

BIRD BOX ACTIVITY

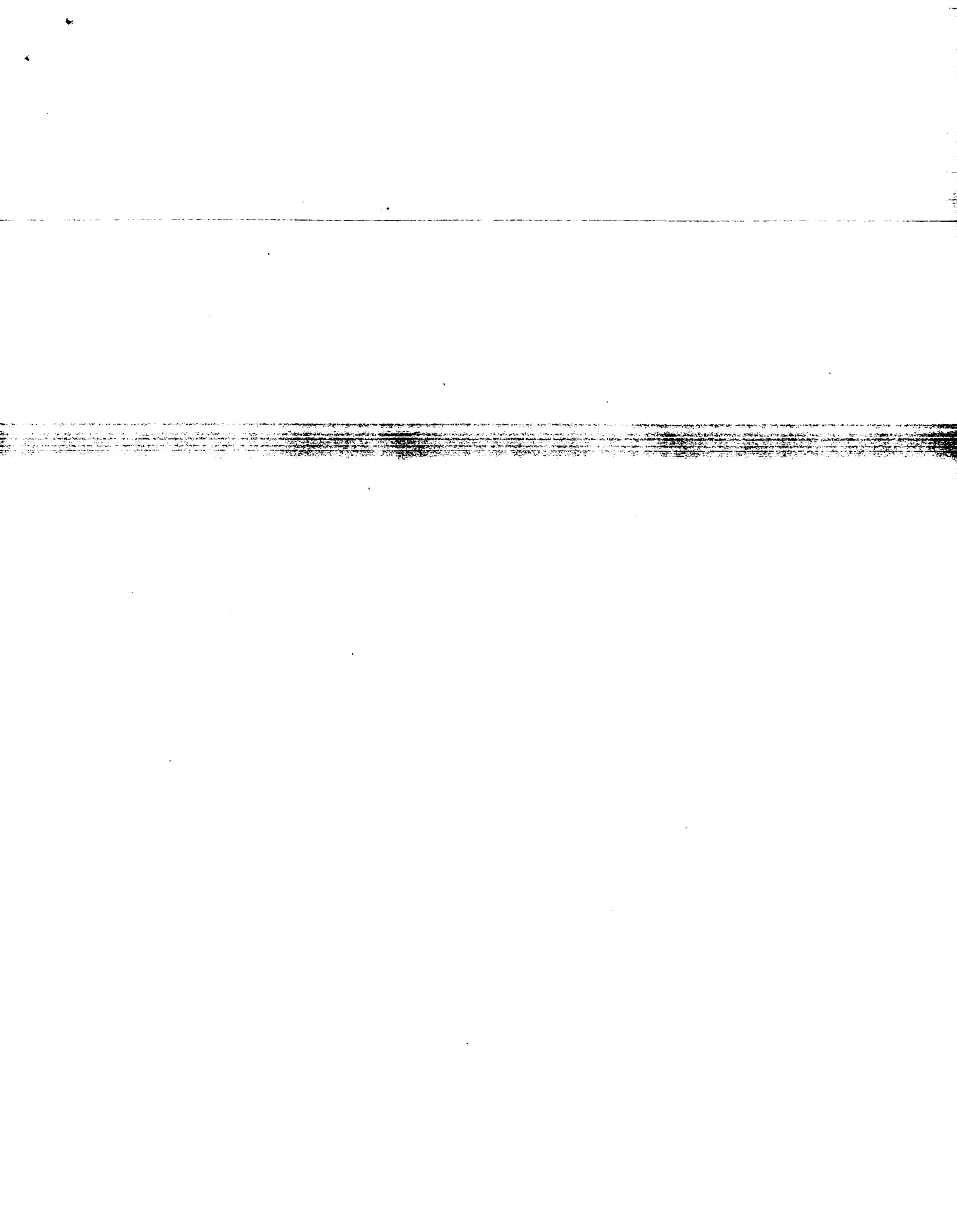
University of Michigan Biological Station

Douglas Lake, Cheboygan County, Michigan

Summer, 1946

- 1. Location of boxes.**
- 2. Nesting and behavior observations;
primarily Tree Swallow and Flicker.**
- 3. Banding operations.**
- 4. Pictures and descriptions of boxes.**

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Introduction

The observations of bird activities encompassed in this report cover a period from June 29th to August 5th, 1946. The chief occupants of the boxes were Tree Swallows (Irodroprocne bicolor). A family of Flickers was raised in # 6 and two Starling eggs were found in box # 1. With the exception of the Purple Martin colony utilizing the four martin houses, these were the only three species observed to use the boxes.

The observations, begun June 29th, caught most of the Tree Swallows after the eggs had hatched. Only two boxes of late nesters, both first-year females (by plumage; Kuerzi, 1941) were observed from the egg stage until the young birds left the nest. The problem was begun too late to observe any of the nest building activity. Observations were made as many times as time permitted. The circuit of the boxes was usually run at least twice a week. A small ladder was necessary to get high enough to see into the boxes.

Three types of boxes, exclusive of the standard martin houses, are found at the Station; photographs, dimensions and general descriptions of these boxes are included elsewhere in the report.

Thirty-five Tree Swallows and three Flickers were banded with Size # 1., U.S. Biol. Surv. bands. Swallow bands ran from #81262 to # 81296 inclusive. Directly above the number on the outside of each band was stamped a small "c", the purpose of which is not known to the writer.

The Flickers were banded with Size # 3 U.S. Fish and Wildlife Serv. bands from 46-305302 to 46-305303 inclusive. The boxes from which birds were banded and the numbers placed on the birds from a given box are indicated in the proper place in a discussion of the activity at that box.

Each box has been given a separate sheet of paper and the observations thereat recorded chronologically.

Concerning the Tree Swallows---by July 15 the young from the two tardy nesters had flown. This was the last date of occupancy of any of the boxes by tree swallows. There were no second broods. The birds from the entire colony banded together for a period of three or four days after this date and were observed concentrated about a large, leaning red pine tree next to Box # 3. (This box is broken off at the present time, but the post is still there). I did not see any Tree Swallows at all in the vicinity of the Station after July 22.

Concerning the Martins--- I saw the last Martin on August 4. The colony decreased in size apparently, as the young birds left the nest. There was one nest quite behind all the others, and on July 29 there were only five or six birds apparent around the colony. On June 29, the colony numbered approximately 75 adult birds or around thirty nesting pairs. The Martins were nowhere near as consistent in their brooding or incubating as were the swallows. They began incubating as soon as the first egg ^{was laid} hatched, apparently, for, of five or six young later found in several of the nests, they all

varied an obvious two or three days in age. Also, the fledglings left the nest over a period of two or three, or even four days, and not all within twenty four hours as seemed to be the case with the Tree Swallow.

Concerning the Flickers--- five eggs were first observed in Box # 6 on June 29. The young Flickers did not leave the nest until August 5. This is a considerably longer period of incubation and brooding than exhibited by either the Martins or the Tree Swallows. Only three of the original five successfully completed brooding and incubation and left the nest in a healthy condition.

The chief reference used in working up this report has been:

Kuerzi, Richard G., 1941, Life History Studies of the Tree Swallow. Proc. Linn. Soc., No. 52-53, 1940-41.

It is hoped that this report will serve as a foundation for continued yearly observations of bird activity in the boxes at the Station.

Total population in the boxes: (adult birds)

		<u>Yg. produced</u>	<u>Av. set</u>
Tree Swallows:	18 pairs	ca 82	4.8
Purple Martin:	24 "	ca 85	ca 5
Flicker :	1 "	3	--
Starling :	1 "	0	--

BOX #1

June 29

One of the deep boxes; not a swallow box.

Two Starling eggs found. Apparently two or three nests superimposed on each other. Box had not been cleaned out for two or three years. Top nest lined with birch bark and a few feathers.

July 9

Eggs removed. Obviously not being incubated.

One contained a fully developed embryo; the other was infertile.

A pipe cleaner was found in the nest.

BOX # 2

Unoccupied. Old box directly behind it also unoccupied.

BOX # 3

Unoccupied.

BOX # 3/a

6 # Two old boxes on red pine behind # 3. One facing the lake occupied.

June 29

Tree Swallows

5 young. Barest traces of natal down. Must have hatched within previous 24 hours.

July 4

Eyes barely open; pin feathers just starting on dorsal and ventral tracts. Young show some agitation when held in hand; does not like to be held upside-down. Grasping with feet to nest lining and to hands. While in nest, however, no fear or excitement reactions on part of young. Huddled together in ball in center of nest; when moved to edge, immediately seek to return to center, ostensibly for warmth. One unhatched egg. Birds probably hatched on June 27 or 28; about 6 or 7 days old. Nest built of pine needles, straw and assorted weed chaff. Lined with gull and chicken feathers. Parents greatly excited. Exhibit characteristic swooping and diving on intruder, all the time uttering alarm call--- a single, squalling, short, high note. After leaving nest, observed that parents did not return to box for 14 minutes, but continued to swoop down over it. Made no immediate effort to investigate box closely, but flew around catching insects, apparently unconcerned.

July 9

Flight feathers, primaries, and plumage about half out of sheaths. Humeral and dorsal tracts slightly feathered. Single egg still unhatched. Parents not in evidence for about five minutes. Then returned and began to raise hell. Photographed egg and one young.

(Box # 3⁶, cont.)

July 10 Cloudy, cool. Wind: N.E. Some rain night before.

Banded all 5 young. Band numbers:

81292	81294	81296
81293	81295	

Unhatched egg removed. Proved to be an undeveloped embryo. Young developing rapidly. Parents quite agitated as usual. Upon leaving nest, continued to swoop and circle about, but seemed to be capturing insects at the same time as if not wanting to waste anytime. Did not return to nest for 15 minutes after I left it. Parents observed to be able to suddenly change direction of flight from a full speed ahead to an absolute vertical. Quite well-developed powers of flight.

July 12

Parents dove on me while still 50 yards from box, uttering alarm call. 5 near-fledglings still in nest. Only one parent, probably female, continued to dive-bomb me. The other perched on a branch in the pine about 15 feet above box and watched.

July 15

All young flown. Nest in typically filthy condition. Heavily parasitized, as were all the other nests, without a single exception, with Protocalliphora, flea larvae, mites, and wasp larvae, which are parasitic upon the Protocalliphora larvae. (Hungerford)

BOX # 4

Unoccupied . Year old nest. Apparently tree swallow,
on top of which was what appeared to be a nest of this
year. Was heavily infested with Protocalliphora which
might explain why it was abandoned.

BOX # 5

June 29

One dead young , ca 8 days old found in nest.
Covered with Protocalliphora and flea larvae. Possible
cause of death, and abandonment of nest.

BOX # 6

June 29

Two Flicker eggs found in nest.

July 9

Female disturbed while incubating. Five eggs now. Nest of pine needles, coarse chaff and straw. Not lined. About 3 inches deep.

July 10

Only four eggs left. Don't know what could have happened to other one unless there are some wild-eyed ecologists in camp.

Actions of female upon disturbance quite characteristic and different from swallows. Will leave box immediately when tapped and fly away into the woods. No attempt to harass intruders. Male not yet in evidence. Is supposed to incubate at night. Don't know what he does during the day.

July 11 Windy, N.W., cloudy and sunny.

All four eggs hatched. Young a reddish-pink, no down at all. Eyes closed, of course. Female left immediately upon tapping as usual. Flew straight away. Inside of box (made out of smooth pine boards) roughened, by pecking. Only in one small area high up. Later, nearly all of inside of box was thus roughened, apparently to provide purchase for young when holder to grasp and feed at hole. Believe that parent does this. One of the deep boxes, by the way, not a swallow box. Parent returned to nest in 4 minutes. Remained 1 minute. On seeing me, flew away again. Flew back along shore 4 minutes later. Made no attempt to

stop at nest. Returned in 21 minutes, Flew about box, stopping on trees etc, never approaching any nearer than 20myards. Left again and had not returned when I left 40 minutes later.

July 13

Eyes still closed. No down yet. Little reactionary behaviour yet noted except indiscriminate begging, of a very restricted sort. Female brooding when I tapped box. Left immediately. Bits of cast egg shell still in nest. Apparently no huury to carry them out. Nest not lined in any way. Young about doubled in size.

July 15

Eyes still closed. No down development.

July 17

No apparent change, except a slight increase in size.

July 19 8:15 p.m.

Parents not at nest. Only 3 young left. Can't imagine what happened to other one unless an overzealous parasitologist thought that a couple of dozen young terns were not enough. Young could not possibly get out of box by itself and I think it would have been too heavy at this stage for parent to drag it out. Any other type of predator unlikely, as post supporting box is surrounded by tin. Possibly another bird predator, but I couldn't say what.

Nest spotlessly cleand No evidence of fecal matter of any kind. I do not believe that young begin to void feces at this stage but absorb the greatest percentage of the regurgitated food fed by parents.

??

Eyes of young barely open. No down as yet. Pin feathers about 1/8 to 1/4 inch out on primaries and secondaries.--- even less on ventral tract. Indiscriminate begging for food still exhibited only when light is shut off and front of box put back on. As soon as box front is taken off, more of a wild scrambling, and less begging results. Begging reaction seems to be stimulated by a reaction to light. If light is shut off at hole, young immediately beginning there sniggering call and open their mouths to receive food. The begging reaction is always accompanied by this sniggering, similar to a locust with hiccups. Quite audible, even from first day after hatching. Birds have grown in size considerably, but feather development very slow. Fresh patches of pecking inside of box. No evidence of moustache on any of the three birds yet which all the young are supposed to have. Nets still remarkably clean. No parasites in evidence.

July 24

Banded three young. Numbers:

46-305301
 46-305302
 46-305303

U.S. F.&W. Serv. bands

July 23 5:00 p.m.

Parent not at nest. Pin feathers well out. Sheaths emerging on well-defined ventral tract and wings. Red patch on head noticeable even in pin feather stage. Birds half way between discriminate and indiscriminate begging for food. Do not yet exhibit fear. Utter begging sounds continually while at nest. Nest suddenly infested with flea larvae. Adult fleas on birds also. No sign of feces or ures in nest. Yg do not void feces on disturbance

or handling as in the Tree Sparrow. Inside of box now roughened for a considerable area.

July 25 5:00 p.m.

Young show discriminate feeding reaction in part, though will grasp on to a proffered finger and attempt to feed. White rump patch evident. Constant chipping and burring noises by young.

July 29

Feathers 2/3 out of sheaths. Nest now quite dirty. Full of fecal sacs. Parents apparently make no effort to carry them out when young finally do start voiding them. Parent not seen at nest. Fear reactions now quite evident. Shrink to bottom of nest and cling to lining. Characteristically turn back on intruder and try to dig into nest with a backward motion instead of forward, so that care must be taken that they do not back out of nest when front is off. A good deal of fluttering around and scrambling upon intrusion. No squalling yet. Immediately revert to feeding reaction when front of box is placed on, however.

August 5 a.m.

All three young left nest while photographing. Probably a day or so before they ordinarily would have left, but they flew very capably. Started out over water, but circled back and flew off into woods. Moustaches apparent on all three. Nest reduced to a pile of filth---regurgitated food, fecal matter etc. Inside of box almost completely roughened and scratched. Parents were not observed at nest at any one of the several brief visits

between July 29 and August 5.

Young at last stage of fear at this date. Remained quiet when box was tapped. Would then catch onto side of box and poke heads out of hole. Showed great alarm when front was taken off. Uttered sharp cries and scrambled and fluttered about. Always kept tail toward intruder and tried to back out of box.

This family of flickers was nesting in quite close association with Tree Swallows but with no apparent transgression of territory. It is a bird of entirely different personality, very secretive and quiet, especially during incubation. Also a very suspicious and cautious bird. While I saw swallows chase Martins and Kingbirds that happened to be passing by too closely to a box, I never once saw them harry the Flicker that was nesting within 25 yards of the nearest swallow nest.

BOX # 7

July 4

The Suckler

Fresh nest of the year, but all young flown the coop.

BOX # 8

Unoccupied nest.

BOX# 9

Young flown coop. Nest heavily infested.

* A small wren-size old box on oak tree between 9 and 10 unoccupied. A storehouse for chipmunks.

BOX#10

Young flown coop. One egg remaining---an undeveloped embryo. Nest infested with flea larvae and Protocalliphora

BOX # 11

Young flown coop. Two eggs remaining----one infertile, one undeveloped embryo.

BOX # 12

July 4

Tau Swallow

Five fledglings. Strong flyers. All left after banding. Female brooding on nest but failed to catch her.. She did not return to harass. Nest very filthy and highly infested.

Band numbers:

81271	81273
81272	81274

BOX # 13

July 4, 1946

Tau swallows

Six young. Eyes not yet open. Same relative development as BOX 3*. Nest of pure pine needles, lined with gull feathers. Male perched on pine near box watching my activities. Did not seem to be the least bit alarmed. Female (~~young~~ first year, by plumage which is a distinct brownish on top and on head; Kurveigh, 1941) came up with food in her mouth and perched next to male about 20 feet from box. Did not seem to be alarmed at all. Did not exhibit any of the agitation characteristic of the parents of other nests invaded, during any of the several times I visited this box.

One infertile egg.

July 9

Eyes open. Young developing rapidly. Huddle in group in center of nest. Try to bury heads. Show signs of fear and certainly selective or discriminate begging. Male perched on pine again. Female returned again with mouth full of insects. In fact, her mouth was completely crammed with food. Did not appear to be alarmed in the least.

Banded all 6 young, Band numbers:

81282	81289
81287	81290
81288	81291

(Note: Band # 81282 was overlooked in previous banding and is rightfully out of place)

Nest heavily infested.

July 12

Female still feeding young in nest. Female alone returned while I was at box with mouth full of food. Took up same perch as before. Not alarmed at all. Young were sticking heads out of hole when I came up in curiosity. Show no excited fear reactions.

July 15

Young all flown.

Note: This brood, including the parents, differed markedly from the other broods in that the fear and agitation reactions of both the parents and the young birds was at a minimum. No explanation.

BOX # 14

Twe Swallow

June 29

Five near fledglings almost ready to go. Banded:
three birds:

81275

81276

81277

Female returned with food while I was banding. Birds did not show wild fear but merely remained very quiet and stared when I opened box. Did not draw back or try to huddle together.

An interesting observation was made here and at one other box. The first bird banded was returned to box and immediately scrambled out and flew some 100 yards out over the water where it fell in. Swam out after it and returned it to box. It sat upon the water somewhat like a Ruddy Duck with its little tail sticking straight up in the air and used its wings very much like a seal uses its flippers in a sideways sort of crawl stroke. It made very good headway swimming in this fashion and probably would have gotten to shore on its own power. Did not go into paroxysms of fear when it lit~~l~~ on the water but proceeded to swim in a straight line toward shore in a very business like fashion. Several adult birds swooped down over it before I got out to it and were calling to it. I returned bird to box upon bringing it in. Peggy Muirhead was a witness to this exhibition. (The bird swimming, I mean.)

July 4

Nest abandoned

BOX # 15

Partly constructed nest. Not finished. Box unoccupied.

BOX # 16

Empty

BOX # 17

Empty. Full of twigs only, no leaves or chaff. Don't know what brought them there.

BOX # 18

June 29

Tree Swallows

Five near fledglings almost ready to go. Parents raising Cain. Several (5 or 6) mature birds joined this set of parents in dive bombing and wheeling and uttering alarm calls.

Banded two birds:

81278

81279

Two birds left nest while I was banding first one. First banded bird returned to nest. Immediately left it, flew out over water and exhibited swimming action ~~as~~ as described for Box 14. This bird made it all the way to shore without any assistance---about 25 yards. Was placed back in nest and apparently stayed

July 4

All young gone.

BOX # 19

Empty

BOX # 20

Empty

BOX # 21

Young all flown coop.

BOX # 22

Empty

Box # 23b

Young all flown coop. One egg---undeveloped embryo remaining.

Old boxes

One on telephone pole ^{Created} directly behind aquarium shelter. Occupied by Least Flycatcher this spring. Young had left nest as of this date.

One on oak tree between Boxes 11 and 12 in front of 2nd cabin from end.

One on telephone pole back of new cabin.

BOX # 23a

Empty

BOX # 24

Empty

BOX # 25

July 1

2:45 p.m. bright sunny, warm, very windy

7 Young. ^{Tree Swallow} Pin feathers well along. Primaries, secondaries and coverts emerging from sheath. Tail feathers $\frac{1}{2}$ to 3 inches long.

Young show fear. Withdraw into wings, pull heads way in. Eyes open, of course. Were all chirping when I approached box. Stopped the minute I touched it. Mother did not fly out until I had opened box. Flew out right over my head. Remained aggressive, flying about and sounding alarm call. Then disappeared after about 3 minutes. Young exude feces in excitement. when hand moves near or when handled. Contained in a transparent mucous sac. Have observed parents to carry these sacs out of nest at other times and drop them over the water. Typical nest of straw, chaff and scattered pine needles, lined with chicken and gull feathers.

July 8 overcast, very humid, cool. 9:00 a.m.

Four young remaining. Advanced nestlings. Flight feathers and plumage practically full developed. Traces of sheaths at bases only. Nest filthy. Banded two birds: 81280 and 81281. Parents raising Cain.

All four of these birds left nest while I went down to lab to get bands. Two were recovered on ground near box and -placed back in.

July 9

All flown. Nest heavily infested.

BOX # 26

July 1

Five young. Primaries, secondaries, and coverts well developed. Plumage well developed except for ~~breed~~ patch on belly. Down on humerus. Young show fifth stage of fear, grasp tightly to nest lining with feet, draw far back and try to bury themselves in nest. Nest heavily infested. Found Protocalliphora larvae attached to the legs of two birds. No attempt made by parents to harass intruder. Might be explained by heavy wind.

July 9

Flown coop.

BOX # 27

July 1

Tree Swallow

Two advanced nestlings remaining. Banded both.

Nnumbers: 81262 and 81263.

One egg, an undeveloped embryo. (Eggs a pale buff or beige color about the size of a kidney bean.

One parent only flying about apparently in great agitation upon discovering young were gone from nest. (They flew off after being banded). Juvenile plumage complete. Tail not fully developed yet, but flight feathers o.k. Young showed fear. Were particularly active with their feet and claws.

Nest typical. Contained one hawk feather.

One characteristic of young when agitated is to stick tail straight up in air wren-like.

BOX # 28

July 1

Tau Swallow

Five young. Juvenal primaries and secondaries about half developed. Parents not in evidence upon visitation to nest.

Nest of typical construction. Heavily infested.

Young seemed to lose sense of fear to a degree after handling.

Female returned to nest. Was captured and banded. Had food in mouth consisting of bits of snail shell, peice of birch bark, and a still kicking bluebottle fly. Upon release disappeared.

Band numbers:

81264	yg
81265	yg
81266	ad.

July 8

Nest abandoned.

BOX # 29

July 1

Tau Swallow

Five young. Pinfeather stage. Primaries and secondaries just emerging from sheaths.

Typical fear reactions. Bits of natal down still evident. Eyes open, Nest heavily infested. Typical construction

July 8

All five birds still present. Near complete development.

4 Birds were banded on July 1 : Band numbers:

81283
81284
81285
81286

July 9

All flown.

BOX# 30

Empty

BOX # 31

Empty

BOX # 32

Empty

BOX # 33a

July 4 clear, sunny, warm. 8:00 a.m.

7 near fledglings. Four handed: *Tree Swallow*

	81267	81269
	81268	81270

One flew out on opening box. Three of the banded birds flew away after banding. One unbanded bird flew out after we had left, toward the dining hall, struck telephone wire and was killed. One banded fledgling flew to dirt mound in center of gravel pit where it was observed being attended by the parents. Two other banded birds flew off in strong flight in direction of lake. Parents swooped on me all during operations at box and for some time after I left box. Three or four adult birds partook in this harassing, one or two diving at intruder and the other visiting nest, apparently to check up. Nest filthy. Feather lining matted or gone. Plumage well developed except on brood patch.

Nest heavily infested.

July 5

All birds gone.

BOX # 33b

Unoccupied

BOX # 34

Empty

BOX # 35

Unoccupied

One old box at corner of ornithology lab unoccupied.

No attempt has been made to draw any conclusions or make any definite statements about these birds. This is only a listing of scattered observations over a given period and will be of value only if this problem is continued in years to come.

Martin Houses

July 17

Hot, still, bright. 10:00 a.m.

House # 1

East side: One nest occupied by living young. Two of them. Flight feathers about half out of sheath.

One nest occupied by three dead young. Quite decomposed, nothing but skeletons left. Looks like a last years nest, but caretaker says houses are cleaned out every year

North Side: One nest occupied by 2 young. Same development as above. Legs downy.

West side : No nests occupied

South side : Two nest occupied. 5 young in one, 4 in another.

Two dead young on ground below box. Apparently fell out.
Totals:

4 out of 16 nesting holes occupied.

13 living young in this house.

3 niches containing partly constructed nests.

Nests very dirty. Made out of coarse twigs and chaff. Invariably lined with birch leaves ----fresh, green ones. Young all about same stage. Show signs of fear and crowd away into corners of box. About 20 birds circling overhead constantly and uttering alarm calls.

House # 2

July 17

East side: One nest occupied by 3 partially developed nestlings. Eyes open. Feathers just out of sheaths.

North Side: Three out of four nests occupied. One with 5 half developed nestlings; one with 3 1/3 developed nestlings; one with 4 half developed nestlings. Eyes open on all of them, Fourth nesting hole completely empty.

West side : One hole occupied by 4 half developed nestlings. Eyes open. All other holes completely empty.

South side : Two out of four holes occupied. One with 4 2-3 day old young, eyes not yet open;

one with 5 half developed nestlings, eyes open. and pin feathers about half out. Large peice of grocery twine in one nest. Also twigs as big around as a pencil. One hole with partly constructed nest unoccupied.

Three dead young on ground below box. Eyes not yet open on any of them. Feathers just out of sheaths.

Totals:

Living young: 28
Dead young : 3
Unoccupied fresh nests : 3
7 out of 16 holes occupied.

House # 3

East Side: one nest occupied by 3 partially developed nestlings. One other hole with partially built but unoccupied nest.

North side : 3 out of 4 holes occupied. One with 5 near-mature nestlings; one with 6 half developed nestlings, one with one newly hatched young and two eggs. Latter indicates that Martins begin incubating as soon as first egg is laid. Also explains why there are only one or two young birds in some of the nests, the older ones having laready left.

West side : one nest occupied by 2 partially developed nestlings. Two other holes with partially developed nests unoccupied. These partly constructed unoccupied nestss show no signs of having been occupied at all be were interrupted while building. Indicate that adult birds get confused while building and bring nesting materials to wrong hole, but right hous, or possibly even to wróng house.

South side : 3 out of 4 nests occupied . One with 5 half developed young, eyes open, having fear raactions. one with 1 half developed nestling, eyes open. one with 3 2-3 day old young, eyes not open, no feather development, pin feathers just beginning to show under skin.

Totals:

Living young; 23
Unhatched eggs: 3
Unoccupied, partially construced nests: 3
6 out of 16 holes occupied.

20-30 birds wheeling and crying above hpuse all the time.

House # 4

East side : 3 out of 4 holes occupied by fresh nests only; no birds. All lined with fresh birch leaves. Characteristic of every nest in the colony.

North side : 3 out of 4 nests occupied. One with 4 eggs; one with 2 partially developed nestlings, eyes open, and 2 eggs; one with 6 near fledglings. This nest very dirty and unkept. Other hole with partially constructed unoccupied nest.

West side : 2 out of 4 nests occupied. One with 5 mature fledglings; one with 3 partially developed nestlings, eyes open.

South side : 1 out of 4 holes occupied with 4 2-3 day old young, eyes not open, but black pin feathers evident under skin. One nest with dead young half out of hole. Apparently parents tried to drag it out. Crawling with larvae.

Totals:

Living young: 20
Eggs : 6
Constructed nests, unoccupied : 6
6 out of 16 holes occupied by birds.

During entire 2 hours I was at colony, at least 30 birds were continually wheeling back and fourth above me, occasionally diving very close, and uttering shrill, high-pitched alarm notes. They do a lot of gliding and soaring. Observed them carrying fecal sacs out of nest and dropping them in the lake. Doesn't seem to do much good for nests are very dirty.

MARTIN HOUSES(cont.)

July 24

House # 1

South Side :

One hole occupied with 2 fledglings. One hole killed out with 2 dead young. Nests contain rootlets, chaff, very coarse twigs in most cases.

Esat side : one nest with one fledgling only remaining. Large locust found dead in nest and untouched by bird.

North side : One nest only and deserted.

West side : 2 nestss occupied; one with 5 fledglings, one with 4. Well developed. Quite crowded in the relatively small boxes by this time. Nests very filthy with excrement.

Totals:

Occupied nests; 4
Living young : 12

House # 2

South side : 2 nets occupied. One with 5 fledglings; one with 4 nestlings, eyes just open, feathers about $\frac{1}{2}$ out of sheaths.

East side ; 1 nest occpied by 3 fledglings.

North side : 4 nests occpied. One with 1 fledgling; one with 2 fledglings; one with 4 fledglings, and on with 1 nestling, plumage and flight feathers about $\frac{1}{2}$ developed. All nestss filthy.

West side : 1 nest occupied with 3 fledglings.

Totals:

Living young : 23
Occupied nests : 8

House # 3

South side : 1 nest occupied by 2 freshly hatched young, eyes not yet open. Exhibit indiscriminate begging. One unhatched egg remaining.

East side : 2 hole occupied. One by 3 3/4 developed nestlings; one by 3 1/2 developed nestlings. with natal down still plentiful. Pin feathers about 1/2 out of sheath. Large locust dead in nest --- untouched.

North side : 1 nest occupied by 5 2/3 developed nestlings. Exhibit 5th stage fear reaction.

West side : 1 hole with 1 egg in incomplete nest composed only of a few scattered bits of chaff and twigs/. Egg pure white, infertile.

Totals:

Living young : 14
Occupied nests : 4

House # 4

East
~~South~~ side : No nests occupied.

South
~~East~~ side ; 1 nest occupied by 5 1/3 developed nestlings pin feathers just starting out of sheaths. Natal down still on backs, legs and breast. Eyes open. Exhibit cowering and crowding fear reactions.

North side : 2 nests occupied . One by 2 3/4 developed fledglings and one infertile egg; one by 5 fledglings. Entrances to both nests piled high with feces. Large locust found stuck and still alive in feces entering one hole. Young exhibit typical 4th stage fear reaction.

West side : 1 nest occupied by 3 fully developed fledglings. One nest used this year but all flown coop.

Totals;

Living young : 15
Occupied nests : 4

Martins(cont.)

General

One fledgling was observed in water. Swam into shore after fashion of swallows. Flight feathers of left wing found to be snipped off at base and somewhat bloody as if cut with shears ,pr pecked off. Possibly, fish snapped them off or young bird broke them off while flopping around. Who knows.

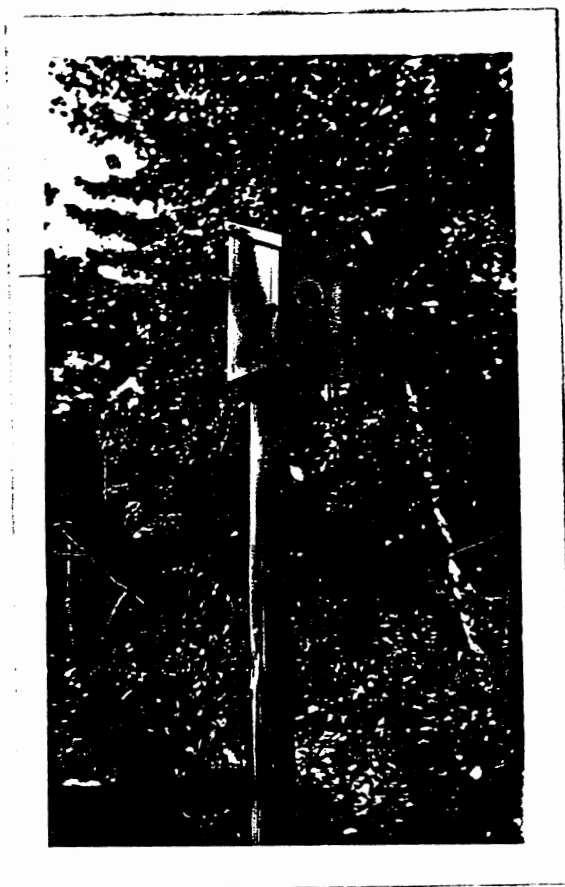
One adult observed to enter nest with locust in mouth. The fourth one seen in houses .

One young bird was found on ground in Manville. Flew away when attempted capture.

All birds gone from colony on August 4. Flocked up for awhile in large red pine used previously by swallows. Saw no Martins around Station after August 7.

TYPES OF BIRD BOXES

1. Tree Swallow box



The Tree Swallows invariably nested in this type of box. Dimensions:

Back: $13\frac{1}{2}$ "
Front: ~~12~~ $8\frac{3}{4}$ "
Width: 6"
Height of hole: $3\frac{1}{2}$ "
Dia. of hole : $1\frac{3}{4}$ "

Boxes made out of $\frac{3}{4}$ " pine boards painted white and supported on cedar posts ca 8' above ground.

2. Flicker Box



The Flicker family nested in this box. Also, the two Starling eggs were found in a box of this type. (# 1). Dimensions:

Back: 25 "
Front: 21 "
Width: $8\frac{1}{2}$ "
Height of hole : $13\frac{1}{2}$ "
Dia. of hole : $2\frac{1}{2}$ "

Constructed out of same materials as Swallow boxes.

3. Old, un-numbered boxes



One swallow family occupied a box of this type---the one shown in the photo, to be precise. The only other species found nesting in this type of box was the Least Flycatcher. Dimensions:

Back;: 13 "
Front: 11 "
Width : $7\frac{1}{2}$ "
Height of hole;: $5\frac{1}{2}$ "
Dia. of hole : $2\frac{1}{2}$ "

Constructed out of 1" pine(?) boards; unpainted and now quite weatherbeaten.

Crested?

4. Martin Houses



Martin House # 2. Similar to other three. About 30 ' above ground. Four holes on a side, or a total of 16 possible nesting places in each house.