

A STUDY OF THE NESTLING STAGE
OF THE YELLOW-BILLED CUCKOO (COCCYZUS AMERICANUS AMERICANUS)

by

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INTRODUCTION

This report concerns a study of two nestlings of the Yellow-billed Cuckoo (Coccyzus americanus americanus). The nest was discovered July 21, 1942 on Grapevine Point, at Douglas Lake, Michigan, on the property of the University of Michigan Biological Station. The study was made in order to gain information on the growth and development of the nestlings and on the activities of the parents. Observations were begun on July 22, 1942, just prior to the hatching of the young, and extended to July 30, when the young left the nest. A total of fifty-seven hours was spent in observing during the nestling stage, the periods varying from one hour to fifteen hours in length. Because of the shyness of the adult birds, a ground blind was placed at a distance of twenty-five feet from the nest, and a nineteen power telescope was used as an optical aid. On July 28, the fifth day after hatching, it was possible to place the blind within six feet of the nest, the adult birds having become accustomed to the blind.

Appreciation is expressed to Dr. O. S. Pettingill, Jr., of Carleton College, Northfield, Minnesota and of the University of Michigan Biological Station, Douglas Lake, Michigan, for valuable advice and for the use of the ground blind and telescope. Thanks are extended to Mr. Jack Stanford for indicating the location of the nest observed, and to Mr. Clifford Davis for the donation of Nest 2, which was used in a comparison of nest structure.

HABITAT

The nest was situated in a small clearing¹ covered with bracken. The nesting tree was an American Beech (Fagus grandifolia) located in the north part of the clearing. The surrounding trees were American Aspen (Populus tremuloides), White Birch (Betula alba), Sugar Maple (Acer saccharum), Pin Cherry (Prunus pennsylvanica) and Scotch Pine (Pinus sylvestris).

Other birds observed were the Red-eyed Vireo (Vireosylva olivacea), Black and White Warbler (Mniotilta varia) and the Ovenbird (Seiurus aurocapillus). The only mammal seen was the Chipmunk (Tamias striatus). Small black ants were observed on the nesting tree and a bird louse on one of the young, but the species of these were not determined.

It was evident that the adult birds did not obtain food in the immediate vicinity of the nest, since they disappeared from sight during inattentive periods. However, a portion of the food was certainly gathered within the habitat, as evidenced by the fact that one of the adults returned with food after an inattentive period of only two minute's duration.

No other Yellow-billed Cuckoos were seen in the vicinity, therefore, there was no opportunity to observe territorial boundaries through intra-specific conflicts. There was seemingly no contact with other birds of the environment, until after the young had left the nest. On the afternoon of that day, one of the young was momentarily inspected by a Red-eyed Vireo, and later by a Black and White Warbler, both feeding in the

1. See Map 2

vicinity.

NESTS

The nest of the Yellow-billed Cuckoo family studied, Nest 1, was located in the main fork of a small, double, American Beech. The bottom of the nest was 1.9 meters above the ground. Two additional Yellow-billed Cuckoo nests were examined for purposes of comparison. Nest 2, also located on Grapevine Point, was found in a young Sugar Maple. Supported mainly by dead grapevines, the nest was 4 meters above the ground. Nest 3, two miles west of the first two nests, was placed in an American Elm (Ulmus americana), 2.5 meters from the ground and 4 meters out from the trunk. The three nests were collected and comparisons made. A comparative analysis of the nests as to dimensions and materials of construction is as follows:

<u>Dimensions</u>	Nest 1	Nest 2	Nest 3
Inside diameter	100 mm.	70 mm.	No cup
Outside diameter	250 mm.	170 mm.	250 mm.
Inside height	25 mm.	5 mm.	No cup
Outside height	80 mm.	50 mm.	60 mm.

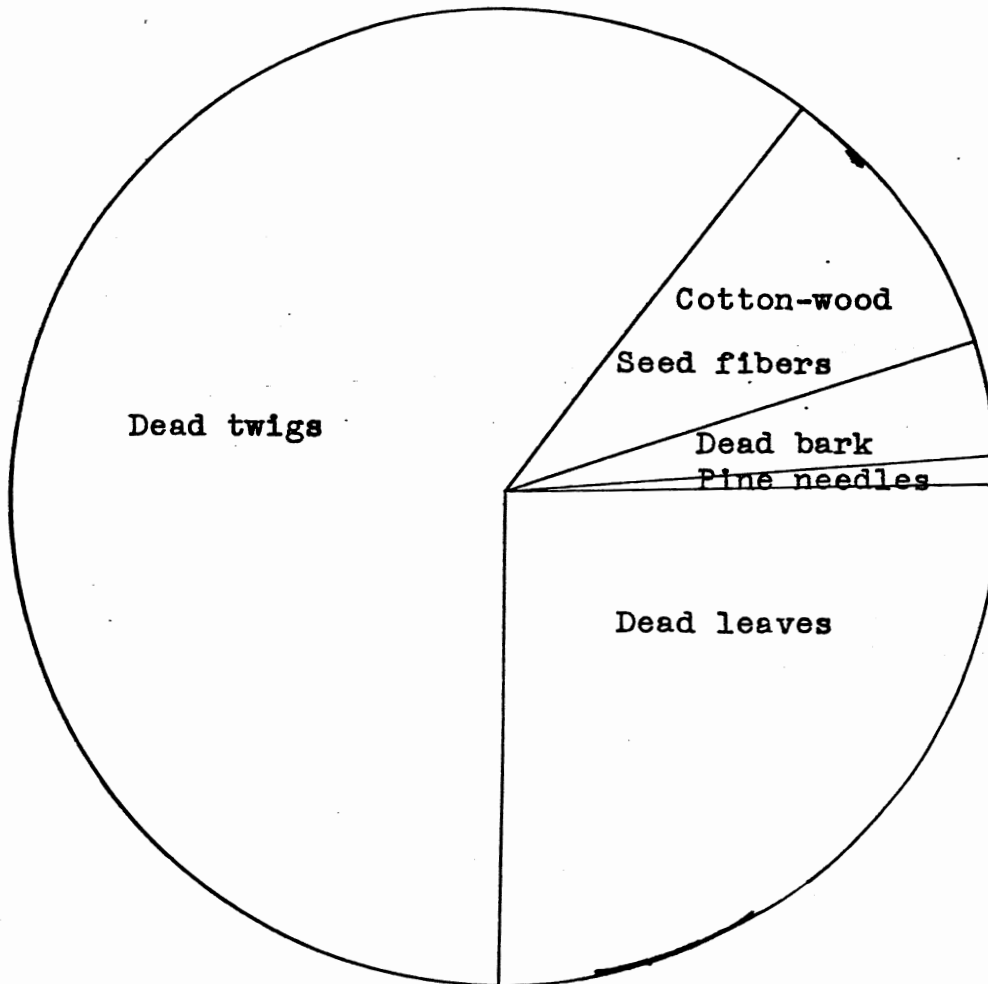
<u>Materials</u>			
Dead twigs	60%	69%	99%
Dead leaves	25%	15%	1%
Seed down	10%	0%	
Dead bark	4%	15%	
Pine needles	1%	1%	

See Figures 1, 2 and 3 for a graphic analysis of nesting materials by volume.

The dead twigs used in nest construction showed freshly-broken ends, indicating that they had been broken from trees, rather than having been picked up from the ground. The dead

NEST 1 OF THE YELLOW-BILLED CUCKOO
 at
 Douglas Lake, Michigan

Nesting Material Analysis by Volume



1.9 Meters above ground

MATERIALS

Dead twigs---60 %
 Dead leaves--25 %
 Seed fibers--10 %
 Dead bark---- 4 %
 Pine needles- 1 %

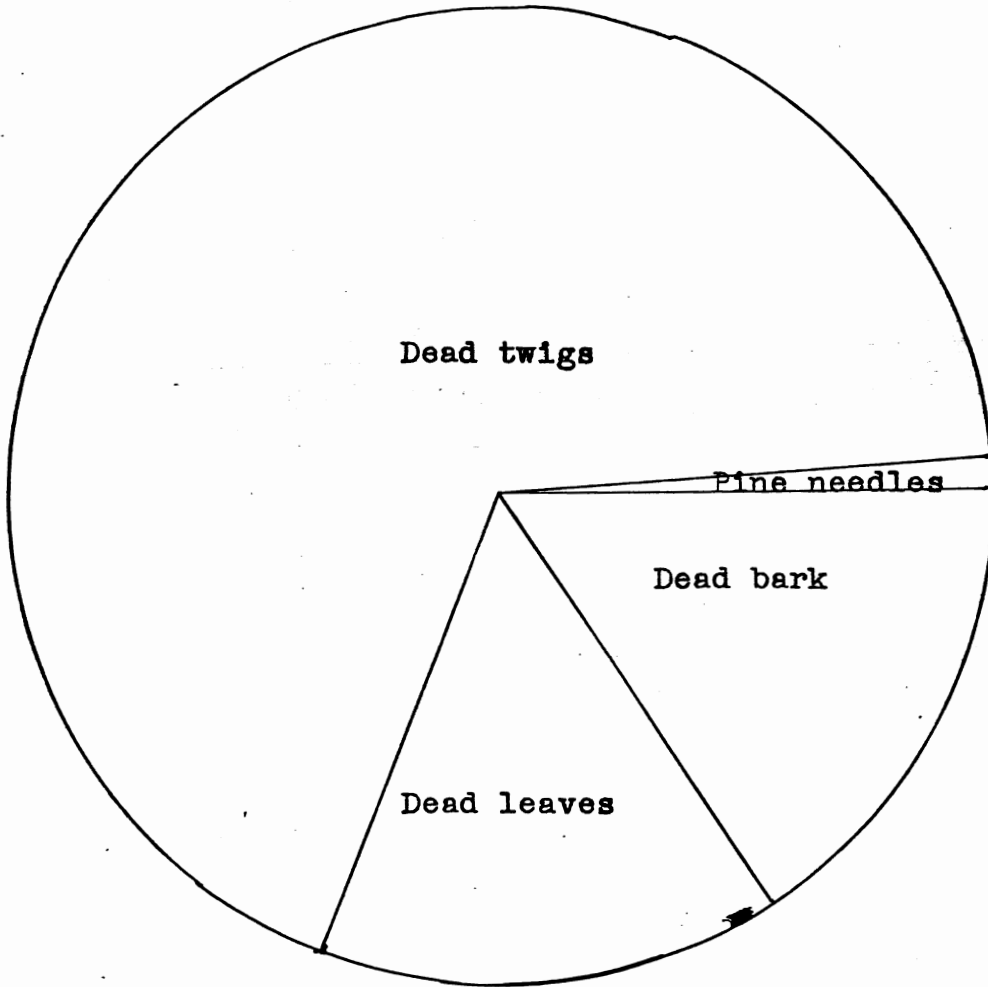
DIMENSIONS

Inside diameter--100 mm.
 Outside diameter-250 mm.
 Inside height---- 25 mm.
 Outside height--- 80 mm.

Figure 1

NEST 2 OF THE YELLOW-BILLED CUCKOO
at
Douglas Lake, Michigan

Nesting Material Analysis by Volume



4 Meters above ground

MATERIALS

Dead twigs---69 %
Dead leaves--15 %
Seed down---- 0 %
Dead bark----15 %
Pine needles- 1 %

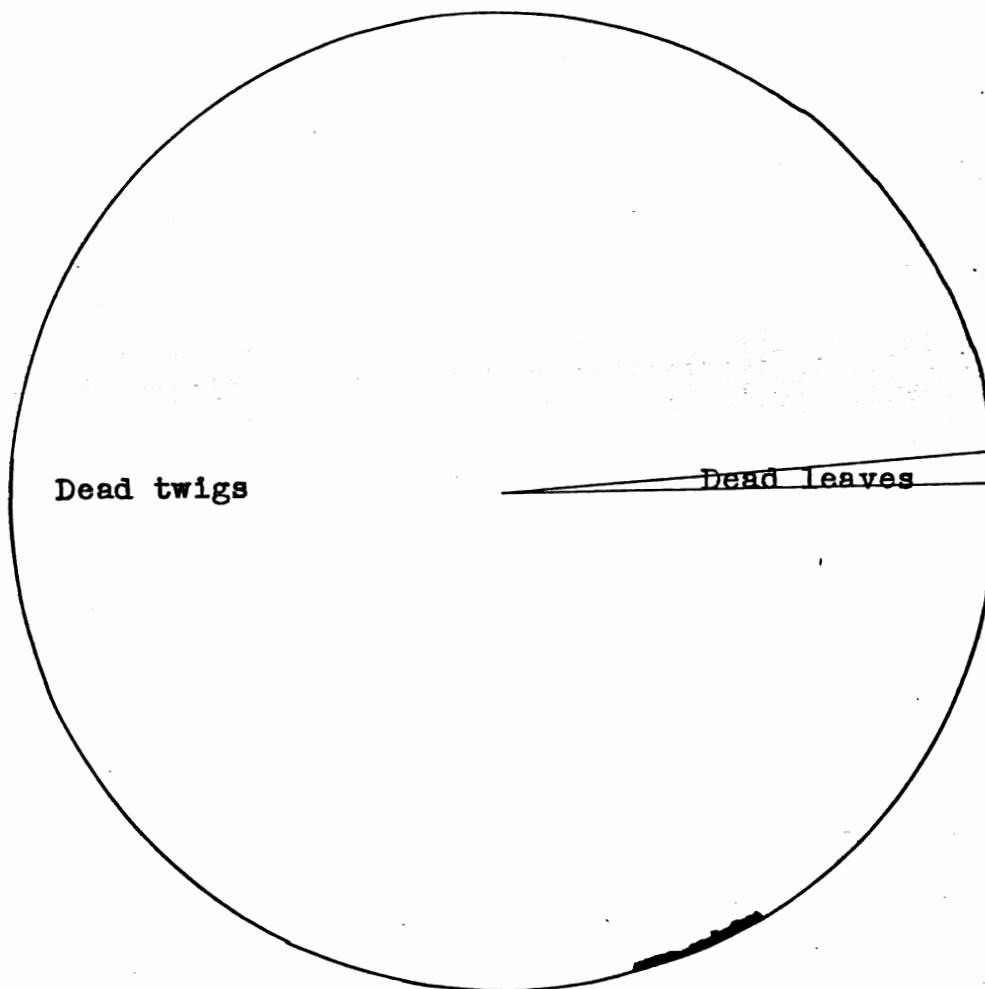
DIMENSIONS

Inside diameter--70 mm.
Outside diameter-170 mm.
Inside height---- 5 mm.
Outside height---50 mm.

Figure 2

NEST 3 OF THE YELLOW-BILLED CUCKOO
at
Douglas Lake, Michigan

Nesting Material Analysis by Volume



2.5 Meters above ground

MATERIALS

Dead twigs---99 %

Dead leaves-- 1 %

DIMENSIONS

Inside diameter--No cup

Outside diameter-250 mm.

Inside height----No cup

Outside height---60 mm.

Figure 3

twigs used in Nest 1 were firmly enough intermingled so that the nest remained intact upon being collected, and some of the twigs had to be broken in order to dismantle the nest. The lining was complete enough that light did not come through. Nests 2 and 3 were not so firmly constructed, Nest 3 lacking a cup.

EGGS

The eggs were observed but once prior to hatching. They were two in number, and light bluish-gray in color....Chapman (1932:Color Chart facing xxviii).

SUMMARY OF NESTING EVENTS

- July 22---Two eggs observed in nest
- 23---Both young supposedly hatched
- 24---Young did not raise heads when touched by observer
- 25---First feeding observed; mandibles of one of young painted
- 26---Food calls of young heard from a distance of 25 feet; bodies of young beginning to project above the edge of the nest; eyes beginning to open
- 27---Young show fear and hiss when touched; eyes open
- 28---Food swallowed without hesitation; one of the young observed standing; blind placed within six feet of the nest
- 29---A clucking, adult-like tone appeared in the voices of the young; they picked at their feather sheathes and were generally active
- 30---Both young jumped from the nest upon being approached at 6:00 a.m.; replaced; feathers brought out by preening; young hopped to branches of the nesting tree at 11:00 a.m.; fed by at least one adult all afternoon; 6:00 p.m. one of the young captured and measured
- 31---Entire family disappeared

PARENTAL CARE

Since the parents were not trapped, it was impossible to obtain specific data on activities of each sex. Table 1, showing attentive-inattentive periods, is, therefore, worked out for the pair. However, one of the adult birds had stains on the right side of its bill and a black speck on the breast feathers. These markings persisted throughout the observations, making it possible to distinguish between the two adults when either bird's right side was toward the blind. The bird with the markings was designated as Bird 2 and the other parent as Bird 1.

The young were actually on the nest during fifty-one hours of observation. The activities of the parents during that time are summarized as follows:

Percent of time attentive-----	64%
Longest attentive period-----	2 h. 21'
Shortest attentive period-----	5" ↓
Average attentive period-----	33.3'
Percent of time inattentive-----	35.5%
Longest inattentive period-----	1 h.
Shortest inattentive period-----	10" ↘
Average inattentive period-----	16.6'

1. A feeding actually occurred
2. Bird 1 already approaching when Bird 2 left the nest

Percent of attentive time spent in brooding-- 85.6%
 Longest brooding period----- 2 h. 21'
 Shortest brooding period----- 4'
 Average brooding period----- 49.3'

Largest number of feeding visits per hour
 (Based on a twelve-hour period of observation) 3.17

Smallest number of feeding visits per hour
 (Based on a two-hour period of observation)-- .5

Number of feeding visits per hour after the
 young left the nest
 (Based on a six-hour period of observation)-- 3

More detailed information concerning parental care may be found in Table 1.

Although the parents became quite accustomed to the presence of the observer in the blind, they would not carry on normal activities if the observer were moving about anywhere within sight of the nest. This shyness made it impossible to observe any food hunting or other activities away from the nest.

During the early part of the nestling stage the duties of feeding and brooding were almost equally shared by the parents. However, beginning July 28, Bird 1 appeared to be increasingly inattentive, and after the young left the nest Bird 1 was not positively identified in the vicinity.

The "rain crow" call was seldom heard, never within one hundred feet of the nest. However, during about half of the brooding periods, near the close of each, a monotonous "cuk-cuk-cuk-cuk" came from the trees bordering the clearing, a call

TABLE 1. ATTENTIVE-INATTENTIVE PERIODS

	23	24	25	25	26	27	27	28	29	30
Age of young	2	2	2	2	2	2	2	2	2	2
Age in days	0	1	2	2	3	4	4	5	6	7
Time of observation	1:55 pm	7:15 pm	7:30 am	4:00 pm	6:00 am	4:35 pm	6:00 pm	6:00 am	4:45 pm	6:00 am
Temperature	75-75°	75-75°	65-75°	85-65°	65-65°	85-85°	85-75°	60-70°	75-65°	60-70°
Wind, mph	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
Weather	Good	Good	Good	Good	Rain	Good	Good	Good	Good	Rain
Total Hrs. observation	2 h.	1 h.	4 h.	5 h.	15 h.	1 h.	2 h.	12 h.	3 h.	6 h.
Time attentive	2 h.		3 h. 29'	4 h. 42'	13 h. 13'	29'	1 h. 4'	6 h. 11'	1 h. 42'	3 h. 40'
Att. periods	1		8	5	28	2	2	39	4	10
Longest period			1 h. 8'	2 h. 17'	2 h. 21'	18'	1 h. 3'	1 h. 30'	55'	2 h. 31'
Shortest period			1'	15'	1'	11'	1'	10"	30"	5"
Average period			26'	56.5'	28'	14.5'	32'	9.5'	25.5'	22'
% of time attentive	100		87	95	88	50	53	51.5	58	62
Feeding visits			6	5	28	1	1	37	3	8
Brooding periods	1		5	5	24	2	1	9	2	2
Longest period	2 h. †		1 h. 7'	2 h. 16'	2 h. 21'	17'	1 h. 2'	1 h. 29'	54'	2 h. 33'
Shortest period			13'	14'	4'	11'		17'	45'	35'
Average period	2 h.		29'	56'	32'	14'	1 h. 2'	36'	50'	1 h. 34'
% of Att. brooding	100	0	97	99	97	96.5	98.5	85	97	86
Other visits								1		
Longest visit								1'		
Shortest visit										
Average visit										
% of Att. time								.25		
Time inattentive		1 h. †	31'	17' 30"	1 h. 47'	31'	56'	5 h. 49'	1 h. 18'	1 h. 20'
Inattentive periods		1	8	4	27	2	2	39	3	9
Longest period			17'	16'	23' 30"	30' 30"	32'	44' 50"	45'	19' 30"
Shortest period			2'	30"	10"	30"	24'	20"	15' 30"	2' 50"
Average period			4'	4.5'	4'	15.5'	28'	9'	26'	15'

evidently uttered by the mate of the brooding bird. This calling was commonly practiced by both of the adult birds, and seemingly stimulated the brooding bird to leave the nest. In one instance, Bird 2, being on the nest, answered this call with a few low "cuks" and a quivering of the body.

When disturbed, the adults uttered single, clucking notes, while jumping from one low branch to another, drooping their wings as if lacking control.

YOUNG

The time of hatching was not positively determined, since hatching occurred during the interval between the first and second visits to the nest. The entire nestling stage was completed within seven days and sixteen hours, the time between the observation of the eggs at 7:00 p.m. July 22 and the time at which the young left the nest, at 11:00 a.m., July 30. Herrick (1935:94) gives the nestling stage of the Black-billed Cuckoo (Coccyzus erythrophthalmus) as seven to nine days, and Roberts (1932:593) cites an instance in which two Black-billed Cuckoos hatched on September 13, 1907 and showed their first feathers on September 20, 1907.

On July 23, one of the adult birds brooded continuously during a two hour observation. Once in that period the adult stood, and pecked at something in the bottom of the nest. Although the brooding bird was not disturbed, it is assumed that hatching took place during that day.

Two young were found in the nest on July 24. Their skin

perched on the edge of the nest, with food. The bodies of the young were beginning to project above the edge of the nest, and their eyes were starting to open.

During the afternoon of July 27, Bird A was fed a cicada by Bird 2. Later in the day, as the mandibles of Bird A were being repainted with fingernail polish, both nestlings hissed, and crouched in fear. Measurements of the young, begun on this day, may be found in Table 2.

On July 28, during a twelve hour period of observation, there were thirty-seven feedings, equally divided between Bird A and Bird B. For the first time, the young often swallowed their food without hesitation.

The nestlings, beginning to show tail quills, were very active; one of the young stood for a short time.

The blind was placed within six feet of the nest.

A clucking call, with an adult-like tone quality, was first uttered by the young on July 29. Both Bird A and Bird B showed interest in their surroundings, and gave this new call when the parents were near with food. Bent (1940:58) describes this sound as "cuk-cuk-cur-r-r-rrr". During the afternoon, the nestlings began to pick at their feather sheathes, and some feathers became visible.

On the morning of July 30, the young would not tolerate the approach of the observer, and jumped from the nest to the ground. Upon being retrieved, they showed much pugnacity, and used their mandibles in resisting capture. After being replaced in the nest, they resumed the picking of the sheathes from the

feathers. Forbush (1927:243) describes these feather sheathes as black, however, in this case, they were almost transparent. During the morning, the birds underwent a great change in appearance, becoming well feathered in a few hours. The young stretched their wings, and Bird B crawled over the back of the adult bird sitting in the nest at the time. Shortly before 11:00 a.m. Bird B hopped onto a near-by branch, but returned immediately to the nest.

At 11:00 both birds left the nest and started to crawl upwards toward the ends of separate branches of the nesting tree. A little after 12:00 noon both young left the nesting tree, proceeding, mostly by crawling, and sometimes using their wings to aid them in hopping a few inches through space. They gained positions in near-by trees, Bird A covering a part of the journey on the ground, and Bird B proceeding from branch to branch. During the afternoon, Bird A reached a position fifteen feet above the ground. Food was offered by Bird 2, but each of the young often refused it, upon which it was fed to the other. In one instance, after a feeding, one of the adults, in springing from the branch, overbalanced Bird B, leaving the young bird hanging by its feet. It was able to quickly regain its position on the branch.

Bird B was captured and measured during the late afternoon. The color of its feathers very nearly resembled that of the adults, but its tail was very stubby. It continuously resisted and uttered loud distress calls.

On July 31, the entire family disappeared.

NESTING SUCCESS

Two eggs were present at the close of incubation; both young hatched and fledged.

SUMMARY

1. The habitat was a typical aspen association, and the food was obtained in this habitat. No conflict with other animals was observed.
2. Nest 1 showed some inter-twining of construction materials, and remained intact in handling. The other two nests examined were not of such durable structure.
3. Somewhat less than seven days and sixteen hours were consumed in the nestling stage.
4. Parental duties were equally assumed during the first few days, but when the young became five days old Bird 2 essentially took over their care.
5. The brooding periods became shorter as the age of the nestlings increased.

TABLE 2. MEASUREMENTS OF THE YOUNG

Taken at 6:00 p.m.

July 27	Bird A	Bird B
	Bill-----12 mm.	Bill-----13 mm.
	Wing-----20 mm.	Wing-----21 mm.
	Tarsus-----22 mm.	Tarsus-----22 mm.
July 28	Bird A	Bird B
	Bill-----14 mm.	Bill-----14 mm.
	Wing-----25 mm.	Wing-----25 mm.
	Tarsus-----23 mm.	Tarsus-----23 mm.
July 29	Bird A	Bird B
	Bill-----15 mm.	Bill-----15 mm.
	Wing-----30 mm.	Wing-----31 mm.
	Tarsus-----24 mm.	Tarsus-----24 mm.
July 30		Bird B
		Bill-----16 mm.
		Wing-----50 mm.
		Tarsus-----24 mm.

GRAPEVINE POINT
at
Douglas Lake, Michigan

Box--Area shown on Map 2
1"=500'



Grapevine
Point

+--Nest

South Fishtail Bay

Biological Station

To Pellston

BIBLIOGRAPHY

- Beal, F. E. D.,
1898 Cuckoos and Shrikes in Relation to Agriculture.
Wash. Govt. Printing Office.
- Bent, A. C.
1940 Life History of the North American Cuckoos,
Goatsuckers, Hummingbirds and Allies.
U. S. Govt. Printing Office
- Chapman, Frank M.
1932 A Handbook of the Birds of Eastern North America.
D. Appleton and Co.
- Forbush, E. H.
1927 Birds of Massachusetts and other New England States.
Vol. 2. Norwood Press, Norwood, Mass.
- Herrick, F. H.
1935 Wild Birds at Home. D. Appleton-Century Co.
- Roberts, T. S.
1932 The Birds of Minnesota. U. of Minn. Press,
Minneapolis, Minn.