

Some Observations On The Nesting Activities
Of The Baltimore Oriole (Icterus galbula)

by

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Introduction

This study of a nest, with young, of the Baltimore Oriole (Icterus galbula) was made in connection with required work in our Advanced Ornithology class. The object was to observe activities at the nest and the general behavior of the adults in the vicinity of the nest. The nest was discovered June 30, 1947, and the young left the nest on July 9, 1947. The nest was found on the University of Michigan Biological Station property in Cheboygan County, Michigan. It was located near the faculty cabins along South Fishtail Bay of Douglas Lake. Nesting activities were observed from a blind for fifteen hours and from the ground at short intervals. The study of the nest was facilitated by the use of a 40 foot tower at the top of which the blind was fastened. An abandoned Oriole's nest from another area was collected for analysis after it was evident the nest was not in use.

Environment

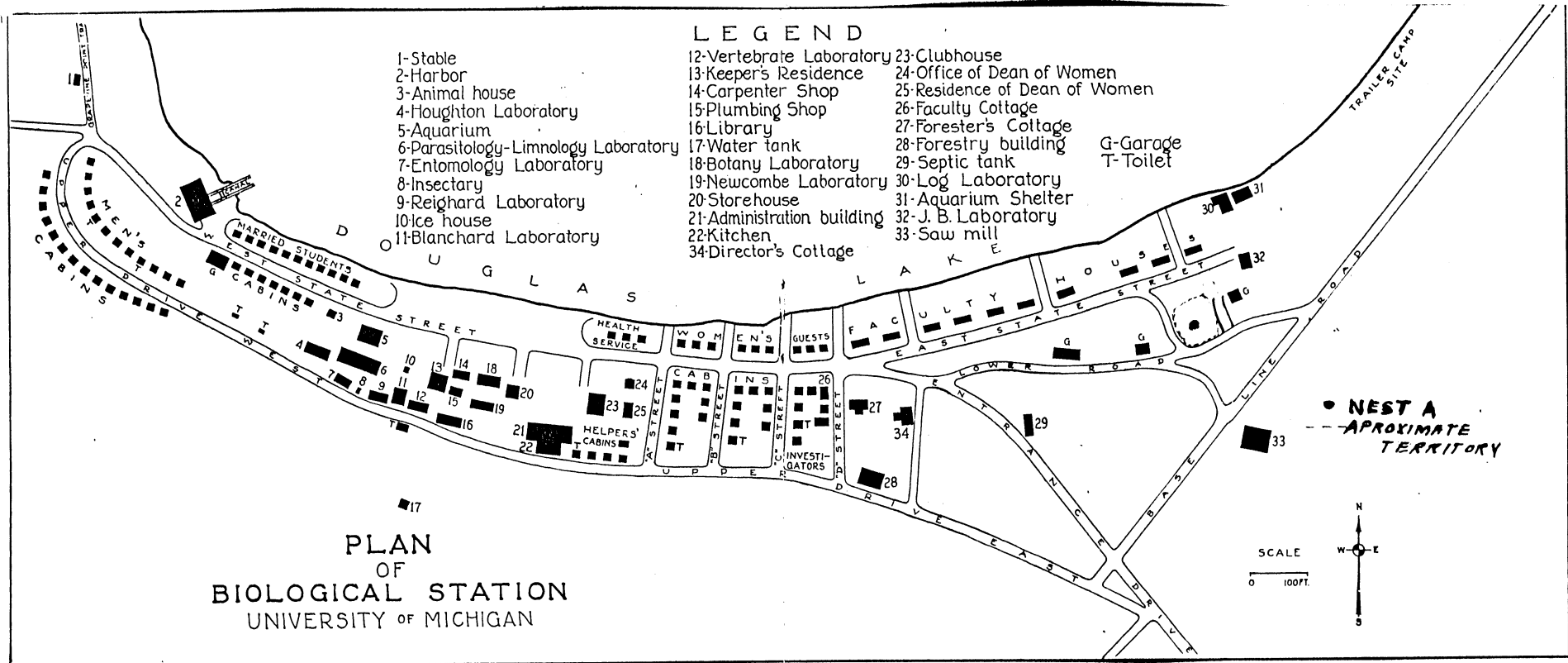
The nest of the Baltimore Oriole was found in an aspen association in which the dominant trees were Quaking Aspen (Populus tremuloides), Large-toothed Aspen (Populus grandidentata), and White Pine (Pinus strobus). Sapling trees of Red Oak (Quercus borealis), Juneberry (Amelanchier sp.), Red Maple (Acer rubrum) and Red Pine (Pinus resinosa). In the ground plants, Bracken Fern

(Pteris aquilina) was the dominant plant with Wintergreen (Gaultheria procumbens), Cow Wheat (Melampyrum lineare) and seedlings of Pinus strobus and Quercus borealis.

This area 40 feet by 80 feet was at one time a part of a large aspen area but has been cut off on the west by a driveway, the east by a driveway and the open area of the sawmill, a road to the south and faculty cabins on the north. The presence of the roads opened up the area to the wind and the young aspens swayed a great deal in the rather brisk winds from Douglas Lake. Across the road to the south was a similar aspen area with more ground plants including Blueberry (Vaccinium pennsylvanicum) and other species of trees including White Birch (Betula papyrifera) and Sugar Maple (Acer saccharum). The open area around the sawmill was for the most part a grassland.

Territory

The area around the nest was used for mating and nesting in a plot 50 by 70 feet within the limits of the roads. This appeared to be the extent of its territory but I felt that it was probably limited by the roads on at least three sides of the area. When searching for food the birds did so almost entirely outside of the breeding territory. The nest was located approximately in the center of the territory and when defending it both male and female participated.



The only interspecific fighting I witnessed was with the Kingbird. It usually appeared in late afternoon or early evening and sat on the male Oriole's favorite singing perch near the top of a Populus grandidentata. This interference roused the male to give his series of rapid, harsh sounding scolding notes and then the female promptly joined in and both continued very persistently.

My entrance into the area in the early evening was a great cause for alarm and both adults joined in a series of loud scolding notes. On one occasion they gained the attention of another pair of Orioles from another territory and then all four birds gave the scolding notes. On another visit there the scolding mates brought into the territory a Myrtle Warbler, Red-eyed Vireo and Kingbird all of which joined in the scolding but remained on the edge of the territory. This demonstration of mobbing may have been an attempt to aid in territory defense but may well have been in defense of the young.

Davis (1941, 53:157-168) states that the Kingbird is usually the victor in skirmishes with other species but on one occasion a Baltimore Oriole repelled his attacks by using his bill and fluttering his wings. This interspecific fighting was observed in my study of nest A. Bent (1942, 5-29) tells of a pair of Kingbirds

that took possession of an old Oriole's nest in the top of a Maple tree". Forbusn (1927, 443-448) tells of Orioles driving off Bronzed Grackles, taking materials out of other birds nests and throwing Redstart eggs out of a nest and then destroying the nest.

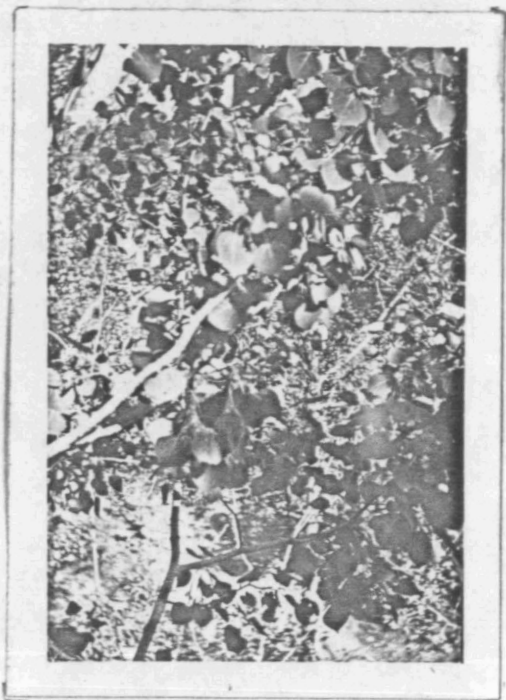
The defense of the territory against intruders seemed to become greater as the young developed. The length of time spent in threat displays and attacking the blind was increased in duration and also showed an increase in violence each time I visited the area. The female, when the young were eight days old was restless most of the time and scarcely fed the young or came near the nest. The day the young left the nest the adults very actively attacked the blind and made threat displays as soon as I approached. They continued to defend the territory for two days after the young had left the nest and after that I did not see them in the territory.

Nesting Site

The nest under observation from the blind (nest A) was loosely woven out of plant fibers into a pendulous, cup-shaped structure. It was attached with fibers to a horizontal branch between parallel twigs that had clusters of leaves at the end. As the birds became older and the number of visits to the nest became greater the nest began to slip off of the twigs. For the last two days it was held in place only by the leaf petioles. This nest as described in Table I. was about a foot and a half from the trunk and was shaded by leaves on a higher branch until about 3:30 P.M.

Another Oriole's nest as described in Table I was found on the hill above the open gravel pit near a road cut through an aspen association. The birds were observed singing in the vicinity of this (Nest B)

Photographs in Baltimore Oriole Nesting Territory.



Position of nest on branch.



Blind used for observation.

for about a week and then gradually stopped and left the territory. I checked the area periodically for two weeks and then decided to collect the nest. It contained one egg 22.75 mm. long and 15.5 mm. wide and was slightly cracked. The egg is elongate ovate, a grayish white color with streaks and irregular lines etched on the surface in varying degrees of brown. A rosy color in the gray with dark spots at the large end mark it as a distinctive egg. At least one other egg had been laid and was broken in the bottom; this may or may not have been the reason for the desertion of the territory. The nest was about 40 feet away from a Kingbird's nest but on a slightly higher level. In view of the references made to the Kingbird, I am inclined to think that the proximity of their nesting territories they have in some way prompted the Orioles to leave the area.

Table I
Structure of Nests

	Nest A	Nest B
Location	Horizontal branch of a Populus tremuloides tree	Same
Height from ground	38 feet	25 feet
Distance from trunk	1 ft. 8 in.	1 foot
Measurements		
Inside diameter	63 mm.	66 mm.
Circumference	300 mm.	300 mm.
Inside depth	105 mm.	80 mm.
Materials		
Lining	Fine plant fibers and cottony material	Same
Bulk	Plant fibers	Same

Young and Their Development

The nest contained five young whose eyes were not open when the nest was found on June 30th. Assuming this to be the first stage in development with down feathers on the main feather tracts I called the young fourth day birds on my first day of observation. (July 2nd.). In the second stage of development the fifth and sixth day there was not much evidence of motion except for the open mouths which were seen whenever the adults approached the nest. They approached the nest with a melodious three syllable call and immediately the young mouths opened.

During the third stage, seventh, eighth, and ninth days, one young seemed to be consistently on top of the others. It did quite a bit of stretching of its wings over the edge of the nest. On three occasions I was able to hear their crying call for food. Chapman (1912, 489) refers to these birds as "Cry Babies of the Bird World", so named by Mrs. Olive Thorne Miller. I noticed the crying call not as a continuous one for food but only on the part of one fledgling. On one occasion as the female was feeding the young near the top of the nest it seemed as if in answer to this cry she used her bill and pushed the others aside, feeding the smaller bird at the bottom of the nest.

In the fourth stage, ninth and tenth day, the young birds looked rather weird as the neossoptiles, attached to the tips of the teleoptiles had been pushed out of the sheaths and had become dislodged or disintegrated. This was true except for two areas over the eyes adjacent to the capital feather tract. This gave the young a horned appearance. The rest of their body was well feathered. I demonstrated

Table II

Feeding activities of the Male

Date	Time	Activity at nest (male)	Interval
July 2, 1947 4th day (4:30 A.M. to 8:20 A.M.)	4:38 A.M.	Food	
	4:42	Food	4
	4:50	Food	8
	5:04	Fecal sac removed	14
	5:05	Food	1
	5:07	Food	2
	5:10	Food	3
	5:14	Food	4
	5:16	Food	2
	5:20	Food	4
	5:23	Food	3
	5:27	Food	4
	5:29	Food	2
	5:35	Food	6
	5:46	Food	11
	5:55	Food	11
	6:00	Food	5
	6:08	Food	8
	6:15	Food	7
	6:35	Food	20
	6:48	Food	13
	6:57	Food	9
	7:01	Food	4
	7:10	Food	9
	7:32	Food	22
	7:41	Food	9
	7:48	Singing at nest	7
7:54	Food	6	
8:04	Food	10	
8:12	Food	8	
8:20	Food	8	
		Av. 7.3	
July 2, 1947 (7:10 P.M. to 8:45 P.M.)	7:10 P.M.	Food	
	7:25	Food	15
	7:34	Food	9
	7:40	Food	6
	7:54	Food	14
	8:45	Flew away	51
		Av. 19	

Table II (cont'd)

Feeding activities of the male

Date	Time	Activity at nest	Interval
July 4, 1947 6th day birds (8:40 A.M. to 1:35 P.M.)	8:20 A.M.	Food in mouth no feeding	
	10:02	Food and fecal sacs	82 min.
	10:12	Food	10
	10:20	Food	8
	10:27	Food	7
	10:37	Food	10
	11:02	Food	25
	11:13	Food	11
	11:27	Food	14
	11:32	Food	5
	11:40	Attentive	8
	11:43	Attentive	3
	12:06	Food	23
	12:10	Food	4
	12:14	Food	4
	12:17	Food	3
	12:25	Food and fecal sacs	8
	12:32	Food	7
	12:50	Food	18
	12:52	Food	2
12:56	Food	4	
1:06	Food and fecal sacs	10	
1:16	Food	10	
1:30	Food	14	
1:34	Food	4	
			Av. 12.2
July 7, 1947 9th day birds (10:40 A.M. to 11:50 A.M.)		No feeding	
	(2:30 P.M. to 4:30 P.M.)	Threat display	
	2:30	Food	40
	3:16	Food and fecal sacs	31
	3:47		Av. 23.7
July 8, 1947 10th day birds (7:40 P.M. to 8:50 P.M.)	7:40	Not in site	
	8:05	Food	
	8:50	Not returned	

Table 11-a

Feeding activities of the female

Date	Time	Activity at nest (female)	Interval
July 2, 1947 4th day. (4:30 A.M. to 8:20 A.M.)	4:45 A.M.	Threat display	
	4:47	Call notes	2
	4:56	Food	9
	5:05	Food	9
	5:09	Threat and song	4
	5:12	Warning notes	3
	5:13	Call notes	1
	5:19	Singing and calling	6
	5:24	Warning notes	5
	5:35	Warning notes	11
	5:42	Warning call	7
	6:03	Food	21
	6:05	Attentive	2
	6:12	Attentive	7
	6:17	Attentive	5
	6:23	Attentive	6
	6:25	Call notes	2
	6:40	Food	15
	6:43	Food	3
	7:04	Attentive	21
	7:15	Attentive	11
	7:20	Fecal sac	5
	7:32	Warning	12
	7:48	Singing at nest	16
	7:58	Food	10
	8:02	Call notes	4
	8:06	Call notes	4
			Av. 7.73
July 2, 1947 (7:10 P.M. to 8:45 P.M.)	7:10	Food	
	7:47	Food and removal of fecal sacs	37
	7:54	Attentive	7
	8:02	Fecal sac	8
	8:25	Sleeping position five feet away	23
	8:30	Sitting by	5
8:45	Flew away	15	
		Av. 16.1	

Table II-a (cont'd)

Feeding activities of the Female

Date	Time	Activity at nest	Interval
July 4, 1947 6th day birds (8:40 A.M. to 1:35 P.M.)	8:40	Scolding at nest	
	9:05	Food - white grub	25
	9:25	Singing	20
	10:25	Food	60
	10:50	Fecal sac	25
	10:59	Food	9
	11:35	Food	36
	11:38	Attentive	3
	11:44	Food	6
	12:05	Attentive	20
	12:14	Fecal sacs	9
	12:20	Food	6
	12:58	Attentive	38
	1:15	Food	17
	1:24	Food - 2 larvae	9
	1:31	Food	7
		Av. 18.2	
July 7, 1947 9th day birds (10:40 A.M. to 11:50 A.M.) (2:30 P.M. to 4:30 P.M.)	2:30	No feeding	
	2:30	Threat display	
	3:15	Food and fecal sacs	45
	3:28	Attentive	13
	3:37	Food	9
	3:42	Attentive	5
	3:51	Food	9
	4:02	Food	11
	4:06	Food and fecal sacs	4
	4:28	Food	22
		Av. 14.8	
July 8, 1947 10th day birds (7:40 P.M. to 8:50 P.M.)	7:47	Food	
	8:50	Not returned	

Table III

Summary of Tables I and II.

Date	July 2	July 4	July 7
Age of young	4th.day	6th.day	9th.day
Time of day*	(4:30 to 8:30A.M.)	(8:40A.M.to 1:35 P.M.)	(2:30 to 4:30 P.M.)
Air temperature	M.74 Min.54	M.74 Min.63	M.78 Min.59
Wind velocity	20 to 25 mi.	15 to 20mi.	slight
Weather Conditions	Clear, warm	Clear	Clear
1.Total feeding visits	38	32	9
2. Total feeding visits of the male.	29	23	2
3. Total feeding visits of the female.	9	9	7

my lack of experience in bird observation because on the morning of the eleventh day (July 9th) four of the young left the nest, while the small inactive fledgling revived rapidly after that and it left in the early afternoon. This came as a surprise as 12 and 13 days were reported in previous nest studies. Though I did not personally see all five birds leave the nest I believe they did so successfully. My search in the territory was fruitless - I could not find a trace of any young birds.

Parental Care

In my 38 foot blind, four feet from the nest, it was possible to see the type of food the adults brought to the nest and to observe their manner of attentiveness at the nest. My observations of the fourth day birds began from the blind at 4:30 A.M. The male continued direct feeding at fairly regular intervals but the female was uneasy and spent the first hour sitting on nearby branches alternately giving threat displays and singing a short uncertain but melodious call. She visited the nest occasionally but brought no food. During the first period of observation she brought^t food to the nest 9 times as compared to 29 for the male bird. I returned to the nest in the evening and in one and one half hours the young were fed five times by the male and three times by the female. She made no threat displays when I entered the blind but stayed near the vicinity of the nest with her feathers fluffed out as if she were asleep and occasionally closed her eyes.

On the sixth day the female and male made threat displays when I approached the blind, the first food was brought by the female at 9:05. Before feeding, what may well have been a white spider, the female sang a short melodious call and then darted quickly to the nest

and then left the area. By 9:25 both birds had quieted down and were singing but not feeding. The young lifted their open mouths in unison at 9:55 and at 10:07 in response to a certain type of call note given by the adults in a nearby tree. At 11:02 a large winged insect was placed in first one mouth and then another and finally the third young was able to swallow it. During this period from 8:40 A.M. to 1:35 P.M., as summarized in Table I and Table II, the male fed 23 times and the female 9 times. (Table III)

On the ninth day, July 7th., it was calm and sunny and the birds seemed to react accordingly. They made threat displays for 20 minutes after my arrival, did no feeding and then left the territory. I stayed in the blind about 50 minutes waiting for them to return and then left. During the absence of the adults the young would lift their heads and open their mouths. I did not observe any crying along with this activity but it may not have been possible for me to hear it over the sound of rustling poplar leaves. The afternoon of the same day I visited the nest at 2:30 P.M. and found both birds in the territory with food in their mouths. They promptly ate the food and begin their customary threat displays. About 45 minutes later the male brought food to the nest and again 37 minutes later. In the same time the female fed three times and again three times in the next hour. The male left the area and did not return, thus from 2:30 to 4:30 P.M. the interval of inattentiveness for the male was averaged to be 23.7 as compared to that of the female which was 14.8 minutes (Table I and II).

The tenth day from 7:40 to 8:50 A.M. the young were fed twice and the adults seemed inattentive. This should have been indicative to me of a change in attitude toward the young but, unfortunately, not until I was told by a fellow student the next morning was I aware of the significance. The eleventh day, July 9th, two of the young were

out of the nest on a nearby tree about 20 feet high at 10:00 A.M., and a third young was out of the nest but not seen. I watched the fourth bird balance on the edge of the nest for about an hour and then hop to the twig above the nest. It sat there another hour and showed no sign of going further so I left the blind. At this time the fifth, and smallest fledgling, looked very inactive asleep in the nest and I assumed it would remain so for quite some time. At 4:00 P.M. when I returned the nest was empty and an hour's search of the area revealed no young but the adults continued their threat displays. On July 28th. two young Orile's were seen on the hill above C Street but I have no way of knowing whether or not these young had started their journey in Nest A. about an eighth of a mile away.

Nest Sanitation

The birds both took part in nest sanitation by carrying away the fecal sacs. The female was recorded as having carried them away seven times as compared to the male who carried five. It was difficult to determine if the bird was being attentive and merely sitting on the nest or carrying the sacs. The depth of the nest made it necessary for the adults to lean far into the nest when carrying on this function.

Songs and Call Notes

Both adults used an approach call of three syllables which is melodiously given through a half opened bill containing food. This call was given at short intervals as the birds approached the nest by hopping quietly from one branch to the next. A raucous scolding call note was used as a warning note mostly by the female when she was aware of disturbance in the blind and the male was feeding. This raucous rapid

call was more emphatically and rapidly used in their threat display and attacks on the blind. Their regular song which was heard quite frequently in the tree tops is used by both male and female, but in my short study I was unable to distinguish any variation in the manner of singing.

Discussion

The presence of the Oriole's nest in an aspen tree close to the main trunk raises a question as to why in an elm tree the nest is at the tip of the branch. This seems to indicate an adaptation to the materials available. The size of the territory herein described can best be verified by making comparisons with similar territories in order to determine the effect on size of the territory by the various man made changes in the area and his intrusions.

Summary

1. The study of the Baltimore Oriole was made on the University of Michigan Biological Station property near South Fish Tail Bay on Douglas Lake in Cheboygan County, Michigan.
2. The nest was located in a Quaking Aspen (Populus tremuloide) on a horizontal branch 38 feet high, in an Aspen-Pine Association.
3. The territory set up was a mating -nesting one about 50 by 70 feet in size, the nest located in south central section.
4. In defending the territory interspecific fighting and mobbing were observed, the latter in attacks against my intrusion.
5. The nest under observation (Nest A) was similar in structure to (Nest B) a deserted nest found in a similar habitat but 25 feet high and 40 feet from a Kingbird's nest.

6. The young were four days old when the study was begun and they left the nest the morning of the eleventh day.
7. Feeding of the young by both sexes showed a close relationship in the in the percentage of attentiveness of both sexes.
8. Nest sanitation was carried on by both sexes usually directly after a feeding. The fecal sacs were carried out of the territory
9. The calls varied from a harsh, raucous, rapid call used in threat displays and attacks, to the more common song used on a singing perch by both sexes.
10. The young left the territory the same day they left the nest and thus no post-nesting study was made. The adults remained and defended the territory for two days after the young left.

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