dark eye bulges. The white fluff was a little more in evidence and looked slightly gray.

On August first I began observation at 7:47 a.m. I had observed the young until 8:10 p.m. the day previous. At that time they appeared quite normal. (It should be noted at this point that I could not actually see the young in the nest from the blind unless I used a special mirror arranged on a pole.) When the male fed the female at 8:35 that morning I noticed that she waited longer than she had ever waited previously before she regurgitated and fed the young. At that time I noticed that she fed only one or two young at the most as that was the only possible number of heads that I had seen fed. It had about 15 mouthfuls. After this feeding the female flew. Using the mirror, I found that there was only one bird in the nest. It was larger, more feathered, and looked grayer than before. At 10:25 the female arrived

back on the scene followed by the male bird. She was fed by the male,but she did not feed the young. I went below the nest and found four live young scattered on the ground. I could not find the fifth. I picked the four up and put them together in the sun. Then I left the site to seek advice and something with which to put the young back, as I could not reach the nest from the blind. When I returned, all but one young appeared quite lifeless. I did not know what to do with them, but thought food or brooding might revive them, so I put them all back in the nest nest with the one nestling which had not fallen out. During these proceedings the female bird was much agitated. She gave her alarm call continuously. At 11:08 the female returned to the nest after much deliberation. She settled on the returned young, then looked quite confused and sprang away, giving her alarm call. I left the blind. At 4:58 p.m. I returned to find two dead young in the nest and four dead young below, one of which I had not found previously. It was quite mashed from the fall. An agitated female bird was calling above me. I collected the four young.

Upon closer observation of the nest I saw that the northeast edge was torn and much flattened out. Dr. Pettingill said that the chipmunks had destroyed several nests and that they were probably the cause for this disaster.

As the oldest young from nest number one had only been hatched about two days,it was felt that observation on another nest was in order. I began observation on nest number two which was also being observed by Mr. Erickson of the Advanced Ornithology class.

OBSERVATIONS ON NEST NUMBER TWO

According to Mr. Erickson's notes, nest number two was located on July 18. On July 22 there were two eggs in the nest, on July 23 there were three eggs, four eggs were present on July 24, and on July 25 the fifth and last egg appeared. The female incubated until August fourth when the eggs began to hatch. This was a period of about nine and a half days incubation.

On August fourth one egg hatched; on August fifth there were three young. On that day, Mr. Eichstedt, a visitor from Detroit, was taking pictures and he observed the female bird eat an egg shell. On August sixth the fourth young hatched and the following day the fifth and last young hatched.

The process of feeding the young is quite complicated. First the male regurgitates and feeds the female. Then she regurgitates the same food into the mouths of the young. This was the usual procedure, although if the female was not on the nest the male would feed the young himself. Sometimes they would both arrive at the

nest site together and then the female would receive the food and regurgitate it for the young. At first the young could only hold their heads up feebly for food. Day by day they got stronger until on the sixth day (counted from the day the last young hatched) they were able to stand up in the nest. At first the parent birds swallowed the fecal sacs. Later on I observed the male bird carrying the fecal sacs from the nest. On the seventh day the young birds showed much bluish-gray on their wings, yellow on the ventral tract and dull yellow-green on the spinal tract. The caudal tract also showed sheathed feathers. On the eighth day they stood straight up in the nest, their yellow under-bodies showing plainly and their wings fluttering. They made much more noise than they had ever made before this time. The young learned to recognize their father's voice for they would open their beaks when he called announcing his arrival for feeding. One I observed them follow the flight of the male parent with their heads as he circled the nest area calling "per-chic-ory!" The young birds also began stretching and preening---possibly this action was incited by the mites which were on the young. On the eight day the nest was very messy as most of the fecal sacs were merely defecated over the edge of the nest. Some of the fecal material clung to the sides of the nest and some dropped to the branches and leaves below. On the eleventh day I attempted to get a specimen of the parasite which was

on the young. The five birds, which were now quite well feathered, showing buffy wing-bars, yellow below and yellow-green above, were huddled together in the nest. They huddled even closer when my hand came out toward them. I had never taken the young from the nest before this time, but they had been removed by Mr. Erickson. When my hand emerged from the hole in the blind the young looked quite frightened. My hand had almost closed upon one when he unexpectedly flew to a branch ahead and below the nest. It was a flight of about three feet. He looked rather perturbed, although that was the usual expression of the young birds. I made another attempt. This time my hand closed over one as the remaining three dispersed in various directions, one straight to the ground, peeping all the way, the others to nearby branches. I removed what parasites I could from the bird I had caught. They were very small. Twenty-five or thirty of them spread on my hands in a few seconds. I put the young bird back in the nest but he flew out also. I descended the tower and found one young bird on a low branch on the other side of the tree. I do not know whether or not that was the young bird which had flown to the ground. The other birds had remained on the same branches to which they had taken their "maiden flight." During this procedure the female bird had been perched on a limb of a nearby tree, giving her alarm call. Later a student

found a young Goldfinch on the sidewalk and brought him to the ornithology office. Dr. Nelson instructed him to return the bird to where he had found it. I was unable to observe the Goldfinches further as I left the Station that day.

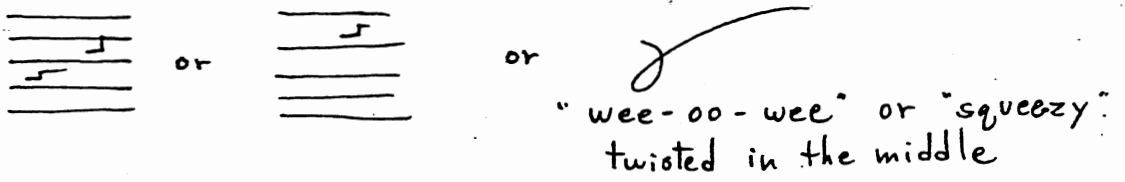
I submitted the specimens of mites to a student parasitologist and I expect to have further information on the parasite.

BEHAVIOR OF THE FEMALE BIRDS

As I have had no previous experience with nest watching, I did not realize the exceptional timidity of the female of nest number one. Dr. Pettingill mentioned this fact to me and I had an opportunity to compare the behavior of the female bird from the first nest with the female from nest number two.

There was never an occasion when I entered the blind on nest number one that the female did not go off the nest and give her alarm call. The only time I ever heard the alarm note from the second female was when she was deliberately frightened from the nest and when, on my final day of observation, the young prematurely left the nest. As to the first female, she usually flew to the aspen east of the blind and gave her alarm call. This sounded much like the quality of a soft Blue Jay call. Sometimes she would only give one note

and other times she would give two notes. This is how I interpreted the call in my notes:




I counted as many as 40 calls at one time. This lasted for about two minutes.

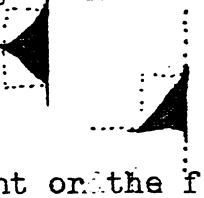
In speculating on the behavior of the female number one there are many answers to offer. From what I have read I deem female number two to be an average behaving female Goldfinch during the breeding season. In the comparisons following I am attempting to show the emotional deviation of female number one from the average female Goldfinch, female number two.

There may have been a difference in the individual emotional setup of the two birds; or this may have been the first nest built by female number one; female number two may have had many broods or may even have been observed before.

It seemed to me that the most obvious possibility was the location of the ladder on the blind. On tower number one the ladder was on the east side, the nest to the north. On tower number two the ladder was on the east side, but the nest was west of the tower. At nest number one, therefore, the female could always see me going up the ladder, moving the canvas aside and entering

the blind. No matter how obscure I tried to make my entry she could see and hear me. At nest number two the female could not see me enter the blind unless she herself was off the nest.

My approach to nest number one was usually from the beach. The female would see me before I ever reached the blind. At nest number two I usually approached from the east and could not be perceived by a bird on the nest. Then too, nest number two was on State Street and therefore subject to much traffic from people, automobiles, and trucks. There were people passing in and about the territory of nest number one, but the number would be very much less in comparison. The actual location of nest number two indicates that the female was much less wary or she never would have attempted building where so much human activity was being carried on.

The blind opening in nest number one was merely a split in the canvas thus:  which I pinned so that the hole was thus:  Nevertheless, I could hardly make a movement or the female would be off the nest. Nest number two had a zipper opening which could be slowly slid up or down without more than a curious look from the female.

Reactions of the female birds to foreign elements:

I observed a young Cowbird being fed by a Red-eyed Vireo about six feet to the left above the

female number one who was on the nest. At another time there was a young Chipping Sparrow being fed by its parent at about the same distance to the right above. The female ignored both procedures. At another time there were several Chickadees in the surrounding trees, some about five feet away in the pine. She seemed quite interested in these birds and turned, cocking her head to see them. Yet another time, Dr. Nelson was on the beach calling to her racoon; the female appeared attracted by the voice and turned her head to look downward.

I was observing female number two in the blind one day, when the truck was below us loading milk cans. One large can was thrown into the truck, creating an unexpected loud noise. I jumped slightly and I noticed that the female bird jumped also. The movement was noticeable mostly in her wings. Another similar noise followed immediately after and as my nerves were more accustomed to the noise I did not make a noticeable movement, but the female bird jumped as before.

HABITUAL PATHS TO APPROACH AND LEAVE NEST???

The female bird at nest number one was quite consistent in her manner of approaching and leaving the nest. Only once while I observed her did she return to the nest from the direction south-left. All the other times she entered and left the nest from the right of the blind. Except for a few times when she entered the nest with the male following to feed her, the female always

hopped up to the nest from about two feet below the nest branch. She usually made about eight hops and then jumped onto the edge of the nest then settling onto the eggs or young.

Her mate was not as consistent as she. He would fly either direction when he left the nest. Usually he would fly directly in back of the nest and then hop onto the edge where he would feed the female or the young. Sometimes he would alight upon the branches about the nest before coming to the nest. It should be mentioned that it would be natural for either of the birds of nest number one not to take a northward path from their nest as they were so close to the lake that such a path would be a roundabout way to any possible feeding territory.

At nest number two there was not a noticeable consistency. Although both sexes usually would leave toward the northeast they varied in this path. The female hopped up to the nest once or twice, but she usually would alight on a small branch which protruded from the side of the nest which it supported.

It may be that the timidity of the first female caused her to take the path up the nest branch before actually entering the nest. Often she would stop and wait a few seconds before hopping onto the nest edge. I observed that this hopping stimulated the young, for they began to open their mouths and stretch their necks as soon as the branch began to move from the hopping of the female.

**NEST NUMBER ONE: INCUBATION AND BROODING**[1]

Date: July 26, 1945

Nest: 6 eggs

Length of observation period: 3 hours, 17 minutes

Incubation by female:

Number of periods on nest: 3 periods

Minimum time on nest: 10 minutes

Average time on nest: 54 minutes

Maximum time on nest: 2 hours

Percentage of total time: 82 %

Minimum time off nest: 2 minutes

Average time off nest: 8 minutes

Maximum time off nest: 16 minutes

Percentage of total time: 12 %

Date: July 29, 1945

Nest: 5 young, 1egg

Length of observation period: 6 hours, 49 minutes (not continuous)

Incubation by female:

Number of periods on nest: 10 periods

Minimum time on nest: 2 minutes

Average time on nest: 29 minutes

Maximum time on nest: 1 hour, 48 minutes

Percentage of total time: 82%

Minimum time off nest: 2 minutes

Average time off nest: 5 minutes

Maximum time off nest: 12 minutes

Percentage of total time: 15 %

1. Hickey, J. J.; "A Guide to Bird Watching", pp. 199.

Date: July 30, 1945

Nest: 6 young

Length of observation period: 1 hour, 42 mintes

Incubation by female:

Number of periods on nest: 3 periods

Minimum time on nest: 7 minutes

Average time on nest: 12 minutes

Maximum time on nest: 20 minutes

Percentage of total time: 49 %

Minimum time off nest: 3 minutes

Average time off nest: 9 minutes

Maximum time off nest: 17 minutes

Percentage of total time: 50 %

Date: July 31, 1945

Nest: 6 young

Length of observation period: 3 hours, 35 minutes (not continuous)

Incubation by female:

Number of periods on nest: 6 periods

Minimum time on nest: 4 minutes

Average time on nest: 14 minutes

Maximum time on nest: 19 minutes

Percentage of total time: 40 %

Minimum time off nest: 5 minutes

Average time off nest: 18 minutes

Maximum time off nest: 35 minutes

Percentage of total time: 59 %

Date: August 1, 1945

Nest: 1 young : 5 fell from nest

Length of observation period: 3 hours, 21 minutes

Incubation by female:

Number of periods on nest: 6 periods

Minimum time on nest: 3 minutes

Average time on nest: 21 minutes

Maximum time on nest: 32 minutes

Percentage of total time: 64 %

Minimum time off nest: 1 minute

Average time off nest: 11.5 minutes

Maximum time off nest: 24 minutes

Percentage of total time: 35 %

NEST NUMBER TWO :INCUBATION AND BROODING

Date: August 5, 1945

Nest: 3 young : two eggs

Length of observation period: 1 hour, 15 minutes

Incubation by female:

Number of periods on nest: 4 periods

Minimum time on nest: 5 minutes

Average time on nest: 15 minutes

Maximum time on nest: 37 minutes

Percentage of total time: 81 %

Minimum time off nest: 3 minutes

Average time off nest: 4.6 minutes

Maximum time off nest: 6 minutes

Percentage of total time: 18 %

Date: August 6, 1945

Nest: four young: one egg

Length of observation period: 1 hour, 15 minutes

Incubation by female:

Number of periods on nest: 3 periods

Minimum time on nest: 7 minutes

Average time on nest: 25 minutes

Maximum time on nest: 46 minutes

Percentage of total time: 99+ %

Minimum time off nest: 1.5

Average time off nest: 1.5

Maximum time off nest: 1.5 (only off nest once)

Percentage of total time: 1- %

Date: August 7, 1945

Nest: five young

Length of observation period: 2 hours, 10 minutes

Incubation by female:

Number of periods on nest: 4 periods

Minimum time on nest: 10 minutes

Average time on nest: 28.5 minutes

Maximum time on nest: 65 minutes

Percentage of total time: 81 %

Minimum time off nest: 7 minutes

Average time off nest: 8 minutes

Maximum time off nest: 16 minutes

Percentage of total time: 18 %

Date: August 12, 1945

Nest: 5 young

Length of observation period: 1 hour, 11 minutes

Incubation by female:

Number of periods on nest: none

Minimum time on nest: -

Average time on nest: -

Maximum time on nest: -

Percentage of total time: 0 %

Minimum time off nest: -

Average time off nest: 71 minutes

Maximum time off nest: -

Percentage of total time: 100%

Date: August 13, 1945

Nest: 5 young

Length of observation period: 2 hour, 20 minutes

Incubation by female:

Number of periods on nest: 2 periods

Minimum time on nest: 2

Average time on nest: 2

Maximum time on nest: 2

Percentage of total time: 3 %

Minimum time off nest: 19

Average time off nest: -

Maximum time off nest: 117

Percentage of total time: 97 %

Date: August 15, 1945

Nest: 5 young

Length of observation period: 4 hours, 57 minutes

Incubation by female:

Number of periods on nest: 3 periods

Minimum time on nest: 10 minutes

Average time on nest: 17 minutes

Maximum time on nest: 21 minutes

Percentage of total time: 16%

Minimum time off nest: 5 minutes

Average time off nest: 49 minutes

Maximum time off nest: 81 minutes

Percentage of total time: 84%

Date: August 17, 1945

Nest: 5 young

Length of observations Period: 53 minutes

Incubation by female:

Minimum time on nest: -

Average time on nest: 13 minutes (only on once)

Maximum time on nest: -

Percentage of total time: 25%

Minimum time off nest: -

Average time off nest: 40 minutes (only off once)

Maximum time off nest: -

Percentage of total time: 75%

**NEST NUMBER ONE:** FEEDING [V]

Date: July 29, 1945

Young: 5 young one day old: one egg

Period of Observation: 8:00 a.m. - 11:13 a.m.
1:45 p.m. - 4:52 p.m.
8:39 p.m. - 9:02 p.m. 5 hours, 43 minutes

Total number of feeding visits by ♂ to ♀. 1

Total number of feeding visits by ♂ to ♀ to young. 8

Total number of feeding visits by ♂ to young. 0

Total number of feeding visits by ♀ to young. 0

Average number of visits: a.m.: 1 per 28.6 minutes
p.m.: 1 per 47 minutes

Intervals between feeding:

| Morning: | Afternoon: | Evening no feeding |
|---|---|---|
| Minimum 19 minutes | Minimum 10 minutes | |
| Average 38 minutes | Average 34 minutes | |
| Maximum 59 minutes | Maximum 61 minutes | |

Date: July 30, 1945

Young: 6 young: 5 one day old: one just hatched

Period of Observation: 8:37 a.m. - 10:19 a.m.
4:06 p.m. - 5:00 p.m. 2 hours, 35 minutes

Total number of feeding visits by ♂ to ♀. 0

Total number of feeding visits by ♂ to ♀ to young. 3

Total number of feeding visits by ♂ to young. 2

Total number of feeding visits by ♀ to young. 0

Average number of visits: a.m.: 1 per 25 minutes

Intervals between feeding:

Morning:

Minimum 23 minutes

Average 30 minutes

Maximum 40 minutes

[V] J. J. Hickey, "A Guide To Bird Watching," pp. 200.

NEST NUMBER ONE: FEEDING

Date: July 31, 1945

Young: 6 young; 5 two days old: one one day old

Period of Observation: 8:20 a.m. - 11:25 a.m.
7:40 p.m. - 8:10 p.m.
3 hours, 35 minutes

Total number of feeding visits by ♂ to ♀. 0

Total number of feeding visits by ♂ to ♀ to young. 3

Total number of feeding visits by ♂ to young. 1

Total number of feeding visits by ♀ to young. 2

Average number of visits: a.m.: 1 per 35 minutes

Intervals between feeding:

Morning:

Minimum 10 minutes

Average 26 minutes

Maximum 44 minutes

Evening: no feeding

Date: August 1, 1945

Young: 1 young in nest: 5 young on ground

Period of Observation: 7:47 a.m. - 11:08 a.m.
3 hours, 21 minutes

Total number of feeding visits by ♂ to ♀. 1

Total number of feeding visits by ♂ to ♀ to young. 3

Total number of feeding visits by ♂ to young. 0

Total number of feeding visits by ♀ to young. 0

Average number of visits: a.m.: 1 per 50 minutes

Intervals between feeding:

Morning:

Minimum 13 minutes

Average 17 minutes

Maximum 19 minutes

**NEST NUMBER TWO:** FEEDING

Date: August 5, 1945

Young: 3 young : 2 eggs

Period of Observation: 4:30 p.m. - 5:45 p.m.
1 hour, 15 minutes

Total number of feeding visits by ♂ to ♀ . 0

Total number of feeding visits by ♂ to ♀ to young. 1

Total number of feeding visits by ♂ to young. 0

Total number of feeding visits by ♀ to young. 0

Average number of visits: 1 per 75 minutes

Intervals between feeding: only one feeding

Date: August 6, 1945

Young: 4 young: one egg

Period of Observation: 10:21 a.m. - 11:46 a.m.
1 hour, 25 minutes

Total number of feeding visits by ♂ to ♀. 1

Total number of feeding visits by ♂ to ♀ to young. 1

Total number of feeding visits by ♂ to young. 0

Total number of feeding visits by ♀ to young. 0

Average number of visits: 1 per 42 minutes

Intervals between feeding: 47 minutes (only one interval)

Date: August 7, 1945

Nest: 5 young:

Period of Observation: 1:30 p.m. - 3:40 p.m.
2 hours, 10 minutes

Total number of feeding visits by ♂ to ♀ . 0

Total number of feeding visits by ♂ to ♀ to young. 2

Total number of feeding visits by ♂ to young. 0

Total number of feeding visits by ♀ to young. 0

Average number of visits: 1 per 65 minutes

Intervals between feeding: 36 minutes (only one interval)

NEST NUMBER TWO: FEEDING

Date: August 13, 1945

Young: 5 young

Period of Observation: 8:30 a.m - 10:48 a.m. 2 hours, 18 minutes

Total number of feeding visits by ♂ to ♀. 0

Total number of feeding visits by ♂ to ♀ to young. 0

Total number of feeding visits by ♂ to young. 2

Total number of feeding visits by ♀ to young. 2

Average number of visits: 1 per 34.5 minutes

Intervals between feeding:

Morning:

Minimum 8

Average 9

Maximum 10

Date: August 15, 1945

Young: 5 young

Period of Observation: 8:35 a.m - 10:45 a.m.
1:22 p.m - 4:29 p.m. 5 hours, 15 minutes

Total number of feeding visits by ♂ to ♀. 0

Total number of feeding visits by ♂ to ♀ to young. 1

Total number of feeding visits by ♂ to young. 4

Total number of feeding visits by ♀ to young. 3

Average number of visits: 1 per 39.3 minutes

Intervals between feeding:

Morning:

Minimum 10

Average 35

Maximum 75

Afternoon:

Minimum 8

Average 33

Maximum 48

NEST NUMBER TWO: FEEDING

Date: August 17, 1946

Young: 5 young

Period of Observation: 5:50 a.m. - 6:43 a.m. 53 minutes

Total number of feeding visits by ♂ to ♀. 0

Total number of feeding visits by ♂ to ♀ to young. 0

Total number of feeding visits by ♂ to young. 1

Total number of feeding visits by ♀ to young. 1

Average number of visits: 1 per 27 minutes

Intervals between feeding: 16 minutes (only one interval)

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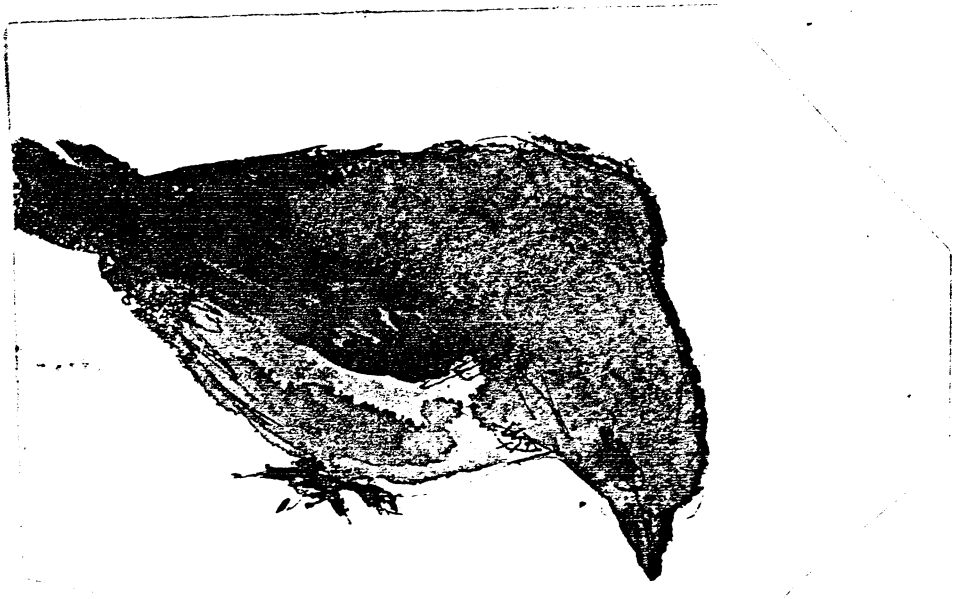
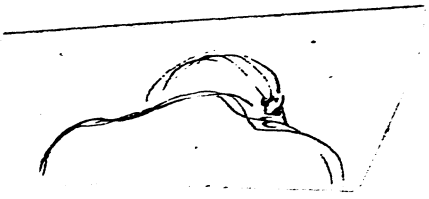
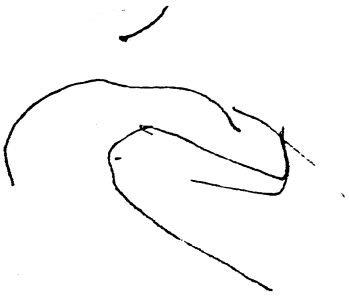
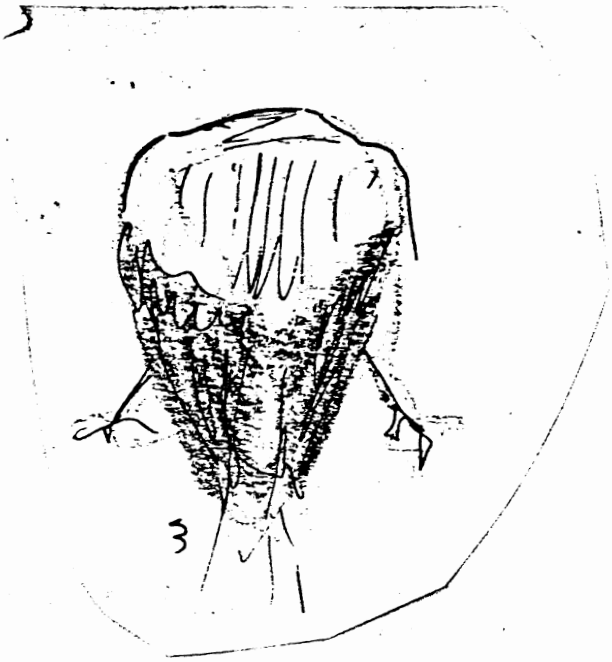
August 1, 1945
UBS.





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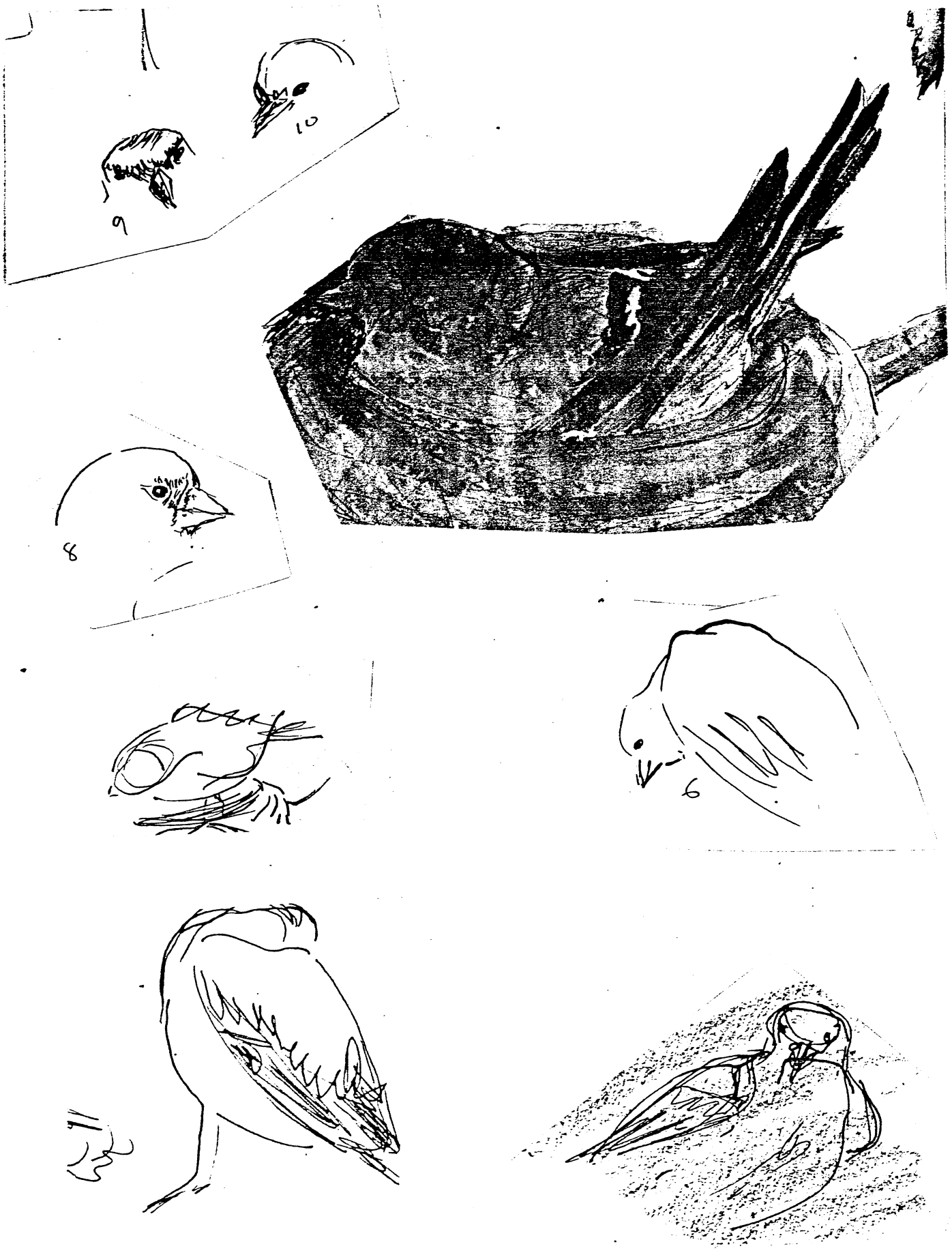
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