

Ketterson / Nolan Research Group Collection

This document is part of a collection that serves two purposes. First it is a public archive for data and documents resulting from evolutionary, ecological, and behavioral research conducted by the Ketterson-Nolan research group. The focus of the research is an abundant North American songbird, the dark-eyed junco, *Junco hyemalis*, and the primary sources of support have been the National Science Foundation and Indiana University. The research was conducted in collaboration with numerous colleagues and students, and the objective of this site is to preserve not only the published products of the research, but also to document the organization and people that led to the published findings. Second it is a repository for the works of Val Nolan Jr., who studied songbirds in addition to the junco: in particular the prairie warbler, *Dendroica discolor*. This site was originally compiled and organized by Eric Snajdr, Nicole Gerlach, and Ellen Ketterson.

Context Statement

This document was generated as part of a long-term biological research project on a songbird, the dark-eyed junco, conducted by the Ketterson/Nolan research group at Indiana University. For more information, please see IUScholarWorks (<https://scholarworks.iu.edu/dspace/handle/2022/7911>).

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PRAIRIE WARBLER NOTES

1956

BLOOMINGTON, INDIANA

Volume III

July 1 to end

Val Nolan Jr.

668
7/1/56
VN

July 1, 1956

NB 6/1/56
69%

A cloudless, fresh day with a breeze in gusts generally from the SW; temperature in the 70's and 80's. Present from 0800 to 1230.

T59 at 0820 - The male is silent, the female not in sight. I sit to watch the nest for a while.

0837 - M59 begins to sing loud skids within 30 yards of the nest, evidently staying high. To 0841, when he quits, he sings 16 times while moving around the little clearing where the nest is. When he gets near me I can hear the little "tsu" calls mentioned yesterday. Note again that it is not quite the same as the alarm call; I can say only that it is less sharp and clear.

0843 - M59 begins to skid again near the nest clearing. I hear the "tsu" again. He catches an insect within 8 yards of me, 2 feet up; his bill snaps. To 0847-1/2, 9 songs.

0853 - M59 sings 6 songs in 4-1/2 minutes.

0903 - M59 sings 2 high skids, rather weak, then 8 loud ones, one weak one. He stops in 5-1/2 minutes. Again he's in the trees around the clearing, once probably in the nest clump.

0915-1/2 - M59 sings a skid at the nest clump, moves S toward me. I see him sing 25 feet high. I am sure I hear the female calling the "tsu" described above, but I don't see her.

17

100k (4.0)

2

Call

9pm

5 1/2

6pm

5 1/2

110k

2

120k

3 calls
disc

feeding
B

♀
Call

0920 - 59F goes to the nest, stays 20 seconds while turning and shaping, working at the rim with her bill. I see no material, but it's almost impossible to do so. M59 had sung 12 times to 0920, sings a very weak skid when 59F leaves and goes W 20 yards to a perch 15 feet high.

0937 - 59F goes to the nest, stays 8 seconds. She never enters but seems to remain outside and work at the rim.

0951 - M59 begins to skid, the first few songs high and weak. At 0955 he quits after 12. As usual he's been around the clearing and near the nest.

1005 - 59F goes to the nest, picks at the rim for 5 seconds before entering, gets in and shapes for about a minute. She then sits quietly for 1-1/2 minutes, goes at 1007-1/2.

I couldn't see that she brought anything.

1040 - M59 begins to skid W of the nest. In 2 minutes he sings 4 skids and a chatter (the first I've heard from him).

1057 - M59 sings 8 loud skids in 1-1/2 minutes within about 20 yards of the nest. He seems to be in the high trees just E of it.

1112 - A Sparrow Hawk flies over.

1120 - 59F has come to the nest 3 times in 3 hours, her last trip 1-1/4 hours ago. I suspect that this is fairly typical of the day between building and laying. She presumably will pay little or no attention to the nest now during mid-day and the afternoon. She may not have built at all today and on 1 trip very probably did not.

I leave the territory.

T57 from 1130 to 1230 - I find both adults in the little open wooded area 50 yards E of the osages. At least 1 young is there and I'd guess all of them are. M57 is right with the young bird, and 57F twice goes into the woods where it is, so presumably both are feeding. Both show mild alarm at my approach, calling "check," but 57F seems much less disturbed than she has been lately. Once she preens quietly near me, sitting about 18 feet up.

posit 49
finch
one

The fledgling is 7 feet up when I see it. Its tail is about 1-1/4 inches long.

The wind has become quite strong from the S so observation is difficult. I watch for signs of 57F's carrying nest material into or out of the woods, but see nothing.

1230 - I leave.

671
7/2/56
VN

July 2, 1956

A clear windless dawn with clouds beginning to form about 0600; temperature 71° at 0500. Present from 0500 to 1230 and from 1700 to 2030; Board present from 0900 to 1700.

T59 - I sit to watch 59F lay her first egg. *dawn*

0529 - 59F comes silently to within 1 foot of the nest. *laying*
In 1 second she enters it. For the next 2 minutes she moves around in it every 2 or 3 seconds, turning again and again to face in a slightly different direction or to settle a little. It's as though she is trying to get comfortable. Finally she faces S.

0541 - 59F seems to be sitting up in the nest with her cloacal opening down. This position is maintained for about 6 minutes. I've done nothing to clear away the few leaves that obstruct my view a little, so further details are not seen.

0605 - 59F quietly slips off the nest, dropping down toward the W.

M59 hasn't appeared or sung this morning.

0630 - The sky is 70% covered with scattered clouds; the sun shone briefly about 10 minutes ago. It's 74°.

0630 - 59F returns directly to the nest, looks in, enters and makes a full turn, settles facing SE. In 2 minutes she turns to face W.

0632-1/2 - M59 skids once about 30 yards W of the nest, weakly. *100 ft Song*

4
4pm
0635 - 59F quickly leaves the nest. I just catch the motion as she goes.

0636-1/2 - M59 sings 4 more weak skids in 1 minute, from the same location as before.

0645 - A little S breeze rises.

0648-1/2 - 59F returns to the nest, enters and turns 2 or 3 times, settles down facing W. I'm pretty sure she works at the rim once or twice as she turns.

0652-1/2 - 59F jumps out of the nest and leaves to the N.

0700 - The sky is unchanged; it's been sunny for about 3 of the 30 minutes. It's 76°.

I've found 3 other nests that can probably be attributed to this female. The one of last week, of course, can; one about 25 feet up in a dogwood top on the S side of the ravine (in 3F's last nest tree) probably can; and the maple tree nest on old T6 possibly can.

0723 - 59F returns to the nest, turns several times, settles facing E. She picked at the rim once. I'm sure she's tucking in loose ends of material.

0730 - It's nearly totally cloudy but the layer is thin and slight shadows are cast. It's calm, 78°.

0758 - 59F leaves. She faced E the whole time. I noted that her tail stuck straight out behind her, a position unlike that usually seen in incubation, when the tail is cocked and

S
W
E

N 13

N B

position
79

not far from upright. If 59F had been sitting deep in the nest the horizontal position of the tail would have been impossible. Too, I could see her back above the nest rim. I therefore take it she wasn't really incubating.

0800 - The cloud layer is thinning; it's calm, 78°.

33 1/2
2 1/2
5 1/2
4 ok
15
0
0803-1/2 - M59 begins to skid weakly NE of the nest, probably only 20 yards from it. By 0807 he is 15 yards W of the nest, about 25 feet up in the largest of the cherries; his song is stronger though not at its full vigor. At 0808-1/2 he quits after 21 songs.

0814 - M59 skids 4 times in a minute.

0830 - The sun has shone nearly full strength through light cloud cover during the last 30 minutes. It's 80°.

0841 - A hawk flies low through the woods, a Kingbird chasing it; probably a Cooper's Hawk. *Coopers*

0900 - The weather is as before; 82°.

0905 - Board relieves me and I go.

T57 - M57 sings occasional skids and chatters, the latter sometimes sotto voce. I finally find 57F feeding young about 3 feet high at the edge of dense tangle bordering the woods N of yesterday's location. I.e., the young seem to have moved N 30 yards or so across a clearing. The female pays no attention at all to me today; her feeding is persistent and I'd judge she isn't building. The male is undoubtedly feeding though I don't see it. *posio 77 feeding*

T53 at 1030 - M53 is singing insipid steps and feeding all 3 young in the NE corner of the pine field and in the edge of the woods. All young are within 10 feet of each other and about 3 feet high when I come up. They call and flutter their wings when fed. They then move into the woods, going up to 15 feet or so. One chases an insect through the air about 20 feet, fluttering slowly after it and trying to take it in mid-air.

feeding
1st

See below under T55 and T53 for more.

T55 - The unbanded male sings skids here for nearly 30 minutes at a rate of some 4 per minute. I follow him and see an unbanded female moving near the ground in the SE corner of the clearing. I have her in sight for only a few seconds, after I've watched the male for 10 minutes. She moves slowly. The male is nearby and there is a short pause in his song at this time, for about 3 minutes, so he may have joined her. After I lose her the male moves all over the area; he isn't concentrating on one area. If the bird is his mate she probably already has a nest.

40/10
35 min

At one time when I'm in the SW corner I see M53, well onto the clear area (as opposed to the woods) and about 40 yards from where I left him. He forages quietly 6 feet high, disregarding the songs of the other male coming from a higher perch some 20 or more yards away. There is no sign of the young 53's.

675
7/2/56
VN

T53 at 1115 - About 15 minutes after the foregoing episode I hear M53 singing skids at a rate of 3 per minute in the NW corner of the pine field, the E fringe of 2. He is feeding the young, all of which are now here. Suddenly at 1120 a female flies up calling "tsu" about once a second or more. The "tsu" note isn't the alarm type; it's the communication note that mates give to each other. To my surprise it is 53F, last seen on T56 after she deserted her nest.

paid
gg

ST 0
7
she has
egg

M53 flies up to the female and they move a few yards (4 feet high) out of sight. In about a minute I see the two fly together into 2; they are a few feet apart.

1130 - There's 1 skid near 1, and I go there.

1140 - I see 53F 25 feet high in a locust in 1. As I watch M53 flies up to her from 10 feet away, lands on her back and instantly leaves it and moves 2 feet away. She then crouches, raises her tail, spreads her wings with the wrists forward and slightly depressed so that the primaries seem to extend outward and backward and slightly upward. She gives a little series of twittering notes. This all lasts about a second and the male approaches. As he does so she flutters her wings, but as he starts to mount her she turns, opens her bill at him, and gives another little twitter. This part of the episode lasts another second or 2. The male doesn't get on her.

Col

coll

very
ing

She then flies down to a locust and perches 6 feet up near me. The male flutters down with big slow beats, moving slowly past her and several yards to one side. In a few seconds she takes off and goes straight N, the male following 20 feet behind. She lands 30 feet up in a woods tree. As I put up my glasses the male is just getting off her back; he must have been on her about 1 second. She flies N into the woods and downward, and he follows out of sight. It's now 1145.

1153 - M53 begins to skid at the E edge of 2 and I find him feeding young there as though nothing had happened. The young call, the feeding is persistent, and all is as before. I don't see the female in 10 minutes.

1205 - I leave the territory.

T59 - I mark the first egg, leave Board to watch the nest.

1230 - I leave.

T59 at 0900 - I [Board] arrive and relieve Nolan.

0930 - M59 has sung 2 times in the half hour.

1000 - He sings twice.

1030 - No songs.

1039 - M59 sings 7 skids nearby.

1100 - He sang the 7 songs indicated.

It's 88, though the sun may have hit the thermometer.

1128 - 59F comes to the nest, sits high facing W. At

7 1134 she shifts to face E.

1130 - No songs.

1137 - 59F leaves the nest.

1200 - No songs.

0 It's 91°.

1230 - No songs.

1300 - No songs.

0 It's 88°.

1330 - No songs.

1400 - M59 sang 7 times.

0 It's 88°.

1430 - No songs.

1500 - No songs.

0 It's 88°, cloudy from time to time, thundering occasionally
in the distance.

1530 - No songs.

1600 - No songs.

0 It's 87°.

1630 - No songs.

1700 - No songs.

It's 80°, generally cloudy.

1700 - I return. It's hot, humid, clouding over and
thundering. The temperature is 84° and the sunlight is filtered
through the overcast.

T59 - I relieve Board.

1800 - The weather is as described above.

1900 - It's cleared a good deal and only thin white clouds are in most of the sky. The horizons are darker and thunder is audible at a distance. It's 80°.

1906 - M59 begins to skid in the cherry 15 yards W of the nest, moves to about that distance. E of it. The song is loud and frequent, 8 in 1-1/2 minutes; then silence. *last song*

2000 - The weather is unchanged; it's 78°, It's still quite light.

2027 - It's now too dark to see the nest without glasses. Whip-poor-wills have just begun to sing and only Towhee songs and calls and Indigo songs are audible. It's 75°.

2030 - I leave. The day has been at least 80% sunny.

July 3, 1956

Still and nearly clear at dawn, with clouds on the horizons; partly cloudy during the rest of the day and threatening to rain from 1100 on; temperature 68° at 0500. Present from 0500 to 1200; Board present same time.

T59 at 0510 - See Board's notes.

T53 from 0600 to 0750 - M53 is singing insipid steps when I arrive, feeding all the young in 1. I find them at the W edge about 3 feet up, follow them as they move S to the very corner at the W edge and up into the 20-25-foot tops of the locusts. The male feeds devotedly, sings occasionally. I note that 1 young looks to be in full immature plumage, with the partial white eye ring. Another hasn't developed quite so far; its head is still untidy looking and a few quills can be seen both on the head and the wing coverts. Both behave like adults except for being fed. I'd guess they catch over 50% of their food.

M53 occasionally moves away from 1 to sing skids, usually at the E edge of V in the woods trees. Once he gives a number of chatters here. I cover the territory thoroughly and see nothing till 0655 when 53F appears in the vicinity of 1 and then flies up 20 feet into the tops there. A young bird is near her, about 10 feet away, but after a few seconds during which she disregards it she leaves. She flies high straight

Large feeding + egg
chuck
929
by note
7
102
wood

N to a perch 40 feet up in a woods edge tree, moves through it and out of sight.

I then begin to walk over the territory again. The young move N along the E edge, keeping high. The male still sings sporadically, steps, skids, and chatters. There is no further sign of the female, nor any suggestive behavior by the male; but see below under T55.

T54 - A young 54 (S) is in the S end of 2 when I arrive on V and a male that isn't M53 is singing skids near it. The young moves W and I lose it. Later a male sings in 3, but by the time I reach there it has gone. I don't cover the territory carefully.

T55 from 0750 to 0900 - As I come on the territory at its SW corner I find M53 and 53F there, about 6 feet up. She is feeding quietly, wiping her bill many times at one juncture, apparently without relevance to any eating she has done. M53 flutters in flight, moving away from her. She goes up into the trees in the woods to the W and he flutters up. I see them for 2 or 3 minutes 30 feet up, the male keeping with the female and flying along near her. Both are silent so far as I can hear. Then I lose them. I'd guess that she is the one not in breeding condition, but since she seems to have severed ties with the young he may be able to get her to re-nest. *note*

During the rest of the time I walk all over T55. At about

0830 a male sings 4 or 5 songs, but that's all that happens.

T57 - M57 sings skids near the osages and the dead elms and once carries food into the woods a few yards E. The young are silent. Another time he sings skids and chatters to the N near the area where the female was yesterday and near the ravine. I walk the territory pretty carefully and see nothing more.

I'm inclined to think that the young have separated, probably just after fledging, and that the female is feeding the N element. I doubt if she's building. The vegetation is so much heavier near the ravine that I suppose I just can't find her very often.

Once when I'm watching M57 singing near the osages an unbanded well-marked male flies up to within 25 yards of him. The bird is silent, acts rather alert, looks about him and feeds. In a few seconds I lose him to the N.

There must be a regular floating population of non-breeding birds silently moving around the fringes of the territories. Not
Note the way M55 was replaced, but also that many males in the past have not been replaced. [And note that later a pair was found to have bred E of T57.]

T56 - Silence.

LVN - I pass through here going to and coming from the far N fringes of the golf course. At 1130 as I'm returning S a male skids on old T6. I'm inclined to believe that there

is a pair here. [Error.]

N area - In an hour of looking and listening at all possible PW habitat N of the course I find only the birds in the 5-acre NE field. The male sings 4 or 5 step-buzzes and both he and the female feed full-grown young.

T59 - At 1145 I mark the second egg.

1200 - We leave.

T59 at 0510 - We arrive. It's 61°. [Board]

0524 - 59F comes alone, in 5 seconds settles in the nest facing E.

0534 - She rises up slightly.

0536 - She looks into the nest, repeats at 0539. At 0540 she is settled facing E. She has opened and closed her bill frequently since 0536, now stops.

0542 - M59 begins to skid within 35 yards of the nest, stops after 6 in 2 minutes.

0546 - M59 sings twice within 15 to 20 yards of the nest.

Nolan leaves the territory, finds M59 singing S of the nest as far as the old road separating I and IV; 9 songs in 3-1/2 minutes from 0546.

0550 - M59 begins to chatter near the nest; 18 to 0559.

0600 - It's 69°.

0602 - M59 begins to sing; 14 to 0607.

0608 - 59F leaves the nest.

0700 - M59 has sung 8 times since 0630.

It's 73°.

0730 - M59 sang 7 times in the period.

0800 - It's 79°. [Songs?]

0833 - 59F is foraging 20 feet W of the observation post.

M59 sings 3 skids, during the 2 or 3 minutes she's in view.

0900 - It's 82°, cloudy.

1000 - It's 84°, cloudy with occasional distant thunder.

1100 - It's 85°, cloudy.

1145 - M59 has sung 7 times in the last 15 minutes. [Presumably Board made no notes at all when he heard no songs.]

1200 - We leave.

July 4, 1956

A still foggy morning after some rain in the night; it is difficult to see more than the shapes of trees across a field; temperature 68° at 0500. Present from 0500 to 1230; Board present from 1015 to 2030.

T59 at 0505 - The nest is invisible in the fog and dark from my observation post. 59F is not on it. The eggs are quite cold.

0520-1/2 - 59F comes to the nest silently and alone. The nest tree moves and 1 second later she is at the rim. After a quick glance in she enters and faces NW, the first time I recall her facing in that direction.

0524 - She rises and looks into the nest for a second.

0529 - She repeats this.

0530-1/2 - She looks into the nest, then sits with her breast out of the cavity by as much as about 3/4 of an inch, her cloacal opening down toward the bottom, her tail just a little above the horizontal.

0533-1/2 - She rises a little so that the position of her breast is unchanged but her tail region is not so deep; it seems slightly out of the nest too. I would guess she has laid. Possibly she avoids full contact with the still-soft egg.

0535-1/2 - She looks into the nest, simply drawing up a little and looking down under her belly. After 1 second she

settles deep facing nearly W, a little N. The egg has now clearly been laid.

0536-1/2 - She looks into the nest, pokes for a second, settles deep facing as she was.

0538 - She repeats.

0549 - She looks in for 3 seconds, possibly probes.

0600 - The weather is unchanged except that it's a little lighter, 70°.

0608-1/2 - 59F rises up a little, sits thus for 10 seconds, looks into the nest for 5 more, settles.

0616 - She jumps to the N rim, in 1 second flies N.

0624 - M59 sings 1 weak skid W of the nest about 30 or 40 yards. *1st song*

0630 - M59 may have sung 2 more very weak skids in the last 5 minutes.

0636-1/2 - M59 sings 2 short weak skids not far to the N, then comes S to the clearing. He quits at 0641 after 7 songs.

Rain 0643 - A slow dripping rain begins to fall.

0700 - It's still raining, the temperature 69°. There is no wind.

0710 - The rain lets up a little. It's now very slight, hardly more than the drip from the trees.

0800 - It's still drizzling a little, completely cloudy, 72°.

0810 - It quits raining. Note that the rain never brought the female back to the nest to protect the eggs. The rain water must be at air temperature, of course.

0850 - M59 may sing once.

0900 - It's still completely cloudy, possibly a little lighter; 75°.

0925 - M59 begins to skid weakly about 50 yards W of the nest. He quits after 5 in 1-1/2 minutes.

0930 - It became lighter 5 minutes ago; I can see where the sun is through the clouds. It's 77°.

0931 - M59 comes to about 25 yards W of the nest and sings skids, moving closer all the time.

0931-1/2 - 59F goes to the S rim of the nest. Perched there she pokes at the eggs delicately for 25 seconds, then quickly enters and faces NW in normal incubating position. M59 sings above her, I'd guess 10 yards W and at about 30 feet. By 0938 he has moved slowly E and is singing 15 yards from the nest over my head.

0939 - 59F rises, looks in for 5 seconds, settles facing NW.

0943 - She repeats this.

0945 - She resettles quickly, still facing NW. The male has moved N about even with the nest and is singing close to it.

0947 - 59F rises, looks in for 2 seconds, settles.

5-80 (3.6)
16.58
2.6
1.0

cut off
2.6

0947 - M59 quits after 58 songs. There were 2 pauses of about 25 seconds; otherwise his rate was near 5 songs per minute.

0949 - 59F rises, looks in for 2 seconds, settles facing NW. The sun has come out and shines on her head.

0951-1/2 - She repeats.

0953 - She seems to work for a second on a loose end in the nest rim.

0954-1/2 - She probes the nest for 1 second, settles, swung around to face more toward the W.

0957 - She's sitting at the normal incubating angle but very slightly higher in the nest. In 1-1/2 minutes she settles down deep.

1000 - The sun appears occasionally through a lighter cloud layer. It's 81°.

1003-1/2 - 59F rises and looks in for 1 second.

1005 - She repeats.

1010 - She picks once at the rim.

1015 - She sits a little higher on the nest, looks all around her nervously.

1018 - She jumps to the rim, takes off to the N.

1020 - Board relieves me.

T53 at 1035 - M53 is singing an occasional insipid step in 1. I find him there feeding the young, in the SW edge. The young are low, about 5 feet up. During the next hour they

feeding

move about freely in 1 but so far as I can tell never leave it. The male may go N to the woods edge once.

I never see the female nor does the male act as though she's present. My search includes the little opening in the woods N of V.

T54 - Silence.

T57 - M57 is singing frequent, long chatters, most of them loud, near the osage oranges. I find a fledgling in the creeper-covered trees just to the S. Both M57 and 57F are here, the latter twice carrying food and acting alarmed at me the second time she comes. I think it's unlikely now that she'll nest again. *feeding*

T59 - I mark the third egg.

1230 - I leave.

The day cleared a good deal in the afternoon, was about 60% sunny. There were thunderheads in the evening and some lightning but no rain.

T59 at 1015 - I [Board] arrive and relieve Nolan in a few minutes.

24 1059 - M59 begins to skid nearby in short series and with "tsip" calls at times. He quits at 1108 after 24 songs.

1100 - 59F comes to the nest, settles low facing NW.

It's 84°, generally cloudy.

1147 - 59F is now facing N. Some sun touches her head and her bill is about 1/16 inch open.

1200 - 59F leaves the nest.

It's 89°, but possibly the thermometer was in the sun.

1244-1/2 - 59F returns to the nest, perches just above it for 10 seconds, settles facing NW.

38 1245-1/2 - M59 is in the vicinity skidding and calling "tsip." He skids 38 times.

1255 - 59F turns to face N. Her bill is slightly open.

1300 - It's 85°, mostly cloudy and without sun.

1319 - 59F leaves the nest.

1400 - It's 84°.

1500 - It's 86°.

1600 - It's 85°.

1653 - 59F returns to the nest, settles facing NE, bill slightly open.

1700 - It's 85°, sunny with some clouds.

1705 - 59F is restless, moving her head around constantly.

1728 - 59F leaves the nest.

1800 - It's 83°.

13 1804 - M59 begins to skid, sings 13 times.

1900 - It's 79°.

2000 - It's 75°.

2030 - It's dark and 59F is not on the nest. [N.B. - She did not incubate this night.]

I leave.

690
7/5/56
VN

July 5, 1956

to 0747, all birds
more recorded

A clear still dawn; temperature 67° at 0430. Present from 0430 to 1130 and from 1500 to 1700; Board present from 1100 to 2015.

T59 at 0445 - 59F is not on the nest. The eggs are cold and a little moist.

0534 - 59F comes to the nest, is out of sight for 1 second in the surrounding leaves, jumps to the rim and looks in for 2 seconds, enters and settles facing NW. *laying*

0536 - She rises and looks in for 1 second. When she settles I can see that her back is pulsating rhythmically up and down and that her tail, cocked at a 45° angle, is wagging up and down very slightly in the same cadence. Its arc at the tip is less than 1/4 inch. This could be the effect of her breathing, but I've never noticed it before.

20h 0538 - M59 skids twice, once within 30 yards of the nest to the SW, once within 15 yards. *10x song*

At 0540 the female's tail is still moving.

0540 - M59 begins to skid to the N and slowly moves S toward the nest. *10x*

0541-1/2 - 59F rises, looks in for 2 seconds, settles facing NW with her body at the same angle as before but higher in the nest.

0543 - 59F assumes the laying position, her tail cocked but at only a 30° angle. It is still moving a little. M59 is singing close by.

0544-1/2 - The female's tail is now out of sight and therefore must be nearly horizontal.

0545-1/2 - 59F is in the laying position but her cloaca is not deep in the nest. I.e., the angles of her body is unchanged, but she's higher. Twice she flips her tail from the horizontal to a 30° angle and right back again. Note that this would be difficult or impossible if the cloaca were pressed into the cavity. I'd guess she has laid the egg.

0546 - She rises with her body above the cavity, looks in, settles deep and faces W.

0546 - M59 quits after 13 skids since 0540.

0548-1/2 - 59F looks into the nest for 1 second, settles deep facing W.

0552 - She rises and probes for 1 second.

0557 - She disregards Field Sparrows and chickadees flying around in the nest tree.

0600 - 59F rises, probes for 1 second, settles.

0600 - It's cloudless, 68°.

0605 - M59 skids faintly to the N, 5 times in 75 seconds.

0608 - M59 comes to the scrubby little walnut tree N of the nest about 5 yards, to which he sometimes went during nest building. He perches 8 feet up, sings a skid, hops around until he's out of sight. He sings 3 times in the 40 seconds he's near the nest, never looks toward the nest or behaves

B

during
F-5, Chaco

5 skids

3 skids

202
differently. He then moves into the woods beside me and sings twice more.

0625-1/2 - 59F rises and looks in for 1 second.

0627 - Two Field Sparrows are flying around within 5 feet of the nest, sometimes shaking the limb it's on. 59F disregards them. *Drive FS*

0632 - 59F rises, probes for 1 second, looks in for 1 second, settles facing W as usual.

0635 - She repeats.

0636-1/2 - She rises and looks in for 1 second.

0640 - 59F looks around her, rises, looks into the nest for 1 second, probes for 3, settles.

0641 - Without preliminaries 59F gets to the N rim and flies N. There are 4 eggs.

0658 - I hear "check" calls repeatedly (about 1 per second but with short breaks) within 5 yards of the nest. These continue till 59F enters.

0700 - It's cloudless with a trace of S breeze, 72°.

0701 - 59F goes to the nest, calls one last "check," looks in, enters facing W.

I assume true incubation has begun. Note the unusual fact that she did not spend last night on the eggs. Cf. 54F.

52
0717 - M59 begins to skid to the W, faintly and rather far away. He moves E toward the nest, at 0722 singing in the clump of trees it's built in. 59F rose and looked in at this

time, then looked above her. The male goes on singing in the woods E of the nest, quite close by.

0733 - 59F looks in for a second, probes, settles facing W.

The Field Sparrows and gnatcatchers in the area frequently fly around within a few feet of the nest, rustling the foliage. 59F never pays any attention.

0734-1/2 - She looks in for 1 second.

0737-1/2 - She rises and resettles.

0741 - She probes for 1 second. She always faces W.

0742 - 59F seems to me to be looking around more than females usually do. This could be caused by the constant activity of other birds around her or by the male's presence. He's still singing skids within 25 yards of her in the woods to her SE.

0745-1/2 - She rises, looks in for 1 second.

0746-1/2 - Repeat.

0747 - She leaves the nest. M59 goes on singing.

0748-1/2 - There are "checks" and "tsus" above me. M59 quits after 123 songs. At 0749 he is about 15 feet behind me calling the contact type "tsu." He then flies to the tree above the nest (20 feet high) with a brown insect in his bill. In 10 seconds he drops to the nest still holding the insect, sits among leaves just out of my sight looking in. In 5 more seconds he thrusts at the nest, but I think he's already eaten

AFB

total
123 songs
(4.0)

4
123
124

the insect. In 3 more seconds he flies into the trees to the SE again and at 0750 begins his frequent skids.

During the long series of songs completed a few minutes ago M59 sang the first few faintly but all the rest at normal volume. Some perhaps lack the ringing vigor of early spring songs.

0800 - The sky is the same; it's 77°.

0802 - 59F calls "check" near me twice.

0803 - She goes to a 25-foot perch in the bare dead tree above the nest, sits there looking around silently, wiping her bill 2 or 3 times. The male is singing to the E in the woods.

0804 - 59F drops a foot, another, then down to the nest, which she enters from the E. She faces W.

The male goes on singing. I'm pretty sure that some of his songs are longer and more ringing than others, and I think the loudest ones are sung at the clearing and nearest the nest. The trouble is that he's nearest to me too, so it could be a matter of distance.

*Song
volume*

0810 - He quits after 65 songs.

I'm not trying to record all of 59F's movements on the nest during this time on. Until this time, I did record all.

NTB

0840 - There are clouds coming in from the W. At 0845 one darkens the sun for a moment.

0854 - 59F leaves the nest and flies E. For the last 4 or 5 minutes she has seemed to be looking around her and

65th

695
7/5/56
VN

craning her neck to look below more than usual.

0900 - It's sunny with clouds on the N and W horizons; a very light SW breeze; 80°.

0919-1/2 - 59F begins to call "check" between me and the nest.

0922 - After 17 calls she flies directly to the foliage in which the nest is built, coming from about 6 feet up SE of the nest, landing in the foliage on the E side. She enters and faces NW almost without a pause to look in.

0926 - A NW breeze begins to blow a little. The sky, as usual, is becoming threatening.

0932-1/2 - 59F rearranges the eggs for 20 seconds. I'm B not trying to get every movement.

0935 - Having sat a little high on the eggs for 10 seconds, B 59F turns and faces E.

0936 - M59 begins to sing loud skids NE of the nest about 30 yards. I think he's probably sung for 2 or 3 minutes to the N just out of my earshot. He moves S and continues.

0942 - 59F is sitting rather high, her bill open slightly and then wide. It's 84°.

0943 - She turns and faces S but doesn't settle, turns further to face E. At 0944 she turns again to face SE, sits with her breast out of the nest so that she looks as if she's almost on the rim, her bill open and her wings noticeably spread in the sheltering position. Her position, toward the NW rim, is no good to provide shade. The sun is very slightly B

obscured and it doesn't seem hot at all.

At 0950 she's still in the position described, having settled once for 2 or 3 seconds. The male is singing loudly in the woods just E of me. These woods are open and the trees are of uneven height at the edge, so he's not actually in a canopy.

0951 - 59F settles and closes her bill. She's facing E.

0955 - M59 is visible above me at 25 feet, 15 yards from the nest. He's foraging and still singing loud and often.

0957-1/2 - M59 quits skidding after 37 songs.

0958 - He sings 2 weak short chatters, starts to skid again. After 7 he chatters again, then skids.

1000 - The sky is 80% or more cloudy but the sun is shining. It's 84°; there's a S breeze.

1002 - 59F turns from the E and faces W. I've seen and noted all these direction changes.

1004 - M59 quits after 18 skids since the last chatter noted.

1004-1/2 - 59F turns to face S.

1005-1/2 - 59F leaves the nest.

Board relieves me.

IV N from 1020 to 1120 - I walk this area carefully, but hear only M59 singing loud, frequent, regular skids from 1043 to 1055 and 1110 to 1120. He is at the ravine in a high tree,

87ch
(4.0)
2 ch
7 ch
1 ch

12 ch

88

13

then across on the S hillside, his old territory. Note the extreme range he is covering.

1130 - I leave.

1500 - I return. It is cloudy much of the time and threatens to rain, but the threat never quite materializes.

I - M59 sings the same loud skids in the strip of habitat dividing I and IW, slightly S of the hawthorns. He continues for at least 10 minutes.

T53 - M53 and all the young are in 3 at the SE end when I arrive, the first time I can recall their leaving their territory. The spot is the one where M54 had his young not many days ago. The birds are 6 feet and less high, and the male is feeding them faithfully. They flutter their wings noisily when fed, stay 2 or 3 minutes in the same general location and then move a few yards. They go W into the clearing between 3 and 4 and the field S of it as I leave.

feeding
use

T57 - M57 and 57F are both feeding young near the osages. 57F makes 2 trips and I go.

feeding

I see only 1 fledgling, in the apple tree just E of the osages, about 2 feet up. Either some of the young have died or this family is unusually spread out.

1730 - I leave.

The day was 60% cloudy or more, with a cold front arriving about 1800.

T59 at 1000 - I [Board] arrive and in a few minutes
relieve Nolan.

1035 - 59F returns to the nest and settles facing NW.

1036 - M59 comes to the nest, stands on the rim for
about a minute, leaves and stays nearby. He sings skids,
15 to 1043, and sometimes calls "tsu." [Did he have food?]

1043 - Nolan hears M59 singing at the ravine dividing
IV S and N; song continues to 1055.

1100 - It's 80°, cloudy.

1110 - Nolan hears M59 sing on old T3.

1118 - 59F shifts to face N.

1138-1/2 - 59F leaves the nest and goes E.

1158 - M59 begins to skid and 59F to call "check."

1201 - 59F returns and settles facing NE. The male goes
on skidding; he sounds close by.

1230 - M59 is still skidding.

1235 - He quits after 93 songs in 37 minutes.

1241 - 59F rises up slightly and for 1-1/2 minutes does
something that seems to be bill wiping. She then settles as
before.

1243 - The male begins to skid, does so 21 times in 9
minutes.

1252 - 59F leaves the nest. The wind is fairly violent,
moving the nest branch considerably.

1300 - It's 83°.

- 1313 - M59 begins to skid, does so 10 times.
- 1319 - 59F returns to the nest, settles facing NW.
- 1320 - M59 comes to the nest with food; 59F takes and eats it. He stays 45 seconds, sings 2 skids after going. APTB
- 1323 - M59 begins to skid again, does so 19 times.
- 1347 - M59 begins to skid, sings 36 times to 1403 and stops.
- 1400 - 59F leaves the nest.
- It's 78°, alternately cloudy and sunny.
- 1422-1/2 - 59F returns and settles facing NW.
- 1500 - It's 80°, with the sun shining but some clouds in the sky.
- 1515 - 59F leaves the nest and goes NE.
- 1533 - She returns, settles facing NE.
- 1535 - Nolan hears M59 singing loud, regular, frequent skids in the relict strip of trees between I and I W, near and S of the hawthorns. He sings for 15 minutes or more.
- 1600 - It's 77°, cloudy and breezy.
- 1644 - 59F leaves the nest.
- 1700 - It's 75°.
- 1707 - 59F returns and faces NW.
- 1800 - It's 74°, overcast and breezy.
- 1810 - 59F leaves the nest.
- 1840 - 59F after calling "check" for some 2 minutes, returns and settles facing NE.
- 1900 - It's 71°, cloudy with a strong breeze.

700
7/5/56
JB

1932 - 59F leaves the nest.

1954 - After 3 or 4 minutes of calling "check," she returns
and faces NE.

2000 - It's 70⁰, cloudy and breezy.

2015 - I leave.

July 6, 1956

A cool gray morning (cloudy till 1500) with a fine mist falling at 0900 and occasionally during the morning; windless; temperature in the high 60's till about 1030. Present from 0845 to 1215.

T59 - 59F is on the nest.

T53 and T54 - I get some interesting information here.

M53 is singing infrequent skids in 1 when I arrive and all 3 of the young 54's are being fed by M54 in the NE part of 2. I follow the 54's as they move along at about a 4-foot level and keep generally together. Occasionally the young will separate by as much as 20 yards, but they soon come together. All call the juvenile vibrant note a lot and are especially noisy when fed. They often fly up to M54 when he appears with food, and the one he turns to flaps its wings as the food is passed. I'd guess that not much more than 15 or 20% of a young bird's food is given to it. feeding

As I watch, a poorly marked unbanded bird, almost surely a male, comes into view near one of the young. I try to follow the newcomer as it moves along low with the young. Once there is the sound of a feeding, but I don't actually see food carried or passed. In 2 minutes I lose the bird (definitely neither 54F nor a 53) and see it no more. help?

Meanwhile the 54's have moved into the middle of the pine

field, calling noisily. M54 never sings, and there is no challenge by M53. The young give the contact "tsu" note at times as they go along together. Finally the family reaches 1, and the loud feeding goes on at the N edge.

call
note
function

I go to find the 53's so I can see if the 2 families will meet. M53 is feeding all 3 young at the very SE corner, 2 feet high. He has sung a few type-8's during the last half-hour. The sound of the 54's about 25 yards N is clearly audible. Then the 53's begin to move N and the 2 groups seem to meet toward the center of the W side of 1. The young go higher and into 1, so I see no interesting behavior by them, but I do see M53 chase M54 out into the clearing between 1 and 2. There is a loud burst of harsh fight notes for about a second, and the 2 males face each other about 15 yards apart, low. I lose them almost immediately and see M54 no more. M53 begins to fly out into the pine field and sing 2 or 3 insipid steps for a few seconds, then return to 1. I'd say this is awakened territorial behavior attributable to the fight.

♂ ♀

Note that males seem not to be aggressive or to pay much attention to boundaries at this time. They will even tolerate the sound of other PW's on their territories, but if there is direct contact they will fight (and win?). Note too that the young (or is it the influence of the parent?) seem to have a

T

sort of base of operations on their territories to which they return after their wandering. It would be interesting to see if they fly back to it at night.

T55 - Silence during 10 minutes.

T57 - M57 is singing his long chatter in the usual place.

I find a fledgling in the creeper-covered trees S of the osages, sitting about 2 feet high. It has a tail about 1-3/4 inches long, not quite full size. The breast shows no yellow and the bird looks about 1/2 inch shorter than an adult. Once in a little cherry it pecks several times at a brown gall on a yellow leaf, presumably trying to eat it. The male feeds it, calling "check" and showing alarm at me.

I can't find any other young; and I walk over the territory without seeing the female. Finally she shows up without food at the place where the fledgling is, when I return there. She doesn't seem alarmed.

1215 - I leave.

704
7/7/56
VN

July 7, 1956

A clear windless day after a clear night; it's still cool (see Board's notes) so there's a heavy dew. Present from 0745 to 1215; Board present for the same time.

T53 - As I pass through, 53Y is calling in 3. I don't see or hear the males on V.

T55 [T60] - I set out at 0815 to discover the situation here.

0822 - I find the female in the SW corner feeding low. For exactly 20 minutes I follow her as she moves silently and at leisure within the restricted area of the corner, spending most of her time at the edge of the woods but not beyond it. She seldom goes above 15 feet. The male may be near her at one time, for I hear a few "checks." At 0842 she flies quickly E toward the SE corner and I lose her. *♀ pre vic (high)*

0858 - I find the female in the center of the S part of the area, feeding just as before. The male is moving with her in the same trees and only 10 feet or so away, sometimes flying up to within a foot or so and sitting rather tensely. Both are silent. As they move along never out of sight for more than a few seconds a third PW may come on the scene: One that I'm following, a female I think, flies high to the SW to V, but when I turn there are still 2 PW's where I've been seeing them.

I follow the female E along the S edge and then half-way N along the E edge. The male is with her at least once more; again both are silent. She moves without haste, sometimes low and occasionally going to a tree top. At about 0925 she goes E into the woods about 10 yards and I can see her foraging there some 30 feet high. At this time the male begins type-8 songs well to the SW, very occasionally. The female doesn't react. At 0930 he sings once much closer, possibly 35 yards away and the female immediately starts to call "check," doing so about 10 times in 15 seconds. The male sings no more, but instead seems to come to the female; at least I hear 2 sets of check calls for half a minute. It seems likely that the "check" is a location note while the faint "tsu" is given between 2 birds already together. In any event, the female's calling at the male's song is interesting and seems to indicate they are mated.

Call to
61

Call
from above

0937 - I quit trying to follow the female, which is still in the E woods. In the 60 minutes in which I've had her in sight during the last 80, I'd say she has foraged all the time at the following levels: under 6 feet, 40%; under 12 feet, 75%; under 20 feet, 85%; the rest up to 35 feet. The male has sung about 15 times, all type-8's.

hts

It is clear that the only nesting phase in which this female could be is the post-building resting, or the laying. Or she could be a female which hasn't nested or one whose nest

just failed. I walk over the territory until 1100 looking unsystematically for a nest. The male sings about 5 more type-8's, and as I leave at 1105 is singing some 6 or 7 skids. Note how silent he has been today.

I'll call this pair 60.

T53 - As I pass through I find the male and all 3 young over among the white pines at the S edge of V, in the weeds and the growth under 6 feet high. They are thus far onto T54 without attracting the attention of M54 at the moment; their base at 1 is 75 yards away. M53 isn't singing, but the young are very noisy. They all move along together and in the few minutes I watch them they move a lot, going N into the field in 5 and 10 yard hops. I check the bands of the young to be sure none of the 54's have got mixed up with the group; they have not.

T57 - M57 is singing skids in the usual spot, the area just S of the osages, between them and the bean field. I see him carry food to a creeper-covered hawthorn and find 2 young there, the first time I've seen two together. He shows some alarm at me, calls "check."

The young have probably reached full size. There is the barest trace of yellow in 2 streaks on the breast where the new plumage is coming in. They move about a good deal in the tree, staying between 2 and 5 feet high. Once one flies at

or to the other, which sidles along to make room, then hops to a nearby branch. They call occasionally, especially when the male is near, and when he comes to the tree with food both advance to meet him.

One interesting thing is that after the male has fed them (having called at me but not displayed or seemed intensely alarmed), he flutters out of the tree to a perch 15 feet away. His tail is quite spread and his wings beat rapidly and shallowly. He calls a series of little high "tsu" notes all run together. After landing he does not display in any way, but in 5 seconds or so he flutters on, this time I think with large slow beats. Within 5 seconds 1 young leaves the tree and flies calling into the woods edge where the male went, and in another second or two the other follows. Can the display have the function of leading the young to follow? This would not be surprising since it seems to produce that reaction in the female. I'll check it again.

57F is not in sight during 15 minutes. The possibilities are that (1) she's simply away at this time, (2) she has a new nest, (3) she's with the third young, (4) she is less attentive than the male and has quit tending the brood.

1215 - I leave.

[Note that an implication of waning territorialism in M53 and M54 without a consequent lowering of attentive behavior is that these two drives are at least not wholly linked. Con-

Very
high
B 49

N B

708
7/7/56
VN
JB

*also may and
Smile 20 -
D13, D57*

sider that males desert females still on eggs in late summer
but may not desert if there are young in or out of the nest.]

T59 at 0745 - I [Board] arrive. 59F is not on the nest.

*not
with
using*

0750 - I see 59F, 25 feet or more high working her way
from tree to tree back to the nest. Occasionally she sits and
preens. At 0758 she perches about 6 feet above the nest, bobs
her tail, stays 1/2 minute.

0758-1/2 - She returns, settles facing NW.

0808 - M59 skids in the vicinity for the next 5 minutes.

0856 - 59F leaves the nest.

0900 - It's 74°.

[22]

M59 begins to skid, does so for 5 minutes. [It is pro-
bable that Board doesn't detect a song unless it's pretty
close to him and the nest.]

0913 - 59F is near me, calling "check" and flying from
tree to tree.

0915 - 59F returns to the nest, settles facing NW. At
0922 she turns to the NE.

0940 - 59F, in the same position, has her bill open.

1007 - It's 82°.

M59 is skidding nearby.

1013 - 59F leaves the nest.

1014 - M59 flies to the nest with food, perches about 1
minute on the rim doing nothing, leaves with the food still

APB

in his bill. He immediately begins to skid.

1028 - 59^F calls "check" SW of me, goes N.

1034 - 59^F is perched 15 to 20 feet above the nest, on a dead branch.

1035 - She drops straight down to the nest, settles facing NW. By 1040 she's facing NE, her bill open constantly.

1100 - It's 84°, sunny.

59^F is sitting high.

1141 - 59^F leaves the nest.

1157 - She begins to call "check" nearby. By 1159 she is perched on a dead branch 15 feet above the nest. She continues to move about, goes 20 feet SE into the clearing.

1200 - It's 86°, sunny with a few light clouds.

1203 - After 30 seconds on the rim 59^F enters, faces NW, quickly turns to the SE. She keeps on calling "check" till she's settled.

1205 - She has risen a little, has her bill open.

1215 - I leave.

July 8, 1956

A fairly clear morning with a few light high clouds and a SE breeze; temperature about 68° at 0500. Present from 0500 to 1000 and from 1600 to 2015; Board present from 0945 to 2030.

T59 at 0510 - 59F is on the nest, facing W. *dever*

0517 - She rises and looks in for 1 second.

0523 - After looking around for 10 seconds 59F repeats the foregoing maneuver. She's sat so low since I arrived that her head is below the nest rim or only just visible above it.

0537 - She rises and looks in for a second.

0541-1/2 - She repeats this. Note that a female never seems to leave the nest from this position; when she rises to look in she always settles back. *B*

0543 - She rises again. She's sitting higher now, so that her head is visible.

0546-1/2 - She rises a little and keeps looking over the rim below her; then she looks in, looks below, and after 7 seconds settles.

0550 - She looks in for 1 second.

0551 - She jumps to the N rim and drops down. About 10 seconds later a small bird flies past me fast from somewhere below the nest.

1
0556 - M59 sings 1 loud skid near the nest.

1088
Song

0600 - There is a complete high cloud layer, a SE breeze.
It's about 70°.

0602 - 59F calls once near me and toward the nest, immediately goes to the nest and enters from the E.

0610 - 59F turns and faces E. The clouds are low now, and it seems sure to rain.

0630 - M59 begins short weak skids within 25 yards of the nest.

6
0635 - After 6 songs he goes to the nest with a brown caterpillar, perching on the SW rim. The female is facing E and she turns to look at him. He lowers the food 3 times and she does nothing; it's not aimed at her head or bill but just at the cavity. In 15 seconds he goes W; his head was out of sight, so I can't tell if he ate the food or carried it away. Certainly 59F did not touch it. He sings no more.

AFB

0644 - 59F leaves the nest.

0655 - 59F begins to call "check," and I see her in the dead tree above the nest. She moves fast and nervously, drops to the walnut behind it, and after 7 calls goes to the nest at 0655-1/2. She looks in for 1 second, enters from the E and faces W.

0700 - It's still completely overcast with the breeze in the S and SW, but there are no longer low storm clouds; temperature about 71°.

0746 - 59F leaves the nest.

0800 - 59F begins to call "check" W of the nest (last time it was E). In 30 seconds, after 5 calls, she flies to the nest branch on the E side of it, calls once more, and in 2 seconds hops to the SW rim of the nest. She enters immediately and faces E.

0800 - The overcast is burning off; 6 minutes ago the sun came out a little, and it is shining rather weakly now. It's still about 74°.

0855 - 59F leaves the nest.

0900 - It's breezy occasionally, with a slight hazy cloud cover through which the sun is shining. The temperature is 75°.

0917 - 59F is calling "check" about 15 or 20 yards W of the nest. She probably began it half a minute ago. By 0918 she's called 60 times. In 45 more seconds she goes to the nest tree, calls there 4 or 5 times while 2 feet E of the nest. She goes to the nest, calls once, looks in, settles facing W and I think calls once more. In about 20 seconds I hear still another call that sounds like her. Excluding this note I counted 96 calls.

The SE wind is getting strong and clouds are coming in from that direction. A few drops of rain fall at 0923. It's 77°.

0945 - Board relieves me.

1000 - I leave.

1600 - I return. It's sunny but with clouds in the sky most of the time, occasionally obscuring the sun.

T56 - Silence as I pass slowly through.

T58 - Silence.

T57 at 1630 - I work over the osage area where the young were yesterday but see nothing. Finally I hear faint chatters to the NE and find the male feeding a young bird at the brushy edge of the deep woods near what seems to be the old foundation of a house. This is at the N edge of the PW habitat and about 100 yards E of the osages, in all 150 yards from the place the 2 young were yesterday. *feeding*

At 1648 I find 57F here too, so I sit to see how long she'll stay in view. The male calls "check" loudly at me for 3 or 4 minutes, then disregards me except to come in rather surreptitiously to feed the young. The female calls occasionally but pays little attention to me.

I have a good chance to observe the young, all 3 of which are together for the first time. They are in a 15-foot hawthorn, the N side of which is in the woods. They keep low, from 2 to 6 feet high, show no alarm at me, and are generally silent (even when the male feeds them). They move a little, sitting for from 1 minute to 5, then sidling, climbing, hopping, or rarely flying a few feet. All are within 10 feet of *up gone*

each other and sometimes 2 will be only a foot apart. I note that the inverted V of yellow breast feathers is now showing its quills and feather ends clearly, although it is still a narrow line. When one fledgling stretches I see a second molting area I haven't noticed before, what looks to be the fore edge of the wings and a small line just below it, all this between the body and the wrist and very restricted and inconspicuous.

The following are random facts observed about the young. One calls 6 or 7 "tsu" notes indistinguishable from those of an adult (more like the nervous than the contact call). One pecks at a rust spot 1/16 inch in diameter on a leaf. One hangs upside down like a chickadee while picking at something. All seem interested in the few inches around them and occasionally peck at things I can't see. They sit with flexed tarsi perhaps one-third of the time; it looks strange in full-sized birds.

57F is in view every few minutes until 1750, so she clearly isn't on a nest. I'll check here a few more times, but it now is very unlikely that there will be developments. I never see her carry food, though she may do so; she's less attentive than the male.

M57 sings chatters for about 2 minutes when I first find him, is silent for 20 minutes, chatters for perhaps 10 minutes while foraging 30 to 40 feet high in a walnut (and bringing

food to the young 1 or 2 times in this interval), then is silent. He disregards the chatter songs of a strange male somewhere far to the E, presumably in the little strip of habitat there [and later found to be on territory].

A Worm-eating Warbler comes to the edge of the trees once. [I heard a Black and White in the locusts near the road cut on about July 1 and saw an Ovenbird on V a day or so before that.]

Worm eating

7/8/56

1750 - I leave the territory.

T55 from 1735 to 1915 - I walk over the territory several times and see and hear nothing.

T53 at 1915 - My purpose here is to see if the 53's will return to 1 at night to roost. When I arrive they are not in 1, though I can't find them. At 1935 I hear them in 2 and find them feeding in the S edge with the male bringing food. They are noisy and move a few yards out into the field. Within 5 minutes all 4 birds fly across to the N edge of 1, about 30 yards, and then go E along the N edge.

M53 sings occasional insipid steps and in a minute or so M54 begins to do the same in the S edge of 2. The 2 males sing thus for 2 or 3 minutes, just as though M54 were still maintaining territory lines. He's 20 feet up in locusts, then goes S into the 12-foot top of a dogwood. I don't see M53 at the moment, but M54 is singing E of the place the 53's were

7/8/56

in a few minutes ago.

There is extremely noisy feeding at the N edge of 1, the young calling frantically when the male brings food. They are less than 7 feet up and range down to a foot or so when they venture out into the pine field a few yards. Once one flies straight at another in an aggressive way and supplants it. At 1955 all suddenly fall silent; they were within 10 yards of each other and presumably have quickly gone to roost either low in the edge of 1 or in the little trees adjoining it in the pine field. A heavy dark cloud to the N and W makes it a little darker than it ordinarily would be, but it's still quite light. M53 sings about 10 insipid steps to 2001, and at 2005 a male which may be he sings 3 type-8's deep in 1 to the S.

I haven't noted that a strange male, unbanded, was low in the N edge of 1 near the young at 1950. Possibly the noise attracted him. As I leave at 2010 a male sings 3 skids in the big elm S of V in the field.

2015 - I leave. It's been 70% sunny today.

T59 at 0915 - I [Board] arrive. 59F is on the nest, settled quite low and facing NE. I relieve Nolan.

1018 - 59F leaves the nest.

1035 - She returns, settles rather high, bill open and facing NE.

1100 - It's 80°, cloudy, somewhat windy.

1139 - 59F leaves the nest.

1200 - It's 82°, cloudy but with some sun.

1201-1/2 - 59F enters and settles facing NW. Her approach was circuitous, and she called "check."

1212 - 59F is facing NE.

1300 - It's 86°, sunny and breezy, with a few clouds.

1305 - 59F leaves the nest.

1324 - 59F begins to "check" in the vicinity.

1326 - She returns and settles facing NW, after an approach like her last one.

1330 - 59F is settled facing NE, bill open and sitting not quite as deep as she can. B

1400 - It's 84°, quite cloudy and with considerable wind.

1425 - 59F leaves the nest.

1440-1/2 - She begins to "check" in the vicinity.

1441-1/2 - She returns in the usual manner and settles facing NW.

1500 - It's 82°, sunny, breezy, with some clouds.

1503 - 59F turns to face NE.

1518-1/2 - 59F leaves the nest.

1531 - She begins to call "check" somewhere nearby.

1536 - She returns, settles facing NW. A minute before the wind (SW) was blowing the nest branch very much, violently tossing the nest on the outer tip. This note does not suggest a connection between this fact and the female's return.

8
1550 - She's facing NE.

1600 - It's 82°.

1621 - M59 sings for 3 minutes. [This is his first note about M59; it may be taken that Board didn't see him but no inferences should be drawn as to whether M59 was silent.]

1624 - 59F leaves the nest.

1655 - She begins to "check."

1658 - She returns, settles facing NE. Her approach was as usual.

1700 - It's 80°.

1750 - 59F leaves the nest.

1756 - She returns and settles facing NE.

1800 - It's 80°.

1805 - 59F leaves the nest.

1824 - She begins to "check."

1826 - She returns and settles facing NE.

1900 - It's 77°.

1944 - 59F leaves the nest.

2000 - It's 72°.

2001 - She begins to "check." I can see her 50 feet NW of the nest tree, 25 feet up in a cherry. She is nervous, bobs her tail and turns about a lot. She gradually approaches the nest.

2006-1/2 - 59F returns, settles facing NW.

2025 - She is very low, still facing NW.

2030 - I leave.

July 9, 1956

A fresh sunny morning, temperature in the 60's, with a violent SW wind. Present from 0745 to 1215 and from 1645 to 1800; Board present from 0745 to 1215.

T60 - I go to see if I can find the new female and her nest.

The male is singing faintly at the S end when I arrive. In the 30 minutes I keep him in view he ranges between 5 and 25 feet with perhaps 50% of the time spent below 12. His song is irregular and erratic. Usually he sings weak type-8's, but sometimes he follows a type-8 with a little skid and/or a step, so that he sings 3 songs within 5 seconds or so.

I begin to quarter the territory and at 1000 find the nest with the female on it, necessarily in her first or second day of incubation. The nest is about 12 feet high in the S center of a 14-foot dogwood which is 10 yards or less W of the high woods on the E side of the clearing. Details later. The fact that both of the 55's were replaced is very interesting.

T54 at 1000 - M54 is singing in the S end of 2 and for 25 minutes I follow him all over the territory, W to the pines. Most of the time he's in 4 and 5, singing loud skids. I never see or hear the young, which must have parted company with him.

T53 - Silence.

T60 at 1200 - 60F is on the nest.

1215 - I leave.

T59 at 0800 - I [Board] arrive. 59F is on the nest, settled facing NW. M59 is singing in the distance toward the NE.

0803 - 59F leaves the nest. It's 70°.

0823 - She returns, settles facing NE.

0851 - M59 is singing skids nearby. After 4 songs he takes food to the nest, thrusts it 6 or 7 times toward 59F, which seems disinterested. She never takes the food so far as I can see, and after about 20 seconds he leaves toward the NE.

AFB

0900 - It's 72°, sunny but with some clouds and a breeze.

0917 - 59F leaves the nest.

0935 - She begins to "check" nearby.

0938 - She returns, settles facing NW.

0950 - She turns to face NE.

1000 - It's 78°.

1027 - 59F turns to face NW.

1033 - 59F leaves the nest.

1040 - She begins to call "check," moves about near me (once only 3 feet away) and then gradually approaches the nest.

1044 - 59F returns and settles facing NW.

1048 - The wind blows so violently that at times it almost turns the nest upside down. 59F stays on.

B

1106 - 59F leaves the nest, goes E.

721
7/9/56
JB
VN

1120 - She begins to "check."

1121 - She returns, settles facing NE.

1129 - She shifts to face NW, then back again as before.

The wind is very strong.

1145 - 59F shifts to face NW.

1200 - The SW wind is in violent gusts, making it likely that the eggs will be thrown out of the nest. There are fast-moving high white clouds, an occasional dark one, all going ENE. It is sunny 90% of the time.

Wind -
Sun 732

1203-1/2 - 59F leaves the nest, and I check to see how many eggs there are: still 4.

1205 - I go.

1645 - I return. It's cloudy occasionally and quite cool when it is, and the wind is violent and gusty.

T59 - I check to see if the nest has been blown down or the eggs tossed out. 59F is incubating.

T40 - 60F is off the nest from 1726-1/2 to 1735 and I manage to feel the contents. There are 3 eggs. She pays no attention to me when she's going and coming. Incidentally, the nest branch is too rigid to be endangered by the wind.

1800 - I leave.

July 10, 1956

A calm cloudless dawn with 49° temperature and a heavy dew. Present from 0430 to 1200; Board present from 1145 to 2030.

dawn

T60 at 0500 - 60F is on the nest facing NE.

0540 - She's still sitting in the same way, sleeping much of the time. I've seen no egg turning or probing during the last hour, though till 0510 I could see little and that only with a flashlight.

A little sunlight hits the tree tops at 0545. It's still a cold 49° .

0548 - 60F begins to raise her head a little higher out of the nest and to look around some, although her eyes still close occasionally.

0600 - It's windless and perfectly clear, 50° . The female has pulled her head down again, with her bill sticking up at a 35 to 40° angle. This lasts for only 3 or 4 minutes, after which she raises her head again and sits slowly looking about.

0626 - After 55 seconds of looking actively around and below her 60F jumps to the N rim and leaves the nest. She drops down low, doesn't seem to go far on her first flight.

0630 - It's 52° . The sun is well up, but since the nest is only 10 yards from the E edge of the clearing the high woods has it completely in shade.

0634 - 60F returns directly to the nest. She may have called once first, but she seems to be completely unconcerned

at my presence 20 yards away. She faces S.

0640 - A few rays of the sun hit the top of the tree where the nest is.

0700 - It's 57°. A very slight SW breeze has come up.

0708 - 60F drops from the nest to the W.

0712 - I hear faint "checks" 15 or 20 yards W of the nest.

0713-1/2 - 60F, still calling, goes to the nest tree 4 feet below the nest. She takes 5 seconds to hop up, calling faint "checks" all the way, then falling silent as she gets to the nest and settles facing S.

0730 - It's 60°.

0739-1/2 - 60F leaves the nest.

0744-1/2 - She begins to "check" 25 yards W.

0745 - After some 10 checks she flies to the nest tree, lands 2 feet below the nest, immediately hops up, calls 1 "check," enters and faces S.

0800 - It's 66°, otherwise unchanged.

0806 - 60F leaves the nest.

0810 - She calls exactly as last time.

0811 - She goes to the tree 4 feet below the nest, silently hops up and enters facing S.

0814-1/2 - M60 begins type-8's, the first sound I've heard from him this morning. His songs are faint, to the SW. He stops after 5 in 1-1/2 minutes.

This female seems to rise or stir in the nest hardly at all, a fact that may be correlated with her short periods of

101
Song

incubation.

0829-1/2 - M60 sings 2 faint type-8's.

0830 - 60F drops from the nest toward the S, the general direction from which the songs have come.

0830 - It's 70⁰, occasionally slightly breezy from the E, perfectly clear.

0836 - 60F returns silently to the tree, 5 feet below the nest. She hops up, calls "check" 4 or 5 times in 5 seconds (the last when a foot from the nest), and as usual enters from the N and faces S. Her calls were barely audible. She always comes in from the W.

0911 - 60F drops to the S. She was looking around her during the preceding minute.

0920 - 60F comes silently from the W, lands 1 foot below and 2 feet W of the nest, in 2 seconds enters from the N and faces S. She makes no sound.

0946 - 60F leaves the nest.

1000 - The weather is unchanged. It's 76⁰.

1005-1/2 - 60F flies from the W into the lower part of the tree on the E side and takes about 20 seconds hopping up to nest level. She calls 3 or 4 "checks," enters from the N and faces S. This is the first substantial change in her approach at close quarters. Heretofore she has not gone so low, and she has moved up the SW side of the tree.

1032-1/2 - M60 skids once well to the W. 60F is looking

around her and has been since a few seconds before the male sang.

1037 - 60F leaves the nest. I've moved closer to get into the shade, so her return may be slower.

1049-1/2 - 60F comes to the E side of the tree at nest level, descends 3 or 4 feet, then hops to the N side and enters facing S. She calls "check" 3 times, takes only 10 seconds to go to the nest; she is very tame.

1100 - It's 75°. There are a few small high white clouds.

1115-1/2 - 60F leaves the nest.

1126 - 60F returns so quickly and silently that I see her only as she settles facing S.

1145 - Board relieves me.

T59 at 1200 - 59F is on the nest.

1200 - I leave.

The day ends with 100% sunshine. Board says that M60 never sang while he watched the nest, nor did he ever visit it.

T60 at 1145 - I [Board] arrive and relieve Nolan. 60F is incubating.

1214 - 60F leaves the nest.

1222 - She returns.

1246 - 60F leaves the nest.

- 1252 - She returns.
1300 - It's 78°, sunny.
1301 - 60F leaves the nest.
1311 - She returns.
1336 - 60F leaves the nest.
1345 - She returns after "checking" 6 or 7 times.
1400 - It's 79°.
1421 - 60F leaves the nest.
1432 - She returns.
1458 - 60F leaves the nest.
1500 - It's 80°.
1507 - She returns.

Note that 60F has consistently faced S today, her tail almost vertical. Now at 1510 for a few moments her tail is nearly horizontal.

- 1526 - 60F leaves the nest.
1542 - She returns, faces S with her tail vertical
[which means that she is settled deep in the nest].

- 1556 - 60F leaves the nest.
1600 - It's 76°.
1604 - 60F returns, faces S.
1625 - 60F leaves the nest.
1638 - She returns, faces S.
1651 - 60F leaves the nest.
1700 - It's 74°.

1710 - 60F returns.

1743-1/2 - 60F leaves the nest, dropping down and flying

W very low.

1758 - She returns.

1800 - It's 72°.

1844 - 60F leaves the nest.

1850 - She returns and faces S.

1900 - It's 70°.

1924 - 60F leaves the nest.

1932 - She returns and faces S.

2000 - It's 62°.

2030 - I leave.

The day has been 100% sunny.

July 11, 1956

A nearly cloudless dawn with a trace of S breeze, a moderate dew, and a 52 degree temperature at 0500. Present from 0500 to 1200; Board present from 1130 to 2035.

T59 at 0500 - 59F is on the nest facing W and sitting extremely low.

0556 - She looks into the nest for a second, the first time she's done so. So far she has sat very quietly with only 2 slight elevations of her back.

0600 - It's still, completely clear, 53°.

0607-1/2 - M59 begins weak skids 30 yards or so to the W. 59F seems to sit up a little at the first song, then to sink back down.

M59 quits after 5 songs to 0611.

0617 - M59 skids very weakly, to the W or possibly across the fairway.

0620 - 59F rises a little and settles.

0622 - She looks into the nest for 1 second.

0622-1/2 - 59F leaves the nest and goes W. M59 has just sung his twelfth song; he now quits.

0629 - 59F begins to call "check" in the clearing W of the nest. After 15 calls in 20 seconds she goes to the nest and enters from the E facing W. M59 lands at the nest as she does and for 90 seconds sits 2 inches above it and 2 inches

to the W. 59F sits quietly except that once her bill opens and closes rapidly. The male seems to be perched oddly so that his body is nearly vertical; it seems to move, almost to tremble slightly, and a leaf near his head moves as though he is pecking at it. I can't see if he has food. He goes W at 0631. The episode was silent. B

2 0634-1/2 - M59 skids very weakly to the W 2 times.

0636 - 59F rises in the nest, looks around, settles deep.

0700 - It's still sunny, but there are clouds on the N and W horizons, the only ones I can see. It's 60°.

0720 - 59F rises, not for the first time during this period, and looks in for a second.

0722-1/2 - M59 skids faintly or far to the W.

0724 - 59F jumps up, probably to the rim, almost leaves, looks in, settles back facing S. B

0726 - 59F looks around her, gets to the S rim, picks at a leaf for 3 or 4 seconds. (Note M59's possible picking at this leaf earlier.) She then hops down 2 inches below the nest and just S of it, sits quietly for 6 seconds, turns and goes W.

9 At the time 59F leaves, M59 has just sung 9 skids. He is silent thereafter.

0730 - It's clouding over, but the sun is not quite covered yet; 66°.

0739 - 59F begins to "check" in the clearing to the W.
She then moves across to the E, calling less often than once
a second.

0743-1/2 - After 122 calls 59F flies to the cluster of
leaves E of the nest, is silent, in 2 seconds enters and
faces W.

0800 - It's clouded over, nearly windless, 69°.

2 0806 - M59 sings 2 faint rather nondescript songs. The
second is an insipid step.

0814 - 59F sits for a minute at the usual angle but
with her body raised high; she then settles.

0830 - Clearing, sun emerging; S breeze; 70°.

0838 - Since 0834 59F has been restless. I've seen her
rise and look into the nest 3 times; and I may have missed
another time. B

0845 - The sun hits the area where the nest is and on a
clear morning probably would have done so first at about 0800.
The leaves completely shield the female and the cavity. A
thin overcast is coming over the sky again.

0900 - It's 60% cloudy with a S wind. The sun is shining
through a very little. It's 72°.

0905 - 59F hops to the SW rim and drops down in that
direction out of sight.

0914 - 59F begins to call "check" to the W as she works
toward the nest in the clump of trees; she's staying about 7
feet high. She calls 62 times to 0917-1/2, quits. I see her
sitting within 2 feet of a female Goldfinch, looking at her. B
Igr
GPR

0919 - 59F flies silently to the nest, looks in for 1 second, enters from the E and faces W and a little N.

I'm going to try to see all of her movements on the nest during this next period.

B -

0924 - 59F rises slightly and settles.

Note that she no longer works at the rim as she did during her early visits to the nest.

?

0927-1/2 - She rises a little, settles as before.

0929 - She rises and probes for 1 second, settles facing NW.

0930 - Complete thin overcast, 76°.

0932 - 59F looks around alertly. Every once in a while she snuggles down tight on the eggs, but since this involves no rising I won't mention it.

0934 - 59F rises, probes for 2 seconds, settles.

0936-1/2 - She rises, possibly probes for an instant, preens her breast once, settles.

0943-1/2 - She rises and looks in for 1 second. As she settles she rises slightly and turns to settle facing N. She then turns so that she's facing NE.

0946 - She rises and settles facing E.

0952 - She rises slightly for 3 seconds, looks in for a second and probably probes.

0959-1/2 - She rises, looks in for 3 seconds, settles.

1000 - It's quite cloudy with a S breeze and 73° temperature.

1015 - 59F begins to glance around and behind her, doing so sporadically for 2 minutes.

1017 - She rises and looks or probes for 1 second. She's still facing E.

1019 - She hops to the N rim and drops. For 45 seconds beforehand she looked around, pulling in her head after raising it, so that her intentions weren't clear. She also made 2 slight false starts, rising suddenly but only a very little, possibly 1/4 inch.

I check the nest. It contains only 3 eggs, and I find egg 2 lying unbroken beneath it. It was surely thrown out by the heavy winds of July 9. It lacks the chalky color of a well-incubated egg. It is 15.6 x 12.6 mm. 141

1030 - It's 72°, very cloudy.

1035-1/2 - 59F begins to "check" when she is 20 yards W of the nest. I can see her 20 feet up in the big cherry as she comes there calling.

1037 - She goes to the leaves a few inches E of the nest, having called 84 times. In 3 seconds she calls 3 more times, looks in and enters, immediately calls once more. She's facing W. I'm not going to try to see all her moves this time.

1100 - One or 2 drops of fine rain have fallen in the last few minutes. It's windless, 70°.

1101 - 59F reaches out and picks at the outside of the nest for an instant. She eats nothing. B

1104 - A light rain begins, stops right away.

1122 - 59F leaves the nest. It's not quite so dark-looking as it was; 74°.

1130 - Board relieves me. It's 75° with a little shadow cast by the sun behind the clouds.

T60 - 60F is on the nest, the male silent.

1200 - I leave.

T59 at 1130 - I [Board] arrive and relieve Nolan. 59F is not on the nest.

1140-1/2 - 59F begins to call "check." I see her 20 yards away to the NW and 25 feet up in a tree, wagging her tail.

1147 - She returns and settles facing NE.

1200 - It's 77°.

1220 - 59F leaves the nest.

1240 - She begins to "check."

1242 - She returns, perches just beside the nest for 10 seconds, on the nest for another 10, then settles facing NE.

1300 - It's 80°, sunny and with a light breeze.

1326 - 59F leaves the nest.

1335 - She begins to call, stops after 2 or 3 minutes.

1348 - She begins to call again.

1352 - 59F returns to the nest, settles facing N, then rises a little.

1400 - It's 82°.

1420 - 59F is facing NE.

1440 - 59F leaves the nest.

1443 - M59 is singing steps nearby.

1456 - 59F returns and settles facing NW; she is probably not low. M59 is skidding nearby.

1500 - It's 80°.

1505 - 59F is facing NE. The male has quit singing.

1540 - 59F leaves the nest.

1559-1/2 - She begins to "check" nearby.

1600 - It's 82°.

1603 - 59F returns, settles facing NE, then turns to the NW. M59 sings 2 or 3 insipid steps nearby.

1630 - 59F leaves the nest.

1657 - She begins to call nearby.

1700 - It's 84°.

1705 - 59F returns to the nest and settles facing NE.

1755 - 59F leaves the nest.

1800 - It's 80°.

1817 - 59F begins to call "check."

1819 - She returns and settles facing NW.

1823 - She turns to face NE.

1841 - 59F leaves the nest.

1855 - She returns and settles facing NE.

1900 - It's 76°.

1920 - 59F leaves the nest.

1936 - She begins to "check."

1937 - She returns and settles facing NW.

2000 - It's 73°.

2035 - I leave.

It has been 70% sunny today.

736
7/12/56
VN

July 12, 1956

An overcast morning with the sun shining through faintly, a S breeze, temperature 71° at 0800. Present from 0730 to 1220; Board present during same time.

T53 - M53 is singing weak skids when I come on to V. He is in the pine field between 1 and 2 but out toward the center; i.e., he is on his regular territory. In 2 or 3 minutes he goes into the S end of 2 and then across to 3 and the field S of it. Significantly, I don't see the young or hear them. Note how territories seem to have broken down but with some impulse left to sing and even to fight. It would be interesting to see where the young are; is it a bond toward the parent or the place that holds them on the territory so long? N13

T60 at 0801 - 60F is on the nest and I sit to watch her during the morning. It's rather threatening; the sun is altogether hidden now.

0829-1/2 - 60F gets to the S rim of the nest and drops to the S. She may have stretched her wing for an instant before going.

0835 - 60F returns straight to the nest tree in silence. I miss her first landing, but see her hop to the N rim and enter and face S.

0848 - 60F rises up, probably looks in for a second, settles.

0900 - It's 73°, cloudy with a little thin light from the sun, blowing moderately from the SW.

0901 - 60F leaves the nest.

0903 - She lands in the S part of the tree 4 feet below the nest, hops quickly and silently up a few inches at a time, and enters from the N to face S.

0914-1/2 - 60F rises and looks in or probes for a second.

0936-1/2 - She rises and looks in for 2 seconds.

0949 - She rises, looks around but I don't think at the eggs, settles in 2 seconds.

1000 - It's as it was at 0900 except that the temperature is 75°.

1010 - After a minute of looking around 60F rises and drops to the S. I'm sure she stretches for just a fraction of a second while rising or before flying.

1017 - She returns exactly as she did last time.

1024 - She rises and looks in for 2 seconds. I'm probably missing some of her actions since I'm not keeping my glasses on her constantly.

1030 - It's a little breezier, 76°.

1050 - It's going to rain. There is occasional thunder, and the sky is dark. It's still 76°.

1054 - 60F leaves the nest after the usual restlessness.

1100 - The weather is unchanged since 1050.

1103 - 60F returns to the S side of the tree 18 inches

below the nest, hops quickly and silently up to the N rim and enters facing S.

1123 - It begins to rain big drops but not heavily. There's a good deal of distant thundering. The rain lasts for only 3 minutes.

1127 - 60F leaves the nest. It's not raining.

1133 - She returns directly from the S, lands a foot below, enters immediately and faces S.

1135 - It rains again for 5 minutes, with thunder in the W and N. It's 70°.

1150 - It begins to rain very lightly, continues off and on.

1200 - It's 67°.

1201 - 60F after glancing around for about 2 minutes drops to the S. I see no stretch this time, which confirms my idea that she really was doing it before. It isn't raining.

1203 - A few drops fall.

1204 - It begins to rain hard (for a few minutes) and 60F immediately returns to the nest.

I leave the territory.

T53 and T54 - Both males are singing insipid steps, M53 in the edge of 2 and M54 about 15 yards S of 2 in one of the dogwoods. During 10 minutes I hear nothing of the young of either. Surely they have separated from the adults.

1220 - I leave.

T59 at 0750 - I [Board] arrive. 59F is on the nest,
settled facing NW.

0838 - 59F leaves the nest.

0847 - 59F begins to "check" nearby.

0909 - She has been calling 7 times per 5 seconds, and
now she returns and settles facing NE.

0945 - 59F leaves the nest.

1005 - She returns and settles facing SE. A bird of PW
size flew along with her to within about 15 feet of the nest;
it may have been M59.

1010 - 59F turns to face NE.

1015 - M59 begins to skid nearby, goes on for 10 minutes.

1055 - 59F leaves the nest.

1107 - She begins to "check."

1110 - M59 starts to skid nearby, does so for 3 minutes.

1111 - 59F returns and settles facing NW.

1125 - It rains lightly for 3 minutes.

1135 - M59 is skidding.

1136 - A light shower begins, lasts till 1144.

1147 - 59F leaves the nest.

1154 - She starts to "check" nearby.

1155 - Rain begins again.

59F returns quickly, faces NW.

1208 - It quits raining.

1226 - 59F leaves the nest.

1230 - I leave.

Songs continued

740
7/13/56
VN

July 13, 1956

A day of rain off and on till 1700, clear thereafter; there is a gusty S wind and the temperature is in the 70's most of the time. There was a violent downpour yesterday at 1700 and a good deal of rain earlier. Present during much of the day but worked on PW's only from 0930 to 1000 and from 1415 to 1600.

T59 at 0930 - 59F is on the nest.

T60 at 1415 - 60F is on the nest. I watch her for 30 minutes. She sits low, seldom rises to look in. A caterpillar about 1-1/2 inches long covered with yellow hair and with several bristles climbs past her on a leaf about 2 inches away. She doesn't react.

T53 and T54 - I walk over the E part of V for an hour without hearing or seeing young. Once an unseen male sings 2 skids in the S end of 2. I have several ideas about the males: Are they more attentive to young fledglings than females are? If females lose interest after bringing off young, as possibly the experience with the 57's and with the successful females on V might indicate, will 60F tend her fledglings? Do the males have a sort of regeneration of territorial behavior after they are rid of the young, lasting a day or so? Consider M54's behavior recently. Do they tend to stay in thickets, or in 1 thicket, while molting, much as

uy +

741
7/13/56
VN

young do while maturing? Note M53's use of 2.

T57 - In 45 minutes I see and hear nothing, but the conditions are very poor; there's a strong wind.

A 3-1/2-foot pilot black snake is on the side of a big dead elm.

*black
snake*

1600 - I leave.

July 14, 1956

A dawn with such a ground mist that I can't see over 200 yards; it is windless, cloudless, 62° at 0500. Present from 0500 to 2030.

T53 - Silence as I pass.

T54 - Silence.

T60 at 0515 - 60F is on the nest facing S.

0554 - 60F moves her head around for the first time I've noticed so far. She's sat motionless.

0600 - The sky is perfectly clear and the mist is burning off. It's 62°. 60F is still looking around her as though she's wide awake.

0602 - She rises, seems to stretch a little, looks for 1 second into the nest. I think this is the first such move since I've been here.

0602-1/2 - 60F leaves the nest.

0609-1/2 - She lands 2 feet below and a foot N of the nest, climbs to it immediately, looks in for a second, settles facing S.

0627 - A N wind comes up for a few minutes. To this time there had been only a faint W breeze.

0643 - A little sunlight gets through to the top of the tree and the nest.

0649 - 60F rises in a manner suggesting she's stretching slowly, looks in for a second, drops to the S. During this

last period I never saw her rise up although not all the time was spent with my glasses on the nest.

0656-1/2 - 60F flies low to the nest tree from the W, rising as she gets to it, so that she lands 4 feet N of and 2 feet below the nest. She goes to it immediately and after a glance in enters facing S.

0700 - It's cloudless, with a W breeze; 64°.

0735 - The weather is exactly as above.

0746-1/2 - 60F leaves after (I think) a minute or so of the usual glancing around.

0753 - 60F lands in the same place she did last time, but I don't see where she came from. She goes to the nest quickly and in short hops, as usual, enters from the N and faces S.

0800 - It's cloudless with a mild breeze occasionally in the tree tops; it's 68° and just beginning to warm up fast.

0803 - 60F rises and looks in for a moment, the first I've seen her do so during this or the last period.

0829 - 60F leaves the nest and drops to the S.

0830 - It's 70°. The breeze is from the W.

0836 - 60F calls "check" faintly in a dogwood 10 yards or less from me, flies straight to her tree and lands out of sight about 6 or 7 feet below the nest. She hops up to it in 2 seconds, sits on the N rim looking in for 25 seconds, enters and faces S. I don't know why she looked in so long.

0900 - It's 73°.

0913-1/2 - 60F leaves the nest after at least 2 minutes of looking around her, including behind.

I'm going to watch all her moves during her next period on. N13

0918 - 60F returns silently from the S, lands about 6 feet up, hops to nest level, perches an instant on the N rim looking in, enters facing S. The tree is in full sun, but no sunlight has hit the nest today.

0926 - 60F rises for a second. She may have looked in, but I doubt it.

0930-1/2 - She either preens or picks at something on the rim, almost surely the latter. It's 74°.

0936 - She rises and looks in for a second, repeating for 3 seconds about 10 seconds later.

0937-1/2 - For 10 seconds she sits high while picking at the S nest rim or its outside edge, or else at a leaf.

0940 - For 2 seconds she picks at the S rim or possibly preens her throat, without rising at all.

0943 - She rises for a second, but I can't see what she does.

0953 - 60F begins to look around her slowly but quite noticeably. This continues.

0956-1/2 - She suddenly gives a little false start as though she were going to leave and thought better of it. In

10 seconds she drops to the S. She may possibly grab something on a leaf just as she goes.

1000 - It's 76°. There are a very few small white summer clouds.

1006 - 60F comes in high from the NW, passing over me in flight. She lands 4 feet below the nest, hops up in 3 seconds, looks in and enters, facing S as always.

I'm not going to watch every move, until further notice. N/13

1043-1/2 - 60F leaves the nest.

1055 - 60F comes to the tree from the N, lands 2 feet below the nest, hops up and enters facing S.

1100 - It's clear, occasionally breezy from the W, 82°. —

1108 - For about a minute 60F sits high on the nest. I think she's preening. At 1110 she looks in for 10 seconds but settles deep. The sun has never touched her directly, but I'd guess her activity is connected with the heat. At 1111 she rises and preens her breast for 1 minute. At 1112-1/2 she preens her back and upper tail coverts for half a minute. She never gets out of the cavity and when she sits she's nearly always low, but she's hardly sitting half the time at 1115. At 1117 she sits high. Until there is a note that she's sitting quietly and low again it can be taken that she's behaving as described (which began at about 1105). At 1125 she's still preening, this time her back and flanks, while sitting high on the nest.

1127 - 6OF leaves the nest.

1136-1/2 - She returns from the N, landing in the N part of the tree at nest level and 6 feet away, hopping down 3 feet or so and then up, to face S. It takes 6 seconds to get to the nest after landing.

1140 - She's sitting high, bill open. She then sits low for a minute, rises, etc. Her bill is open wide. I'd say she's high 75 or 80% of the time.

1200 - It's 84°, a typical clear summer day.

1213 - A little sun gets through to 6OF's back, for the first time today. She's sitting high all the time.

1223 - Only a tiny spot of light hits the nest now, and not in the center as the light was 10 minutes ago. Note 6OF's long stay at this time. She sits low in the nest at 1224, at what looks to be normal depth for the first prolonged time in many minutes.

1227-1/2 - 6OF gets to the E rim, in 2 seconds jumps about a foot E and then 4 feet N. She then flies 30 yards N and lands 3 feet up at the edge of the woods.

1246 - There is a "check" call behind me, probably from 6OF. She then flies 30 yards S to the tree, lands at nest level and goes straight to it. She faces S.

1300 - It's 84°.

1308 - 6OF leaves the nest.

1318-1/2 - She returns from the S, landing below the nest

some 3 feet and hopping up as usual to face S. She sits higher than usual but 80% of the time covers the nest. Her bill is open about half the time when I can see it. The nest has been in complete shade since about 1230.

1347 - 60F leaves the nest.

1400 - It's 84°.

1404 - She returns as usual. Because I've moved to avoid the sun I can't tell her direction. She sits high on the nest.

1415 - 60F is sitting very high, bill wide open, facing N for the first time. About 90% of the time she stays like this; the rest she sits low. Her bill, as usual, opens and closes every minute or so.

1429-1/2 - She leaves the nest.

1440 - 60F returns, landing 5 feet below, hopping quickly up, facing S. Again she sits high.

1505 - 60F leaves the nest.

1520-1/2 - She comes into the N part of the tree from the NW, landing 1 foot below and 4 feet from the nest. She immediately enters and faces S. She must have flown 35 yards or more to get to the nest tree; she was 12 feet high when I saw her.

1530 - It's 78° with an almost imperceptible film of white clouds, in the W half of the sky and filtering the sun.

60F is preening her upper tail coverts, then sits high

748
7/14/56
VN

with open bill. The side of the nest, but not the cavity, gets a little sunlight.

1533 - 60F drops to the N and flies 30 or so yards low out of sight.

1546-1/2 - 60F returns just as she did last time, faces S. She sits high, bill open. Ten minutes later she's at the deep angle but is a little higher than she would be if she were sitting as low as possible.

1600 - The sky is cloudless where the sun is; the white clouds have drifted E. It's 79°. 60F is sitting very high; I doubt if her breast is touching the S rim, so she's nearly standing half out of the cavity. The W side of the nest still gets sunlight, on perhaps 20% of its surface. None hits 60F or the rim.

1610 - After twice turning her head far around to look to the N, 60F turns in the nest and hops (and flies) 1 foot N. For half a second she gives a side stretch here; I can see only a foot and the tail. Then she drops to the N, out of sight after moving a few feet.

1630 - 60F lands at nest level on the N side of the tree, 5 feet from the nest. It takes her 3 seconds to enter; as usual she looks in just before doing so. She continues to sit high and with open bill. A little sun still penetrates to the side of the nest.

Rather frequently this afternoon she has craned her head

around from the S so that her body is almost bent in two. She's not paying this attention to me though. She also preens her breast and belly from time to time. I don't suppose she sits down deep in the nest 5% of the time.

1653 - 60F leaves the nest.

1700 - It's completely windless and cloudless, 77°.

1705 - 60F returns just as she did last time and faces S. The sun no longer hits the nest; it quit about 1700, and only an occasional ray touches the side. 60F is sitting low at what looks like normal depth. At 1715 she's still doing so, and the period of staying high is clearly over.

1720 - 60F leaves the nest. She sat normally the whole time, so her departure after so short a time is not necessarily connected with the sun or her position on the eggs. This is important; it would be interesting to see if her rhythm resembles today's on a cloudy day when she never sat high on the nest.

1730-1/2 - 60F comes to the N side of the tree, nest level, hops down about 2 feet as she goes toward the nest, enters immediately facing S. She always sits low now. The nest is completely shaded.

1800 - The weather is unchanged; it's 76°. A little sun touches the side of the nest for a minute or two.

1834 - 60F leaves the nest. It's 75°.

1843 - 60F lands 6 feet below the nest on the S side, hops straight up and enters to face S.

1900 - It's clear, still, 73°.

1911 - 60F leaves the nest.

1918-1/2 - 60F goes up to the nest from below, but I miss her coming to the tree. She faces S. I heard 2 or 3 faint call notes near the nest tree, possibly 60F as she arrived there.

2000 - It's 66° and very damp. 60F is sitting low, probably bedded down for the night.

It is clear that there is no male here. I've thought that he was gone since July 12. If young hatch and are brought off, this should provide interesting data.

2030 - It's almost too dark to see 60F on the nest. She won't leave again. It's 65°. The day has been 100% sunny.

I leave.

751
7/15/56
VN
JB

July 15, 1956

A rainy stormy morning with a SE wind and a complete cloud cover; temperature 73° at 1115. Present from 1000 to 2025; Board present from 0500 to 1115.

T59 at 0500 - I [Board] arrive. 59F is low on the nest, facing NW. It's 62°.

0535 - It begins to sprinkle lightly. There is occasional thunder.

0550 - 59F leaves the nest.

0555 - It starts to rain a little harder, and 59F returns and settles facing NW.

0600 - It's 64°, raining very hard.

0700 - It's 65°, no longer pouring and at the moment only a fine sprinkle.

0701 - 59F leaves the nest.

0703 - The rain increases a bit, and 59F returns, settles facing NW.

0715 - 59F leaves the nest. The rain just slackened up.

0730 - She returns; the rain just increased slightly.

0740 - It quits raining.

0746 - M59 begins to skid nearby.

0750 - 59F leaves the nest.

0751 - M59 brings food to the nest, thrusts into it 2 or 3 times, leaves after perching near it for 30 seconds. [Food

AFB

disposal?]

0753 - 59F returns and settles facing NE.

0800 - It's 67°.

1 5' 0812 - M59 skids nearby.

0818 - 59F leaves the nest, and M59 quits singing.

8' 0822 - M59 resumes singing, goes on 3 minutes.

0829 - The female "checks."

0830 - She returns and settles facing NW.

21 0830-1/2 - M59 starts to skid nearby, does so for 7 minutes.

0900 - It's 70°.

0912 - 59F leaves the nest.

0915 - A very light rain begins.

0926 - 59F calls "check" near me.

0928 - She returns, settles facing NW.

0930 - The slight rain stops.

0947 - It begins.

0953 - 59F leaves the nest.

0955 - The rain stops.

1000 - It's 69°.

1010 - 59F starts to call.

1012 - She returns and settles facing NW.

1025 - It rains lightly for 5 minutes.

1055 - It rains lightly for 10 minutes.

1100 - It's 70°.

1115 - Nolan relieves me, and I leave.

753
7/15/56
VN

T57 at 1015 - M57 is singing his slow chatter in the thin woods at the S edge of his territory next to the bean field, i.e., due S of the spot where the family was a week ago. The song is infrequent and not very vigorous during the 20 minutes I'm present.

I find the male feeding at least 2 young, probably all 3. *feeding*
He tends them diligently and responds for a second to my squeaking. I may see the female for a moment but I can't be at all sure; I think I see a FW with a painted tail, but not quite like M57's. In any event it's M57 that's doing all the feeding.

The young are very frowsy. Their bellies have only a trace of the old plumage in the center and low; the rest is yellow. *22*
The heads and throats are molting into gray and yellow. The flanks look disarranged too; the rest of the body seems to be well into immature plumage. The birds are active, flying at the male and moving along together. Most of the time they are between 3 and 10 feet high. There is not much loud calling; the only little bursts I hear are when the birds are flying and once or twice when the male feeds one.

The most interesting thing seen is the presence here of 54S and 54Y, which stay with the 57's during 10 or 15 minutes and may have attached themselves to the family group. Once I see a young 57 and 54S fly together as though perhaps the younger bird were following the other. M57 reacts in no way

*489
attacked to
surface
N13*

that I can see. The 54's are tame about me, silent, and they don't show any especially interesting behavior toward the young 57's. The two 54's don't keep right together; I never see them simultaneously.

T53 - Silence.

T54 - Silence. See above under T57.

T60 - 60F is on the nest at 1100.

T59 - I relieve Board at 1115 with 59F on the nest facing NW. She sits deep and quietly.

1150 - It isn't raining and hasn't since I arrived; the sky lets a little light through, enough to cast a shadow.

1200 - The sky is as it was 10 minutes ago. It's 77°.

1200 - 59F leaves the nest. It contains the 3 eggs.

1212 - M59 skids once in the woods 20 yards SE of the nest. He repeats in 3 minutes. The song is weak.

1219 - 59F begins to call "check" W of the nest in the thicket. She calls about 40 times in 50 seconds.

1220 - Both male and female go to the nest, the latter about 1 second earlier. Neither has food, I'm pretty sure. They perch within 2 inches of each other, facing the cavity from the rim or from twigs around it. After 30 seconds spent silently and motionlessly in this way, M59 flies N. In 7 more, 59F enters and faces NW.

It's becoming very dark and will soon rain.

1300 - It's dark, thundering, 74°. 59F is deep, facing NW.

*Pr. to
nest*

- 1305-1/2 - After 3 minutes of looking around 59F leaves.
- 1318 - It thunders loud and is very calm.
- 1320 - The rain begins to fall lightly.
- 1320 - 59F starts to call in the walnut tree 10 feet N of the nest. She moves toward the nest calling 41 times in a minute.
- 1321 - 59F enters and faces E.
- 1400 - The rain is lighter, has nearly stopped. It's 72°. The female still faces E.
- 1404 - After looking around for 1 minute 59F leaves and goes N. The rain has just stopped.
- 1408 - I hear "checks" W of me and in the clearing. 59F is actively catching insects in the field cover from 1 to 3 feet high. She calls only every 3 to 5 seconds, pays no attention to me, comes to within 15 feet of me.
- 1411 - 59F flies to a tree 7 feet E of the nest and at nest level, goes straight to the nest and faces W.
- 1417 - 59F dozes off and on for 15 minutes.
- 1432 - 59F leaves the nest.
- 1445-1/2 - She begins to "check" 15 yards SE of the nest, calls 22 times and moves toward it.
- 1446 - She goes to the nest and faces W.
- 1453 - It begins to rain and does so steadily and moderately.
- 1500 - It's 71°, raining as before.
- 1600 - It's 70°, raining possibly a little more lightly.
- B

1601 - 59F leaves and goes N. It's raining.

1604-1/2 - She returns to the nest, calls "check" twice before entering and facing E.

1640 - At about this time 59F turns to face NW.

1648-1/2 - 59F leaves and goes N. It's raining lightly (hasn't quit since 1453). At 1652 it quits.

1656-1/2 - 59F begins to call "check" in the trees W of the nest about 15 or 20 yards. When I first see her 2 or 3 minutes later she is extremely nervous, twitching and flexing her legs, calling constantly. She moves toward the nest with reluctance, always shows great hesitation before an advance. I've no idea of the cause; I haven't moved, but she seems frightened of me. She calls 1187 times, all but 20 or so "checks" and the rest "tsus," to 1713-1/2.

*increasing
fear*

1700 - It's 70°, gray but not raining.

1713-1/2 - 59F goes to the nest and faces E.

1745 - 59F leaves the nest. A little thinning of the clouds in the W lets the sun appear weakly. At 1750 it clears a little more and sunlight gets through to the nest.

1753 - A Sparrow Hawk which has been flying over noisily during the last 25 minutes (without eliciting any response from 59F) flies calling over the cut W of the nest.

B

1800 - It is clearing still further, and the sun is shining through a thin cover. A beam touches the sides of the nest.

757
7/15/56
VN

The temperature is 72°.

1805 - 59F begins to "check" at least 25 yards NW of the nest. She doesn't see me, of course. The calls are irregular.

1806 - She now is in the trees that are W of the nest, calling regularly and behaving as before. I count 268 "checks" to 1809-1/2.

1809-1/2 - She flies 15 yards straight to the nest, calls 5 or 6 times while sitting an inch below and SE of the nest, enters and faces W, calls twice more with less volume. B

1840 - The sky is 50% clear and the sunlight is still filtered. Some light still touches the side of the nest. 59F sits deep.

1900 - It's nearly cloudless, still, sunny, 73°.

1907 - 59F leaves the nest.

1916 - 59F begins to call "check" in the clearing SW of the nest. She then goes to the big cherry 15 yards W of the nest, calls till 1917-1/2, goes to the nest tree.

1917-1/2 - After 59 calls 59F enters the nest immediately on arriving and faces E. Sunlight hits the sides of the nest.

1939 - 59F turns and faces W, sitting very low.

1946 - She rises, looks in for a second, settles. As she settles, the rear half of her body moves quickly 10 times or B

758
7/15/56
VN

so. I've seen this often and thought it was largely a lateral N13
motion to get the eggs against the brood patch, but now I
wonder if she isn't kicking or moving them with her feet.

2000 - There are a few light clouds with more in the
N. It's nearly windless, 71°.

2003 - A red fox walks past within 8 yards of the nest B
and 12 of me.

2020 - 59F is clearly in for the night. It's 70°, getting
too dark to see.

2025 - I leave.

It's been 10% sunny at the most.

759
7/16/56
VN

July 16, 1956

A still, partly cloudy dawn; 67°. Present from 0500 to 1700; Board present from 1600 to 2030.

T59 at 0505 - 59F is on the nest facing W. *lawn*

0534 - 59F rises, looks in, probes for 2 seconds.

0542 - She repeats.

0546½ - 59F looks about for 60 seconds, jumps to the W rim, drops. I check: 3 eggs.

0556 - 59F begins to "check" 20 yards SW of the nest; 45 calls. Her last flight is to 7 feet E of the nest.

0557 - She flies to the nest, calls 2 times, enters and faces W, calls faintly once.

0600 - It's 67°. There seems to be a hazy overcast, already burning off.

0606 - 59F probes for 1 second, settles.

0612½ - 59F half rises, turns to look E, probes for 1 second, settles facing W.

0619 - M59 sings 3 skids in 1 minute, 30-40 yards to the W.

0622 - 59F rises and looks in for 2 seconds, touching the eggs with her bill.

0625 - 59F begins to look around. In 1 minute M59 silently brings food. She sits low, turns to look; he's on the NE rim. He proffers the food, waits 10 seconds

AFB

and repeats, flies away to the W. He goes so soon after the last thrust that he must carry the food with him. She then rises and probes for 1 second.

0630-1/2 - She probes for 1 second after 30 seconds of looking around.

0634 - She probes for 2 seconds, eating a small object, not eggshell.

0637-1/2 - M59 skids twice W of the nest.

0638 - 59F leaves and flies in the direction of the male's song, 6 or 7 feet high.

very much recorded

0643-1/2 - 59F begins to "check" S of me. I see her feeding 2-3 feet high only 10 feet away. She works her way to the nest, followed at every move by what must be M59, always 3 or 4 feet away and out of my sight.

acc.

0645 - She goes to the nest after some 20 calls, enters immediately and faces E. The second bird went E of the nest with her but not to the nest tree on her final flight.

0650 - M59 skids in the woods to the E, comes W to the clearing and on W of the nest. At 0656 he quits after 11 songs.

0656 - 59F has probed 3 times in 4 minutes. I'm not trying to record every move as I did last time.

*13
N 13*

0700 - It's completely cloudy and rather dark, with a S breeze at times, 70°.

0700 - The male begins weak skids 35 yards W of the nest.

// He sings 11 times to 0707, when 59F flies from the nest toward him. He quits.

0707 - 59F leaves and goes W toward the male.

0715 - 59F "checks" 40 times while 25 feet up in a tree 20 yards S of the nest. She then goes to the nest tree, calls once.

0717 - 59F hops the last 6 feet to the nest, enters from the E, faces W.

0740-1/2 - M59 sings once to the N. 59F seems to be dozing quietly.

0800 - The weather hasn't changed; it's 71°.

Rain
0829 - A very few drops of rain begin to fall, only occasionally.

0830 - 59F leaves the nest. The slight rain continues.

0839 - 59F begins to "check" in the trees SW of the nest and W of the clearing. She goes to the cherry, 20 feet high, calls, and after 86 "checks" goes to the leaves by the nest.

0840-1/4 - She calls 4 times by the nest, enters, faces W. The rain is steady now, just getting harder. *Rain*

0900 - It's raining, 71°.

0930 - The rain, steady to this time, slacks off to a slight mist.

0933 - It begins to rain hard. At 0950 it gets very hard. *Rain*

0958 - The rain quits.

1000 - It's 70°, dark, windy from the W, ready to rain

again.

1004-1/2 - 59F looks around for 15 seconds, flies low at least 25 yards SW. The eggs are still intact. It isn't raining.

1014 - 59F begins to call at the SW corner of the clearing, then takes 1 minute to work her way to the nest, calling 41 times.

1015 - She lands beside the nest, calls once, enters and faces W.

1045 - 59F looks out for a few seconds, flies low to the N, I'd judge a good distance (30 yards?).

1054 - She "checks" N of the nest 12 times.

1054-1/2 - She flies the last 10 feet to the nest, pauses 1 second beside and below it, hops to the E rim, looks in, enters to face W.

1059 - 59F turns and faces E and a little S.

1100 - It is calm, completely cloudy, 72°.

1149 - 59F turns to face NW.

1200 - It's cloudy with enough light to cast a slight shadow; 76°.

1204 - 59F leaves the nest.

1217-1/2 - She begins to call above and behind me; I see her soon 35 feet up in a honey locust. She displays great nervousness and though she 3 times goes to within 5 yards of the nest each time she withdraws. At 1225 she begins to slow down her calling and at 1230 she goes to the nest tree.

1230 - 59F goes quietly and silently to the nest, faces W.

1255 - M59 begins insipid steps in the big cherry W of the nest.

1257 - It starts to rain lightly. *Rain*

9 1258-1/2 - M59 quits after 9 songs.

1300 - It's gray, raining a little, 74°.

1317 - It quits raining except for the lightest sprinkle.

2 1321-1/2 - M59 sings 2 insipid steps very near the nest.

1322 - 59F after 1 minute (before the songs) of looking around, goes N.

1327 - It rains a little harder. *Rain*

3 1332 - M59 skids at a distance to the N, 3 times in 1 minute.

1334 - 59F begins to call in the walnut N of the nest, calls 10 times in 10 seconds, flies directly to the N rim, looks in, enters facing E.

1338 - M59 begins to sing insipids that are nearly step-buzzes, in a tree 15 yards SE of the nest.

1339 - 59F turns to face S, then W.

1341 - She turns to face S, then SE.

13 1341 - M59 quits after 13 songs, the last 5 skids. One additional song was interrupted after the first 2 notes.

1351 - M59 skids once 15 yards SE of the nest, a weak, short song.

1400 - It's completely cloudy though fairly bright light

gets through; windless; 78°.

1405 - 59F looks into the nest with no special interest.

1435 - It is clearing; the sky is 25% blue, and the sun is out.

1437 - M59 sings faint insipid steps W of the nest. He sings 3 to 1439-1/2.

1440 - 59F turns to face E.

1441 - She leaves the nest. The eggs are unhatched.

1443-1/2 - M59 begins to sing short (5 notes at a maximum) faint insipids and 3 or 4 skids, in the clearing W of the nest. He quits at 1450 after 14. At 1454 he sings an insipid.

1459 - M59 skids twice within 10 yards of the nest.

1500 - It's 75% clear, sunny with a S breeze, 79°.

1502 - M59 skids twice more, like the last two, 15 seconds apart.

1505 - 59F begins to "check" between me and the nest. After 50 calls in 60 seconds she goes to the leaves surrounding the nest.

1506 - She calls 7 more times in 12 seconds, enters and faces W.

1525 - 59F sits back and picks at the contents of the nest for 30 seconds, looks around for 15 more, settles. At 1526-1/2 she rises and pokes around for a minute, then sits with her breast away from the rim looking around. A little

765
7/16/56
WN

light touches the side of the nest, but she isn't shading;
it's gone by 1550.

1530 - She's still poking occasionally into the nest.

1534 - She eats an egg shell, picking it to pieces out
of sight in the bottom of the nest except for 1 brief glimpse
I get at 1536-1/2 when she seems to be eating a half. At that
time she settles deep, after 10 minutes of never sitting quite
over the nest.

watch

1538 - M59 sings 1 type-8.

1541 - 59F is sitting with her breast slightly back from
the rim and therefore with her belly up from the cavity bottom.
She looks around a good deal, seldom into the nest. At 1 time
she pulls her head down out of sight in the nest; there are
Blue Jays around at the moment, one calling, so there might be
a connection.

3

*think to
you*

1548 - M59 sings 3 faint type-8's to 1551.

1548 - The female draws back and picks in the nest for
a minute.

1555 - She probes around for 2 minutes, stopping occasionally.
Her head movements lack the vigor with which she eats the shell.
She's settled facing W.

1600 - It's clear, calm, 79°.

1600 - She pokes for 1 minute, moving her head a lot as
though an egg is hatching.

*what is
she
doing?*

1610 - 59F is ducking down completely out of sight; Blue Jays are quite noisy. However, she looks in and probes for 10 seconds at 1612 while they're still near. At 1620 2 jays fly in above her, and she ducks way down.

B
reacts
to jay
?

1622 - 59F probes for 45 seconds. Note her very long stay, which has no connection with the weather.

1626 - She probes, picks, moves her head around as though working hard at something. I don't see her eat a shell. At 1629 she is scared by a rabbit and quits.

reacts to
rabbit
B

1632-1636 - She goes through the same head motions as before, but this time I'm sure she eats egg shell in little pieces. She never lifts any of the shell out of the nest.

1639 - She works with her bill again, for 90 seconds. Once she pulls very vigorously at something. I see no eating.

1642 - She eats something, pulls very hard again, settles in 30 seconds. Now she's very deep.

1648 - After 45 seconds of looking around 59F leaves to the SW, going only a short distance. I find 1 young and eggs 3 and 4 intact.

1652 - After 10 seconds of calling 6 or 7 times 59F re- turns straight to the nest with food, offers it, settles.

1653 - I leave T59, and Board relieves me.

1700 - I leave.

T59 at 1653 - I [Board] arrive and relieve Nolan.

1654 - 59F leaves the nest and forages toward me. At
1656 she eats a green larva while 3-1/2 feet up in a sumac
near me. In a minute she "checks" 10 feet from the nest, then
goes on.

1700 - It's 77°.

1705-1/2 - 59F returns and perches on the rim for 40
seconds, settles facing NW. I saw no food in her bill.

1725 - Blue Jays call near her, and 59F ducks lower. *Jay*

1731 - 59F leaves the nest and goes N.

1738 - She returns and settles facing NE. I saw no food.

1740-1/2 - 59F leaves the nest.

1744 - She returns and feeds once, settles facing SE
after perching 1 minute on the rim.

1750 - She ducks way down as a jay calls nearby. *Jay*

1800 - It's 79°.

1825 - 59F leaves the nest.

1840 - It rains a few drops for 3 minutes.

1844 - 59F begins to "check" nearby.

1845-1/2 - She returns, feeds once, settles facing NW.

1857 - 59F gets to the N rim and faces N for a minute,
settles facing NE.

1900 - It's 79°.

1900-1/2 - 59F leaves the nest.

1915 - She begins to call.

1917-1/2 - She goes to the nest and feeds.

1922 - She pokes in the nest for 90 seconds.

1924 - 59F leaves the nest. Two eggs are intact.

1932 - She returns and settles facing NW, probably without food.

1938 - 59F leaves the nest and goes N.

1949 - She returns without food, settles facing NW.

1954 - For 3-1/2 minutes 59F leans into the cavity and thrusts frequently with her bill. She eats something, settles. *hatch*

1958 - She leaves the nest.

2000 - It's 72°.

2003 - 59F leaves the nest. There is a second young bird in it. I can't tell which egg remains unhatched.

2012-1/2 - 59F returns and faces NW. I see no food [but there probably was some].

2030 - She's settled very low facing NW.

I leave. It's been only 20% sunny.

July 17, 1956

A calm cloudless dawn with a heavy dew and a mist in the hollows; temperature 65° at 0500. Present from 0500 to 1645; heard present from 1335 to 2035. *dawn*

T59 at 0500 - 59F is on the nest, evidently facing W.

0519-1/2 - 59F leaves the nest and goes NW. Egg 4 is still unhatched. It looks very chalky and perfectly sound.

0527 - 59F returns silently, seems to feed 1, looks in for 10 seconds, broods facing W.

0533 - She probes for 10 seconds.

0536-1/2 - 59F leaves and goes N.

0537-3/4 - She returns, seems to look in for 10 seconds, or to feed, goes W. So far today she's been silent.

0540 - She returns, probably feeds 1, looks in for 3 seconds, settles facing W.

0546 - After rising and looking in for 6 seconds 59F leaves and goes a short distance N.

0550 - She returns silently, feeds 1, looks in for 16 seconds, broods facing W. So far she has invariably perched on the E rim to feed. Unless she does something else, I'll not note the point every time.

0557 - She rises and looks in, leaves in 1 second and goes SE.

0558 - She returns, stays 20 seconds (I can't see what she does), goes SE again.

0600 - It's clear, windless, 66°.

0601-1/2 - She returns and feeds 1 after seeming to get no response for 2 or 3 seconds. In 5 seconds more she broods facing NW.

0609 - 59F leaves again. The sun has just begun to shine on the trees 15 feet from the ground; one is beside the nest tree.

0611 - She returns feeds 1, eats some small object, in 6 seconds settles to the NW. The food she's bringing is very small; I can just see that her bill is open.

0616-1/2 - 59F leaves after looking around alertly.

0630 - Sunlight touches the leaves around the nest.

0632 - 59F returns with a thin green larva about 1/2 inch long. She seems to get no response to her arrival at first, and I doubt if the young ever take the food. She goes through eating motions and settles facing NW after 30 seconds.

16 0650-1/2 - M59 skids, his first song today.

0653-1/2 - 59F turns to face N.

0655-1/2 - She leaves the nest and goes N. M59 is singing some 35 yards to the NW, and he continues; the song is regular and at full volume.

0656-1/2 - M59 quits after 16 skids, 2 sung since the female left the nest.

0658-1/2 - 59F returns with food, settles facing W. I can see the male 20 feet up and 15 yards W. in a cherry tree. At

1st song

2 0659 he begins loud skids, sings 2 to 0700.

0700 - It's clear with a slight S breeze, 66°.

59F occasionally rises to look or probe in the nest for a second, but hardly more often or for a longer time than she did when she had eggs. The nest branch is still in sunlight.

0706-1/2 - 59F leaves the nest.

0714 - She returns and feeds 1. She then pokes for 2 or 3 seconds as though eating, lifts the large half of a shell and eats it whole in 25 seconds, pokes 6 or 7 times more. I can't decide whether she eats the small half at once or in fragments. Possibly she eats a few fragments and 1 big piece. Note that she didn't help this young hatch and that this would have been an ideal time to carry the shell away if she had the least disposition to do so. She settles and faces NW at 0716.

*hatch -
didn't
help 1st
cause
hatch
eggs to
hatch so
much
easier -
if so, why
they so
close together?*

0731-1/2 - M59 sings short insipid steps 25 to 15 yards W of the nest, very irregularly. The songs are faint, almost fragmentary.

0740 - 59F looks in for 1 second. The male is singing in the big cherry 15 yards W of her.

28 (23) 0744 - 59F leaves the nest. The male has just sung his 28th song, all but 1 (a skid) insipids. He now falls silent.

0745-1/2 - M59 begins to skid 20 yards W of the nest.
He sings 5 songs in 3 minutes.

0753 - 59F returns (silently as always today), feeds 1, enters and broods after 6 seconds. She's facing W.

0757-1/2 - M59 comes and seems to feed, staying 10 seconds. 59F rises, but I can't see the details. He was silent throughout.

0800 - It's still, cloudless, 70°. For the last half hour the nest area has been in and out of the sun as intervening branches have sometimes shaded it.

0845-1/2 - 59F leaves to the SE after about 2 minutes of alert looking around. Each time she'd looked for a minute or so she'd rise as though to leave but would look into the nest instead, then settle. She did this 3 times before finally going.

I remove a few pieces of leaf that obscure the view of the nest without providing it any shade.

0900 - It's still calm and perfectly clear, now 73°.

0903 - 59F comes to the low trees E of the nest, then flies to within 2 feet W of it, goes and feeds 1 with a very small object. She looks in for 3 seconds, settles W. She may have called 7 weak "checks" before I first saw her.

0905 - M59 skids once near the nest. The female looks around. In 3-1/2 minutes the male skids faintly, continues.

0912 - 59F leaves and goes NE. The male is here and he quits after 4 songs.

0915 - 59F comes silently from the N to the bare branch below the nest, a new approach. She hops up to the N rim and feeds from there. I'd guess she has 3 small items and feeds

3. She settles due S in 10 seconds, soon moves slightly to the E.

A little sunlight touches her on the tail. I notice her bill is open slightly for 5 seconds. By 0922 she has pulled up so that her breast is not against the front rim and she has her bill open again. The direct rays are off the nest by this time. None of this is caused by my removal of leaves.

11
0927 - M59 begins to sing weak skids (and 1 insipid step) high in a cherry 15 yards SE of the nest.

0930 - 59F leaves and the male stops after 11 songs.

(6
r
0949-1/2 - M59 sings 6 weak skids in the woods to the E in 2-1/2 minutes.

0952 - 59F flies from the woods to the E to the nest (she was 20 feet up), feeds 1, eats something in 2 or 3 seconds. I then see M59 on the nest branch 7 inches below her.

M59 hops up, gives 59F a green caterpillar which she feeds. He sits on the N rim, she the E, for 30 seconds, when she takes something and eats it (presumably a fecal sac). She then twice opens her bill wide at him and he goes NE at 0953-1/2. She settles immediately, facing W.

0956 - M59 sings an insipid step. The female is sitting a little back off the nest so that her breast doesn't touch the rim. Her bill is open a little. The sun doesn't hit the nest at all.

774
7/17/56
VN

1000 - It's lightly clouded over in parts of the N and E. There is a N breeze. It's 76°.

I forgot to note that M59's throat is molting and looks ragged. *molt*

1000-1/2 - M59 sings a very faint step. 59F is now deep in the nest.

1002 - M59 skids faintly 1 time.

1003 - 59F drops low out of the nest to the W, but in a few feet rises so that she lands 20 feet up in the cherry 15 yards away.

1003-1/4 - M59 comes to the nest. I miss the feeding, from the W rim. He stays 1 minute and goes NE. It's just become quite gusty, and I think the sky is changing. *↗*

1015 - 59F comes silently with 1 small object, feeds 1, looks in for 10 seconds, settles facing W.

1019 - 59F has risen and is preening her back and breast. She stops at 1020, sits back from the nest. *B*

1019 - M59 sings weak steps to the W.

24 1030 - M59 is still singing (24 to now); some of his songs are short and fragmentary. 59F has sat with her breast back from the rim to now, when she is deep (but only for a few moments).

The sky is clear, the breeze strong from the W.

1033 - 59F leaves the nest.

1034 - M59 quits after 29 very irregular songs.

14
1038-1/2 - M59 begins the same song in the same place.
Some songs are really step-buzzes and not the basic form,
the insipid step. He quits after 14 to 1045.

1045 - 59F calls 59 times to 1049, W of me, stops half
a minute and resumes. I can see her foraging from 1 to 3
feet up. *forage*

1052 - 59F goes to the dogwood N of the nest, takes 5
seconds to approach to the N rim, feeds 1 with 1 object,
eats a small sac, in 5 seconds broods facing S. Fecal sacs
have no distinctive shape or color yet; they are small, possi-
bly 1/8 inch in diameter. *See*

59F sits back off the nest at least 90% of the time. It
is completely shaded, and I'd guess it receives direct sun-
light only in small quantities on the outside early and late
in the day. I've seen her bill open only when I've noted it
here.

1059 - 59F turns to face W, sits low for 2 minutes.

1100 - It's windy from the NW, partly cloudy with the sun
nearly always out, 77°.

3
1110-1/2 - M59 sings 3 insipid steps 20 yards SE of the
nest, then 1 skid. He stops at 1115.

A little sun hits 59F's head because it's in a raised
position.

1117-1/2 - The male sings 2 weak skids.

1122 - 59F has her bill open; the sun is on her head as she sits back and faces W. She closes her bill in a few seconds and leaves it closed.

1135 - She's sitting low.

1138 - 59F leaves the nest.

1200 - It's cloudless, breezy (NW), 79°.

1200 - 59F begins to "check" 10 yards W of the nest.

There is a pause after 28 calls.

1201 - She goes to the nest from below and the N; evidently she has abandoned the old approach. She feeds 1 small green caterpillar, looks in for 30 seconds, sits facing S. In a few seconds she is sitting drawn back and with her bill open. The nest is in shade. In a minute or two she spreads her wings a little but into a pronounced sheltering position, although there is no sunlight that needs to be deflected. Nor does anything in the environment explain why she's sitting facing S. At 1215 her bill is still open, and much of the time she's sitting so far back that it looks as though she's on the rim.

1222 - 59F turns to face W, sitting back as before.

1228 - She sits down on the nest fairly low and stays that way till 1232, when she backs off a good deal.

1237 - For over a minute 59F looks up (?), with her bill pointing straight upward. When she quits I note that she is shading again while facing NW, though no sun gets through.

1251 - 59F leaves the nest.

1300 - The sky has some scattered white clouds; it's windy from the SW, sunny, 82°.

1316 - 59F begins to call "check" about 10 yards E of the nest. After 43 in 90 seconds she goes to the nest in the old way, pausing 8 seconds below it before making her hop up. She delivers 1 object, looks in for 6 seconds, enters and faces W.

1320 - 59F suddenly jumps to the SW rim and flies SW across the clearing.

1322 - She begins to call in the clearing.

1323 - After 4 calls she makes the old approach, feeds 1 object, looks around for 15 seconds, leaves. She probably ate a fecal sac during her half-minute at the nest.

1329 - 59F appears suddenly at the nest, twice delivers a half-inch green caterpillar. She then assumes an unusual crouched position, tarsi bent, head down and thrust forward as though she were trying to peer under something. Her feet are in the usual perching hold on the rim. At 1334 the stiffness of the position has relaxed and she's simply perched on the E rim, tarsi flexed more than usual, head lower than, or level with, her back. B

1337 - She enters the nest and sits facing W.

Board relieves me and I leave the territory.

T60 - 60F returns to the nest while I'm here.

V for 50 minutes - I find a PW after 25 minutes or so,

a male that sings an insipid step in the edge of 4 and then flies across to 2. Here he sings 3 steps, each about a minute apart and each sung from somewhere between 6 and 15 feet. I never see him; he skulks, won't respond to squeaking.

T57 - In an hour spent covering this territory I see and hear nothing of the 57's.

1645 - I leave.

There was a Blue-winged Warbler on V.

T59 at 1335 - I [Board] arrive and relieve Nolan. 59F is sitting high on the nest, facing NW. At 1342 she settles lower.

1344 - M59 begins to skid nearby. 59F rises higher. The male calls "tsu," sings several skids and an insipid step.

1353-1/2 - 59F leaves the nest.

1356 - M59 is now chattering.

1400 - It's 80°.

1420 - The male seems to have quit singing. Until 3 minutes or so ago his pattern has been to sing and remain silent for periods of a few minutes and to vary his songs a good deal.

1429 - M59 comes to the nest, I think without food. He perches on the rim and looks in for 30 seconds, leaves.

1430 - 59F comes and feeds 1 a large green larva, settles facing SE. M59 begins insipid steps.

1435 - 59F leaves the nest and goes 15 feet to a sumac, in 30 seconds returning with food.

M59 comes to the nest before 59F returns; [she may have left on seeing him coming]. They perch on the rim for 15 seconds and he leaves. She then feeds 1 and settles facing SE. 6-1

1541 - 59F leaves just as M59 arrives. He feeds 1 and in 30 seconds goes. 59F begins to "check" as soon as she leaves, goes on for 2 minutes. 13-1

1554 - She comes, feeds 2, settles facing NW, then sits up higher.

1500 - It's 80°. It's sunny, but there are clouds and the breeze is fairly strong.

1507 - 59F leaves the nest.

1511 - M59 begins to skid, changes to steps.

1527-1/2 - 59F begins to call nearby.

1529 - She returns, feeds 1, settles after 1 minute and faces NW.

1533 - She probes for 15 seconds, may eat a sac, settles as before, sitting high.

1546 - She bends over and probes, occasionally flutters her wings slightly but rapidly. This lasts 3 minutes. R

1556 - 59F leaves the nest.

1600 - It's 77°, very windy and with some clouds.

1611-1/2 - 59F returns and feeds 1, may eat a sac, settles to face NE and then SE.

1621 - She probes for 1 minute.

1627 - 59F leaves the nest.

1636 - She returns after a minute of calling, feeds l,
seems to eat something herself, settles NW.

1655 - 59F leaves the nest.

1700 - It's 76°.

M59 begins to skid.

1701-1/2 - M59 comes and feeds l, leaves after 20 seconds.

1718 - 59F starts to "check" nearby.

1719 - She returns and feeds l, after 1 minute of perching
on the rim settles facing NW.

1730 - 59F leaves the nest.

1737 - M59 comes and feeds l, leaves.

1738 - 59F after 2 minutes of calling comes and feeds l,
settles facing NW.

1748 - 59F leaves the nest.

1800 - It's 75°.

1805 - 59F returns and feeds l, settles facing NW.

1807 - She leaves, begins "checking."

M59 arrives just as the female leaves, feeds l, goes
after 15 seconds.

1811 - M59 comes and feeds l, goes in 15 seconds.

1813 - 59F returns, feeds l, settles facing SE.

1824 - 59F probes busily for 30 seconds, settles facing
NE for 5 seconds, leaves the nest.

1845 - She returns and feeds l, settles NW.

1857 - 59F leaves the nest.

1900 - It's 69°.

1911 - 59F returns and feeds 1, settles NW.

1941 - 59F leaves the nest.

1947 - She returns, may feed 1, settles NE.

1958 - 59F leaves the nest.

2000 - She returns, feeds 1, settles NW.

It's 66°.

2005 - 59F leaves the nest.

2007 - She returns, feeds 1 (2?), settles SE.

2012 - 59F leaves the nest.

2015 - She returns, feeds 1, settles NW.

2035 - I leave.

The day has been 95% sunny.

a little fog

July 18, 1956

A still, cloudless dawn with a very heavy dew and a mist so thick it hides objects 100 yards away; temperature 58° at 0500. Present from 0500 to 1630; Board present from 1630 to 2045. *dawn*

T59 - 59F is on the nest.

V - Silence.

T60 at 0520 - 60F is on the nest facing S.

0600 - The weather is unchanged. The mist makes it seem like autumn.

0640 - The sun is coming over the tops of the trees in the woods. The mist is still heavy, which probably accounts for 60F's still being on the nest.

0700 - It's calm, cloudless, still misty and very wet; 62°. I haven't watched 60F constantly, but I haven't seen her move once while I've looked at her.

0721 - 60F rises, may possibly pick at her left wing as though preening for a second, turns and drops to the NW.

0728 - 60F flies past me as though having come some distance and goes on to the nest tree 15 yards away. She lands 1-1/2 feet below the nest, hops up immediately, looks in, faces S.

0800 - It is sunny with the mist gone and the dew beginning to dry. There's a very mild S breeze. It's 70°.

0804 - 60F leaves the nest.

0812 - I hear her call about 6 light "checks" perhaps 15-20 yards from the nest.

0812-1/2 - She enters and faces S, having come to the tree 5 feet below the nest and called 5 weak "checks" while climbing up to it.

0842-1/2 - After 90 seconds of looking around her 60F seems to stretch her left wing for an instant, and then she drops to the S. A few small rays of light have just begun to touch her head as she incubates.

0851-1/2 - 60F flies rapidly to a point 2 feet below the nest, coming from the SE and acting as though she has flown a good distance (i.e., she isn't slowly working her way). She calls once faintly, takes 5 seconds while hopping up to enter, and faces S.

0900 - It's cloudless, slightly windy at times from the S, 76°. The sunlight hits the nest tree, but only occasional rays get through to the female.

0923 - After the usual minute of looking around, including back at me, 60F twists in the nest, gets to the N rim, hops 1 foot, then another, to a point out of my sight. I don't see her departure from the nest tree, but I hear her calling 1 or 2 mild "checks" 10 yards from it to my left. In a minute she appears near me, at most 20 yards from the tree, foraging very rapidly in the grass and weeds. At 0928 she flies to within 8 yards of the nest, forages and feeds up to the nest tree 5 feet below the nest.

forage

0929 - She enters after the usual short hops up to the nest, faces S.

1000 - It's perfectly clear, fresh with a slight breeze, 79°. 60F hasn't begun to stand up in the nest yet; it's in shade.

1015 - 60F leaves the nest.

1025-1/2 - She comes to the ash tree near the nest. In 45 seconds she drops into some dwarf sumac beside the nest, at the edge of the woods. She stays there foraging for 1 minute, flies into the nest tree about 3 feet from the ground.

1027 - In 5 seconds, a little after this time, she is at the nest. She glances in, enters to face S.

1039 - 60F backs off the nest, preens her breast and belly for half a minute, settles down. In 2 minutes she rises to preen her back for a little while. At 1044 she repeats, then probes while almost backed up so that she's standing on the rim. In a minute she preens for a few seconds, then sits back from the rim. At 1057 she's been sitting deep for 10 straight minutes, as though the preening were only a brief interlude.

1057 - She turns her head and neck in the nest to look at me, bending almost double.

1057-1/2 - 60F leaves the nest.

1100 - It's 80°, with a few light white clouds.

1118 - 60F returns and faces S. Everything is done in her usual way. She sits low.

There are a few clouds and one covers the sun.

At 1130, 60F is still deep in the nest, though the sun is out and has been for all but a minute.

1138 - 60F begins to sit back off the cavity of the nest. *Handwritten: None*
No sun touches her. She keeps her bill closed as far as I can tell.

1145 - She sits down again for 2 minutes. Then she backs off, bill open. When she sits in a minute, she closes her bill but sits high on the nest.

1151 - 60F leaves the nest.

1200 - It's calm, sunny, but with about 20% clouds scattered in the sky, 82°.

1206 - 60F returns as usual, silently, and faces S as always today. I see her only when she's 1 foot below the nest. *Handwritten: 13*
She settles, then sits high with her bill open, then in a few minutes backs off the nest.

1222 - She turns and faces N for the first time today, *Handwritten: here*
backed high off the cavity.

1227 - Her wings are a little extended though no sun hits the nest. At the same time she preens very actively. When she quits this she opens her bill.

1244 - 60F leaves the nest.

1300 - 60F comes to the nest tree from the S, lands 3 feet below the nest. She has her bill open, I think. Bill closed, she hops to the nest and faces S. She sits back,

bill wide open now.

1300 - The sun is shining though there are still the scattered white clouds. The breeze is from the S. It's 82°.

1305 - 60F sits down low on the nest, bill closed half the time; she rises after 2 minutes.

1316 - She sits high on the nest, then goes lower. We're having 5 or 10 minutes of no sun. She rises when the sun comes out, so there seems to be a correlation. The same sort of approximate correlation occurs during a 3-minute cloudy period at 1328; her rise when the sun comes out is a little delayed.

1332 - 60F looks around, turns to get to the N rim, stretches her wings a little in a low-intensity upward stretch, hops 1 foot, then another, leaves the tree and drops a short distance N.

1349-1/2 - 60F returns from the N, making the usual silent approach from 3 feet below the nest. She settles deep facing S, waits 70 seconds before rising to draw back with open bill. This habit of first sitting deep seems invariable.

1400 - The weather is unchanged in any way.

1409 - 60F preens for a minute, as she does often when backed off the nest.

1418-1/2 - 60F leaves the nest.

1430 - She returns silently exactly as always, faces S, settles for about a minute before sitting high.

1455 - The sun is not very bright and 60F is deep in the nest. I don't know whether she sat down when the sun went in though. She rises, preens her back, sits high with her bill open.

1500 - The sun is out but not at quite its full brightness. There are white summer clouds and a fine general white haze. It's 81°.

1513 - As 60F sits back with her head high, some light touches her head. Her bill is wide open. My view isn't good, but I can't see that she is opening her bill.

1517 - 60F leaves the nest.

1532-1/2 - 60F comes in high from the N on what must have been a long flight. She lands 1 foot below the nest and (as usual) a little to 1 side (N on this occasion) of it. She then hops up after a 2-second pause, enters and faces S.

1540 - She's sitting back with her bill open. The sun hits the side of the nest.

1554 - The sun is hidden and she's low, but again I don't know how these 2 facts were timed.

1600 - The sun's still in and the sky is mostly cloudy; it's windless, 79°. 60F is still deep in the nest.

1606 - 60F leaves the nest.

1621-1/2 - She returns silently, landing 1 foot below, entering immediately and facing S.

Board relieves me.

1630 - I leave.

T60 at 1625 - I [Board] arrive and relieve Nolan. 60F
is on the nest, facing S.

1652 - 60F leaves the nest.

1658 - She returns and faces S.

1700 - It's 80°, rather cloudy.

1745 - 60F leaves the nest.

1756 - She returns, settles S.

1800 - It's 77°.

1900 - It's 73°.

1908 - 60F leaves the nest.

1921 - She returns, settles S.

2000 - It's 68°, partly cloudy.

2035 - 60F seems to be asleep.

2045 - I leave.

The day was 85% sunny. There are showers from about
2000 on and into the night.

July 19, 1956

A wet morning with rain falling nearly constantly, and a humid, partly cloudy afternoon; temperatures normal, in the 70's and low 80's. Present from 1000 to 1230 and from 1700 to 1830.

T57 at 1030 - I spend an hour or so walking over all of the uncut area E of the fairway without seeing or hearing the 57's. I do see other PW's though.

A male sings slow chatters occasionally at the E extreme of the PW habitat, and I find him there, an unbanded bird just beginning to molt. He sings about 6 times in 10 minutes, stays between 30 and 20 feet high, moves freely from tree to tree. It's conceivable that there is a territory here though there is no considerable expanse of open growth. Song

Farther W, near the dead tree stump which was the center of the 57's activities in the last few days when I found them, are 54Y and 54S. They are feeding from 15 to 25 feet high in the open tree growth, moving quickly but sitting quietly for seconds at a time. They are 10 feet apart when I first see them, silent except at the moment they fly away from me some 25 yards. Then I'm pretty sure I hear 1 or 2 contact "tsu" notes. In any event they're clearly staying together. y/n

T53 and T54 - Silence during 15 minutes.

T60 - 60F is on the nest from 1200 to 1230, but I decide not to stay; it's raining hard and she may remain too long. notes 9
28

1230 - I leave.

1700 - I return. The sun is out, but it could rain anytime.

T59 - M59 feeds as I pass.

V - Silence during 20 minutes.

T60 - 60F leaves the nest at 1813 and in 2 minutes is back with a small green caterpillar. She seems to eat fecal material, so a young has been out of the shell long enough to excrete.

Today's hatch means that incubation ~~inevitably~~ ^{must} began on July 8; note my observations on the 7th. It means too that the all-day watches here began on the 3rd and ended on the 11th day of incubation.

1830 - I leave.

791
7/20/56
VN

See p 794
794a
re fork
oligot

July 20, 1956

A stormy dawn with some heavy rains during the night and with so much threat of all-day rains that Board and I give up plans both to spend the day. At 0730 it's partly cloudy with the sun shining, calm, 72°. Present from 0730 to 1300 and from 1700 to 1800; Board present from 0745 to 1300.

T54 - M54 is singing occasionally (5 times in 10 minutes) at 0740. I find him as a result of his insipid steps sung in the SE edge of 3, 20 feet high. Although his appearance may be in part due to the wetness, it's easy to see he has begun to molt. Especially messy are his flanks, lower back, and neck; and I see no white feathers on the left side of his tail. He feeds actively for a minute, then moves more slowly and finally seems almost to be sun-bathing on an outer branch, although the only special pose assumed in the raising of his left leg so that it is invisible among his belly feathers. The leg isn't crippled; once he stands on it alone to scratch and he uses it normally. (Cf. the late-April male on V, the one that raised its leg.)

T60 at 0755 - 60F is not at the nest.

0759-1/2 - She returns, feeds 1, sits for 6 seconds on the rim, broods facing S.

0800 - It's partly cloudy and humid; the sun is out. It's 75°.

0816-1/2 - 60F leaves the nest.

Song

molting

Sun
bathing

0822-1/2 - She comes from the S to a point 4 feet below the nest, carrying 1 small light green object, probably a spider or a caterpillar. She hops silently up, feeds from the N rim, looks in for 20 seconds, broods facing S.

0840 - 6OF leaves the nest.

0850-1/2 - 6OF returns. Except that she lands 1 foot S of and 1 foot below the nest, her return, food, behavior, etc., are exact duplicates of those on her last trip.

Occasionally the sun touches the outside of the nest and I suspect the cavity too. 6OF sits deep the whole time.

0900 - It's completely cloudless, still, 77°. It's interesting that 6OF is still sitting low. It seems to me to be hot enough, with the sun sufficiently on the nest tree (though not now on the nest), to cause her to sit back or high. Is it possible that that is mid-day behavior only, so that it never appears unless the sun is at a certain angle? I can't see 6OF's bill.

0917 - 6OF begins to look around, 2 or 3 times craning to see me.

0917-1/2 - She jumps to the NE rim, gives a quite definite upward stretch of the wings (the same motion I saw the other day), hops 1 foot, another, another, and another. She drops low to the NE about 3 seconds after leaving the nest, seems to go only 15 yards or so.

0926 - 60F comes to the tree from the S and lands as she did last time. I think I saw her fly past the nest tree from the N and land 5 yards or so from it a few seconds earlier. It takes her 10 seconds to go to the N rim. I can see only a small green caterpillar, but she seems to feed twice. She eats feces at least once, sits for 1-1/2 minutes on the rim, enters and sits low facing S.

0937 - A SW breeze rises.

0956-1/2 - 60F leaves precisely as she did last time with the single exception that she looks around at me and elsewhere for nearly 4 minutes before going.

1000 - It's clear, windless, 78°.

1004 - 60F comes from the N to the 20-foot top of the ash 8 yards N of the nest. She carries 1 green caterpillar. She stays 15 seconds in the ash, may call "tsu" 2 or 3 times, goes to the nest tree and takes 10 seconds to hop 3 feet up and S to the nest. She feeds, may eat feces, looks in for 1 minute, settles S and sitting deep. No sun hits the nest or the leaves around it.

1017 - 60F leaves exactly as before but this time without the wing stretch and with only 2 minutes or so of preliminary restlessness.

1026-1/2 - 60F lands 6 feet up on a dead branch of the nest tree, E side. She may have called "check" before arriving,

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VN

but I doubt it. She takes 10 seconds to climb by short hops to the N rim, feeds 1 object, looks in for 20 seconds, settles deep facing S.

1036 - After 1 minute of looking about, 60F drops low to the SE. None of her initial flights seem to be long.

1040-1/2 - 60F comes from the S to a point 2 feet just below the nest. It takes her 20 seconds to reach the nest, silently carrying 1 green caterpillar. After feeding and looking in for 15 seconds she settles S and sits low.

Note that on this nest I can't be sure that I always see her eat feces, so my failure to mention that isn't a reliable indication in that regard. NB

1055 - A red fox passes, growls, goes into the woods.

1057 - 60F leaves the nest to the S. She began to look around 2 minutes ago but not very actively at first. She accelerated as she went along. Finally she jumped to the S rim and sat there. 5 seconds looking around and back at me. Then she dropped.

1100 - It's 82°. There are a few light white clouds.

1100-1/2 - 60F returns, feeds 1, looks in for 1 minute, turns and slowly leaves the nest tree to go N.

1108 - 60F returns from the N with a green caterpillar and a small black object. She probably feeds 2, eats feces, looks in for 45 seconds, broods facing S and sitting low.

1120 - She's still sitting low in the nest.

1123 $\frac{1}{2}$ - 60F leaves after about 1 $\frac{1}{2}$ minutes of the usual preliminary looking.

1131 - She returns from the S and lands 1 $\frac{1}{2}$ feet below the nest carrying a green caterpillar and I'd guess something else. I think she feeds 2. After 30 seconds she broods facing S. So far she has never sat high.

1136 $\frac{1}{2}$ - 60F leaves the nest.

1144 $\frac{1}{2}$ - She lands right beside the nest with a very small food object. (All today have been small or medium-sized.) She feeds it, looks in for 30 seconds, broods facing S and sitting low.

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1149-1/2 - After a minute of looking around 60F leaves the nest.

1200 - It's sunny with a few light clouds and a SW breeze, 82°.

1203 - A Great Horned Owl flies from the woods to a 40-foot perch 20 yards from the nest. In 1 minute it flies N across the clearing.

1205-1/2 - 60F returns from the N with a 1-inch, thin brown caterpillar. She lands 1 foot below and 2 feet N of the nest, goes to the rim, feeds, perches there to 1209, enters and sits low facing S.

1215 - 60F begins to sit back from the cavity and look around, doing so pretty continuously from this time on.

1225 - A little sun touches her head in its position rather high above the nest.

1226-1/2 - 60F leaves the nest. I inspect the contents with a mirror. There are no eggs and 3 young.

1233 - 60F returns and feeds from the N rim, entering in 1 minute and sitting high.

1235 - I leave T60.

1300 - Board and I leave.

T59 at 0745 - I [Board] arrive. 59F is off the nest.

0757 - After calling for 5 minutes, 59F returns without

food and quickly settles N.

0815 - Occasionally she rises very high for several seconds, resettles.

0832 - 59F leaves and goes W.

0839 - M59 skids twice.

0849 - He comes and feeds 1, carries something W.

0853 - 59F comes and feeds 1, settles N, rises and sits higher.

0856 - M59 is skidding nearby.

0904 - 59F leaves the nest.

M59 arrives as the female goes; he feeds 1, in 40 seconds goes W.

0931 - M59 comes and feeds 1, stays 15 seconds.

0932 - 59F returns as M59 goes. She has at least 1 green caterpillar. She feeds 2, settles N.

1005 - 59F leaves the nest.

1024 - She returns, feeds 1, perches on the rim 1 minute, settles N.

1030 - M59 after 2 skids comes and sits just beside the nest. As he approaches 59F rises. She takes the food from him, feeds 1. In 30 seconds he goes NW and she sits high facing NW.

1035 - 59F probes for 15 seconds.

1043 - M59 skids twice. 59F is sitting very high.

1105 - 59F leaves.

2

1113 - M59 skids twice.

3

1125 - He skids 3 times and comes to the nest and feeds

1. In 30 seconds he takes a fecal sac W.

1125-1/2 - 59F arrives as the male leaves. She perches below the nest a minute, goes to the rim and feeds 1, eats a sac, sits very high facing N.

1136-1/2 - 59F leaves the nest.

M59 arrives on the female's heels, feeds 1, stays 15 seconds. [There may be some survival value in this characteristic departure as the male arrives.]

NB

I have been able to see the bills of the young all morning. All three are present.

1215 - 59F returns after 2 minutes of calling, carrying a very large caterpillar. She has to soften it and take it back several times. She then sits high facing N.

1218 - 59F leaves the nest and perches 2 or 3 inches away, to the W and just under the rim. She seems to look at the nest; occasionally she wipes her bill.

1221-1/2 - She jumps up to the nest, sits very high facing SE.

1226 - 59F leaves.

1250 - She calls "check" for 2 or 3 minutes.

1258-1/2 - She calls again.

1259-1/2 - She returns and feeds 2, may eat a sac, sits high facing S. In a few seconds she hops out and perches 2

or 3 inches away, and in 1 minute goes back and sits high facing NW.

1300 - I leave.

1700- I return. It has been sunny most of the afternoon but is fully cloudy now with a light rain falling.

T59 - 59F is on the nest at 1715. I sit to wait to band the young. The brood will have silver on the left and red on the bottom on the right. My balances are broken, so I can't get weights.

25-66001 - Yellow

25-66002 - Green

25-66003 - Blue

1739 - 59F leaves. I band and return all young by 1746. M59 has sung skids during this period rather regularly.

I couldn't induce the young to utter a sound, and they gaped only when in the nest. When returned to it they made little effort to right themselves.

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N B

1749 - M59 brings a large object. The young are out of position to gape, so he gets little response and I think eats the food himself. He stays 45 seconds poking only twice.

Note that the feet are still small enough to permit the number 1 color bands to slip off, so the adults may remove them.

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It's clear now. 59F's departure came a little after the rain stopped, although it never was more than a few scattered

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VN

drops.

1800 - I leave.

800
7/21/56
VN

July 21, 1956

See 801
see from
613
804 m
position
in field
down

A windless, cloudless dawn with a heavy dew; temperature 58° at 0500. Present from 0500 to 2030; Board present from 0500 to 2030.

V at 0510 - Silence.

T60 at 0512 - 60F is on the nest facing S.

0534 - 60F rises and looks into the nest for 5 seconds, her first moves this morning.

0540 - After 3 minutes of looking around, with the greatest intensity in the last minute, 60F turns and hops to the NW rim to a twig 2 inches away, and drops NW on what is probably a 25 or 30-yard flight at the very least.

0542-1/2 - She returns and feeds, 1 I'd guess; in 5 seconds she enters and broods facing S.

0548-1/2 - 60F looks around once, drops S.

0551-1/2 - She comes from the W with a very small object, feeds, stays 10 seconds, drops W.

0553-1/2 - She returns and feeds 1, eats a sac in 5 seconds, in 15 more drops W.

0555 - She returns, feeds 1, probes or prods the nestlings for 30 more seconds, broods facing S.

0600 - It's still calm. The sun is just up, and it's 60°.

0607 - 60F turns and drops 20 yards W. I see no preliminaries.

0608-1/2 - She returns, feeds 1 (I think), probes for 20 seconds, goes W 20 yards.

From now on today unless the contrary is specifically stated, each trip can be assumed to involve 1 object and 1 feeding. Note that I can't see this nest very well for the purpose of counting the actual number of young fed.

N 13

0613 - The sun hits the top of the big woods trees.

0614-1/2 - She returns, feeds, prods about 10 times, in 40 seconds broods facing S. She called "check" very faintly 3 times in the nest trees.

0627 - 60F gets to the W rim and flies W, I think without dropping.

0630 - It's 61°.

0632-1/2 - 60F returns with 2 small objects, seems to feed 2, broods in 10 seconds, facing S.

All her returns to the nest are made by landing from 1 to 3 feet below it and quickly hopping up. She uses no fixed path.

0642 - After 1-1/2 minutes in which she looks around several times and once rises to look into the nest, 60F turns and drops N.

0644 - She returns with a green caterpillar. She delivers it twice, eats a sac, and at 0645 flies low 35 yards N.

The sun has just hit the top of the nest tree.

0649 - 60F returns with a 1-inch, fat green caterpillar. She delivers it at least 10 times in 2 minutes, taking it back to soften between deliveries. She then probes till 0652, broods facing S.

0700 - There are a few very thin white summer clouds. It's 63°. A little sun is hitting the E side of the nest and 60F too.

0707-1/2 - 60F leaves the nest to the NE.

0710 - She returns with a green caterpillar, delivers it 3 times, goes W at 0711. I think I hear her calling "check" 15 yards S of me, 20 yards W of the nest.

0715 - 60F returns with a small adult insect, feeds, looks in for 5 seconds, broods facing S.

0727 - After 2 minutes of looking around 60F turns nearly double, gets to the NE rim, drops.

0731 - 60F returns with a small green caterpillar, probably eats a sac, broods facing S 20 seconds after her arrival.

0737 - 60F gets to the N rim and drops N.

The sun hasn't hit the top of the nest tree for 20 minutes.

0747 - 60F returns with a large dark object which she seems to have a little trouble getting the young to eat. She may feed 2. In 15 seconds she broods facing S.

0753 - The sun hits the top of the nest tree and will not leave it now until late this afternoon.

0758-1/2 - After 1 minute of looking 60F twists, gets to the NE rim, jumps a foot to a branch, flies NE without

dropping.

0800 - It's cloudless, practically windless with what breeze there is coming from the S, 72°.

0803-1/2 - 60F returns with a small object in the tip of her bill, a green caterpillar behind. She seems to feed both to 1 nestling, billing the caterpillar several times. She eats a sac and in 40 seconds broods as usual. From now on it can be assumed she faces S unless the contrary is stated.

0810-1-2 - 60F leaves the nest and goes W.

0815 - She returns with a green caterpillar and probably a second brown one. She eats a sac, in 30 seconds broods.

A little sun touches her head in certain positions.

0820 - 60F leaves the nest.

0822 - She returns with a 1-inch brown adult insect. For 1 minute she continually probes the nest, possibly trying to pass the food. She eats something. At 0823 she leaves to the W.

0824-1/2 - 60F brings a 1-inch, stiff brown object like a millipede or a wire worm. She tries for 1-1/2 minutes to feed it, billing it constantly. Succeeding, she looks and probes till 0826-1/2, then broods.

0833-1/2 - After a minute of looking 60F drops to the NW and flies at least 35 yards.

0842 - She returns, seems to feed 1, pokes till 0843,
broods.

All feedings have been from the N rim; unless the oppo-
site is pointed out this is to be taken for granted hereafter. ND

0851 - After 20 seconds of looking 6OF hops 1 foot N,
drops to the ground or to low cover 10 yards N of the nest.

A W breeze has just become noticeable.

0900 - It's clear with a SW breeze, 78°.

0906-1/2 - 6OF lands in the nest tree 6 feet from the
ground, takes a green caterpillar up to it. After feeding
she eats a sac, pokes around for 2 minutes and looks in for
another, broods at 0909-1/2.

0920 - After 45 seconds of peering around, mostly at
me with her body twisted nearly double, 6OF jumps to the
NE rim, in 3 hops gets to the edge of the nest tree, drops
to the ground 10 yards away.

0922 - She returns, feeds, looks in for 20 seconds, goes
NE at 0922-1/2.

0926-1/2 - 6OF brings an adult insect and a green cater-
pillar, feeds 2, probes for 75 seconds, broods.

0930 - 6OF leaves the nest.

0942 - 6OF brings a green caterpillar, feeds it, looks
in for 45 seconds, broods.

0955 - After 1-1/2 minutes of active looking, as usual
with much craning around to see me, 6OF gets to the NE rim,

stretches her wings slightly, drops about 12 yards away.

0958 - 60F brings 1 green caterpillar, feeds it, looks in and pokes for 75 seconds, broods. She's still sitting deep.

1000 - There are a few light clouds and a fresh SW breeze blows at times. It's 82°.

1005 - 60F leaves to the N after a few seconds of looking about.

1012-1/2 - She brings a green caterpillar, feeds it, perches on the rim probing and looking for 2 minutes. She then broods sitting deep.

1020-1/2 - 60F looks around as usual, drops SE. The sky is 15% cloudy, but the sun is in for only a minute or so at a time.

1023 - 60F brings a dark-colored imago; after feeding it she looks in and probes for 1 minute, then broods.

1027-1/2 - After 30 seconds of looking 60F leaves the nest.

1050 - She brings 1 object from the N, feeds it, eats something, eats a sac, after 75 more seconds of the usual behavior broods sitting deep.

1059 - 60F begins to stand over the nest but quits in 2 minutes and sits deep.

1100 - The sky is as it was at 1020, with a light S breeze; temperature 83°.

1104 - 60F leaves after 15 seconds of looking.

The wind is turning to the NW and getting harder.

1111 - 60F brings a long (1-1/4 inch) brown caterpillar.

She works until 1115 to get this into a nestling and finally succeeds after passing it and taking it innumerable times.

She then perches on the rim and picks and looks in till 1117-1/2, when she broods deep.

1123 - 60F leaves the nest.

1128 - 60F brings a green caterpillar, feeds it after several delays, pokes till 1130, broods deep.

1132 - 60F looks around, leaves and goes N.

1138 - She brings a small black imago, feeds and pokes till 1140, broods low.

1146 - 60F leaves the nest.

1152-1/2 - She brings a green caterpillar and a second insect, seems to feed 2. She probes to 1154-1/2, broods low.

1158 - She looks around for 15 seconds, turns and drops to the NW.

1200 - The sky is as before; it's 82°.

1216 - 60F brings a green caterpillar, feeds it, probes and looks till 1218, broods deep.

1223 - 60F looks around, goes NE. I check the nest and find there are 3 young.

1237-1/2 - 60F brings a green caterpillar, feeds and probes till 1239, broods. In 10 ^{seconds} minutes she gets off, stands

on the E rim facing N, hops 3 inches N, then 2 inches W, goes to the N rim in 8 seconds and looks in. At 1241 she settles.

1242 - 60F suddenly jumps from the nest and goes 2 inches S, sits for 30 seconds looking S, drops 2 feet straight down in the nest tree, in 2 seconds leaves the tree.

1247-1/2 - She brings a green caterpillar and probably another insect. She feeds, perches on the rim and probes till 1250, when she broods. She then rises and sits high, the first time I've seen her do so today. Almost immediately she sits lower again.

1253 - She leaves and goes S.

1300 - It's 60% cloudy; the sun is in temporarily. The breeze is unchanged. It's 80°.

1308 - 60F brings 2 green caterpillars and feeds them. One is taken with great difficulty and only after 1-1/2 minutes. She then probes till 1311 and broods low.

1320 - 60F rises after looking around, drops to the SE. The sun is still in.

1322-1/2 - She brings a green caterpillar and after feeding it goes through the usual probing. At 1325 she broods. The sun comes out.

1330 - 60F leaves after looking around for a minute. She goes NE.

1357-1/2 - 60F brings a small object, feeds it, and in 20 seconds enters and broods. She seems to be sitting normally low.

1400 - There is a big cloud directly overhead. For 3 hours I'd say it has been sunny about 70% of the time. It's 80°.

1407 - 60F looks around for 45 seconds, turns and jumps to the NE a few inches. In 2 hops she leaves the tree and goes NE.

1413-1/2 - 60F brings a green caterpillar, feeds it, probes, and at 1414 broods.

1419 - 60F leaves the nest.

1438 - She brings a fat green caterpillar over 1 inch long. After offering it for 45 seconds and finally succeeding, she probes till 1440, when she broods. She looks around for 30 seconds but settles down.

1443 - 60F picks at something as she sits in the nest. It seems to be a passing insect. In 10 seconds she gets to the NE rim and faces NE for 12 seconds. She then leaves the nest tree slowly in 6 hops, doesn't drop low when she goes.

1500 - It's sunny with the sky 40% full of white clouds. The breeze is S, and it's 83°.

1504-1/2 - 60F brings a small object, feeds 1, pokes till 1505-1/2, broods.

1505-1/2 - She looks around, hops off 2 inches to the NE, sits for 5 seconds, takes 10 more seconds to leave the tree in small jumps. She goes NE.

1520 - 60F brings 1 green caterpillar, eats a sac, probes for 30 seconds, broods after a total of 45 seconds at the nest. She faces S, as always.

Note that in the relatively little time spent brooding since 1200 she has always (or substantially always) sat low.

1523 - 60F leaves the nest exactly as she did last time.

1530-1/2 - She brings a black adult insect. After feeding and behaving as usual, she broods at 1531-1/2.

1532-1/2 - 60F leaves and drops NW after a minute of looking around; i.e., she began to look as soon as she settled on the nest.

1539-1/2 - 60F brings a brown caterpillar which it takes the nestling 75 seconds to get down (after many deliveries and softenings). In 5 seconds 60F eats a fecal sac. She looks into the nest till 1541-1/2, flies NW without dropping much.

1555 - 60F brings a green caterpillar. She may call "check" once, her first call today. After 2 minutes of looking in and probing (a little), she broods. A little sunlight hits her head. I disturbed the nest rim slightly when I put my mirror up, and several times I've thought she was working the materials back in again.

1600 - 60F turns and gets to the NE rim, where she faces outward. In 8 seconds she begins to hop NE; it takes her 15 more seconds to leave by little hops, the last from the highest point in the tree.

1600 - It's sunny with the sky 10% cloudy (white clouds); the breeze is from the S, rather strong. It's 82°. It's been sunny 75-80% of the hour.

1609 - 60F returns and feeds an unseen object. After 45 seconds at the nest she leaves again.

1622 - 60F "checks" twice 10 yards N of the nest. She then quickly takes a green caterpillar, feeds it, perches on the N rim probing occasionally.

1625-1/2 - 60F leaves the rim and goes S.

1637 - 60F brings a green spider, I think. She calls "check" twice before getting to the nest, both calls very faint. For a minute she probes in the nest; then she broods facing S.

1642 - 60F looks around, gets to the NE rim, takes 10 seconds to hop through the tree and drop to the E.

1651-1/2 - 60F comes silently from the N with a fat green caterpillar which is eaten on the first try. She eats something, probes pretty actively till 1653, leaves the nest.

Sunlight hits the outside of the nest and possibly part of the cavity.

1700 - Within the last 2 or 3 minutes, very heavy storm clouds have come up in the W and the sun has gone in. It's begun to thunder. The temperature is 80°, but a SW wind is cooler.

1705 - 60F brings a green caterpillar after calling 14

somewhat louder "checks" for half a minute before, 8 yards away in the ash and then in the nest tree. She feeds it for 30 seconds, probes for 60, settles and broods at 1706-1/2.

It is now 76°, the sky is 70% cloudy, the sun is in, and the wind is down. The storm may pass NW of us, but it is thundering to the W.

1712 - It sprinkles a very few drops.

1715 - 60F seems to work on the nest rim which I disarranged.

1715-1/2 - 60F leaves the nest. It isn't thundering and the sky is as clear or clearer than it was. It's 77°. I'd feel sure that so far her behavior hasn't been affected by the weather. It's not dark, and the thunder is about the only factor to which a response might come.

1720 - It thunders loud in the W twice. Note that 60F stays off the nest.

1722 - 60F brings what seems an adult insect. She feeds it in 15 seconds, probes for 45, broods. It is calm, silent; no change in the weather.

1731 - 60F leaves the nest.

1732 - It sprinkles lightly for 3 minutes, with a brisk SW breeze. It's 74°. 60F doesn't return. At 1739 the sun comes out; it is quite light.

1740 - 60F passes me from the NW, flying 18 feet high. She goes to the nest with a green caterpillar, feeds it, be-

haves as usual, broods at 1741.

What I have called probing today seems to consist in part of that and in part of picking at things in the cavity and sometimes eating them.

1745 - It is sunny, calm, 78° . The sky is cloudy in the N half.

1749 - 6OF looks around for 30 seconds, gets to the NE rim, stretches her wings very slightly, leaves the tree in 3 hops, goes 15 yards NE. On this and many other trips she goes to the low woods edge, where the most conspicuous plants are dwarf sumac and sassafras.

1756-1/2 - 6OF brings a dark item, looks in after feeding it, may eat a sac, broods at 1757.

1800 - It is sunny, calm, 40% cloudy, 76° .

1803-1/2 - After nearly a minute's activity, 6OF drops to the S.

1811-1/2 - 6OF brings a food object I can't see, delivers it as usual, probes for 35 more seconds, settles facing S.

1817-1/2 - 6OF leaves the nest.

1826 - 6OF brings what looks like a green caterpillar. After passing it in 20 seconds, she eats a sac, looks in and probes, settles after 45 seconds in all.

1833 - After 1-1/2 minutes of looking around 6OF gets to the NE rim, hops through the tree, drops NE into the edge 15 yards away.

I wonder if females (males too possibly) have a series of places to which they regularly go to feed; or a series of general areas.

1840-1/2 - 60F flies to the tree from the NW, passing 15 feet over me. She has a brown caterpillar and a green object (neither is quite sure). She delivers them, seems to eat small things from the nest, pokes and looks in, broods 1 minute after her arrival. *delivered*

1847 - 60F turns and flies SE. She almost seems to hover at a leaf for an instant as she goes, a leaf an inch from the nest.

1854 - 60F takes a green caterpillar and a brown object, has a little trouble delivering the latter. She leaves low to the NW in 30 seconds.

Note the number of 2-item feedings. Since she so often has to try several times to pass things, I'd guess the items usually wind up going to different young.

1900 - It's sunny, 95% cloudless, calm, 71°.

1902 - 60F brings a 1-1/4 inch green caterpillar which she has to deliver 7 times in 1 minute. Between each delivery she softens it. She then pokes and looks in for 45 seconds, broods facing S as always.

1912 - 60F looks around her for 1 minute, turns counter-clockwise so that she covers 220° of a circle, and drops NW.

1921-1/2 - 60F takes 2 adult insects. She eats 2 and

I think probably 3 fecal sacs, broods after 1 minute at the nest.

The sunlight still hits the top halves of the woods trees. At 1926 it's 69 and beginning to get damp.

1934 - 60F leaves the nest.

1935 - She brings a green caterpillar, gives it twice, in 5 seconds more flies NW past me low. I think she is foraging behind me, 25-30 yards from the nest; there are a few faint "checks."

1939-1/2 - 60F goes to the nest with a green caterpillar in the back of her bill, a brown imago in front. She feeds, looks, in 30 seconds broods.

The sun is on the tree tops only.

1945 - 60F leaves the nest.

1951 - She takes a small whitish object and probably something dark, feeds, broods in 20 seconds.

60F's brooding has been while facing S all day, with the direction changing possibly 10 or 15 degrees.

2000 - After looking around for 1 minute 60F leaves and goes NE.

2000- It's nearly clear with a thin haze of clouds, no wind, 66°. The sun is down, and it's beginning to get dusky.

2002 - 60F takes a green caterpillar, eats a sac, goes W low in 20 seconds. She calls 35 yards from the nest.

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JB

2005 - 60F takes something I can't make out, looks in for 20 seconds, broods.

2020 - 60F is clearly down for the night; most bird sounds have ceased. It's still clear, 65°.

The day has been 80% sunny and behavior has not been inhibited by the weather.

2030 - I leave with 60F on the nest.

T59 at 0500 - I (Board) arrive. 59F is on the nest, although I can barely see her in the darkness.

0525 - 59F starts to stir.

0533 - She leaves the nest.

0542 - She returns after 2 minutes of "checking," feeds 1, eats a sac, perches for 30 seconds on the rim, settles N.

0551 - 59F leaves the nest.

0600 - She returns, feeds 1, settles N.

0608 - 59F leaves the nest.

0611 - She returns, feeds 1, settles NW.

0616 - 59F leaves the nest.

10 0617 - M59 begins to skid; 10 songs.

0625 - M59 comes, feeds 1, stays 10 seconds. 59F "checks" for about 5 seconds, out of sight.

0631 - 59F comes and with difficulty delivers a very large reddish insect, settles E and then NW. She is not sitting low.

0643-1/2 - 59F leaves the nest.

0645 - M59 comes and feeds 1, in 10 seconds goes W.

3 0648 - M59 after 3 skids comes and feeds 1, in 5 seconds
takes a sac W.

0650 - 59F after 1 minute of calling returns, feeds 1,
settles NW.

0659 - 59F leaves the nest.

5 0704 - M59 after 5 skids comes and feeds 1, goes W in
25 seconds.

0715 - After 10 seconds of calling 59F comes, feeds 1,
settles NW.

1 0721 - M59 skids once and comes, feeds 1, goes W in 10
seconds. He keeps on skidding.

59F left the nest as the male arrived.

0727 - 59F calls for a few seconds.

5 0741 - M59 after 5 skids comes and feeds 1.

59F arrives 3 seconds after the male. The two perch
on the rim opposite each other, M59 motionless and 59F occasion-
ally probing. He goes NE in 45 seconds and she settles SE.

3 0747 - M59 after 3 skids comes and feeds 1, in 5 or 10
seconds takes a sac W.

59F left as he came up.

6 0759 - M59 after 6 skids comes and feeds 1, perches on a
branch 3 or 4 inches to the E for 4 minutes, till 59F comes.
He leaves and sings twice.

0803 - 59F comes, feeds, sits high facing NW.

0805 - 59F leaves the nest.

0811 - M59 after 5 skids drops from the 25-foot sassafras clump to my left directly to the nest, feeds 1, takes a sac W.

0822 - M59 after 3 skids comes, feeds 1, takes a sac, perches 5 seconds on the rim, goes a foot NE and stays 5 seconds, goes NE.

0833 - 59F after 3 minutes of "checking" comes, with difficulty feeds 1, settles NW.

0843 - 59F leaves the nest.

0855 - She returns, feeds 1, sits high facing S.

0915 - 59F leaves the nest.

0943 - She returns, feeds 1, perches facing SE with 1 foot on the rim and the other on a twig. After 3 or 4 minutes of this she sits very high facing N.

1025 - 59F leaves the nest.

1035 - M59 comes and feeds 1, leaves.

1045 - M59 after 7 skids comes, feeds 1, in 10 seconds takes a sac E.

1050 - M59 after 3 skids comes, feeds 1, stays 15 seconds.

1057 - 59F comes, feeds 1, after 3 minutes of perching on the rim goes NE.

The young seem very active; their heads often bob up.

1109 - 59F returns, perches as she has been with only 1 foot on the rim, feeds 1, goes.

1110 - M59 comes and feeds 1, stays 5 seconds. The young rise as an adult approaches.

2 1118 - M59 after 2 skids comes and feeds 1, in 8 seconds takes a sac W.

1132 - 59F comes and feeds 1, stays 30 seconds.

3 1134 - M59 after 3 skids comes and feeds 1, after 30 seconds goes W.

1150 - 59F comes and feeds 1, stays 5 seconds.

1158 - 59F comes and feeds 1, leaves quickly as the male arrives.

M59 feeds 1, stays 15 seconds.

1230 - 59F comes and feeds 1, stays 20 seconds.

1325 - 59F comes and feeds 1, stays 15 seconds.

1339 - 59F comes and feeds 1, perches for 2 minutes on the rim, goes SE.

1404 - 59F comes and feeds 1, goes W in 15 seconds.

1410 - M59 after 2 skids comes and feeds 1, goes W in 10 seconds.

1427 - 59F comes and feeds 1, eats a sac, goes W in 20 seconds.

6 1430 - M59 after 6 skids feeds 1, in 10 seconds goes W.

1502 - M59 comes and feeds 1, stays 5 seconds.

59F comes as the male goes; she feeds 1, perches for 5 minutes on the rim, then sits high facing NW.

The wind is rather strong and has been that way most of

the afternoon.

1517 - 59F leaves.

1554 - M59 after 7 skids feeds 1, looks into the nest for 1-1/2 minutes, takes a sac NW.

1615 - 59F comes and feeds 1, sits on the rim for 2 minutes, goes E.

1615-1/2 - M59 after 5 skids arrives, feeds 1, in 30 seconds goes W. No special behavior between M59 and the female.

1653 - 59F comes and feeds 1.

M59 arrives 3 seconds behind the female; he passes food to her and she feeds it. They perch on the rim opposite each other for 30 seconds. M59 then flies to a branch 10 feet E of the nest, begins to call "tsu," leaves after 1 minute there. In 30 more seconds 59F leaves.

1710 - 59F comes and feeds 1, perches on the rim. It's cloudy with occasional thunder.

1716 - It rains slightly for 1 minute. 59F is seated high facing NW.

1727-1/2 - 59F leaves the nest.

1735 - It begins to rain.

1735-1/2 - M59 comes and feeds 1, stays 5 seconds.

1736-1/2 - 59F calls "checks" nearby.

1738 - The rain stops. 59F quits calling.

1801 - 59F comes and feeds 1, may eat a sac, perches on

the rim facing NE.

1812 - 59F leaves.

1830 - M59 after 14 skids feeds 1, in 10 seconds takes
a sac W.

1832 - 59F comes and feeds 1, stays 30 seconds.

1834 - M59 after 2 skids feeds 1, in 10 seconds takes a
sac W. 07

1918 - 59F comes and feeds 1, stays 10 seconds.

1932 - M59 comes and feeds 1, goes W in 20 seconds. 87

1940 - 59F comes and feeds 1, in 15 seconds takes a sac E.

2015 - 59F comes and feeds 1, in 15 seconds takes a sac
NE.

2022 - 59F comes and feeds 1, sits 5 seconds on the rim,
settles high facing NE.

2030 - She's sitting quietly. fwdy

I leave.

July 22, 1956

A cloudless, windless dawn; temperature 63°. Present with Paul Davis from 0500 to 2035.

T59 at 0505 - 59F is on the nest facing W. dawn

0511 - After activity for 2 or 3 minutes she rises and pokes into the nest, faces SW. It's still very dark in the woods.

0515 - 59F gets to the rim of the nest on the W side.

0516 - She gets back on, seems to feed, broods facing E. In 2 or 3 minutes she rises and sits back off the nest. B

0525-1/2 - She gets out but stays at the nest, E of it. She seems to feed the young when she turns toward the cavity. B

0526-1/2 - 59F leaves.

0533-1/2 - She goes to the nest, but I don't see the feeding; the young gape and she seems to stay an inch or so back. In 20 seconds she goes SE 15 yards and calls "check" there once a second.

0535 - 59F goes and feeds 1. She calls "check" 3 or 4 times at the nest. She looks in for a minute, leaves at 0536-1/2, but goes only a foot or two away. In 30 seconds she returns, calls once, perches without food on the rim, turns on the N rim to face N, picks at something. She drops at 0539 but probably stays within a foot of the nest; at any rate she goes only that far at first, calling once. B

0541 - 59F comes silently to the nest from wherever she was, feeds 1, takes a sac N in 15 seconds. A young continues to gape.

0544-1/2 - She comes, feeds the highest, takes a sac, drops it into the nest, gets it and goes N in 20 seconds. One young goes on gaping.

0547 - M59 (conceivably 59F) feeds 1, takes a sac NE in 10 seconds.

0556 - M59 (possibly the female) feeds 2, goes SE in 35 seconds. Both trips have been in complete silence.

0600 - It's clear, calm, 64°.

0602-1/2 - M59 skids twice to the NW a good distance.

0606 - 59F silently feeds 1, seems to pick some thing from the nest and eat it, then from a leaf above. She then pokes at the nest, again seems to eat, busies herself till 0608, when she broods facing N for 1 minute. She goes W at 0609.

0636 - M59 skids 35 or 40 yards to the W, twice.

0637-1/2 - M59 feeds 1, leaves in 10 seconds.

0639 - After 30 seconds of "checking" 15 yards SE of the nest, 59F goes and feeds 2. She stays and pokes for half a minute, then sits on the W rim facing N. At 0641 she broods facing N. It's 65°. She manages to cover the nest and sit fairly low. At 0644 she rises a little and picks at the young, then sits back down.

0650-1/2 - 59F leaves the nest; she's brooded till now.

0654 - M59 skids at the S end of the clearing.

0655 - After 6 songs M59 feeds 1, stays 8 seconds, goes SE.

0657-1/2 - M59 skids faintly 5 times to 0659.

The young have several times gaped in the absence of a parent at the nest, and they frequently continue to gape after a parent (both male and female) departs.

0659-1/2 - 59F feeds 2 (one item a green caterpillar), takes a sac N in 15 seconds.

0700 - M59 feeds 1, goes in 10 seconds.

0700 - It's sunny, clear; a slight breeze has come up from the SW. It's 66°.

0707 - M59 skids. All his songs are short and, though not sotto voce, somewhat weak.

0707-1/2 - He comes after 1 song, feeds a green caterpillar which the nestling has trouble getting down. The male looks but does not take it back. After 80 seconds he takes a sac SW.

0710 - 59F begins to "check," stops after 6 or 7.

0715 - 59F brings 3 caterpillars, gives all to 1 young, takes back 1 item after a second and gives it to another nestling. She takes a sac N. The young gape for 10 seconds after she leaves.

0723 - M59 may sing once.

0724-1/2 - M59 feeds 1, jumps from the N rim to the S and faces away from the nest, hops 4 inches, leaves 15 seconds after arriving.

0727 - M59 skids once in the clearing.

0727-1/2 - He goes to the nest and either feeds while still a little below the rim or else doesn't feed at all. I see nothing pass.

0731-1/2 - M59 skids.

0731-1/2 - 59F feeds 2, eats a sac, stays on the rim while the male goes on singing in the clearing. He quits singing at 0736 after 7 songs. She's on the W rim, facing N and slightly away from the nest. At 0738-1/2 she hops to the N rim and faces N, in 10 seconds hops down the nest branch little by little, sits 6 inches below till 0741, when she leaves.

0751 - Both adults go to the nest, the male first and without any song. He feeds 1 from the S rim, leaves in 5 seconds.

59F perches just below, goes up when M59 leaves, feeds 1, drops down 3 inches to the SE. In 10 seconds she hops up to the nest and in 10 seconds broods. (M59 has fed from the N rim every time until this one.)

0752-1/2 - M59 sings once.

0753 - He goes and feeds 1 while 59F sits up on the nest. He leaves in 5 seconds, and she sits down facing N.

0754-1/2 - M59 skids in the clearing, continues to sing regularly.

0800 - It's nearly clear, slightly breezy from the W, 70°.

0803 - 59F probes in the nest beside herself, rising a little. The male goes on singing.

24 0805-1/2 - M59 quits after 24 songs.

0807-1/2 - M59 skids faintly to the W, goes on irregularly.

0811 - 59F leaves.

7 0811 - In 15 seconds M59 comes and feeds 1, leaves in 7 seconds. He'd sung 7 times.

1 0813 - M59 skids once about 30 yards S of the nest.

0817 - He skids E of the nest in the woods.

6 0821 - After 6 songs M59 gives 2 items to 1 young, after 10 seconds hops 2 feet E, flies E.

2 0823 - M59 sings 2 skids.

0831 - 59F feeds 1. She goes NE with a fecal sac after 15 seconds. She may have fed 2, one with a very small item. She probably called 7 or 8 times before going to the nest.

0834-1/2 - 59F feeds 1, taking a sac N in 5 seconds. She "checked" 3 or 4 times before going.

0844 - M59 feeds 1, in 8 seconds leaves exactly as he did at 0821.

✓ 0846-1/2 - M59 sings in the woods 40 yards SE of the nest; 2 songs.

0849 - M59 feeds 1, takes a sac SW in 6 seconds.

0851 - M59 skids 3 times.

0852-1/2 - 59F (probably) comes and feeds 1, goes NE
in 12 seconds.

M59 is molting around the throat.

0900 - The sky is nearly cloudless and will be completely
so in a few minutes. The sun has been out continuously.
The breeze is as before. It's 72°.

0908 - 59F comes silently, feeds the highest bird, looks
in for 40 seconds, hops to a little branch 6 inches to the
SE, drops out of sight to the W in 6 more seconds.

Sunlight hits the leaves around the nest and occasionally
touches the rim of the cavity.

The young have gaped occasionally all morning. Now one
has rested its head on the rim, bill closed.

0921-1/2 - M59 feeds 1, then goes into the sunbathing
position below the N rim of the nest. I can't see the wings
or tail, but he has rolled over to expose his side to the E;
his head is on its side. In 1 minute he leaves when the fe-
male comes.

sunbathing

0922-1/2 - 59F comes and feeds the highest, perching
for the first time on the SE rim (so far she's used the SW
95% of the time, the S and N the rest). She then sits quietly
on the E rim facing the cavity. Part of the nest is in the
sun, and the young have their heads out, one with bill open;

B

but 59F's bill is closed, and her wings aren't spread. Once, at 0931, she crouches and lowers her head while continuing to look more or less upward; it looks like a fear position. While on the rim she has her tarsi flexed the way a young bird would; is this significant? It is probably the typical pose of a female sitting at the nest. *Ger*
pose

At 0935 she is acting nervous and alert while on the rim, crouching from time to time as before. Occasionally she seems to pick and eat objects from the young. *B*

0938-1/2 - 59F flies SW. The young, which have been quiet, all turn and gaze at her as she goes and for a few seconds thereafter.

0957-1/2 - 59F feeds 1 from the N rim, in 15 seconds hops across the nest and goes 1 foot S, then flies SE. *o*

1000 - There is a light film or haze of summer clouds, a slight S breeze. It's 78°.

1003-1/2 - 59F calls "check" lightly, goes and feeds 2 objects (1 a brown caterpillar) to 2 birds. She seems first to give all food to the nearest young, take back the caterpillar and give it to another. She goes N in 20 seconds.

8 1008 - 59F sings 3 insipid steps in the clearing, switches to 1 skid, 1 step, 5 skids.

1010 - 59F goes to the nest and feeds 1, goes SE after 12 seconds. *o*

1012 - 59F takes a large caterpillar which she has to deliver *B*

5 times. She then perches on the E rim facing inward, picks something from a nestling, sits quietly. She continues to sit, look, and groom the young. They are restless, gape sometimes, jump up and down. Some sun gets through to the nest, but I don't think her long presence there has anything to do with sheltering the nestlings. B

1028 - M59 sings an insipid step to the W. The female continues to perch on the E rim and to behave as before. At 1030 M59 skids twice.

1030 - 59F leaves.

1030-1/2 - M59 arrives 10 seconds later, feeds 1, perches on the W rim and looks in. He leaves in 45 seconds. O

1043-1/2 - M59 skids W of the nest and continues irregularly 5 times in 6 minutes. The young have their heads out, bills open.

1052 - M59 begins to skid again.

1053 - 59F arrives and feeds 2.

3 M59 arrives 5 seconds later and feeds 1. He also takes from a nestling one of the female's items, a big caterpillar, and delivers it himself. 59F eats a sac. M59 leaves after 20 seconds. She stays and sits on the W rim facing N, poking into the nest occasionally. I'd say her loitering at the nest so far today is not due to heat but to the fact that she has time on her hands; i.e., it's just incubation behavior. G

? No

1100 - It's cloudless with a S breeze, 82°.

1113 - The female is still sitting parallel to the nest, looking around but otherwise inactive. At 1116 she picks at and grooms the young. (We have actually seen her bill touch a nestling only twice; usually the assumed contact is in the cavity and out of sight.)

1122-1/2 - 59F leaves the nest.

1137 - M59 skids once.

1137-1/2 - He comes and feeds 1, in 7 seconds takes a sac SW.

1139 - M59 skids once. His songs are weak and short.

1149 - M59 skids once E of the nest 20 yards. He goes W to the clearing, sings 2 fragments, begins to skid again.

1153 - After 7 more skids M59 goes and feeds 1. 59F begins to call 5 yards from the nest when M59 arrives. He leaves in 5 seconds, sings at 1154-1/2, a skid and a fragment.

1155-1/2 - 59F feeds 2, gets a sac in 10 seconds, goes N. Her feeding method seemed to be to give some small object to the first young, as though to dispose of it, then to give a big caterpillar to a second. When the latter dropped the caterpillar, she took and killed the food, reached across 2 other nestlings and returned it to the one that dropped it.

1200 - It has slowly become cloudy during the last hour and is now 95% thinly overcast. There's a light SW wind; 81°.

1205 - M59 feeds 1, stays 6 seconds, goes SW.

1209-1/2 - M59 feeds 1 a green caterpillar, stays 25 seconds, goes SW.

1223 - 59F feeds 2; the details of the 1155 feeding are all repeated except the caterpillar isn't dropped. She then sits on the SW rim with her legs only a little flexed.

The young seemed a little less active for a few minutes after 1200 but occasionally all gaped at once.

1227 - 59F broods half on the cavity and half on the rim, facing N. In a few seconds this turns into the flexed-tarsi-on-rim position, then back to brooding the W half of the cavity again. The two poses are scarcely distinguishable from the rear, but the flexed position is probably the one adopted most of the time.

1236 - 59F gets to the N rim and leaves.

1240 - 59F feeds 1, in 5 seconds takes a sac N.

1240-1/2 - M59 skids just W of the nest.

1250 - M59 sings 2 insipids faintly, approaches and continues in the tree cluster near the nest.

1253-1/2 - After 9 more steps M59 feeds 2 large items (I think) to 1 bird. In 5 seconds he takes a sac E into the woods. The young didn't gape at his song, but about 2 seconds before he got to the nest they began to gape. He came from below, out of their sight unless they saw him fly in to land.

I'm too far away to hear any nestling sounds.

1257 - After "checking" faintly for a minute 59F feeds

2. She gives the first a green caterpillar and possibly something else, then seems to produce a round object from farther back in her mouth and give it to a second. The first bird has trouble with the caterpillar; she takes it and gives it back to that bird. Then she pokes, sits on the W rim. B

When 59F called the young gave no response, either of ducking down or of gaping. As she lit on the nest branch they all gaped. T

1300 - It's sunny through a complete light overcast.

There's a moderate SW wind which is gusty at times. It's 84°. The sun is never directly on the nest except for a rare shaft of light. The young are normally active but possibly less so than they were before 1100. (Cf. fledging time.) Davis suggests that the female is induced to groom by the jumping and other activity of the young. B

1312 - 59F leaves after 15 minutes.

1313 - Davis sees an upward stretch; I described one, and he said it's just what he saw.

1323-28 - Davis watches for me and sees 1 nestling give several upward stretches. At 1330 the activity of the nestlings subsides.

1355 - 59F takes 3 large caterpillars; she called "check" 3 or 4 times before arriving. She feeds 2 birds.

M59 lands below the nest and climbs up with 1 green caterpillar. He gives it to 59F and she feeds one of the nestlings which she has already fed. M59 flies NE in 5 seconds. She stays 20 seconds more, leaves after a full minute. ✓

1400 - The sky is as it was an hour ago, but it has been darker in the interim. It's occasionally gusty, 81°.

1416 - 59F goes to the nest and feeds probably only 1.

Within 2 seconds of 59F's arrival M59 comes up with a big green caterpillar, which he delivers. She takes it from the young and passes it twice herself. M59 leaves to the N within 8 seconds. 59F takes a sac and goes N 45 seconds after arriving. ✓

9 1426 - M59 sings an insipid step, a skid that turns into a step, another 2 steps, a skid that breaks off, another, 3 full skids.

1428 - M59 feeds 2 items to 1 young, leaves in 10 seconds. The young gape again while he is below the nest and at least 2 seconds before he gets to them. ✓

1430-1/2 - M59 sings 1 step.

1436 - M59 feeds 1, goes 3 in 8 seconds. ✓

1436 - It begins to rain very lightly, quits immediately. It's 78°. Rain

1440 - I'm pretty sure a nestling preened.

1500 - The sky is as it was at 1300, though it's changed a little for the better or worse at times during the hour. It's

gusty from the SW, 81°.

As an experiment I walk up and tap the nest branch lightly about 18 inches below the nest. Davis watches and says the young all gape immediately. I repeat this 2 more times with the same result. yg

At 1510 Davis leaves.

1514-1/2 - M59 comes silently with a big caterpillar. o

About 3 seconds later 59F brings a caterpillar too. They wait 5 seconds after feeding and M59 takes a sac E straight into the woods, as he has one or two other times today. 59F follows him with a sac 3 seconds later.

The young leave their bills open some of the time when they rest their heads on the rim. The nest is shaded by the leaves around it.

1532 - M59 sings 2 type-8 steps, of only 4 and 5 notes.

17 At 1535 he sings the first 3 notes of the song, then 9 toneless short skids to 1539. He's in the tree group W of the nest.

1541-1/2 - M59 drops from the trees over me, flies low to the nest area and out of sight. In a few seconds he hops up to the nest with a big green caterpillar. In 5 seconds after feeding, he hops across the cavity to the S rim, flies SW. o

1600 - It's much clearer and has been for nearly an hour. There are 20% white clouds plus a white haze in places. The wind is in the SW. It's 80°.

834
7/22/56
VN

6 1602 - M59 begins insipid steps near the nest. Number 2 is short, the next of 1 note only. He switches then to 3 weak skids.

1604 - M59 feeds 1, in 7 seconds jumps across the nest and goes SW. *Bingy*

1618-1/2 - 59F comes and feeds 1. It raises its tail in 5 seconds, shakes it a little from side to side and produces a sac. 59F takes it NE.

13 1632-1/2 - M59 sings fragments of 2 steps, sings a skid, a 5-note type-8, a 3-note insipid, 4 skids, 2 notes of a type-8, 3 skids. *change song*

1637-1/2 - M59 feeds 1, in 7 seconds hops across and goes SE. *over*

1647 - 59F feeds 1, in 6 seconds takes a sac NE.

1652 - M59 begins his hodge podge of faint songs, sung irregularly and often close together.

6 1653-1/2 - After an insipid and 5 skids he flies W into the nest tree 2 feet from the ground. In 8 seconds he climbs to the nest, feeds a green caterpillar, goes SE in 10 more seconds. *over*

1700 - The sky and wind are unchanged since 1600; it has been sunny the whole hour. It's 78°.

1703-1/2 - 59F feeds a large load (at least 2 items, 1 a caterpillar) to a young; a small part sticks to her upper

mandible. The young beg so that I'm sure I hear them. In 50 seconds 59F hops 2 inches down to the SE to a supporting branch, in 10 seconds goes back to the nest and feeds the scrap to a different bird. In 10 more seconds she goes SW. TB

2 1707 - M59 sings 2 fragmentary insipids, switches to skids. He's 15 yards SE of the nest.

5 1710 - M59 after 8 skids feeds a 1-1/2 inch green caterpillar. In 6 seconds he takes a big sac SW. ↗

At 1720 the young are moving their heads up at times. Sometimes the bill is held open when the head rests on the rim, though it is too cool for this to have anything to do with the weather.

1725-1/2 - 59F feeds 1, turns and flies SE in 10 seconds.

1727 - I watch the young and see both preening and 2 upward stretches. (Have I ever seen an adult stretch upward?)

10 1733 - M59 sings extremely faint, short notes, all fragments of songs, with only the skids sounding much like the usual songs. There are 10 of these to 1737-1/2. At 1740 he begins again; sings 5. ↗

5 1745 - M59 feeds 1, perching on the S rim for only the second time today. In 30 seconds he goes E just as 59F arrives.

1745-1/2 - 59F feeds 1, perches on the S rim and pecks a little while looking quietly into the nest most of the time. She leaves at 1748-1/2.

1750 - 59F feeds 1, pokes once, goes SW after 15 seconds.

1800 - It's perfectly clear and has been for 45 minutes.

There is still a moderately strong SW breeze at times. It's 76°.

1810-1/2 - 59F feeds 1, in 6 seconds takes a sac NE.

Note that her visits have nearly all been made in silence this afternoon.

A Sparrow Hawk flies over noisily for the third time today (the others not mentioned). *Spar Hawk*

1818-1/2 - M59 begins to sing in the trees near the nest, a fragment and then 5 skids to 1820.

1821-1/2 - M59 feeds 1 a green caterpillar, in 6 seconds goes SW. *U*

1850 - 59F feeds 1 (2 items I'd guess), goes SW in 60 seconds. The young beg very actively for 30 or 40 seconds while she's there. I can hear them.

The female touched the young lightly 2 or 3 times about 15 seconds after feeding. I don't know which one she touched, but it is possible she was stimulating defecation. *7*

1857-1/2 - M59 skids, comes S toward the nest.

1900 - The sky is cloudless, the wind down, the temperature 75°.

1901 - After 7 skids M59 feeds 1, in 10 seconds, takes a sac SW. *U*

1905-1/2 - 59F flies to the ground below the nest in a twisting manner as though in pursuit of a flying insect. Almost immediately she feeds a big load (probably 3 pieces, 1 a caterpillar) to 1, takes a sac W in 5 seconds.

4 1931 - M59 sings 4 insipid steps in the sassafrass trees by me.

1932 - M59 feeds 1, takes a sac SW in 10 seconds.

7 1937 - M59 sings 7 insipid steps SW of the nest.

1939-1/2 - M59 feeds 1 at least 1 caterpillar, eats a sac, goes E in 10 seconds.

1949 - After calling loudly but infrequently for 3 minutes 59F feeds 1 a load so big it has to pump hard to swallow. She goes NE when M59 arrives. She was on the SE rim, one of about 5 times today she hasn't used the S or W rim.

1950 - M59 feeds 1, goes SW in 6 seconds. No preliminary singing.

2000 - It's clear, windless, 70°, getting damp.

2017 - For 3 minutes there are indeterminate calls occasionally in the edge growth E of me. They may come from 59F.

2020 - The young gape in the nest.

2030 - It looks as though 59F will not brood tonight, only the seventh night of the nestlings' lives.

It's 68°. The day has been 75% sunny and would have been more so if the clouds (which were thin) hadn't come at mid-day. No weather factors inhibited normal behavior.

2030 - 59F suddenly comes to the nest. It's too dark to see if she feeds. She broods facing E just as the Whip-poor-wills begin to sing.

2035 - I leave. It's very dark, and all day birds are silent.

839
7/23/56
VN

note
840
854

July 23, 1956

A nearly cloudless dawn, windless, dewy, with a 60° temperature. Present from 0500 to 1600; Board present from 1545 to 2100.

A red fox is beside V when I arrive.

down

T60 at 0500 - 60F seems to be on the nest facing S.

It's too dark to be sure.

0513 - I think 60F just left the nest, but I still have trouble seeing clearly.

0516 - 60F comes to the nest without food and immediately settles facing S. She could hardly have left to feed for herself in view of the poor light. Maybe she hopped down into the nest tree somewhere.

0526 - 60F moves her tail a minute ago, and now she rises to look in for a second, settling afterwards.

0527 - A Worm-eating Warbler calls repeatedly 6 feet up in the nest tree without attracting 60F's attention.

Worm-eating
Warbler

0530 - 60F rises and inspects the nest. She sits high, necessarily I suppose.

0532 - Again she rises.

0548 - 60F is sitting quietly. I can't see her head or her eyes.

0558-1/2 - 60F leaves the nest and comes low to the NW. She looked about for 30 seconds or more first.

0600 - The sky is becoming cloudy, especially in the N.
It's still windless; 62°.

0605 - 60F returns silently and feeds 1, broods in 10
seconds. She comes from the N, lands about 3 feet below the
nest, hops up to the N rim, broods facing S.

Note: It can be assumed today that the approach is by
landing a few feet below and hopping, that 1 bird is fed, that
brooding is engaged in while facing S, and that 60F is silent
throughout, unless the contrary is explicitly stated.

0618 - 60F turns and drops low to the NW, flying at least
40 yards at a 2-1/2-foot height.

0620-1/2 - 60F feeds, flies low to the NW in 6 seconds.
She lands somewhere behind me and calls "check" faintly about
every 5 seconds.

0623-1/2 - She calls "check" 2 or 3 times loudly, goes
and feeds, drops N and forages in the grass and low growth
up to 6 feet high, 20-25 yards from the nest, while calling.
The calling is surely because of my presence. She quits it
in 2 minutes.

0628-1/2 - 60F calls twice in the nest tree, delivers a
green caterpillar, drops with a fecal sac and flies NW low.

0629-1/2 - 60F feeds after 1 call, in 10 seconds takes a
fecal sac W low.

0640-1/2 - 60F delivers 1 green caterpillar 7 times in
90 seconds, quite possibly to the same nestling. She then

looks in for 20 seconds, then broods.

0645 - The sun is visible through the cloud cover for the first time, but it won't last more than 2 or 3 minutes.

0655 - 60F drops NW, goes at least 40 yards at a 2-or-3-foot level. She looked around for 75 seconds first.

0658-1/2 - 60F feeds an adult insect or a spider, in 8 seconds broods.

0700 - It's windless, 90% cloudy with a cover that is high and relatively light, 67°. Because of the dew and the absence of sunshine there is a slight mist.

0712-1/2 - After 2-1/2 minutes of looking around, 60F jumps to the NE rim, stretches her wings a very little, drops NE.

0713-1/2 - She feeds, in 7 seconds drops NW with a sac.

0716-1/2 - 60F comes from the N and feeds a medium-size beetle or true bug (I'd guess), having to soften and deliver it 3 times. She looks in for 15 seconds, broods after 45 seconds at the nest.

0722-1/2 - 60F drops NE after 1 minute of looking.

0728 - 60F feeds and broods after 7 seconds. I'm having trouble seeing her arrive, although I'm on the lookout constantly. She appears first when only a foot from the nest; it may be her first landing in the tree.

0735 - 60F drops to the NE but turns and flies low (at 2 feet) to a 2-foot perch 40 yards N. She looked around for

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7/23/56
VN

2 minutes and paused for a second, half out of the nest, before leaving.

0736 - She brings an adult insect, small. In 10 seconds she eats a sac and drops NW.

0740 - The sun is bright for the first time. It's shone through a thin cover for 10 minutes.

0742 - 60F feeds a fly or wasp with its wings still on, broods in 10 seconds.

0744 - 60F leans out and tucks in a loose end on the nest, N 13 the second time she's done so today.

The sun at its present angle touches the side of 60F's head.

0752-1/2 - 60F leaves and goes NE after 30 seconds of looking around. When she goes NE she never drops immediately, since the nest is on the SW side of the tree. She hops out a foot or less, then either drops or hops to the edge of the tree.

0800 - It's calm, 80% clouded over, 76°. The sun is shining at the moment, as it has during 25 minutes of the hour. It is never quite at its brightest, and clouds keep covering it every few minutes.

0801-1/2 - 60F feeds, in 5 seconds takes a sac NE. She drops low to the NW, turns NE as she goes.

0811 - 60F lands 7 feet below the nest with a 1-inch

brown caterpillar. She hops up and delivers it, in 5 seconds eats a small fecal sac, broods.

0820 - 60F flies S but drops hardly at all from the nest height.

0824-1/2 - 60F feeds an adult insect, in 3 seconds goes W.

0828-1/2 - 60F feeds an adult insect and a small green caterpillar to 1 bird, broods in 10 more seconds.

0834 - After a minute of looking 60F leaves the nest.

0838 - 60F feeds a black bug or a wasp, in 10 seconds drops 35 yards NW and lands 1 foot up in a dwarf sumac to which I've seen her go before.

0839 - I may have heard a short skid song.

0845 - I hear 2 fragmentary insipid steps near the nest, then probably the sound of brief (1- or 2-second) fight notes.

0846-1/2 - I see a FW in the sumac, 2 feet high, below the nest tree. It is 60F and for 1 minute she steadily invites copulation from a male I can't see (and I can see pretty well--is he here now?). The female's position is this: She crouches a little, lowers her forward half so that her breast nearly touches her perch. Her head she raises so that the bill points at about 115° from the horizontal. Once, at least, I'm sure she opens her bill. Since her tail is elevated, and very slightly fanned, to a nearly vertical position, her back is consequently much arched. Her wings are spread so that

to

cop.
point

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the wrists are 1/4 to 1/2 inch from the body, but the primaries are nearly parallel with the body, angling away slightly at the rear. The wings droop a little, and her leaning forward makes the wrists seem to be thrust downward below the level of the distal ends of the primaries. In this position, which she always maintains in silence during my watching her, she keeps hopping around a few inches at a time, sidling along a limb or down a little tree trunk. As she moves she constantly shifts in and out of the inviting position. Presumably the absence of the male causes her to move in her excitement; motionless maintaining the position would be the true preliminary to copulation.

In 30 seconds I see 60F for a second in the dogwoods S of the nest. Did she flutter in flight a little?

0855 - A few drops of rain fall.

0859 - 60F brings a green caterpillar, calling 3 or 4 times before leaving the ash for the nest tree. A male follows her and sits quietly 3 feet away in the nest tree. When she leaves in 30 seconds (after feeding) and goes E into the woods trees 30 feet up, he follows. I see no display. He is banded, silver over brown, right leg; this is M58. Since his rectrices are full and unpainted he must have molted [?]. I see the 2 birds together within 2 to 20 feet for 1 minute, then lose sight of them.

T58 is about 3/4 of a mile away.

0900 - It's windless, dark, 77°.

0905 - 60F brings a big green caterpillar, comes alone, behaves normally. She eats a sac and broods in 15 seconds.

0911-1/2 - 60F leaves and goes S.

0915 - It clears a little and the sun comes through temporarily.

0918 - 60F lands 1 foot S of the nest at nest level. She delivers 1 green caterpillar 5 times, after a minute broods.

0926-1/2 - 60F leaves and goes N to the ash and beyond. She first rose half off the nest and looked around for 1 minute. She then stood up and looked for 45 seconds. Then she turned and hopped through the trees at nest level.

0938-1/2 - 60F brings an adult insect and a small green caterpillar, feeds 2 I'm sure. In 15 seconds she drops SW with a sac, and although she passes out of my sight I'm pretty sure she was about to land low 30 yards from the nest just as she disappeared.

0946 - 60F feeds a green caterpillar, in 15 seconds broods.

0948 - She sits up and pokes the young for 30 seconds, broods.

0950 - She repeats but for 20 seconds. It's completely cloudy, 76°, presumably warm enough to permit normal behavior without the special features that accompany heat and direct (overhead?) sun.

0955 - 60F leaves after 15 seconds of looking around.

1000 - It's 100% cloudy, light but with no glare, windless, 78°. The hour hasn't varied much from this.

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1001-1/2 - 60F feeds 2 with perhaps 3 items. I watched her collect these SE of the nest 25 feet up in a red oak top and then from 12 to 5 feet up in hornbeam and sumac. She called "check" quietly once per 2 seconds and moved very rapidly. In 15 seconds she drops W.

found

The encounter with M58 was extremely useful for 3 reasons: (1) It suggests that males whose mates quit nesting don't wander far away from the area. (2) It suggests that some males molt much earlier than others, possibly the result of hormone changes connected with reproduction or activity with the young. (3) It was the best chance I've had to see a female in position for coition; the length of time and the absence of the male combined with a close view to give me a fine opportunity.

1017-1/2 - 60F feeds a green caterpillar, delivering it 6 times in 30 seconds. She carries a sac W low out of sight, following a path I've seen her use before.

1019-1/2 - 60F feeds 1, pokes and looks for 20 seconds, broods.

1029-1/2 - 60F leaves the nest after looking around a good deal of the last 5 minutes she was present.

1046-1/2 - 60F brings a small, food item, in 8 seconds drops W and lands probably 20 feet away.

1048-1/2 - 60F returns with an adult insect. While she is feeding it, an unbanded male, frowsy and molting but with

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a tail, flies to the nest tree, lands 2 feet from 60F and looks at her alertly. Both are silent. In 5 seconds the male flies E into an oak 35 feet high. In 20 more seconds 60F flies E and I see the male crouch and look down at her. Then I lose both. ♂ ♀

This may be M60. His presence may explain the fight notes. I thought I heard when M58 was here.

1055-1/2 - 60F comes alone with a large green caterpillar, in 7 seconds takes a sac NE.

Fox squirrels are numerous in the edge of the woods. pre

1059-1/2 - 60F returns and feeds 1. The unbanded male comes silently to the nest tree. In 20 seconds 60F broods. The male hops up to within 2 feet of the nest and she raises her head to look at him. He's out of my sight and evidently leaves the tree in a few seconds. At 1100-1/2, 60F leaves and flies 15 yards SE out of sight. ♂ ♀

1100 - The weather is unchanged.

Note that the things seen today wouldn't happen to a mated female unless (like 3F) she got off her territory. [Territorialism is useful during rearing of young.] pre

1107 - An occasional drop of rain falls.

1113 - 60F returns and feeds 2. A male follows her immediately, lands 2-1/2 feet from and below her. She broods in 20 seconds. The male hops up; he is banded green over silver, left leg, M53. 60F sits quietly and M53 looks about within ♂ ♀

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1-1/2 feet of her. He flies away to the S and I hear a few little "tsu" notes that may be his. 60F immediately rises and flies S after M53. Trees screen her so she's out of sight right away. I saw no paint on the male's tail. He was molting on the flanks, as was the unbanded bird.

1119-1/2 - 60F brings 1 green caterpillar, in 10 seconds drops to the W with a sac. She was unaccompanied.

I've seen 60F without food only once. Is that why I've seen sex display only once? Are the males different in attractiveness (all have acted alike)? Did the one display exhaust 60F's capacity? If M58 has molted it seems very unlikely he would be able to copulate. ^

1129 - 60F feeds 1, sits on the rim quietly looking in from the N (as always), in 40 seconds drops E. I see no male.

There are still one or two drops of rain falling; it's so slight its almost an occasional condensation.

1141 - 60F brings a green caterpillar. She stands looking into the nest after passing it. At 1141-1/2 a male (legs unseen) lands 6 feet below 60F, sits 20 seconds, hops slowly up. She then broods.

At 1142-1/2 the male flies S from a position 1 foot below 60F. I think he calls "tsu" once about when he flies. She sits as deep as she can on the nest. 519

1144 - It rains a little harder, still not enough to put on my rain gear.

1149 - After looking around for 1 minute 60F drops straight down to the S.

1152-1/2 - 60F brings what is almost surely a spider. After 3 deliveries she takes a sac low to the W 35 seconds later.

The rain is so light that it can have no effect on 60F.

1156-1/2 - 60F brings a green caterpillar, delivers it 3 times, in 25 seconds takes a sac low to the W.

1200 - It is 100% cloudy, light enough to shed a glare, calm, and raining drops so small and so few that I don't close my notebook. It's 73°.

1215 - 60F brings a 1-1/4-inch fat gray caterpillar, offers it about 15 times in 2-1/4 minutes, softening it frequently. Then she flies W with it as though it were a sac.

1218 - 60F returns with the same caterpillar. After a minute it is eaten. She eats a sac, looks in, broods at 1219-1/2.

The rain stopped about 10 minutes ago; it was unnoticeable.

1229 - 60F looks around very actively for 30 seconds goes NE.

1246 - See bottom of page.

1254 - 60F leaves to the NE after 2 minutes of looking around her. She fairly frequently picks at the rim of the nest while she's brooding. 3

1300 - It's windless, completely cloudy but with a glare, 78°. The occasional drops of rain are falling again.

1246 - 60F feeds a brown larva, eats a fecal sac, in 30 seconds broods.

1308 - 60F feeds, in 5 seconds goes W.

1309-1/2 - She feeds an adult insect, in 15 seconds goes SW.

It's still raining a little.

1317 - 60F brings a fat green caterpillar which is eaten on the second delivery. She broods at 1318.

1327 - 60F leaves the nest.

1340 - It begins to rain a little harder, enough to be called a rain.

1341-1/2 - 60F brings a green caterpillar, in 10 seconds takes a sac W.

It almost quits raining.

1348-1/2 - 60F feeds a large green caterpillar. In 25 seconds she takes a sac low to the W.

1400 - It's nearly windless but with an occasional N breeze; sprinkling lightly from a sky like the one described an hour ago; 75°.

1402-1/2 - 60F feeds a green caterpillar, broods in 10 seconds.

1413 - 60F drops to the NW and passes me flying about 1-1/2 feet high.

1430 - 60F feeds a big green caterpillar on the third attempt, broods at 1431. The weather is as it was at 1400 except that it's 78°.

1439 - 60F leaves the nest and flies 30 yards or more N

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into the trees at the edge of the woods.

1444-1/2 - 60F feeds a big green caterpillar after 4 deliveries, goes low to the W in 30 seconds with a sac.

1452 - 60F delivers a green caterpillar 3 times, broods after 30 seconds.

1500 - The weather is the same as at 1400 except that it's 78°. The rain doesn't seem to affect the behavior of 60F unless it's responsible for her brooding.

1500 - 60F drops straight down to the SE.

1518 - She feeds a green caterpillar and without any pause gets a fecal sac which she takes W.

The rain has slacked off to almost nothing. I've worn rain gear for an hour but I see that the ground under little dogwood trees isn't even wet.

1529 - 60F feeds a pinkish spider on the third try. She looks in, begins to brood at 1530.

The rain stops altogether at 1530. It's 77°, otherwise unchanged.

1542-1/2 - 60F leaves to the NE.

Board arrives. I check and find 3 young in the nest.

1600 - I leave.

T60 at 1545 - I [Board] arrive and relieve Nolan. 60F is off the nest.

1548 - She returns and feeds 1, takes a sac low to the W.

1558 - 60 returns and feeds 1, settles S. [South can be assumed unless otherwise stated.]

1601 - 60F leaves and goes S.

It's 74°.

1606 - She comes and feeds 1 a green larva, settles.

1613 - 60F leaves to the E.

1621 - She comes and feeds 1, settles.

1630 - 60F leaves.

1643 - She returns, feeds 1, sits high.

1651 - 60F leaves.

1700 - It's 73°.

1701 - 60F comes and feeds 1, takes a sac W.

1705 - 60F comes and feeds 1, settles.

1714 - 60F leaves. A very light rain begins.

1721-1/2 - She comes and feeds 1, stays on the N rim 30 seconds, goes W.

1729 - She comes and feeds 1, goes W (possibly with a sac).

1735 - It rains harder.

60F returns and feeds 1, settles.

1746-1/2 - 60F leaves. There is very little rain.

1754 - She returns and feeds 1, takes a sac W.

1800 - It's 72°.

1804 - 60F returns and feeds 1 a large green caterpillar, goes.

1805 - A very light rain begins.

1814 - 60F comes and feeds 1 a large green caterpillar,

settles. The rain stops.

1821-1/2 - 60F leaves.

1830-1/2 - She comes and feeds 1 a large green caterpillar, takes a sac W. She always drops to about 3 feet high to fly with a sac.

It's raining a little.

1834-1/2 - She comes and feeds 1 a large green larva, settles.

1843 - 60F leaves. The rain has stopped.

1850 - She comes and feeds 1, in 30 seconds takes a sac W.

1859 - She comes and feeds 1, settles.

1900 - It's 70°.

1908 - 60F leaves.

1914 - She comes and feeds 1, sits high.

1920 - A light rain begins.

1921-1/2 - She leaves to the NW.

1933-1/2 - She comes and feeds 1, stays 2 or 3 seconds.

The rain stops.

1942 - 60F comes and feeds 1, in 60 seconds takes a sac W.

2000 - It's 69°.

60F comes and with difficulty feeds 1 a large green caterpillar. She settles facing S.

2003 - She is settled low, facing NE.

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2030 - Her position is unchanged.

I leave the territory.

T59 at 2050 - I check to see if 59F is brooding. She
is, settled low and facing NW.

brood

2100 - I leave.

The day has been 3% sunny, but I [Nolan] doubt if 60F
was much affected.

[Note: Regarding today's feeding data, where the food
item is not specified it was not identified; where the number
of young fed is not specified, that number was always 1.]

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VII

July 24, 1956

A heavily overcast calm morning with very little light at 0515; temperature 66°. Present from 0500 to 1145 and from 1530 to 1730; Board present from 1330 to 2030. *dawn*

759 at 0505 - It's much too dark to see the nest.

0520 - I can make out the shape of 59F facing E on the nest.

0528-1/2 - 59F gets to the N rim and for 1 minute faces away from the nest. She then turns and faces it.

0530 - 59F leaves and goes SW.

0532-1/2 - A nestling stretches up.

0544 - The young have gaped occasionally, now seem to have gone back to sleep.

0556-1/2 - 59F feeds 1 after foraging near me and "checking" loudly for 7 minutes. The young all gape but subside within 2 seconds after the feeding. She then stands perfectly quietly on the SW rim, from which she fed, 1 foot holding a nest twig, the other the rim.

0600 - It's calm, 100% overcast, 67°.

0600 - 59F hops down 2 inches, in 15 seconds goes W. At her motion all young gape.

0606 - M59 skids SE of the nest, full songs.

3 0609 - M59 feeds 1 after 3 songs. As usual he climbs up along the nest branch to the N rim. *o*

3 0619-1/2 - M59 sings a short abortive song, then 2 weak skids N of the nest.

0615 - M59 feeds 1 a caterpillar, takes a sac SW.

0621 - M59 feeds 1, in 5 seconds carries a sac S at least 30 yards, probably more.

0624-1/2 - 59F feeds 1, in 8 seconds goes N. The young gape the entire time she's there.

0630-1/2 - 59F after calling 3 or 4 times for 1 minute goes and feeds the highest nestling, hops 3 inches to the little branch under the nest, goes W.

0637 - M59 feeds 1, goes SW in 10 seconds.

0638 - 59F feeds the nearest and highest, reaches down at its tail and presumably touches it, gets no sac, goes SW in 15 seconds.

0642-1/2 - 59F feeds 1, takes a sac SW in 5 seconds.

0642-1/2 - M59 skids to the SW.

4 0645-1/2 - After 4 songs M59 feeds the highest, in 8 seconds goes SW. He gets to the nest by landing only a foot or two high in the tree and hopping upward. I've seen him do this before today and on July 22.

0647 - 59F feeds the highest, in 5 seconds gets a sac from it and goes SW.

0650 - M59 skids to the SW once.

0650-1/2 - 59F feeds 1. She goes SW in 6 seconds when M59 arrives.

0650-1/2 - M59 feeds the highest (which I'm not sure the female did) in 10 seconds goes SW.

2

0654 - M59 skids SE of the nest twice.

0655-1/2 - 59F feeds the highest, in 7 seconds goes SW.

The feeding usually occurs instantly when the adult arrives, so there is little chance to decide why a particular nestling is the one fed.

0658 - 59F feeds 1, in 5 seconds drops straight down to the SE. It's impossible to see the food items so far. E.g., the female's back is always turned.

0700 - It's still, dark and threatening, 68°. The rain is almost falling; you can feel it in the air.

0704 - M59 feeds a large object, gets a sac in 4 seconds and goes SW.

0711 - 59F feeds 1. She may eat a sac, but I think it's only a second attempt to deliver the food.

0711 - M59 arrives within 15 seconds of the female, with a big caterpillar. He feeds the highest. 59F takes the food, returns it to the same bird. In 20 seconds M59 leaves. 59F begins to pick at and eat small objects on leaves around the nest and one on the rim. Having done this 5 times from the rim, she hops around the nest within 4 inches, eats 2 or 3 more objects, goes W at 0713.

0719 - M59 flies in low from the E, hops up and passes a brown caterpillar. In 10 seconds he goes NE.

A Blue-gray Gnatcatcher is and has been flying in and near the nest tree. So far the PW's haven't been present

when he has.

2 0725-1/2 - M59 skids twice E of the nest.

0727-1/2 - 59F takes a very large green caterpillar, holds it above the nest 5 seconds before delivering it. I think only 1 young gapes. The bird fed produces a sac and in 10 more seconds 59F takes it NE.

At 0750 there has been a long inactive period, but the young aren't gaping or showing restlessness; in fact all heads have been out of sight for many minutes.

0757-1/2 - 59F feeds 1, takes a sac NE in 10 seconds.

She was on the N rim, a rare perch for her.

0800 - M59 sings 1 skid.

0800-1/2 - In less than 1/2 minute M59 feeds 1, goes SW in 10 seconds. 81

0900 - It's gray, calm, 70°.

0803 - 59F feeds a large caterpillar from the E rim, another unusual perch. She then stays and picks occasionally at the young and looks at them, the first time she's done so today. I can see her picking something from the visible parts of 1 young bird, so presumably many of her pokes in the cavity are for the same purpose. Her actions are desultory now. B

0820-1/2 - 59F leaves the rim of the nest. The young gape, probably at the motion.

The rapid rate of feeding earlier proves that it isn't inability to find food which is responsible for the present NB

long intervals.

0837-1/2 - 59F feeds the highest a caterpillar and probably something else. In 15 seconds she goes NE.

0844 - 59F feeds 1, in 10 seconds goes W.

2 0844 - M59 skids very weakly twice.

0844-1/2 - M59 feeds 1, takes a sac SE in 5 seconds. G-1

10 0849 - M59 sings 10 skids, beginning E of the nest and moving W to the group of trees it's in. At 0855 he stops.

0900 - It's unchanged except for the temperature, 72°.

3 0903-1/2 - M59 skids W of the nest 3 times.

0909-1/2 - 59F feeds 1. I can hear the young calling.

0909-1/2 - M59 arrives and 59F leaves. M59 feeds the highest, takes its sac and goes SW. Each adult was present about 10 seconds. G-1

4 0910-1/2 - M59 begins to skid weakly to the SW near the clearing.

0913 - 59F feeds 2 caterpillars 1 at a time to the same bird, the highest, on its first gape. It may be that the 2-delivery feedings aren't to 2 nestlings as often as I've thought.

The young are active in spurts, gaping or extending their necks. I've seen preening, stretching up, and upward wing stretching this morning.

0929- 59F feeds 1, takes a sac N in 5 seconds.

2 0929 - M59 skids 2 times.

0934 - M59 feeds 1, goes SW in 10 seconds. ✓

0934 - The sun comes out, and the overcast begins to thin.

I think M59 nearly turned into the sun bathing position at the nest. The sun hits the N rim and parts of the nestlings' heads when they extend their necks. Sun 45°

0937-1/2 - M59 skids once in the trees W of the nest.

0938-1/2 - M59 feeds the highest, takes a sac SE into the woods in 5 seconds. ✓

The young preen busily, their breasts and their backs or scapulars. I've seen several upward stretches.

0950 - The sun goes under again.

0959 - M59 sings 2 insipid steps SE of the nest.

0959-1/2 - M59 feeds 1 from the S rim, the first time today. He gets a sac in 8 seconds and takes it at least 45 yards S, flying 20 feet high. ✓

1000 - It's just become sunny again. It's windless, 75% clouded over, 76°.

I'm convinced these young aren't well enough developed to leave the nest tomorrow. They keep their eyes closed too much and are insufficiently feathered.

1004 - M59 feeds 1 object to the highest, goes SW after 20 seconds of watching. ✓

The young rest their heads on the rim frequently, often with bills open. This latter was true before the sun came

out too. A little sun gets through to the nest now at 1010.
At 1023 the sun disappears. At 1042 it comes out again for
5 minutes.

1048-1/2 - M59 skids W of the nest.

2 1049 - After 2 songs M59 feeds a caterpillar, in 10
seconds takes a sac SE into the woods. G

4 1051 - M59 sings 4 skids in 2 minutes.

1051-1/2 - 59F feeds 1, takes a sac NE.

1 1055 - M59 may sing part of an insipid step.

1100 - At the moment it's sunny with the sky 75% clouded.
The sun shone 30 minutes last hour, in short periods. There's
almost no breeze. It's 76°.

Note how much less vocalizing the 59's do today before
going to the nest. I'd say the observer is no factor in their
behavior.

1107 - M59 feeds 1, takes a sac SE into the woods in 5
seconds. On these trips he goes straight into high, heavy
woods, not just to the edge or to scattered trees. G

1115 - A little sun hits the cavity.

1119-1/2 - 59F feeds 1, picks at the nest rim twice,
jumps 3 inches to the little branch, goes W after 20 seconds
all told.

1130 - The sun is still out, and of the 2 nestlings I
can see, one has its bill open. It's 84°. In 3 minutes all
open their bills. B

1145 - A Broad-winged Hawk flies over calling.

The sun goes in.

1200 - The sun just came out, was out 45 minutes in the hour. The sky is 50% clouded. It's still, 78° (presumably because the sun was in).

1201 - M59 comes and feeds 1. Within a second 59F lands at the nest.

1201 - 59F feeds 2 green caterpillars to 1 nestling. M59 stays 20 seconds, 59F 60 seconds. She then comes to within 10 yards of me and calls 4 or 5 loud "checks."

1209 - M59 feeds 1, goes SE in 10 seconds.

1209 - 59F lands a second before the male goes, hops up to the SW rim as usual. She feeds 1 with 2 items, almost seeming to regurgitate one of them. She stays 1 minute.

The young become quite active, with much stretching up and tossing about in the nest. All preen, one working on its back.

1215 - 59F feeds 1, goes W in 10 seconds.

1215 - M59 arrives 5 seconds after the female goes, feeds 1, stays 20 seconds and goes N 8 feet to the walnut.

1220 - One of the young jerks violently up and down repeatedly, using its wings. The impression I get is as of a bird trying to extricate a foot. It does this 3 times, settles deep.

1228 - 59F feeds at least 2 items in 2 separate deliveries, probably to 1 bird. In 5 seconds she takes a sac NE. She foraged above me (she sounded about 20 feet high) to the E and

called "check" for 4 minutes, about 20 calls a minute. I'd say her calling is almost limited to when she happens to get near me or to see me.

1234 - M59 skids once, sings 4 insipid steps, skids once.

1237 - M59 feeds 1 from the S rim, immediately takes a sac 10 feet N to the walnut and perches there 9 feet up for 2 seconds, goes on N with it.

The sun hits the nest in spots.

1240-1/2 - M59 skids 4 times in 3 minutes beside the clearing.

1249 - M59 skids (weakly, as usual) once W of the nest.

1255-1/2 - 59F feeds a large green caterpillar, taking it back from 1 bird and giving it to another. The nestling has some difficulty getting its tail end up to defecate, but he does and shakes from side to side. 59F goes N with the sac.

1257 - M59 skids comparatively loudly and vigorously W of the nest 10 times.

1300 - M59 feeds 1, in 8 seconds goes SW. The young now beg noisily when an adult is present. The note is a vibrant, resonant sound, almost toneless. It's not anything like as loud as the call given by the fledgling.

1300 - The sun, which was out 50 minutes in the hour, is now in; the sky is 85% covered. It's windless, 80°.

1303 - M59 skids to the W 7 times.

1304-1/2 - M59 feeds 1, takes a sac SW in 10 seconds.

Again the young has trouble because the nest is crowded.

1310 - 59^F feeds 1, takes a sac N in 10 seconds. She'd called "check" about 15 times from 1307 to 1309 in the clearing near me.

The young have seemed more active in the last hour than perhaps anytime all day. Much of their motion is preening. Now at 1315 they go into an inactive period. How much is their activity due to excitement created by feeding?

1326-1/2 - 59^F feeds 1, sits for 30 seconds just below and E of the nest, goes SW and calls "checks" in the clearing. The young are active for 3 minutes after she goes.

1334-1/2 - M59 sings an insipid step, goes and feeds 1. He leaves in 10 seconds, seems to fly-catch as he leaves. His throat is molting a lot.

1336 - M59 feeds 1 and in 10 seconds goes SW.

1336-1/2 - 59^F feeds 2 green caterpillars to 1 young, eats a sac, leaves at 1337-1/2.

1340 - Board relieves me and I go.

T57 - I cover this territory for 45 minutes without seeing the 57's. However, in the far corner of this area I find a pair of unbanded PW's with young off the nest. The female puts on a prolonged distraction display so I assume the young are newly fledged. I'm going to try to catch the pair, so I go home to get a net.

1445 - I leave.

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1530 - I return. I put the net up where the female displayed, but now she seems relatively uninterested. I put it up in 2 more spots before I finally learn that the young are too mobile; they're about 5 days off the nest, have half-inch tails, are noisy. The female hits my net 3 times, twice squeaked in by me, but she never gets caught.

molt

Both adults are molting a good deal; it is most conspicuous on the male's flanks and on the female's throat, breast, and belly. This pair must have built about 6 days before the 59's did.

1730 - I leave.

T59 at 1340 - I [Board] arrive and relieve Nolan. 59F is not on the nest.

1343 - 59F returns, feeds a large red caterpillar, after 2 minutes on the rim goes W. The young called just before 59F's arrival.

1353 - 59F comes and feeds 1, perches on a twig 2 or 3 inches E of the nest for 1 minute, goes E. One young calls while present.

1359-1/2 - M59 feeds 1, goes W, moves E about 20 feet from the nest.

1400 - It's 78°.

1407-1/2 - M59 feeds 1, in 10 seconds takes a sac W.

1431-1/2 - 59F comes and feeds 1, in 15 seconds takes a sac N.

1445 - M59 feeds 1, stays 20 seconds, goes W.

1447 - 59F comes and feeds 1, for 5 seconds perches 2
or 3 inches SE of the nest, goes W.

1500 - It's 80°.

1520 - One young preens; another gives an upward stretch.

1522 - M59 arrives with food.

1522 - 59F arrives simultaneously. M59 feeds 1, stays
3 seconds from the time he reaches the nest, goes SE. In 5
more seconds 59F takes a sac E.

1600 - It's 78°.

1633 - M59 feeds 1 a large green larva, in 10 seconds
takes a sac W.

1634-1/2 - 59F comes and feeds 1, perches in her usual
place for 5 seconds, goes W.

1640 - M59 feeds 1 a large green larva, in 10 seconds
takes a sac W.

1652 - 59F comes, and feeds 1 from the N rim, stays 45
seconds.

1659 - M59 feeds 1. In the 45 seconds he's on the N rim
the young are very active, stretching with bills open.

1700 - It's 80°.

1702 - 59F comes and feeds 1, perches in her usual spot.

I see a young fluttering its wings before it's fed; two
preen vigorously after 59F leaves.

1706-1/2 - M59 feeds 1, in 10 seconds takes a sac SE.

1725 - 59F arrives.

1725 - M59 arrives simultaneously with the female. Each feeds 1. M59 leaves, and 10 seconds later 59F does too. Both use their usual routes [?].

1734 - 59F comes and feeds 1, leaves by her usual route.

1737-1/2 - M59 feeds 1 a large green larva.

1800 - It's 81°.

1810 - 59F comes and feeds 1, perches 45 seconds on the branch by the nest, leaves by her usual route.

1819 - 59F comes and feeds 1, eats a sac, for 5 seconds perches on her "exit" branch; however, she goes next to the nest rim, in 2 seconds goes W.

1844 - After 1 skid M59 feeds 1, in 10 seconds goes W.

1900 - It's 74°.

1918 - 59F comes and feeds 1, goes to a perch 2 or 3 inches away, in 5 seconds goes to the nest. She then hops back and forth between the perch and the nest, and back to the perch, and at 1925 goes.

1925 - M59 feeds 1, in 5 seconds takes a sac W.

1928 - After 2 minutes of "checking" 59F comes and feeds 1 a large green larva. She hops to the perch 2-3 inches away and stays 2 minutes, returns to the nest, quickly goes to the perch, quickly flies W.

The young stretch high. One looked as though it might fall out.

1955-1/2 - 59F comes and feeds 1, leaves by her usual route.

2000 - It's 71°.

59F comes and feeds 1, takes a sec NE.

2008 - 59F comes and feeds 1, sits 1 minute on the nest rim. She moves to her usual perch for 2-3 minutes, jumps to the NW rim of the nest. She then sits on the nest, very high and facing NW.

2030 - 59F is on the nest in the position just described.

I leave.

It has been 35% sunny today. I [Nolan] doubt if the weather affected attentive behavior in any way.

869
7/25/56
VN

July 25, 1956

A very foggy damp morning, windless, 68°. Present from 0615 to 2045; Board present from 0515 to 1200.

T59 - 59F "checks" in alarm at my approach to my post. The young call as though already fledged.

0618 - M59 skids once. 59F is still showing alarm and the call of the young continues.

0622 - 59F feeds 1 in the nest, and I see all 3 are still there. She takes a sac SW. Note that they are calling regularly in the nest today, the rattling fledgling call.

0624 - M59 feeds 1, takes a sac NE.

The young stretch and preen. One motion is to stretch up and at the end stretch the wings upward, a sequence of 2 actions. One young gives a full preening in the nest, including the underwing area. At 0625 the young are silent.

0631 - 59F begins to "check" near me. About 30 seconds later there are some calls from the nest. Is there a connection? At least "check" doesn't frighten them.

0632 - 59F feeds 1, has to reach into the nest for the sac. She takes it NE. The young were relatively silent.

So far today there have been 2 periods for the nestlings: They were calling but out of sight from my arrival to 0622; they've preened nearly constantly since, usually in silence.

0635-1/2 - 59F feeds 1, goes W and comes and calls "check" loudly at me.

0637-1/2 - M59 feeds 1, goes SW in 10 seconds.

The young are silent and have become motionless in the nest. Only the tips of their bills are visible.

0640-1/2 - M59 feeds a big green caterpillar, goes SW. The young are inactive even when being fed. 59F was calling E of the nest for a minute but has quit; evidently she calls on general principles this morning.

0644 - 59F feeds 1, getting little response. In 30 seconds she goes E. Gaping had stopped before she left. One preens afterward, gapes.

0647 - M59 sings an insipid, 9 skids in the clearing and to the E. The young don't raise their heads; the inactive period continues. The male's songs are at pretty full volume. He quits at 0651-1/2. In 1 minute he begins again, his songs sounding weaker, certainly less regular. He quits after 2 in 1 minute.

0656 - The young are out of sight and have been for several minutes.

0700 - It's still foggy, wet, calm. Board's data will show the temperature. There is no action from the 59's.

0703 - M59 feeds 1; all birds are silent. He takes a sac SW. 59F begins to call SE of the nest. The young are back out of sight.

0705-1/2 - M59 skids once.

0706 - 59F feeds 1, goes SE. The young are out of sight.

0707 - Two young preen.

0707-1/2 - M59 skids once.

0708 - M59 feeds 1, takes a sac E. The young are much more eager for the food, continue to stretch and preen when he leaves. One scratches twice with the leg over the wing.

0710 - All young fall back out of sight.

0710-1/2 - 59F feeds 1, gets a small response. In 20 seconds she drops straight down. The young are invisible.

0716 - One young begins to preen and within a minute so does another. At the same time 59F starts to call near me.

0718 - 59F feeds 1, gets a moderate response, though a silent one. She goes E in 15 seconds and continues to call for a minute. The young's heads are in sight, though they're doing little. One stretches up. At 0721 activity is over.

0723-1/2 - M59 skids and also sings little 1-to 4-note fragments of an insipid step.

0726-1/2 - M59 feeds 1 after 9 songs. He gets a sac, drops it accidentally, sits 90 seconds at the nest facing away from it.

0729 - 59F feeds 1, leaves in 30 seconds.

The young became quite active at M59's last feeding, responding strongly to his arrival; stretching, preening, scratching all occur. By 0731 they have subsided and are out of sight.

0739 - One young preens for 30 seconds, falls back out of sight.

It is foggier than ever.

0748-1/2 - 59F feeds a long caterpillar; it looks 2 inches. She gets a faint response, in 10 seconds takes a sac NE. The young begin to preen, quit at 0750.

0748-1/2 - M59 skids to the W, 10 times in 5-1/2 minutes.

0800 - The weather is as it was an hour ago.

The nestlings aren't visible.

0804-1/2 - M59 sings an insipid step, then 7 skids W of the nest.

0806 - 59F feeds 1, takes a sac NE. The young stretch, preen. One stretches its wings up, then gives a full side stretch to the left. The male is singing to the W; no response. By 0809 they have quieted down and can't be seen.

0817-1/2 - 59F feeds 1, goes SW in 15 seconds. The response is moderate, audible, subsides in 1 minute. During the period of restlessness 1 young stretches its wings. At 0820 it preens, stretches up. Another then preens fully for 2 minutes. All then disappear into the cavity.

0829 - A nestling sits high and preens.

0829-1/2 - M59 arrives and feeds the high bird. He eats a sac, picks at the outside of the nest for 45 seconds, goes SW. All young preen till 0834.

0833-1/2 - M59 skids 4 times to 0835.

0835 - The fog is disappearing and there is a glare where the sun is.

0845 - M59 sings an insipid step.

0845-1/2 - M59 feeds 1. It has great difficulty raising its tail out of the nest but finally defecates over the side. M59 takes the sac from the outside surface, eats it, in 15 seconds goes SW.

0846-1/2 - 59F feeds 1, takes a sac NE.

0847 - M59 skids once.

The young are quiet. From time to time one moves a little.

0849 - M59 sings an insipid.

0850 - The sun comes out a little.

0850 - M59 sings 3 insipids to 0855; at 0856 he skids 3 times.

0858 - The sun hits the nest area. One young is preening with energy. In 2 minutes it stretches up, then stretches its wings. The others become a little more active.

0900 - The sky is slowly getting lighter and the sun gets through from time to time. The breeze is in the S.

0905 - One or more nestlings have been continuously active since 0858. One flutters its wings. The 2 most frequent types of conduct by far are preening and jockeying for position.

At 0907, one is nearly on the rim. I can see most of its body for 30 seconds. The sun hits the cavity. All are constantly in motion, a sort of an up-and-down shifting with a little horizontal changing of positions.

0910 - 59F brings a big green caterpillar. The young are silent. Only 2 gape, but they continue to move up and down and to preen. In 2 minutes the pace slows down. By 0913 all are quiet; 2 heads are on the rim. There is preening again by 0914, but they no longer sit high in the nest. All are active though. Occasionally one gapes. At 0918 all have quieted down and seem to be asleep with heads pointed upwards.

0923 - 59F comes without food to the nest branch, sits 45 seconds about 3 inches below and 4 inches W of the nest, hops to the little branch running SE from the nest and sits there 15 seconds, goes W. The young make no response whatever (she was always below the nest); all are out of sight.

0926-1/2 - 59F feeds 1, goes S. The young leave their heads up, two with eyes closed, one preening. One scratches, one stretches up, both stretch up. Preening and general activity go on. At 0932 one flutters both wings (probably a shaking of its feathers generally). Side stretch. Wings up. Constant preening. One gets nearly onto the rim, for 2 minutes preens its belly, back, wings. It flutters both wings and immediately drops backward lower. One opens and closes its bill rapidly 7 or 8 times, as though snapping it. If there were 4 young here I can't think they would or could stay another day.

By 0940 the action seems over. Heads show, but eyes are closed.

0947 - One gets almost to the rim. (For 7 minutes there has been only a little occasional preening.) It falls slowly

back. One gapes. All preen. One gets high in the cavity. Two stretch up. One of these stretches ends with an upward lift of the wings over the back. Is this a part of the stretch? I.e., is the full pattern one of a downward thrust of the wings followed by an upward lift?

At 0951 they are quiet again, moving only a little.

0955 - All young are active, sitting high and preening. This lasts a minute, when they sit down but with their whole heads showing, bills open, eyes nearly closed.

1000 - The sun is still shining through a constantly shifting, thin cloud cover moving on a SW breeze. I can feel very fine drops of water on my skin occasionally. The sun hits the cavity.

1003 - The nestlings become active and sit very high.

1007 - 59F feeds 1; they are noisy. She leaves in 30 seconds, calls "check" loudly.

One young flutters both wings hard.

1008-1/2 - 59F feeds 1, takes a sac NE. The young move a lot, sit high.

At 1010 the pace slows down for the moment. All seem to have their eyes closed. One's head hangs way down over the rim.

1018 - One is preening. By 1020 the action is a little faster. Two scratch in the adult fashion. One gives a side stretch. A Blue Jay calls nearby without evoking any reaction.

near to Jay

Two stretch up. By 1026 they are moving very little, though they sit with their heads up. At 1036 their heads are nearly out of sight; only their bills can be seen.

1100 - The sky is unchanged. It's been sunny for the hour, not quite full sun. The breeze is mild.

The young are still inactive.

1101 - M59 sings 3 very faint insipid steps W of the nest. 59F has called "check" SE of the nest for 4 minutes (I'm pretty sure).

1102 - M59 feeds 1, goes SW. All are very noisy.

1103 - The young make begging noises while motionless in the nest. They repeat this twice more to 1105, uttering 5-10 notes in 5 seconds.

1106 - 59F calls "chick" loudly 20 feet above me. She's got no food. She moves W in a minute and falls silent, but returns to my vicinity at 1109 and calls.

1111 - The young seem to be getting active. One sits high, stretches its wings up. (I think this can be an independent self-sufficient motion and needn't be connected with an upward stretch.) All preen. One stretches up.

1114 - M59 starts up the nest branch from below in the usual way, carrying a 1-1/2 inch caterpillar. The young gape. Suddenly he stops and moves 6 inches off the branch. Instantly all young pull their heads out of sight. He goes 10 feet away to the walnut, returns at 1115-1/2 and the young reappear for

NB
alam

the first time. I don't know what the alarm signal was. M59 goes SW after hopping from the feeding perch to the rim and looking for a sac (but getting none).

At 1123 the young are still active but not in the up-and-down, shifting-around way they were earlier. Nor do they rise onto the nest wall and sit as high. It seems pretty clear that peak activity in nestlings occurs in mid-morning ⁷ and is not repeated during the rest of the day. NB

1124-1/2 - M59 sings 6 skids. S of the nest to 1126.

1126-1/2 - M59 feeds the highest, goes SW in 15 seconds. ¹

The young react intensely, are noisy. At 1128 two stretch up and lean well out over the nest rim.

1130 - 59F feeds 1, goes E. I didn't actually see the food pass. She comes S and calls "check" near me about once every 4 or 5 seconds, then a little more frequently.

1131-1/2 - M59 skids 8 times to 1136.

1132 - The current active period of the nestlings seems to be waning.

1135 - There is an upward stretch followed by a wing stretch, then a wing stretch by itself.

1136 - The young are inactive, two sleeping and one preening a little; at 1137 all sleep.

1138 - 59F feeds, takes a sac E. The young are noisy. One flutters its wings over its back, gives a side stretch.

1140 - I leave the territory and go to T60. See also T59 at 2025.

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JB

See bottom of page
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T60 at 0515 - I [Board] arrive. It's very foggy. 60F
is on the nest facing S.

0535 - 60F leaves the nest.

0541 - She returns and feeds 1, in 5 seconds goes W.

0550 - 60F returns and feeds 1, in 15 seconds takes a
sac W.

0558-1/2 - She returns, perches as usual on the E rim
and feeds 1 a large green caterpillar, in 10 seconds takes a
sac W.

0600 - It's 68° and there is still some fog.

0604 - 60F comes and feeds 1, in 10 seconds takes a sac
NW.

0607 - She comes and feeds 1, in 5 seconds takes sac W.

0610 - She comes and feeds 1, in 5 seconds goes W.

0614-1/2 - She comes and feeds 1, in 25 seconds goes W.

0620 - She comes and feeds 1, perches for 45 seconds on
the rim, then sits high facing S till 0623-1/2.

0630 - 60F comes and feeds 1, in 10 seconds takes a sac
W.

0634-1/2 - She comes and feeds 1, in 10 seconds goes W.

0640 - She comes and feeds a big green larva, in 15-20
seconds takes a sac W.

0645 - She comes and feeds 1, in 10 seconds takes a sac W.

0649 - She comes and [hereafter the last 2 words will be
omitted unless there can be a misunderstanding] feeds 1, goes
W in 5 seconds.

NB

- 0653 - 6OF feeds l, in 5 seconds takes a sac W.
- 0655 - She feeds l, goes W in 20 seconds.
- 0658 - She feeds a large green larva, taking it back 6 times, sits high facing S.
- 0700 - It's 70°, cloudy, still foggy.
- 0702 - 6OF leaves the nest.
- 0727 - She feeds l (taking the item back 5 times) and perches some 30 seconds on the rim, sits high facing S.
- 0732-1/2 - 6OF leaves the nest.
- 0749 - She feeds l, in 15 seconds takes a sac W.
- 0752-1/2 - She feeds l a long green larva, in 15 seconds takes a sac W. [As usual, the number of seconds indicates the total time at the nest unless the context is otherwise.]
- 0800 - It's 74°, cloudy, still slightly misty.
- 0801 - 6OF feeds l (after 5 attempts), in 45 seconds goes NE.
- 0810-1/2 - She feeds l, in 10 seconds takes a sac NE.
- 0825-1/2 - She feeds l a big green larva, in 15 seconds goes W.
- 0834 - She feeds l a big dark green larva, in 10 seconds takes a sac W.
- 0849 - She feeds l a small red larva, goes W in 10 seconds.
- 0853-1/2 - She feeds l, in 5 seconds goes NW.
- 0858 - She feeds l a big green larva, on 15 seconds goes NE.

- 0900 - It's 80°, rather cloudy, no longer misty.
- 0906 - 60F feeds 1, in 5 seconds goes W.
- 0909 - 60F feeds 1, in 5 seconds goes W.
- 0912 - She feeds 1, in 5 seconds takes a sac W.
- 0920-1/2 - She feeds 1 a large green caterpillar, for 1 minute perches on the rim, goes NE.
- 0928 - She feeds 1, in 15 seconds takes a sac W.
- 0938-1/2 - She feeds 1 a big green larva, perches 1 minute on the rim, then sits high facing S.
- 0946 - 60F leaves the nest.
- 0959 - She feeds 1, in 10 seconds goes W.
- 1000 - It's 82°, slightly breezy, mostly cloudy but with some sun.
- 1013-1/2 - She feeds 1 a large dark larva, in 20 seconds goes W.
- 1027 - She feeds 1, in 30 seconds goes NE.
- 1037 - She feeds 1 (on the 5th try), sits 30 seconds on the rim, takes a sac W.
- 1046-1/2 - She feeds 1, in 30 seconds goes W.
- 1052 - She feeds 1, in 45 seconds goes NW.
- 1100 - It's 84°, sunny from time to time.
- 1118 - 60F feeds 1 (on the 10th try) a big green larva, in 1 minute takes a sac W.
- 1144-1/2 - She feeds 1 (on the 5th attempt) a big green caterpillar, takes a sac W.

1156 - She feeds 1, takes a sac SE.

1200 - Nolan relieves me and we inspect the nest: 3
young.

I [Board] leave.

[Regarding Board's food data, the number of young fed
is always specified, and the item or items fed are specified
only if identified. This system of noting is slightly different
from my own for T60 today; see the end of my notes for July 25
for my system.]

T60 - I relieve Board at 1200 for the rest of the day.
There are 3 young in the nest.

1200 - The sky is the same, about 50% clouded but with
some sunlight most of the time. There's a SE breeze; it's
84°.

1204 - 60F brings 2 green caterpillars, delivers them
several times, leaves in 30 seconds.

1213 - 60F brings 1 green caterpillar, goes NW in 25
seconds.

1223-1/2 - 60F feeds, in 40 seconds drops low to the
NW at least 35 yards.

Note: Unless the contrary is stated, it may be assumed
that 60F comes silently, lands from 1 to 5 feet lower than
the nest, and feeds 1 green caterpillar from the N rim.
Whatever she feeds, it may be assumed that 1 young gets all

unless otherwise stated.

1229-1/2 - 60F delivers about 9 times in 1 minute, goes W. She came in from the S.

1236 - An unseen male sings a loud rasping step song of 6 notes, probably within 15 yards of the nest.

1246-1/2 - 60F lands 15 feet up in a dogwood 10 yards from me, calls once, goes to the nest tree, looks back at me for 5 seconds, feeds in 4 deliveries. In 10 more seconds she takes a sac N.

1300 - The weather's the same; it's 85°. The sun shone the whole hour.

1302 - 60F feeds a dark imago, picks at the young or the cavity for 75 seconds, drops NW at least 25 yards.

1319 - 60F feeds, in 5 seconds drops NW.

1326 - 60F feeds (probably) 2 green caterpillars, in 20 seconds drops W. I think she gave a little call like a contact "tsu" before lighting in the nest tree. A nestling hangs its head out, bill open. (This nest isn't visible enough to let me follow nestling behavior.)

1330 - 60F delivers a brown caterpillar, in 12 seconds drops W.

1334 - 60F feeds 2 green caterpillars, 1 small, in 15 seconds drops W. On the trips W she passes me flying 2-4 feet high and goes on; she's gathering food at least 25 yards from the nest.

1339-1/2 - 60F comes from the N with a green caterpillar and a brown imago. She delivers them in one motion, but she takes each back so I can't be sure how many young eat them. In 30 seconds she goes SW.

1342 - 60F feeds 2 objects (1 a brown caterpillar), but I don't know to how many young. In 20 seconds she drops W.

1354-1/2 - 60F feeds a small insect and a dark brown caterpillar, both to 1 young. But she retakes the caterpillar, so I don't know if the same nestling gets it. She carries a fecal sac W low.

1400 - It's become one of those hot hazy summer days with a glaring sun, a gusty S to E wind, occasional clouds. It's 89°. This development has occurred in the last 90 minutes at an accelerating rate.

1408-1/2 - 60F feeds in 3 or 4 deliveries. In 30 seconds she drops N into the woods edge 35 yards or more away. On her last few trips 60F has spent about 5 seconds in the tree looking around, especially at me, before going to the nest. It takes her from 10 to 15 seconds to reach the nest after landing.

1417-1/2 - 60F delivers 3 times, in 25 seconds goes W. She called "tsu" twice, once before going to the nest tree and once there.

1423 - 60F takes 15 seconds to decide to go to the nest,

delivers 5 times in 30 seconds, takes a sac W.

1444 - 60F feeds, in 20 seconds goes N into the woods edge 30 yards away.

60F shows no sign of molting yet.

1446-1/2 - 60F calls a contact "tsu," lands in the tree, feeds, in 20 seconds drops SW with a sac.

1452-1/2 - 60F feeds an adult insect, drops 18 yards W to a 6-foot dogwood near me. She "checks" once.

1500 - The weather is unchanged; it's 88°.

1509 - 60F feeds a green and a brown caterpillar with a separate delivery for each. I don't see how many young are fed; I'd guess 1. She drops and goes 40 yards NW flying 2 feet high.

1514-1/2 - 60F delivers twice an unusually large fat green caterpillar. In 10 seconds she gets a sac, drops NW but circles and takes it to (into?) the woods 45 yards N of the nest. She travels 55 yards to get there.

1527 - 60F delivers a small green object and, separately, a small black caterpillar. I can't see the young. In 5 seconds she drops E but rises to 25 feet or more and enters the woods. She called the note that sounds like a contact "tsu" 5 seconds before landing in the nest tree. In view of her slightly delayed approach in the nest tree, I suppose she's a little nervous about me and the note is an alarm note.

1530 - 60F delivers a green caterpillar 3 times, drops W in 15 seconds.

1545 - 60F gives 2 green caterpillars to 2 young, (1 each), in 20 seconds drops 20 yards W to the field cover.

1556 - 60F feeds 2 green caterpillars to 2 young, (1 each), in 15 seconds drops W with a sac.

1600 - It's a little cloudier than before, much less windy. The sky is 85% covered and the sun has been in half the time, but it casts a strong glare and makes shadows. It's 90°.

1606-1/2 - 60F feeds a brown, hard-looking imago. She takes it from 1 nestling and gives it to another. In 15 seconds she drops low to the SW.

1617-1/2 - 60F feeds, in 10 seconds flies 30 yards N and lands 3 feet up in a 6-foot dogwood.

1623 - 60F delivers a big one and a little one, in 30 seconds goes N. I'd say she clearly fed 2.

1626-1/2 - 60F feeds 2 young with a green one and another object. In 15 seconds she goes 35 yards N, lands 3 feet up in a sumac.

1634 - 60F feeds a green one and an insect with legs like a crane fly to 1 nestling. In 15 seconds she drops N low into the woods edge.

1650 - 60F delivers a big one, drops low to the W with a sac. She flies so low that I often miss seeing her pass by

some 10 yards away.

1700 - It's now only 15% clouded and the sun is out, but until a few minutes ago the weather was as it was at 1600. It's 86°.

1715-1/2 - 60F gives 1 little call note, "tsu," and goes in 10 seconds to the nest. She feeds, in 10 seconds takes a sac low to the SW.

1719 - 60F brings a big one, passes it 4 times. She then eats a small object, possibly a sac, carries a big sac to the SW. She may have called before coming. The call note is not the regular alarm "tsu."

1734 - 60F delivers a brown object, in 20 seconds goes N to the woods edge and rises to 20 feet high.

1740 - 60F feeds. She delivers it 4 times to the same nestling, in 25 seconds flies low to the N 40 yards or more.

1750 - 60F feeds an object to one, a green caterpillar to another. She looks down and seems to peer at something below her, hops 2 feet down, goes SW in 25 seconds.

1752 - 60F brings a round orange object the size of a pea; possibly a spider. She goes W in 25 seconds.

1800 - It's 80% cloudy but quite light. The wind has been from the N for an hour. The sun has shone very little. It's 81°.

1806 - 60F delivers a big one, takes a sac in 5 seconds

and goes 50 yards N to the woods. Just as she gets to the woods she rises to 25 feet. I can't see if she enters the woods.

1811-1/2 - 60F feeds, in 20 seconds drops 35 or 40 yards NW.

1820-1/2 - 60F feeds, in 25 seconds drops NW.

1851 - 60F feeds a black insect to one, a green caterpillar to another. She takes the caterpillar back but seems to return it to the same bird. In 20 seconds she drops SW with a sac.

1900 - The weather is unchanged except that there is no clear sky. It's 79°.

1902 - 60F delivers a big one, in 15 seconds takes a sac low to the W. The period at the nest before leaving with a sac is determined by how long it takes the young to swallow its food. It usually defecates (if at all) in from 2 to 6 more seconds. NB

1920 - 60F calls 1 "check" near me, goes to the nest with at least 2 items, 1 a green caterpillar. She makes 2 or more separate deliveries, in 12 seconds drops N.

1924-1/2 - 60F feeds something to 1, takes a sac W.

1934 - 60F feeds a round light object, picks at the young (and not at just one) 4 or 5 times, drops W in 15 seconds.

1939 - 60F feeds 2 items, one a green caterpillar, to 1 young. In 15 seconds she takes a sac W.

1942-1/2 - 60F feeds, looks in for 20 seconds, drops W.

1952-1/2 - 60F feeds but I can't see what. She makes an apparently long flight W in 12 seconds.

2000 - The clouds seem to be thinning so that the cover, while nearly complete, is little more than a haze. The mild wind is in the S. It's 75°.

2006-1/2 - 60F returns to the nest, seems to feed (or possibly to poke once -- I see no gaping). In 5 seconds she hops on to the nest and broods facing S.

2010 - It's 75°.

2015 - I leave the territory. The day has been about 50% sunny but the weather can't have inhibited normal behavior.

T59 from 2025 to 2040 - 59F isn't brooding tonight, and the young are still in the nest. I wait until all birds but Whip-poor-wills are silent and it's very dark.

broody

2045 - I leave.

[Regarding feeding data: If the female fed a green caterpillar to 1 young, I noted simply that she fed; and in every instance I mentioned the subject of the number of young fed only if that number was or might have been other than 1. If the food object was unidentified it was called an "object" or an "item," if identified it was named. Where the term "one" ("big one") was used, "one" was a short expression for "green larva" or "green caterpillar." "Larva" and "caterpillar" are synonymous and refer to what was in each case probably a geo-

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metrid larva. This same scheme is equally applicable to all subsequent notes concerning 60F, with the exception that both where the number of young fed is said to be 1 and where it is not specified, that number is 1.]

890
7/26/56
VN

July 26, 1956

A cloudless morning with a S breeze; 69°. Present from 0545 to 0945 and from 1900 to 2045.

T59 at 0545 - The young are in the nest. *John*

0548 - 59F calls loudly near me for a few seconds, I think.

The young become visible in the nest and call once or twice, then sink out of sight.

0600 - All is quiet so far. I've seen the young only once. The weather is unchanged.

0616 - 59F, carrying food, begins to call in the clump of trees around the nest, but she shows prolonged nervousness, flits around 20 feet up and 10-15 yards away. At 0622 she falls silent.

0632-1/2 - 59F feeds without preliminaries and young become active. She calls 2 or 3 times near the nest after leaving it. In 1 minute the young have subsided.

0637 - A young gives an upward wing and a side stretch, preens. Two minutes later an upward stretch, a side stretch. One twice opens its bill, evidently at another, but I can't be sure. At 0640 all are moving about and 1 is calling regularly.

0642 - A nestling gets on to the rim but immediately hops back into the cavity. At 0643 and at 0644 this is repeated, but I can't be sure if it's the same bird.

0645 - The young are calling, and one is high in the nest. It stretches its wings up. 59F comes and feeds, and

the high bird flutters its wings violently and nearly falls out. When I look up this bird is gone; it calls W of the nest where it must have flown or fallen.

0646 - The 2 remaining birds call, preen.

0649 - A nestling stretches up several times without following through with wing raising; they aren't necessarily connected, then.

The female is in the walnut N of the nest.

The young seem to be subsiding.

0652 - M59 feeds, takes a sac E.

0653 - One gets to the rim, moves along it, returns.

0654 - It gets to the rim, gives a side stretch, in 10 seconds jumps to a twig 3 inches away. It then flies immediately, landing at nest level 1-1/2 feet E on a diagonal dogwood cane. It sits there silently. This bird is 59G(green). It stretches sideways and up, raises its wings; these movements follow in rapid succession.

0700 - It's 73°.

0700 - M59 begins faint steps in the woods E of the nest, sings about 10 to 0713.

59G preens, flutters its wings once, stretches each side. It then raises its wings and I see that this involves a leaning-forward motion.

0705 - The remaining nestling preens, twice flutters its wings while in the cavity. 59G perches.

0709 - 59B flies downward and to the N about 5-6 yards, giving the usual fledgling call rapidly while in flight.

0713 - The nestling sits low and preens. The fledglings call. 59F may have fed one.

The nestling calls now repeatedly, stretches up.

0718 - 59F is in the big cherry 20 feet up, without food. The nestling has just disappeared into the cavity. The others call.

0732 - The nestling stretches a little, its first appearance in some time. The others call. The nestling immediately sinks out of sight and stays there for a long time.

0800 - It's clear, 76°, breezy from the S. The fledglings are noisy. I haven't seen the parents, and the nestling's been invisible except for once when I saw its crown for a second. I doubt if the adults will feed it in the nest, but they seem to have become peculiarly inattentive.

0810 - The nestling puts its head on the rim. It's calling 48 times per 30 seconds, which is about the usual rate for fledglings (I can hear one doing this now). The nestling gives occasional upward and wing stretches, preens a little, but most of the time it just sits and calls. At 0825 this is still true; its head is on the rim, eyes open. Occasionally it turns to change direction a little.

0829 - The nestling without any preliminaries gets to the rim and flutters down to about 2 feet high, a few feet N

of the nest.

I'm going to try to catch the adults.

By 0930 I've caught and banded both 59's with silver over yellow, right leg. M59 is 25-66005 and 59F is 25-66004. I paint the female's tail red, but many of the male's tail feathers come out in my hand, so I don't paint him.

I caught them in a net, using the young to get them to fly where I wanted them. In this connection, I caught all young and had to replace 3 of the 6 color bands, which were so big they slipped off on the first occasion that I put them on. N13

The young are no better developed than 10-day fledglings. One can fly 10 yards or so, but the last one to fledge was caught on the ground and seemed unable really to fly. As for dispersal, the first fledgling was 10 yards W of the nest in the cluster of trees, perched 4 feet up. It is the strongest flyer by far. The male seemed to be tending it exclusively. The second bird was 15 or 20 yards NE of the nest, cared for by the female. It was 2 feet high. The last bird was 10 yards E of the nest, on or near the ground.

0945 - I leave.

1900 - I return to check to see if 60F will brood. It's been over 90° today and is very hot now.

894
7/26/56
VN

T60 at 1930 - I sit to work on my notes. 60F feeds at about 1945, at 1955, at 1958-1/2 (sac). On the last occasion she lands 10 yards from me and seems nervous about me. I note that she is beginning to molt on the flanks and under tail coverts, and there is a loose feather on her head. *molt*

2023 - A Whip-poor-will begins. Evidently 60F is going to roost off the nest on the eighth night.

2045 - I leave, with 60F not brooding. *not brooding*

895
7/27/56
VN

July 27, 1956

*See note
below,
also
p 888,
p 896*

A clear morning with a little S breeze; 74°. Present from 0500 to 1545; Board present from 1545 to 2035. It is surprisingly dark at 0500, even with a fairly high bright moon.

T60 - 60F is not on the nest.

Screech Owl

0527 - I'm pretty sure I hear the monotone song of a Screech Owl.

0538 - 60F goes silently with a green caterpillar. The young gape before she arrives at nest level. In 10 seconds she comes W and calls "check" at me 10 yards away. She's getting ratty looking because of her molt.

molting

Note: Unless the contrary is stated, the approach is from below, with 1 green caterpillar. Silence can be assumed, with delivery from the N rim of the nest.

NB

0541-1/2 - 60F feeds an unseen object, in 10 seconds drops back near me and calls 3 or 4 times.

0544 - 60F feeds objects to 2 birds, in 10 seconds comes NW 25 yards, calls a few times.

0551-1/2 - 60F feeds a black imago, in 5 seconds comes W near me and calls as before but this time for a minute. Her rate is 2 calls in 5 seconds.

*prognosis
always
from gae
on*

0555-1/2 - 60F feeds, in 10 seconds takes a sac 35 yards W. I don't see her get rid of it; she calls 5 times when she lands.

0558 - 6OF feeds an object, in 7 seconds drops W past me and calls a few times.

0559-1/2 - 6OF feeds an object, in 10 seconds comes W near me and calls. She also called in flight. The notes are not loud.

0600 - It's cloudless, and there is a light NW breeze occasionally; 73°.

0602 - 6OF feeds a small one (caterpillar), in 5 seconds carries a sac 35 yards N and into a sycamore or dogwood top, 25 feet up. She called 2 or 3 times as she approached the nest.

0605 - 6OF feeds a large one, in 10 seconds goes 35 yards N to a 4-foot perch.

0610-1/2 - 6OF "checks" once, goes to the nest tree and feeds, in 8 seconds takes a sac SE into the woods (the first time she's gone that way with a sac).

0616 - The sun hits the tops of the woods trees.

0617 - 6OF delivers twice, 1 object unseen. Probably 1 young was fed. In 7 seconds she comes W. This time the whole trip was silent.

0623 - 6OF feeds a white object, in 8 seconds drops 30 yards NW.

0628-1/2 - 6OF calls "check" twice in the nest tree, feeds, in 10 seconds drops W.

Note: From now on unless it is stated otherwise 6OF can be taken to have stayed from 5 to 15 seconds.

NB

0630 - 60F feeds, comes NW, calls 4 times in several minutes.

0633 - 60F feeds 1 caterpillar plus a small adult insect, to 2 young. She drops to 3 feet high 6 yards from me and "checks" lightly 10 times.

0636-1/2 - 60F feeds 2 young, leaves the tree in little hops, goes 12 yards N and calls 3 or 4 times.

0638-1/2 - 60F feeds, in 2 seconds flies NW. I'd say she leaves high about 50% of the time. NB

0639 - A NW to NE breeze comes up.

0639-1/2 - 60F feeds a caterpillar plus a small object, to 2 young. She leaves gradually, goes N 10 yards at 15 feet. She gave the little "tsu" before going to the nest tree.

0652 - 60F comes from the E woods, feeds, returns flying at nest height.

0654-1/2 - 60F feeds, making 3 or 4 false deliveries, takes a sac low 50 yards N toward the woods.

0700 - It's cloudless, very breezy from the NW, 76°. The sun has just begun to hit the leaves around the nest and probably the nest itself. This doesn't last long, since the angle changes and there are trees which give shade.

0707-1/2 - 60F feeds something, drops W.

0713 - 60F feeds, flies 15 yards NE into the woods 15 feet up.

0715-1/2 - 60F feeds, drops 30 yards or more N.

0726 - 60F feeds a brown object, probably a caterpillar, goes E into the woods 30 feet high.

0732 - 60F feeds something I can't see, comes NW and lands 2 feet high, 15 feet from me. She forages at from 2 to 3 feet, calling about twice each 5 seconds.

0734-1/2 - She feeds a small imago, flies 25 yards NW and forages as before, calling 2 or 3 times, near me.

0745-1/2 - 60F feeds a big one, takes a sac N.

0747 - 60F feeds 1 larva, and probably something else, goes low NW.

0750 - 60F feeds, takes a sac low over 45 yards N.

0754 - 60F feeds 1 larva and probably something else to a second bird. She takes a sac N 30 yards 15 feet up into a tree. I lose her there.

0757-1/2 - 60F feeds a small brown caterpillar, goes 35 yards or more N.

0800 - The weather is unchanged; it's 82°. Some sun hits the nest.

0810-1/2 - 60F feeds a brown caterpillar and probably 2 adult insects to probably 2 and possibly 3 young. She then goes NE at nest level, about 20 yards.

0814-1/2 - 60F feeds, redelivers it to another bird, goes 15 yards E to the woods, about 10 feet high.

0816-1/2 - 60F feeds a caterpillar plus something else, takes a sac over 50 yards N flying low.

0822 - 60F feeds, drops 20 yards W.

0840 - 60F feeds a big larva, looks in for 10 seconds, eats a sac, looks in for 25 more seconds, takes 20 more to leave the tree. She flies up from nest height either to the ash 10 yards away or to the woods.

0856-1/2 - 60F feeds, flies to a 10-foot perch 20 yards N.

0900 - The weather is the same; it's 87° but not humid. I maneuver around till I finally see 3 young simultaneously. For 20 minutes while I'm looking they sleep most of the time; there is 1 stretch up.

0931 - 60F feeds probably 2 (one for sure); I think to 2 young. She goes W.

0933-1/2 - She feeds the highest; all gape wildly. She takes a sac low to the W.

0939-1/2 - 60F feeds 2 young with a dark insect and a green caterpillar. She takes 10 seconds to leave the nest tree, flies 20 yards NE, 20 feet high.

0942 - 60F feeds but the gusts of wind blow leaves in my way and I miss the details. She goes E.

0947-1/2 - 60F feeds 1 a big one. The young are audible 13 yards away, as they have been before this morning. 60F makes short hops and flies 10 yards E to the woods edge, 6 feet up.

0952-1/2 - 60F feeds, delivering it 3 times. She takes a

sac very low at least 40 yards NW. I notice the young don't gape till 60F is in sight of them. She comes up from below, often taking 10 seconds to do so. But the nest is built on a stiff branch, and the young discover her only when she arrives at nest level.

1000 - The weather is unchanged; it's 89°.

1001-1/2 - 60F feeds, getting very little gaping. She flies 15 yards to the woods, nest height.

1011 - 60F feeds 1 after getting almost no gaping. She looks in for 1 minute, goes E.

1028 - 60F feeds, leaves the tree in short stages and goes N.

1054 - 60F feeds 1 a big larva, takes a sac E into the woods 25-30 feet high (which means she flies at nest level since the ground falls away sharply to the E). The young gaped that time, though not to an unusual degree.

1100 - The weather's unchanged; it's 89°.

All young are gaping occasionally, then subsiding. Their bills are open about 50% of the time, and they usually have their eyes closed.

1122-1/2 - 60F feeds, takes a sac SW. As usual at this stage the young have trouble getting their tails up out of the nest because the others cover them.

1130-1/2 - 60F feeds, drops E toward the woods but rises to 30 feet as she gets to the trees.

1137 - 60F feeds but a leaf obscures my view. She takes a sac W.

1144 - 60F after a silent 1-minute delay in the ash takes a brown insect and a green caterpillar. I can't see the feeding. In 40 seconds she hops through the tree and goes NE.

1200 - The weather's unchanged; it's 90°. The young now keep their heads out of the nest and lying on the rim, bills open and eyes closed, most of the time. The sun hits them directly now and then.

1225-1/2 - 60F feeds, redelivering to the same young twice. She takes a sac W. She called "check" for 30 seconds before going to the nest, both in the tree and out, without getting any response from the young till she became visible at the nest.

1234 - After delaying for 30 seconds below the nest 60F feeds 1 a big one. She takes a sac W.

1242-1/2 - 60F feeds an adult insect (probably). She flies high to the W, but I can't see how far since I've changed my position a little to avoid the sun.

1244 - 60F feeds, flies high to the W. She's probably going only a few yards and landing in a dogwood near me.

1247 - 60F feeds, making 4 deliveries of a caterpillar to the same bird; she takes a sac W.

1300 - The weather is unchanged except for a few small white clouds; it's 93°. The young sit quietly with heads up, eyes closed, bills open.

1308-1/2 - 60F gives a small object to 1, a large one to another. She carries a sac W.

1318-1/2 - 60F gives a green caterpillar to 1, takes it back and 3 times tries to give it to another. She finally succeeds with the first bird, then goes E to the woods 15 feet up.

1320-1/2 - She gives a spidery-looking object and possibly something else to a second bird. It takes her 45 seconds to hop through the tree and go SW.

1330 - 60F gives a brown caterpillar to 1, a green to another, goes 25 yards N to the edge trees and lands 10 feet up.

1347 - 60F offers one 3 times to 2 birds, succeeds, takes a sac low to the W.

1350 - 60F feeds 1, takes a sac E into the woods, which she enters at 25 feet. She flew in right at the nest that time, then spent 50 seconds hopping around N of it and below it. I suppose I alarm her, though she is silent.

1400 - The weather hasn't changed to speak of, except that during the hour there were a few little white clouds (gone now) that hid the sun for a few minutes. It's 94°. The young are visible, heads up and bills open.

1403-1/2 - 60F brings two, seems to feed 2 (the third doesn't take). She eats a sac, stays 60 seconds.

1414-1/2 - 60F feeds dark objects to 2 birds, leaves the tree slowly for the SE.

1432-1/2 - 60F feeds a small, black, round thing and I think something else. She then hops around in the N edge of the tree and sits 1 minute. She comes NW and forages 7 feet up in a dogwood 10 yards from the nest, then goes E toward the woods edge. I think she may have called "tsu" several times before going to the nest.

1451-1/2 - 60F brings a reddish-brown thing, probably a spider. She takes a sac W. It's surprising how often the first attempt to pass food is unsuccessful. She doesn't drop it; she simply puts her bill out to the young's, nothing happens, and when she withdraws her bill the food is still in it. B

1455 - 60F feeds a long-legged insect like a crane fly (harvest man?), then tries to pass a green caterpillar to the same bird. After failing twice she offers it to another, takes it back and feeds the first. She spends 1 minute leaving the tree. She called "check" in the tree before feeding.

1459-1/2 - 60F feeds something small, carries an object away but I don't think it's a sac. She calls 10 or 15 yards N of the nest.

1500 - It's still clear, windy, 93°.

1510 - 60F brings one, gets a sac and goes E. The nestling as usual shakes its tail quickly from side to side when defecating. B

I think 60F is often calling the faint "tsu" note when she gets to the tree or just before doing so. It produces no

response at all in the young, which still sit with heads high out of the nest and bills open, or in the alternative with heads hanging on the rim and bills sometimes open. Their eyes are nearly always closed; there is no looking around, and I've seen little stretching, no preening. (But I haven't kept my eye on them a lot; the view is poor.) Some sunlight touches them much of the time. Z

1521-1/2 - 60F calls "tsu" ("tseep" might be better for her atypical note) 7 times, the last time a few feet below the nest. She feeds, takes a sac 35 yards N into the woods, circling a little to get there. She enters the trees 25 feet up after flying low to them; so she may light immediately at the edge.

1526 - 60F calls "tseep" 5 times, in 20 seconds takes a brown spider, rather large. She offers it 5 times but always takes it back without really giving the young a chance. In 30 seconds she flies W with it.

1527 - 60F calls twice, takes the large spider and passes it. She drops N 25 yards and lights 1 foot up. Did she take the spider to a perch at 1526-1/2, where she could beat it on a limb? She's done this once before. B

1536-1/2 - 60F brings a big larva, takes a sac W. I've noticed that large caterpillars are very often grasped right behind the head, and I'm pretty sure that small ones are held in the middle too frequently to be a matter of chance. 13

905
7/27/56
VN
JB

1545 - Board relieves me.

I leave.

T60 at 1545 - I [Board] arrive and relieve Nolan.

1551 - 60F comes and feeds 1, stays 1 minute.

1554-1/2 - She feeds 1, perches at the nest 45 seconds,
goes E.

1600 - It's 93°.

1611 - 60F arrives after calling "tsip," feeds 1 a
dark green larva, stays 35 seconds.

1618 - She calls "tsip," comes and feeds 1 on the 5th
try, stays 1 minute.

1621 - She feeds 1 a large green caterpillar, in 30
seconds hops E through the tree at nest level, goes E after
5 seconds on the E tips.

1633-1/2 - She calls, feeds 1 a large green one, in 20
seconds takes a small sac W.

1649 - She calls, feeds 1 a big light gray caterpillar,
eats a small sac, leaves as she did at 1621.

1658 - She calls "tsip" and "check" (first time for the
latter), feeds a large green one after 7 tries, takes a sac
E after 30 seconds.

1700 - It's 92°, sunny, with a light breeze.

1723-1/2 - 60F "tsips," feeds 1 a large green larva,
goes W after 1 minute.

1734 - She feeds 1, in 30 seconds takes a sac N, deposits it 12 to 15 feet high on the bare limb of a little sycamore next to a big sycamore, some 30 yards away.

1744-1/2 - She feeds 1 a large reddish-brown larva, in 20 seconds goes NE.

1746-1/2 - She feeds 1, goes SW.

1750 - She feeds 1 a big green one, in 20 seconds takes a sac N.

1753-1/2 - She feeds 1 a big dark one, takes a sac N.

1800 - It's 91°, sunny.

1824 - 60° "tsips," feeds 1, eats or drops a sac, in 35 seconds goes E.

1857 - She feeds 1 a big green one, leaves as at 1621.

1900 - It's 87°.

She feeds 1, stays 5 seconds.

1903-1/2 - She feeds 1 a big green larva, leaves as at 1621.

1913 - She feeds 1 a large green one, in 15 seconds takes a sac E.

1926 - She feeds 1 a large green one, in 15 seconds goes W.

1932 - She feeds 1, in 15 seconds takes a sac W.

1937 - She feeds 1 a large green caterpillar, eats a small sac, bends deep into the nest and flutters, removes a sac the size of a PW egg, in 20 seconds takes it W.

1947 - She feeds 1 a big green one, in 15 seconds takes
a sac W.

1954 - She feeds 1 a big green one, in 15 seconds again
takes a sac W.

1959 - She feeds 1, in 10 seconds goes W.

2000 - It's 80°.

2001 - She feeds 1, in 10 seconds goes SE.

2035 - 60F has not returned and will not brood.

I leave.

The day has been 99+ sunny.

no brood

908
7/28/56
VN

See

July 28, 1956

A clear morning with a slight N breeze; 74°. Present from 0545 to 1230.

T60 at 0545 - 60F calls near me as I come up and sit down.

Note: See yesterday's notes for the details that may be assumed.

0551 - 60F feeds a black caterpillar.

0552-1/2 - She feeds something small, takes a sac W.
The young are responding only mildly, staying low in the nest.

0555 - 60F feeds, drops NW.

0558 - 60F feeds, flies NW at nest height. She's calling a single contact "tsu" just before she goes to the nest each time.

0600 - She feeds, flies 30 yards NW.

0600 - There are light clouds over much of the sky, and the breeze is stronger. It's 75°.

0603 - 60F feeds a black object, comes NW to within a few yards of me and "checks."

0605-1/2 - 60F feeds, drops W.

So far the young have been invisible except once when I saw one gape.

0609 - 60F feeds, comes W.

0610 - 60F delivers an adult insect, flies W and "checks" once.

0612-1/2 - 60F delivers an adult insect, flies W. She still calls "tsu" before or just after going to the tree.

0614 - 60F feeds, flies W.

0615 - 60F feeds something small and round, flies W. She is silent this time.

0618-1/2 - 60F feeds a dark object, seems to get almost no response, flies W. She seems to have become silent on her approaches.

0622-1/2 - 60F feeds, comes W. On her last 4 or 5 feedings she has stayed at the nest no more than 5 seconds, sometimes 1 or 2.

0634-1/2 - 60F feeds 1 a big larva and probably a small adult, goes W.

0641-1/2 - 60F feeds 1 a small object, gets a big reaction, comes W. The young are audible when fed. 60F calls near me.

0642 - I hear a faint skid twice, then a step. I see no male.

0644-1/2 - 60F feeds, comes W. I've moved to let me see as much surrounding area as possible; 60F calls, probably because of my move.

0645-1/2 - 60F feeds something, takes a sac E. The young are gaping at each visit.

0647 - 60F feeds 1 something and comes W.

0649-1/2 - 60F feeds 1 an adult insect, comes W.

0651-1/2 - 60F feeds 1 a brown caterpillar, probably takes a sac from a leaf just below the nest, goes NE. The young don't gape much.

0653-1/2 - 60F feeds 1 a big one, gets little response. She preens for 20 seconds in the nest tree, goes N.

0700 - It's nearly cloudless, sunny, with a mild N breeze. It's 77°.

0703 - 60F feeds, goes 15 yards NE into the woods 20 feet up.

0712-1/2 - 60F feeds 1 a large red-brown caterpillar, takes a sac at least 40 yards NW.

0716 - 60F feeds 1 a small object. She hops N in the tree and at nest level 3-4 feet away sees a spider with a 1/4 inch body, in a web there. The spider begins to vibrate so that the web bounces up and down. 60F hovers for 5 seconds and delicately picks the spider out, goes N. 13

0719 - 60F may feed 1 the spider; it is the same reddish color. A young defecates over the side and 60F gets the sac on the outside of the nest and goes S.

0720-1/2 - 60F feeds 1 something, comes W.

0723 - 60F is foraging at from 3 to 12 feet in a dogwood 15 yards from the nest.

0726 - 60F feeds 1 a small object (I think) and a green caterpillar, leaves the nest by hopping down through the tree out of sight.

The young are so low I can't see them, and they have been nearly all morning. I've seen no periods of activity except during and just after feeding.

0734-1/2 - 60F feeds 1 an adult insect, probably a moth, goes S.

0745-1/2 - 60F feeds a spider or an adult insect, hops down 2 feet below the nest, goes S.

0753 - 60F feeds 2 green caterpillars, probably to 2 young, takes a sac NE into the woods.

0800 - There's a thin but definite overcast, and there has been the whole hour. The sun shines through it with a paler than usual light. It's windless, 80°.

0800-1/2 - 60F feeds, leaves by hopping a few inches down, then out to the N. She doesn't go more than 5 yards on her first flight.

0802 - The young are active though not high in the nest. I see some preening and stretching for about 3 minutes.

0808 - A male sings an insipid step. I don't see him.

0809 - 60F feeds 2 young, one a green caterpillar. She then forages within 1 to 3 feet of the ground 15 yards NW of the nest. She's 6-12 feet from me, calls "check," goes on farther N out of sight.

0821-1/2 - 60F feeds 1 a big one, pulling it away from the young with some difficulty and restoring it again. She gets a sac as it's dropped over the rim, goes SW.

The young are active for only a minute afterward and very slightly so at that. They then go out of sight.

0829 - 60F delivers an imago, I think; she goes E to the woods.

0834 - 60F feeds 1 an imago, takes a sac W.

0845-1/2 - 60F feeds, hops down out of sight in the nest tree. Today she very frequently leaves by turning and hopping down an inch or two. Sometimes this is all, but even it is a change from yesterday.

The young show no activity at all.

0857 - 60F feeds 1 a small object, goes E after hopping through the tree.

0858-1/2 - 60F feeds 1 an imago, takes a sac 25 yards N and 25 feet up into a sassafras at the edge of the woods.

0900 - The weather's unchanged except that the sun has shone pretty brightly, more so than last hour. It's 84°.

0900-1/2 - 60F delivers a green caterpillar, immediately takes it back and gives it to another bird, goes E.

0902-1/2 - 60F feeds 1, gets a sac and carries it 30 yards N to a sassafras at the edge of the woods. She pastes the sac on a branch 25 feet up. Her flight ascended gradually; there was a slight last-minute rise. She hopped quickly, so I saw no bill wiping.

The young have just begun to leave their heads high, either pointing up or resting on the rim. Eyes and bills are closed.

0914-1/2 - 60F feeds, goes S.

0920-1/2 - 60F feeds, hops through the tree and goes E.

The young gaped vigorously, called. (She hasn't left by jumping down below the nest since I described it at 0845.)

0927-1/2 - 60F feeds, takes a sac 25 yards W and seems to deposit it some 7 feet up in a 12-foot oak.

I conclude from watching her that 60F makes no effort to restore food to the young from which she took it. It's a matter of chance complicated by the question of which young is highest.

0937 - 60F feeds 1 an imago, goes S.

0939-1/2 - 60F feeds 1 an imago, goes N.

0942-1/2 - 60F feeds 1 something whitish, in 2 seconds goes S.

0951 - 60F feeds 1 a big one, takes a sac low 35 yards W and rises to 25 feet as she comes to a sassafras at the woods' edge.

0956-1/2 - 60F feeds, goes slowly through the tree and then E.

0958 - 60F feeds 1 something, takes a sac E.

1000 - It is now completely cloudy with a thicker overcast that the sun doesn't get through. For 30 minutes there has been a NW breeze that is sometimes gusty. It's 84°.

1003-1/2 - 60F feeds, takes a sac from a leaf (when was it excreted?), goes N. Again today the large caterpillars seem always to be held behind the head, the thinner, shorter

ND

914
7/23/56
VN

ones in the middle. I can't see how this could be a matter of diameter, if for no other reason than that big caterpillars are equally thick in the middle and behind the head.

1016 - 60F feeds, flies SW.

1021-1/2 - 60F feeds 1 an imago, hops away and takes 45 seconds to leave the tree, goes N 8 yards to the ash, 20 feet up.

1025-1/2 - 60F feeds a big one, takes a sac E. Many of the large caterpillars she brings are alive and haven't been worked over very much. Note that they are too big to go down a nestling's throat if delivered while held in the middle. M13

1028 - 60F feeds, takes a sac W.

1035 - 60F has a green caterpillar and in front of it a small black insect. The young seem sated, but one finally takes both items. 60F spends 40 seconds at the nest, 60 more hopping about in the tree. She then goes N to the ash top and on out of sight.

1043 - 60F brings a small imago, and a small black and a large green caterpillar. This last, at the back of her bill and thus the last to come out, she can scarcely get the young to eat. I'd guess a different bird eats it than the one which took the other 2 items. 60F goes N.

1100 - It's gray, nearly calm, 82°.

1100-1/2 - 60F brings a snowy tree cricket or a leaf hopper. The young call noisily after she has fed. This brood is much M13

less vocal than the 59's, possibly because it's better fed (if so). 60F called "check" 3 yards from the nest for 45 seconds before going to the nest.

1108 - 60F feeds after foraging for 1 minute, at least, in and under the nest tree. She called "tsu" while doing so; now I lose sight of her in the tree after the feeding. The young were noisy while she was present.

1110 - 60F delivers a small object, leaves immediately and goes into the nest tree, dives into the field cover fly-catching.

1111-1/2 - 60F feeds a small insect caught in the field cover 2 yards E of the nest, immediately drops S. NB

1112 - 60F feeds 1, but I don't see what. She is extremely active, fluttering quickly around in the nest vicinity. She goes out of sight. NB

1116 - 60F feeds 1 something, takes a sac W.

1130 - 60F feeds 1 a big one, takes a sac from a leaf and goes W. The young were silent. Was it their calling that stimulated 60F's recent activity? NB

1139-1/2 - 60F feeds, takes a sac 20 yards N and then into the woods. She rises to 30 feet and probably drops the sac on a limb just inside the woods edge.

1145 - I quit watching the nest.

It is 8h⁰, otherwise unchanged.

T59 - M59 is carrying food into a low edge growth about

916
7/28/56
VN

70 yards (less?) N of the nest, the spur of good PW habitat that projects N between the ravine on the W and the woods on the E. He calls "check" at me but never shows any great alarm. I walk through the nest area (the remains of old T3) but don't see the female.

1230 - I leave.

July 29, 1956

swp 921. NB

A cloudy morning after thunderstorms and heavy rain yesterday in the late afternoon; windless, temperature 68°. Present from 0600 to 1215 and from 1830 to 1930.

T60 at 0605 - I can't see the nestlings.

Note: The usual assumptions as to details of 60F's feedings may be made. See the statement at the end of the July 25 notes.

0609 - 60F feeds something, getting little response. In 2 or 3 seconds she drops W. She "checks" before going to the nest, but only a few times and mildly.

0611 - 60F feeds something small, leaves quickly to the W.

0614-1/2 - 60F feeds an adult insect, leaves as before.

0619-1/2 - 60 feeds, comes W after a more normal pause (7 seconds).

0621 - A Cardinal calls rapidly as though in alarm near the nest, and I'm pretty sure 60F flies to the tree without food.

0621-1/2 - 60F feeds something, drops W quickly.

0622 - 60F feeds, flies W. She forages 10 yards from the nest in a dogwood, 5 to 12 feet high. Once she chases an insect downward in flight.

0627-1/2 - 60F feeds, comes W. So far I've seen no young. They're evidently staying very low and taking food in silence.

nest to
Cardinal

B

0629 - A young sticks its head up and seems to preen.
All begin to move actively.

0632 - One gets to the rim, falls back instantly. I
can see a wing wave.

A SW wind rises, and it threatens to rain.

0635 - 60F feeds something, goes W. The young were
noisy at her arrival.

0637-1/2 - 60F feeds something small, gets a big
response in noise and gaping. She goes N. I think a nest-
ling defecated over the side and she missed it, but I'm not
sure.

Action by the young subsides at 0638, and I no longer
see them.

0643-1/2 - 60F feeds, takes a sac E. There were gaping
and 2 or 3 calls at her arrival.

0646 - 60F feeds something, gets a mild response, goes SE.

0647-1/2 - 60F feeds a black adult insect, takes a sac W.
There was no visible gaping, no noise.

0653-1/2 - 60F feeds an adult insect, goes S. She called
"check" 8 inches below the nest. The young didn't respond
that I could see; as soon as she got to the nest one gaped
and called. B

0655 - 60F feeds something, takes a sac E.

0656 - The young are beginning to move a little.

0658 - 60F feeds something, goes SW. Small response.

0658-1/2 - 60F feeds something, goes SW. The young stretch but there is no active period.

0700 - 60F feeds something, goes S.

0700 - It's dark, breezy occasionally from the S, 69°.

0702 - 60F feeds 1 young with 2 insects caught 10 feet up in the woods edge 12 yards E. The young are quiet.

0703 - 60F feeds an adult, comes W. Her tail is molting, with at least 1 feather gone.

0705 - 60F feeds something, goes W. There was gaping, some noise.

0706 - 60F feeds an adult, goes NW. No visible response. It is getting lighter though its 100% cloudy.

0708-1/2 - 60F feeds 2 small objects, probably to 1 young, goes W. It's pretty sure that most or all of the food items that I haven't been able to identify today have not been caterpillars, certainly not large ones.

0712 - 60F feeds 2 items to 2 birds, comes W. She's got no visible response since last noted, nor have I been able to see the young.

0714 - 60F feeds 2 items to 2 birds. She then perches and looks in for 3 seconds; the young stay silent and out of sight.

0722 - 60F feeds 2 items to 1 bird, goes W. Small response.

0723 - 60F feeds 1 item, goes W. All young gape and call.

Activity then begins.

0724½ - See bottom of page.

0727-1/2 - 60F feeds 2 items to 1 young, goes W. Slight response. Her foraging area this morning must be very small. B

0730-1/2 - 60F feeds 1 item, goes W. Slight response.

0735-1/2 - 60F feeds, looks in for 7 seconds, goes W.

Most of the time today she has stayed for only 2 or 3 seconds at the most; she's moving very quickly at all times.

I didn't see the young then, and can't at 0738.

0740 - The sun comes out. The sky is still nearly completely cloudy, but the cover is thin.

0741 - 60F feeds, looks in for 8 seconds, drops W. No visible response.

0745 - 60F feeds, goes E quickly. Slight response, i.e., a nestling raises up a very little and takes the caterpillar in silence.

0747-1/2 - 60F feeds something, goes W. Small (same as "slight") response.

0751 - A nestling preens for 30 seconds.

0753 - 60F feeds, takes a sac S. Small response.

0800 - It is 95% overcast, with the sun alternately barely visible and then fairly bright. The SW breeze is slight; 70°. The young are quiet and out of sight.

0803-1/2 - 60F feeds something small, takes a sac NW. No visible response.

A Worm-eating Warbler calls in the clearing.

0724½ - 60F feeds something, goes W. All young gape; some stretch. They subside quickly.

Worm-eating Warbler
9/1/56

0807 - 60F feeds something, goes W. No visible response.

0807-1/2 - 60F feeds something small, instantly goes W.

0808-1/2 - 60F feeds an adult, takes a sac 35 yards N and 25 feet high into a tree. Slight response on the last 2 feedings.

0813 - A titmouse goes to within 6 inches of the nest and seems to look at it, goes on in 2 seconds.

0816 - 60F feeds a brown caterpillar, goes N 25 yards and lands 2 feet high in a sumac. No visible response.

It's getting darker and the temperature is down 2°.

0818 - 60F feeds, goes W. Small response. A young stretches and leans far out over the rim. That ends the action.

0837 - 60F feeds, goes N 30 yards to the trees at the edge of the woods, enters 30 feet up. No visible response.

0841-1/2 - 60F feeds a brown caterpillar, goes E. No visible response.

Note: It looks as though these young will not leave the nest today. No further mention will be made of their response to feeding unless it is more than slight. NB

0844 - 60F feeds 2 objects, one a green caterpillar. She takes a sac W.

0845-1/2 - 60F feeds. One young flaps a wing, and there is calling. Activity continues with constant preening, stretching, rising high in the nest, some gaping. It begins to subside at 0855, tapers off for 2 more minutes.

0858 - 60F feeds, takes a sac S. The young become active again for 2 minutes.

0900 - It's dark, slightly breezy, 69°.

0902 - A Field Sparrow is in the nest tree, and 60F returns to it without food. She clearly hops toward the sparrow and watches it. Then she preens in the tree 7 feet below the nest for 2 minutes.

enc
FS

A titmouse flies to within 1 foot of the nest, and 60F quits preening and hops up. She moves quietly a foot away. When the titmouse leaves she goes slowly to the nest without food and looks in. After she leaves the titmouse returns and looks in. There is never any contact or animosity.

enc
FS

tit
into
nest

0907 - 60F feeds and takes a sac S.

0913-1/2 - 60F feeds an adult, drops below the nest, in 30 seconds leaves the tree and goes 25 yards N where she forages 6 feet up in sumac tops.

forage

0916 - 60F feeds a brown caterpillar, goes 35 yards N but this time lands about 12 feet up in a dogwood at the woods edge. She has been coming to the nest tree and landing about 6 feet below the nest several times today, which is a little lower than usual for her.

"

0923-1/2 - 60F feeds, goes E and enters the woods at about 35 feet.

0937-1/2 - 60F feeds 2 birds with 2 adult insects and 1 green caterpillar, goes S. After she leaves there is action.

One flutters a wing, nearly gets on the rim.

0941 - 60F feeds something, takes a sac S. Noisy response. The young sit high; one may possibly get to the rim.

0943 - A light rain begins. Action subsides, but it may be a coincidence. The rain peters out in 2 or 3 minutes.

0947 - 60F feeds, goes S with a sac. A nestling called before she got to the nest, called like a fledgling afterward.

0948 - A nestling gets on the rim.

0948-1/2 - 60F feeds, ignoring the bird on the rim and reaching around it. It turns to face the cavity and enters.

0949-1/2 - 60F feeds, goes SE low. The young are out of sight but called at her arrival. Thereafter they sink back and remain invisible.

0957 - 60F feeds a reddish spider, goes E. No visible response.

0959 - 60F feeds something small, goes W immediately. No visible response.

1000 - The weather hasn't changed except for the few minutes it sprinkled. It's 70°.

1000 - 60F feeds a light green spider (?), goes NW.

1001-1/2 - 60F feeds a brown caterpillar, goes S. Slight response with a little stretching and preening afterward.

1005 - 60F feeds a green caterpillar and a small object, goes S. I don't know how many she fed. She called "tsu"

just before arriving; the young remained unseen.

1003-1/2 - 60F feeds, takes a sac 25 yards N and 20 feet up into a sassafras at the edge of the woods. The young stretch and sit high for 30 seconds before dropping back down.

1020 - 60F feeds, drops NW with a sac. Slight response.

1024-1/2 - 60F feeds something, goes NW.

1035 - There is some preening and stretching for 1 minute.

1037 - A light rain begins.

1039 - 60F feeds, takes a sac S. The young call like fledglings before her arrival, but they stay low.

1042 - 60F feeds, goes W. The young are active for 1 minute.

1049 - 60F feeds something, goes E. Noisy response.

1050 - 60F feeds something, goes S. The young stick their heads up for a few seconds.

The rain stops.

1051-1/2 - 60F feeds an adult, goes 25 yards NE into the woods 40 feet and then 45 feet high.

The young call when fed but stay low.

1053 - 60F feeds something, takes a sac W.

1100 - The weather is the same. It's dark, nearly completely calm, 70°, ready to resume raining any minute. So far the weather probably has had no effect on attentive behavior, but may have inhibited activity in the young.

1103 - 60F feeds something, goes 40 yards N and lands
4 feet up. Some noise during feeding.

1104 - 60F feeds something, goes W quickly.

1108-1/2 - 60F feeds an adult insect, goes 20 yards E
and to a 45-foot limb of a honey locust at the edge of the
woods.

1117 - It rains very lightly for a minute.

1125-1/2 - 60F feeds, takes a sac NW. The young didn't
respond visibly and haven't moved, so far as I can tell, since
last noted.

1128 - 60F feeds a brown caterpillar, takes a sac S. All
3 young stretch.

1131 - 60F feeds, goes W. The young are still preening
and stretching up.

1134 - It sprinkles a little for a minute.

1134-1/2 - 60F feeds something, takes a sac S. The young
begin to call before she gets to the nest. Last time she called
before she got to the nest, but I saw no response to her "checks."
NM

1135 - 60F feeds, goes E. Noisy response.

1136 - 60F feeds something, goes SW. The young gape.

1137 - Action in the nest has waned.

1140 - 60F feeds something, goes E. There is a noisy re-
sponse but no other action.

1145-1/2 - 60F feeds, goes W. The young behave as they
did at 1140.

1147-1/2 - 60F feeds something; goes NW.

1148-1/2 - 60F feeds something, goes 35 yards N and lands 10 feet up.

1149-1/2 - 60F feeds something, goes 35 yards N and lands 20 feet up. The young have been moderately active for 2 or 3 minutes, preening a little and responding to the female's presence.

1153 - 60F feeds, instantly goes 35 yards N and lands 15 feet up. She's moving extremely fast.

1158-1/2 - 60F feeds a black caterpillar, instantly goes W.

1200 - The weather is unchanged.

1205 - I quit watching after 6 hours.

1215 - I leave.

1830 - I return. The afternoon has been less cloudy than the morning, and it is now fairly clear.

T53 - As I walk through the clearing between 1 and 2 a female flies into a tree by me. It is 53F, her tail now much worn off at the tips but the paint still showing (and, of course, the bands). She is still neat looking, and I see no signs of molt yet. She preens, calls "tsu" regularly, faintly and often. Then she picks a floret from Queen Anne's lace and bills it for 30 seconds, finally swallows it with considerable effort. I'd guess she ate it for an insect in it, although it is odd she wouldn't have removed such an

odd
food
bug

insect (substitute reaction?).

To my surprise she suddenly begins to carry food, and I find the young 2 feet high in a dogwood S of 2. It is unbanded but within a few days of being full grown. It's tail is 1-3/4-2 inches long. There is no yellow on the breast yet. I see 2 feedings, both silent. Clearly 53F had a second brood after all, and the big question now is who was the male parent. I'll follow activity on V and search for the nest when the leaves fall.

T60 - The young are still in the nest at 1915. It was to determine this that I came out again.

1930 - I leave.

July 30, 1956

A clear, cool, extremely dewy morning with no wind; temperature 58°. Present from 0605 to 1200.

T60 - The young are sitting well up in the nest and moving actively when I arrive.

0612 - 60F feeds, goes NW. A nestling sits high, is not noisy. 60F forages near me calling "check" mildly. The nestling in sight preens, sits half out of the nest. At 0617 the action continues; a second young stretches and leans far out of the nest.

0619 - 60F feeds something to the nearest and not the highest, drops W.

0619-1/2 - 60F feeds, drops N. The young are only mildly vocal.

0620-1/2 - 60F feeds something, goes NE.

0622 - Activity, continuous to now, is subsiding.

0623-1/2 - 60F feeds something, goes E. Small response.

0625 - A nestling begins to preen and move about.

0626 - 60F feeds, is greeted noisily before she's at nest level. Regular fledgling-type notes persist after she leaves; there are 3 or 4, not loud. Movement and preening go on, but there isn't the high jumping up and down action that usually precedes fledging.

0632 - 60F brings something, goes E. Noisy response.

0633-1/2 - 60F feeds, goes NW. Less response.

0635 - 60F feeds something, goes E. Slight response.

The young are out of sight after the feeding.

0637-1/2 - 60F feeds something, goes SE. The young call and begin to move.

0638 - 60F feeds, goes E. She gave the caterpillar to one, took it and gave it to another.

0639-1/2 - 60F feeds, goes E. The young are high, active, but only for a minute.

0645-1/2 - 60F feeds, takes a sac SE. She took the caterpillar out of one's mouth when it was half down, gave it to another. Moderate response, quickly dying down.

0648 - 60F feeds, goes E high into the woods. Slight response.

0651 - 60F feeds items to 2 young, goes E. Slight response, no action afterward.

0653 - 60F feeds, goes W. Moderate response. One becomes active.

0653-1/2 - 60F feeds the high one, pulls the object away and feeds a lower bird, goes down W.

0655 - One gets on the rim, in 5 seconds turns, and re-enters.

0656 - It repeats, staying 20 seconds and preening and stretching on the rim.

0657-1/2 - 60F feeds the highest, takes a sac S.

930
7/30/56
VN

0658 - One is on the rim, I think.

0659 - 60F feeds the high bird something, goes E. It gets back into the nest.

0700 - It's clear, calm, 63°. There's a slight mist.

The young are now completely out of sight.

0706-1/2 - 60F feeds, goes NW. Very slight response.

0710 - I've not seen the young for 10 minutes except when 60F fed; one responded then.

0710 - 60F feeds something, goes high E. One responds.

0711 - One nestling begins to preen. In 45 seconds another does too. Both stay low, move little, quit at 0714.

0715 - A little sun hits the nest area. It's 64°.

0716-1/2 - 60F feeds, goes NW. They call a little but sit low.

0722 - 60F feeds, takes a sac NE. Only one gapes; all are silent.

0723-1/2 - 60F feeds, goes NW. Same response as last time.

0726 - 60F feeds an adult insect, goes NE to the woods.

0734-1/2 - 60F feeds, takes a sac NW. There still is almost no reaction to her coming to the nest; I can just see the tips of a bill or two, when the young gape.

0740-1/2 - 60F feeds something, goes W. The young call but remain low.

0743 - 60F feeds an adult insect, goes NW. Very slight response.

0745 - Movement begins in the nest. At least two are

preening. This wanes in 1-1/2 minutes, but one continues fitfully and is at least awake. It stretches, sits high.

0750-1/2 - 60F feeds something. The young gets to the rim, stretches its wings, gets back.

0751 - Two young get to the rim and at the same time 60F comes to feed. She goes, and the two turn to face the cavity, and get in.

0752 - One gets to the rim, stretches. In 20 seconds it re-enters. All are high.

0753 - Two are on the rim. 60F comes to feed. One flies down into the nest tree about 2 feet. The other flies out from the nest at nest level, lands in the tree. As the first flies, after 60F has fed one, 60F turns back and calls and I think follows the fledgling down. The third bird sits on the rim. At 0754 it starts to move off, bobbing its tail at least 2 or 3 times as a preliminary. It doesn't quite leave; at the last minute it hangs on to the rim and struggles back up to it. It quickly crosses to the S rim and preens.

0756 - The 2 fledglings are in the tree, the third bird on the rim. One or more are calling.

0759 - The bird on the rim preens and sits quietly by turns.

0800 - It is cloudless, calm, 69°.

0806 - At the nest tree the situation is unchanged. 60F is foraging in an oak at the edge of the woods, 45 feet up.

She "checks." Note her inattention since the young left the nest.

0807 - 60F comes to the nest tree, feeds a bird 3 feet or more below the nest.

0807-1/2 - She repeats. A Red-eyed Vireo seems to be looking on; it is 2 or 3 feet away.

0808 - 60F may feed again. The last young is still on the rim.

0812 - 60F comes to the tree, landing near a fledgling. She turns and looks at it, seems to ignore begging, goes and feeds the bird on the rim, gets a fecal sac and goes S. The young then gets back into the cavity for a minute.

0813 - The young is on the rim or sitting high; it's calling, then preening.

0815 - 60F feeds the bird on the rim, leaves. In 10 seconds it jumps 3 inches, hops up to the top of the nest tree, starts to fly. I think its original course is E, but it turns in flight so that it actually makes a sort of circle and lands in the W part of the tree near the top.

I move in to set up my net and band. It is an extremely tough job. The female evidently sees the net in the sun's rays, so that she goes around it from the beginning. I then catch 2 young about 20 yards SW of the nest; the last fledgling flies from the tree top 15 yards E into the woods at least 15 feet high and is out of reach. Even with the young placed near

the net the female won't go into it except at such low speeds that she doesn't get caught. Finally I move the net into shadow and tether a fledgling under it. 60F persistently seeks to get to it from the other side of the net, but her flight is so very slow and hovering and she is so obviously aware of the net that she never catches even though she hits it. At last I simply chase her into the net and catch her.

I band 60F with 25-66006, silver left and yellow right. She weighs 6 grams. The 2 young are silver over yellow, left leg. 60B is 25-66007, 5 g. 950 mg; 60R is 25-66008, 6 g. 300 mg. The young are clearly more advanced than the usual fledgling. They have rectrices 9 mm. long, and their weights and powers of flight are also significant.

T53 from 1030 to 1200 - After 40 minutes of searching on T53 without success I find 53F feeding a fledgling bird of the age of the one seen yesterday. She is in the white pines and locusts at the SW corner of V, about 75 yards from where she was last night. She calls "tsu" and "cheek," the former much more frequently, but pays little attention to me. The young bird seems to stay between 6 and 10 feet high and is silent.

A Blue-winged Warbler keeps near 53F, evidently following her out of curiosity. They are within 4 or 5 feet of each other often, but I see no reaction by 53F. A male sings 2 high

yg-
NB

B659
LW

934
7/30/56
VN

and weak insipid steps in the S end of 4, but I never am able
to see him.

1200 - I leave.

July 31, 1956

A clear, cool, wet morning like yesterday's. Present from 0830 to 1130.

T53 - I find M53 almost as soon as I arrive. He is foraging in the S end of 3, from 2 to 25 feet high, and carrying food to an unbanded juvenile of the same age as the one 53F has been tending. I consider this sufficient evidence that M53 is the male parent. The young bird is about 20 feet up in the locusts. It is nearly silent except when fed, and even then it makes little noise. However, the calls from 3 seem to come from more than 1 spot, so I'd guess that there are other young of this brood present. M53 sings twice in 50 minutes, both songs weak insipid steps.

53F appears after about 20 minutes and forages along the edge of the 2-3-4 clearing, usually about 5 feet high. She calls "tsu" at me but not very interestedly. I don't see her carry food but she surely is doing so.

Both adults are still in good plumage. I see signs of wear but not of molt.

T60 at 0930 - 60F is feeding a banded young at the extreme W edge of the territory about 35 yards from the SW corner. I.e., this fledgling is about 80 yards from the nest 24 hours after leaving it. It is 9 feet up in a dogwood. 60F shows no great excitement at my arrival, calling "check" but continuing to feed. I don't go near the birds today.

pos'n
yes

T57 - In 30 minutes of careful searching the whole habitat I see nothing.

T59 - M59 is feeding 59G in the hawthorn area on the remnants of I, across the cut-over fairway. They're about 110 yards from the nest, some 140 yards from the spot where I saw M59 the day after the young left the nest. 59G is sitting quietly 7 feet up in a scrubby elm near the hawthorn. M59 is very shabby-looking in an advanced stage of molt. He calls "check" regularly as he forages; I think he was doing so before I came up.

posit
gg

molt
calls
N 49

1130 - I leave.

August 1, 1956

A hot sultry afternoon after a cloudy morning with moderate temperatures. Present with Board from 1415 to 1630.

T59 - M59 is still feeding a young bird in the hawthorns on I. I see him carry food and he calls "checks" as he did yesterday. The nestling is out of sight.

posir
yg

We cover the territory pretty thoroughly, including the hillside on old T3, without seeing the rest of the family.

T53 - As I pass between 2 and 3 an unbanded immature PW in full plumage appears about 6 feet high in the locusts. Some red shows in the back. I catch sight of it periodically as it moves about in the area, and then I find 5hY near it. Both are in the same plumage and both are silent. Not far away is an adult-looking Blue-winged Warbler. Twice there are silent chases, with 5hY in both; it either pursues or is pursued by the other young PW, and it chases the Blue-wing (which quickly retreats). The aggressive behavior is interesting, as is finding 5hY back on V so long after it hatched.

B 3 yg - aggressive
inc Burg W

M53 sings 7 insipid steps, weak and short, in 2; the songs are in a series and are about 30 seconds apart.

2 checks to den
of this is
MD12 -
sing hah
not

538 forages along at the edge of the 2-3-h clearing. She calls "tsu" faintly but regularly. Her throat is molting slightly.

T54 - See above under T53.

T60 - During 10 minutes here I see and hear nothing.

1630 - We leave.

August 2, 1956

A day like yesterday, somewhat cloudy and gray in the morning with increasing sun and sultriness in the afternoon. Present from 1030 to 1230.

T59 - I walk through the remnants of I, the hillside which was T8, and then the areas where the successful nest was. Here I find M59, 60 yards S of the nest. I.e., he has crossed the fairway from I since yesterday. He calls "check" fairly frequently but with intervals of silence, forages from 6 to 30 feet high. I don't wait to see what young he's tending.

T53 - I cover the E half of V for 30 minutes and finally find M53 in the S end of 3. He sits silently, 6 feet up in the edge of the locusts, then calls "check" once and flies NW into the trees.

T60 - In 30 minutes of careful looking I don't find any PW's.

1230 - I leave.

posit
82

939
8/3/56
VW

August 3, 1956

Another day with a partly cloudy morning and some sun in the afternoon; moderate temperatures. Present from 1000 to 1200.

T59 - I take a circling route through I, T3, and T8. At the E edge of the fairway about where T3 and T8 meet is a full-plumaged immature PW, unbanded and silent. It moves through the trees at from 10 to 25 feet, often sitting for a few (as many as 30) seconds, motionless. Note the fact that I'm seeing strange PW's on my area, but that all so far are birds of the year. Note too that the only adult birds that bred on the area and are still seen are ones that are tending young. Is this a matter of chance (and remember that I've seen M58 recently), or of my concentration on territories where I know there are young? Do PW's take to the woods in the late summers? So far I've found no birds in the more open parts of the habitat, e.g., the pine field on V. They seem to skulk.

yg
NB

I find M59 feeding 59G where M59 was yesterday, S of the nest. He calls "check" but without excitement, carries food infrequently. 59G sits 8 feet up in a dogwood, seems to be starting to move to follow the parent. The first time it flies I note that the tail is now about 3/4 inch long; it perches quietly for a minute after landing. It then flies

pos 12 99
fndy

940
8/3/56
VN

W across the fairway to the hawthorn area, M59 moving with it and both calling in flight.

T60 - I cover the clearing and the little openings to the W, but in 40 minutes I find no FW.

T53 - As I leave I hear a young bird calling in 3. It sounds-as if a feeding is going on.

1200 - I leave.

911
8/11/56
VN

August 4, 1956

A hot afternoon after a clear windless morning; temperature about 96° at 1500. Present from 1530 to 1730.

T57 - I walk carefully over the entire habitat without finding a PW. A male Black and White is present.

T53 - 53F is carrying food on the W edge of 2 by the clearing. She is still nest looking but I think there are signs of molt in her scapulars. She calls "tsu" at me when I squeak but shows little alarm. I don't see the young. 53F has her bill open all the time as she forages, staying at about 5-7 feet in height. I can hear a young bird calling as she carries food into the thick edge growth. Note that the young aren't following the adults here, at least not noisily.

molt

bill

open

In the NW edge of the pine field, at the transition point between the edge of 2 and the dense stand of dogwoods, I find M53 and at least 1 unbanded, fully immature (therefore not a 53Y) PW. M53 doesn't carry food, and he is probably silent. Occasionally there are very faint notes like "tsu," but these could come from the immature, possibly a second immature, or from numerous birds of the other resident species. Both the PW's stay low, ranging from 1 to 3 feet high. Once M53 chases the young bird, a silent attack and pursuit that takes them out of my sight in a second or so. I see no other meeting of the two, though they are foraging in the same general area.

of chase
a 22

942
8/4/56
VN

It is interesting that MS3 is aggressive at this stage.

1730 - I leave.

943
8/5/56
VN

August 5, 1956

A very hot day with a strong SW wind in violent gusts in the afternoon; temperature 100° at 1300. Present from 1430 to 1500.

T59 - I find M59 carrying food in the remnant of habitat left between I and IW, near the S end about 30 yards from the drinking fountain. M59 is calling when I come up and it seems clear that the "check" notes are normal and have nothing to do with me. The young bird is in the thickest part of the cover, the tree row. It calls periodically in bursts, the vibrant food calls. The adult's notes are irregular; for 2 minutes or so at a time he is silent.

feeding position

The young bird moves 3 or 4 times, possibly because I'm pressing in too closely in an attempt to see it. It seems to stay from 2 to 3 feet high most of the time, but once it flies up to 25 or so. The wind is so very strong I never get close enough to see the hands.

M59 is molting very badly. He seems fully able to fly but there are only 3 or 4 rectrices and not the regular number of primaries.

molting

1500 - I leave.

9/14
8/6/56
VN

August 6, 1956

A sunny morning, considerably cooler than yesterday.
Present from 0900 to 1130.

T59 - I hear M59 at the hawthorn thicket when I arrive.
(Note how this place seems to be a sort of base to which he and the young return, comparable to thicket 1 for the first brood of the 53's; the range of the birds away from it is rather limited, but on this territory the fairway presents an artificial condition.)

I see M59 carry food to 59G, the fledgling he has been tending every time. I've been able to make an identification. The behavior of both is unchanged and resembles that of yesterday. Today, though, there is an important new development: 59F and probably both the other young are also present here. The female, showing no molt, calls "check" mildly at me and carries food to the young. They give bursts of begging, keeping concealed for 5 minutes at a time and then moving. I see only 59Y (yellow). It sits 4 feet up in a stand of 3-foot hawthorns at the edge of the fairway, motionless except for an occasional sidling along a limb for 1/2 inch or so and except for its looking about. It calls "check" faintly about once every 10 seconds, but this is irregular and there are minutes of silence. Then a series of loud food calls comes. An unseen young calls from 20 yards away, some 3-10 feet up

in an apple.

The state of 59Y's plumage is important. It is in full, neat juvenal dress with no yellow on the breast. The tail is nearly 2 inches long but not quite the length of an adult. It therefore looks just a shade smaller than an adult. (It's at about the same stage at which the young of 53F's second brood was when I first found the latter.) 59F doesn't stay near the fledglings, even when I am close to them. She wanders 30 or more yards away at times, typical behavior when young are this old.

T53 - After 40 minutes I find 53F carrying food at the W edge of 1.

T60 - In 25 minutes I see no sign of a PW.

1130 - I leave.

916
8/7/56
VN

August 7, 1956

A sunny, sultry day with periodic dimming of the sun under a thin cover; the morning was dewy after a cool night, but the afternoon is hot. Present from 1400 to 1530.

T59 - M59 and 59G are just S of the hawthorns behaving as usual. Both call their different ways, and 59G seems to follow the male, or at least to fly toward him when impatient for food. 59G looks full-grown; it is a little higher than usual, some 20 to 25 feet up in the trees of the tree row.

I don't find the rest of the family. It's probably significant that their separation today after the reunion yesterday leaves M59 still tending the same young bird.

I cover all of T59 S of the old T3 hillside, even going W to the strip of habitat beyond the IW fairway.

T53 - In 20 minutes I learn nothing.

T60 - In 15 minutes I learn nothing.

1530 - I leave.

feeding

*separate
feeding*

August 8, 1956

A day with a thin hazy cloud cover of varying intensity, never enough to prevent the sun's casting shadows; moderately hot temperatures. Present with Paul Davis from 1330 to 1630. We take a number of color pictures of nests and nest sites; details will be noted below.

T59 - M59 is feeding 590 in the usual spot at the Hawthorn thicket. Both are noisy and move a lot, with the young bird following the male and once going up to 35 feet after him. *feeding*

The plumages are interesting: M59 is terribly shabby, has only 2 rectrices, and shows no signs of acquiring new feathers. 590, full-sized, now has the beginnings of the yellow V-shaped breast tract and of the yellow feathers on the fore-edge of the wing. I saw no color on him on August 6 during a very brief observation, and there was definitely none on the sibling 59Y. *more* *gg*

We cover the far N hillside and the area of the successful nest but see no other PW's.

T54 - Nothing seen as we walk slowly through.

T53 - 53F is silently feeding 1 young at the edge of the W side of the 2-3-4 clearing. They are 4 or 5 feet high at their highest and for the first time that I've seen the fledgling is following the parent closely. The young has *feeding*

broad yellow strips on the breast and belly, but the tract is not completely developed yet; the head is frowsy looking.

T60 - We see nothing during 20 minutes.

T57 - We cover the W side of the territory see nothing.

T56 - Nothing.

1630 - We leave.

Pictures taken are shown below; the numbers in parentheses are the frame numbers of the film:

1 (11). 59F's successful nest from 3-1/2 feet S, showing my hand holding back leaves. Some 3 or 4 leaves were removed during the nestling period. F8 at 1/25.

2 (12). Same from 18 feet S, with all screening leaves removed. F8 at 1/50.

3 (13). The nest found on the N hillside on old T6, from 3-1/2 feet S; my hand is holding back the leaves of the maple nest tree. F8 at 1/50.

4 (14). Same from 25 feet S, some leaves removed. F8 at 1/50.

5 (15). The unused second brood nest of 53F from 15 feet S; some leaves removed. F8 at 1/50.

6 (16). 53F's successful nest from 3-1/2 feet E and above, some leaves removed. F8 at 1/50.

7 (17). Same from 17 feet NE. F8 at 1/50.

8 (18). 60F's nest from 18 feet S, my hand holding a stick to point to the nest; several screening branches and

9/9
8/8/56
VII

leaves removed. F8 at 1/50.

9 (19). 57F's nest found empty in the little cherry tree, from 3-1/2 feet W. Field cover is now a little above nest height but was not so at the time the nest was built. F5.6 at 1/50.

(Davis also has a picture of 18F's nest which she took so long to build in a little elm on III. I get a copy of this too.)

(There is a red bat 5-feet up in a dogwood on V, a Field Sparrow on 3 eggs, an Indigo and Cowbird about to fledge.)

FS
3

IB
CWR

8/8
- 9
7/31
- 11
7/20

950
8/9/56
VII

August 9, 1956

A hot sunny day with temperatures in the high 80's.
Present from 1700 to 1800 and with Val from 1900 to 2030.

159 - I find M59 feeding 59G on the E side of the fairway, across from the hawthorns and some 40-50 yards S of the nest. The young bird is low in a thicket of ^{tough-leaved} ~~red cedar~~ dogwood, some 1-4 feet from the ground. It calls a lot, the regular feeding calls, and M59 calls "checks" frequently, possibly at me. In addition, he flies about 10 yards N of 59G and frequently calls "tsu" in a way that resembles the contact note. Interspersed are "checks," and shortly after the "tsus" begin 59G and the male both fly N into or beyond the sassafras trees near the nest. It occurs to me that the "tsu" note is a stimulus to induce following by the young.

M59's plumage doesn't show any signs of filling out yet. He is still shabby, has only 2 tail feathers (without any growing in so far as I can tell), and possibly lacks primaries. 59G shows a good yellow V on the breast, the primaries and tail feathers are of course fully developed, and the contour feathers of the back look olive and seem to be moving into the immature plumage.

I cover the W side of the cut but don't see any of the other 59's.

1805 - I leave.

Leaving
details,
B,
etc

indiv

1900 - I return with Val to stay near the hawthorns and
see if the male and his young will return to it to roost. *no 144*
They never appear, and we leave at dark. [I never saw M59
or 596 again this year.]

2030 - We leave.

952
8/10/56
VN

August 10, 1956

A sunny morning with moderately hot temperatures. Present from 0930 to 1230.

T59 - I cover this territory and old T3 carefully without seeing the 59's, the first time I've failed to see them in many days.

T53 - There are a lot of developments here.

At 1100 in the clearing between 2-3-4 I see 2 birds of the year in full immature plumage, moving within a foot or so of each other in the low edge on the E side. Then other PW's appear, and for 15-20 minutes they seem to be everywhere. The unbanded immatures behave just as a flock of fall Dendroicae always does, moving restlessly, darting about, engaging in sudden quick pursuits, and disappearing as quickly as it appeared. During the short period so much happens that it is difficult to follow, and the situation is much complicated by the presence of both 53's and their second brood.

The significant facts about the birds other than the 53's are their quick movements, all of them in the field cover and the edge growth, no higher than 8-10 feet; their general silence, although some "tsu" and "check" notes are probably attributable to them; and their aggressiveness. Short chases are common between two of them. Once one darts at a food-carrying Field Sparrow, which retreats. Usually at least 2 PW's are together in the same tree or 2 adjacent trees or weeds.

mug

mc K

The great trouble is that I can't be sure how many birds I see; it could be as few as four or as many as 8 or 10, but their actions and those of the 53's make any certainty impossible. The "flock" moves E into 2 quickly, and I lose contact within 20 minutes. Later 2 birds are found together in the dogwoods E of 2, again feeding silently and low.

The question remains whether I'm correct in calling these birds of the year, in view of the fact that the literature is pretty vague about the distinction between fully immature PW's and fall adults. I base my identifications on what I think are recognizable plumage characters (grayness about the head, what looks like almost a partial eye-ring, other less tangible things that I think a trained eye can detect), and on the fact that known adults at present are still molting or are in nuptial plumage. When I see known adults later, after molt, I'll be able to clinch the accuracy of my present determinations. [They were correct.]

For the first time the young 53's are together and are making some noise as they follow their parents about. There are at least 3, at the 2-3-4 clearing edges. They stay under 6 feet, are silent most of the time, but occasionally burst into food calls. Sometimes I see 2 within 5 feet of each other, never 3 at once.

B 8, 5-3 '3
many

The plumage has reached the stage where the breast is yellow except for a small gray-olive line in the middle of the breast and belly. The back, wings, and tail are fully molted, of course; and only the head looks ragged. The birds seize food by themselves too, but they are fed by both parents and often follow them rather closely. I see no unusual behavior. When I leave, M53 and 1 young have crossed 2 to its E edge and the female and other young are out of sight. The adults call "check" occasionally, and the young may do so too.

T60 - In 20 minutes I find no PW's.

A red bat is hanging in a dogwood, 10 feet high. Like the bat on the 3th, it is in the open, looks unbanded, and lets me pull the limb down and almost touch it before it flies.

1230 - I leave.

955
8/11/56
VN

August 11, 1956

A sunny day of moderately hot weather. Present from 1000 to 1230.

T52 - In 30 minutes I can't find any of the 59's. I cover the whole area S of old T3.

I then walk to V by going through the woods, along the cinder road running down to the lake. It occurs to me that adult PW's may have taken to the woods, since I can't find them in their breeding habitat. However, I see and hear nothing.

T53 - I find nothing on the regular T53; but see the following discussion.

In the thick growth of weeds, blackberries, locusts, and brush at the S edge of 4 I see an unbanded PW that may be an adult but is probably an immature. I get only a glimpse, see no others with it. The edge is so dense that my attempts to penetrate it may frighten away any birds in it.

I then decide to go into the locust groves on V to see if adult birds are in them. In 5 I see 60F almost immediately. Twice she feeds an unseen young bird 25 feet up in the tree tops. Both parent and young are silent, and after 10 minutes' attempt to locate them again I go on. This spot is just over 1/4 mile from 60F's nest, with almost the whole distance occupied by PW habitat (the 53's using it). The discovery of 60F is significant; it eliminates the possibility of desertion

posit 41
just

and shows the distance a family will travel. (Do males move like this when tending young? Note how 2F probably did; compare the disappearance of 59F while the male remained, and see the roaming of 10F.)

I then find 2 and possibly 3 young 53's of the second brood. They are sitting 3 or 4 feet high in the relatively thick edge growth at the 5-pine clearing. Both move about a few inches or feet at a time, staying within 10 feet to 6 inches of each other and showing no alarm at me or antagonism toward each other. They are silent until, after 5 minutes, both parents come up; then the young call when fed. I note that when the adult feeds from above the young still crouch and receive the food as a new fledgling would. The birds are full grown, show a slight olive line on mid-breast and mid-belly, have untidy looking heads nearing full molt. Despite their complete growth they show one sign of juvenile behavior: When I walk up and make them fly they crouch slightly, glance nervously around as though gathering resources for the flight. After the adults appear the young follow them around in the edge. Neither adult shows any clear sign of molting; their tails are intact though somewhat shortened and frayed by wear (the paint is still visible). I don't think either adult is calling.

Near the young 53's are at least 2 unbanded fully immature FW's, staying in the same dense edge or in the field cover under the border locust trees. One bird is a good

posit
likely
He

29

957
8/11/56
VN

deal yellower than the other(s) and may possibly be adult. These PW's are altogether silent. They stay together, i.e., usually I can see them in the same tree. There are several short pursuits of each other and once when they are 8 inches apart on the same branch they turn and face off. One crouches a little and I'm pretty sure opens its bill. In a second it chases the other out of sight. Probably another sign of aggressiveness is the way one quite clearly keeps following along near 53F as she gathers and carries food. The stranger flies up to about 2 or 3 feet away and tends to keep that distance as 53F moves. Once ~~there~~^{it} is a short flurry of chase, begun I think by the young bird. I see no other attention paid by 53F.

*minus
aggressive*

1 53F

There are no PW's on the E half of V.

160 - I don't go here. For activity by 60F and her young, see above.

1230 - I leave.

958
8/12/56
VN

August 12, 1956

A sunny day with moderate temperatures. Present from 1000 to 1230.

T59 - I see nothing in a 50-minute walk over the whole territory and all of old T3. I then walk through the woods to V without seeing a PW.

V - The young 60's are being fed in S and at the W edge of the clearing on T54. All 3 birds are here, one to the S in the locusts, about 18-20 feet high, one 4-feet up in the small trees in the clearing, and one in the pines to the W. All are very noisy and seem to be engaging 60F's attention by turns; i.e., I think she is feeding each one several times, then going to the next. I see only one; it has lost its individual band and has only silver over yellow left. It is full-size, has olive shoulders but I think not a completely molted back, and has a yellow V on the breast, rather narrow. Its food call rate is 8 times in 5 seconds while the female is absent, goes to 18 times as she approaches, and gets too fast to count during feeding. Once it picks up a locust leaflet, once a long leaf stem; each is dropped after about 2 seconds. After I've watched it 3 minutes it flies W to the pine grove and joins a sibling there in the 15-foot tree tops; they call noisily.

60F shows little sign of molt.

point W?
He.

no molt

959
3/12/56
VN

An unbanded immature bird is in the locusts in 5, foraging noiselessly. Note that I find none in other areas most of the time, which suggests that I'm seeing the same birds each day on V. If so, these PW's aren't migrants or even wanderers.

In 1 I find 53F feeding her young in the NE part. The fledglings are noisy, evidently together about 5 feet high. M53 is nearby, although in 10 minutes I get only a glimpse of him and see only the female feed..

T53 - See above.

T54 - Nothing seen.

T60 - See above.

1230 - I leave.

August 13, 1956

A sultry humid day with clouds coming up in the late afternoon and a violent electrical storm and heavy rain at 2000. Present from 1530 to 1730.

T59 - I can find no PW's on the territory S of T3.

T53 - I cover all of V with reasonable thoroughness and see none of the family. Once I hear a brief series of food calls from a young bird in 2, but I don't see it.

T60 - I don't see these birds on V.

V - At 1610 and at 1615 there are 2 faint insipid step songs in 2. I can't find the singer to identify him, but it seems questionable that it is M53, since he has been silent for some time.

is
Song

1730 - I leave.

August 14, 1956

A fresh sunny morning and a somewhat more humid afternoon, partly cloudy with moderately hot temperatures. It rained heavily last night. Present from 0900 to 1200 looking for artifacts and from 1400 to 1700, and with Val from 1845 to 2000. In the morning I cover the plowed fairway W of old II and hear no PW's.

T59 - I make my usual circuit of the area S of old T3 but concentrate on the strips of habitat W of the place where the 59's had their nest. I'm anxious to find where they have gone, since I'm sure they are still around, completing the molt and probably tending the young. I don't find them.

At the hawthorn and on the fairway to the W is what seems to be a flock of wandering young sparrows, about 30 or 40 strong and composed of Field, Vesper, and especially Chipping. As I watch them a fully immature, unbanded Prairie Warbler suddenly darts at and chases a Field Sparrow. The PW was in a tree, about 7 feet up. Almost as soon as the pursuit ends, after some 10 yards, the warbler again flies at the same sparrow and drives it before him. Both are silent. I then lose sight of them and can't pick them up.

enc
Jmm
FS

IVN - In a strip of trees I find some 10-12 of the sparrows mentioned above, 1 or 2 Indigos, and 2 Bluebirds all concentrating

their attention on something on the ground. The Bluebirds hover 2 or 3 feet high, chattering. The sparrows tend to sit quietly. On approaching I see a racer in a pile of straw, only about 6 inches of its head and body protruding and held motionless. Several young sparrows are sitting in the straw within a foot of the snake, which pulls in out of sight when I come up.

motionless

V - There is 1 unbanded immature bird foraging in the thin woods at the E edge of the clearing on T54, i.e., in 5. It is silent, some 5 to 12 feet high.

T53 - I find none of the family.

T54 - To my surprise I see M54 (left silver, right green) feeding silently in 2 at heights of from 8 to 25 feet. He does not respond to squeaking, and his manner is rather slow and deliberate as he crawls over the leafy branches of the locusts, near the tree tops. He seems to have undergone a complete molt. His tail feathers are definitely new and of full length, and his breast, while deep yellow, looks neater and slightly less heavily streaked than that of a male in breeding plumage.

MS

molting

(I'm quite sure after seeing M54 that none of the unbanded FW's seen on V or elsewhere recently have been adult males.) This find is very interesting and yields valuable information about the duration of the stay of adult males after breeding. I wish I knew where he was during the molt.

963
8/11/56
VN

T60 - I find no 60's on V.

T57 - Nothing during 20 minutes.

1700 - I leave.

1830 - Val and I return. While playing on the fairways on I I have a pretty good chance to listen for the 59's and other PW's, but I hear nothing.

2000 - We leave.

964
8/15/56
VN

August 15, 1956

A sunny morning with a dew after a cool night; moderate temperatures. Present from 1000 to 1300.

T57 - For 75 minutes I cover the entire habitat here with the greatest care, moved by the thought that the 57's may, like M54, be present and molting. I find no PW's, however. It would be easy to overlook them, but the fact that immature birds are found so regularly on V suggests that I would find them on T57 if they were present. It seems most likely that there are none here, or at least fewer, and that the young birds found on V are the same ones from day to day. It is unlikely that different individuals, wandering or migrating in from elsewhere would always be seen on V. If these are the same birds being seen repeatedly, it looks as though birds of the year wander to some spot (probably near their home territories) and stay there till they migrate. It is conceivable that they return there to breed in future years and that this is the way the breeding population is renewed. (Then why no PW's on T57, etc.?)

V - An unbanded bird, I would guess an adult female fully molted, is feeding in the W edge of 5 at heights between 4 and 15 feet. Unlike the unbanded PW's seen in recent days, this one calls "check" from time to time as it moves over the branches. Note that it stays in the edge and the thin locust

o
Call

woods, like all PW's seen since the breeding season.

T53 - An unbanded bird, I think an immature, is foraging about 18 feet up at the N edge of the 2-4 clearing, in the trees at the edge of the woods. It calls "check" occasionally, *call* moves W out of sight.

At the same time I hear young calling and immediately find at least 3 young 53's in the NE edge of 4 near the fox den. They are 2 feet up in the brushy redbud edge growth, all within 3 feet of each other and calling. Two are about 7 inches apart on the same branch and they turn to face each other aggressively; one opens its bill at the other for the second before they separate. *poorly*
Healy

53F is feeding the family with great energy, sometimes giving food 4 or 5 times per minute to 1 bird. She gathers it right beside the young, occasionally seizing it as she turns away after a previous delivery, sometimes going a little farther. The impression is of feverish activity, which is pretty surprising at this late date in the young birds' lives. The young call noisily, the usual feeding notes. 53F calls "check" from time to time as she forages. There are contact "tsu" notes too, but I can't be sure of their source.

In about 2 minutes the young go S and this seems to break up the tight little group. I find 53F feeding one at the same fast pace, 20 feet up in a locust.

The plumage of these birds is interesting. The young for the first time seem fully immature, without any remaining *decidedly*
ly

965
8/15/56
VN

traces of molt. (Despite this they often sit trembling and calling like babies while the female brings food to them.)

53F shows a little patchiness in the feathers of the breast, back, and neck, but is still surprisingly neat. Her tail is complete but very much worn down at the tips, so that only a few feathers have any traces left of my red paint. *molt*

During all the observations of the 53's, another family of young can be heard calling only 25 yards or so to the S, in 3. I find 60F there feeding all 3 fledglings; they are noisy, about 18 feet high in the locusts. These young also feed themselves, move frequently with assurance and grace. They have broad yellow V's on their breasts. *point 31*

The foregoing events took place between 1215 and 1300.

1250 - See above.

1300 - I leave.

August 16, 1956

A hot, sunny day. Present from 1630 to 1830.

159 - I spend the whole time covering the territory and all the strips of habitat W of it where FW's might be; old T3 isn't touched, except at the edges. I see nothing at all.

1830 - I leave.

967
8/17/56
VN

August 17, 1956

A hot, sultry day with clouds in the afternoon and light rain twice falling briefly while I'm in the field. Present from 1600 to 1800.

V - There are several birds in the heavy growth of pines and locusts in the very SW corner of V, among them at least 1 PW. It is an adult male in complete post-nuptial plumage. He is silent as he feeds from 3 to 15 feet, once responding immediately to a squeak by me. *♂ silent*

A few seconds later I hear a food call by a young bird and soon see M53 carrying food to at least 1 fledgling; it is about 18 feet high in the same dense cover as the molted male. M53 is now in the middle of his molt, the first time I've seen any obvious sign of it in him. Not only are his back and flanks very messy looking; he has only 2 tail feathers, both with white in them and apparently next to each other. *fledgling*
molt

The young bird, in full immature plumage, calls 1 burst and I lose them. At 1630 it begins to rain lightly. At this time M53 and the other male are within 10 feet of each other, so I can see both. The instant the rain begins and for 2 minutes after it stops (it lasts 3 minutes) the 2 males start and continue to go through bathing motions. At times they are sitting on bare leafless branches, evidently stimulated by the falling drops and not trying to get wet from the foliage: *2 ♀*
rain - bathing

this is perhaps the most frequent situation. At other times they seem to fly at a cluster of leaves and by hitting them to shake water on themselves. At still others they go through the motions while perched on top of a leafy twig. The behavior itself consists of puffing out the feathers, fluttering the wings vigorously, and shaking the tail with violence from side to side. The timing is hard to judge, but I'd guess that the bathing motions last for a second or two and are separated by even shorter intervals except when the birds change their locations. The general impression is of quivering activity. During the 4 or 5 minutes this goes on, the 2 males are sometimes within 2 or 3 feet of each other; they remain silent, are not aggressive, continue to bathe.

I next hear the young 53 call again. This time he does so for 15 seconds at a rate of 18 times per 5 seconds, the usual intensive rate when the bird is excited but not to the high pitch reached during actual feeding. The calling persists after the male delivers food and while the young bird is itself foraging. (It stays from 10 to 15 feet high.) There are occasional "check" calls but from my poor position under the trees I can't identify the source. (There may be more than 1 strange PW present.) I also hear a few contact "tsu" notes. In 20 minutes I lose contact as the birds move W along the white pine planting; they are very active.

egg
call
don

calls

Two ideas: Does the male molt earlier than the female;

969
8/17/56
VN

evidence so far suggests so. Do the young break the tie with the parent; would the adult feed almost indefinitely if properly solicited? M53 has certainly fed for many days this summer and is still doing so well along into his molt. (He'll surely stick around now till his new plumage is acquired.)

Between 1715 and 1730 there are 2 or 3 very faint and incomplete insipid steps from 2, and I find M54 there foraging in the tops of the locusts at 20 feet. He is surely the singer. I get no response to squeaking and hear no call notes.

At 1735, 53F and at least 1 young fly into 2 from 3 or 4. They feed through toward the E, staying first in the tops but dropping to 5 feet at the E edge. They then go quickly on to 1, the entire passage taking less than 10 minutes. The young bird calls "check" frequently, irregularly; it isn't quite the feeding note, more nearly resembles the usual call. The female is silent so far as I can see her bill, but I hear some contact "tsus." She is very active in passing food.

T53 - See above.

T54 - See above.

1800 - I leave.

insipid

*feeding
calls*

August 18, 1956

A cloudy morning after rain at night and till 0930;
clearing in the afternoon but beginning to get overcast at
dark; moderate temperature. Present from 1830 to 1945.

T57 - I cover the PW habitat here for about 45 minutes,
seeing and hearing nothing.

1945 - I leave.

August 19, 1956

A rainy morning after a night of rain; cool. Present from 0830 to 1230, but I look for birds actively only during the last 2 hours.

V - I hear a young PW call in the edge of the young woods W of V, across the field, and find 60Y without the individual band. It calls very noisily, seems to be alone there; the call rate is 15 times per 5 seconds, uttered at 15 feet in height. The plumage: There is a slight but definite olive center line; the only remaining areas where new feathers seem to be coming in are the nape, the throat, and the auriculars. [See August 22 and 23 for further observations.] *enter*

In 1 minute 60Y flies E to the weeds beside the Virginia pines on the margin of V, feeds there, goes into the pines. I see 60F there and probably hear others of the brood. 60F shows no tail molt yet; she is silent. *planning*

In the N end of h an unbanded, fully molted adult female is feeding silently at 15 to 20 feet. She goes W and I lose her. *9 silent*

I next see MSh in the N edge of h, sitting 3 feet high and preening silently. He flies S into h.

In h and then 3 I find 60F feeding her young, which are very noisy. They range between 3 and 20 feet. Again the female is herself silent. Probably all 3 young are present, though I see *feeding*

the legs of only the unbanded one and the one that lost its individual band. The family is some 125-150 yards from where I saw it about 30 minutes ago, and as I watch it covers 25 yards in 5 minutes. However after another 25 minutes they have moved only 10 yards.

There is an unbanded, post-molt male in the edge of h, about 10-15 yards from the 60's, which he completely disregards. He feeds at from h to 25 feet and is silent except for the interesting fact that he sings twice, 2 very faint, 5-note songs that are rather poor efforts at an insipid step.

Note that as usual all PW's are seen at the edge of or in rather thin groves of trees. Note too, that I seem to be seeing adults now and that the immatures of a few days ago are no longer turning up.

T51 - See above.

T53 - I see nothing.

T60 - See above.

1230 - I leave.

insig 5

NB - location

August 20, 1956

A gray cool day after a light rain during the night.
Present from 1400 to 1630.

T58 - I cover this area pretty well, especially the grown-up, redbud-covered land around the little woods. In 15 minutes, I see nothing.

V - Between 1 and 2 I can hear young calling and I quickly find 60F carrying food to a spot 6 feet high in a dogwood at the N edge of 2. In 2 successive forages she first ranges 25 yards away to 1, then catches her prey in the very dogwood where the young bird is.

I next hear a call note in the W edge of 1 and see 53F feeding through the smaller locusts there, at about 6 feet in height. About 10 feet from her is a young bird, fully molted but presumably her offspring. 53F disregards me and comes quite close, calls about once every 15 seconds, faint contact "tsus" that I'd say have nothing to do with me. I'm anxious to see whether she is still feeding the young. In 3 or 4 minutes she catches 10 food items, eating all herself. The young calls "check" from time to time, forages, twice flies up to the female and sits within 2 feet of her. When close in this way, it calls more rapidly, the notes approximating a burst of food begging. I'd say that 53F is almost surely tending the brood at times but much less often than a few days

ago; when the offspring are younger it is rare to watch for more than a minute without seeing feeding.

53F has a complete set of old tail feathers. Her flanks are molting, her breast doing so a very little. She may call "check" once or twice during the time I watch. *plumage*

The picture gets complicated when a young 53 flies to the dogwood area S of 2, where the 60's are making a lot of noise. At the same time 60F comes to 1 to forage (within 10 feet of 53F, the 2 females disregarding each other), and her brood follows her. A Worm-eating Warbler appears and seems to be following along near the warblers, possibly attracted by their noise and activity. Once it chases a young PW, I think 53Y. The 53's now move on to the E or center of 1 and I lose them. *brood - activity*
inc
lost in
1st

All 3 young 60's are here, the first occasion when I've positively noted the whole brood. The one that still retains its individual band is green or blue. 60F feeds constantly and rapidly with the fledglings keeping after her all the time, moving a lot and seeming to follow her immediately after the delivery of food. They go from 2 feet in height as they arrive in 1 to 25 feet as they go S and then SE into the trees. 60F calls both "check" and "tsu"; the young scarcely ever quit the food call. *feeding*

In the N edge of 1 in the younger locusts W54 is feeding silently about 2-4 feet up. He moves rather slowly and could be followed for a long time if I chose.

T53 - See above.

T54 - See above.

T60 - See above.

1630 - I leave.

August 21, 1956

A sunny, autumn-like day with a heavy dew after a cool night; high temperatures in the middle of the day. Present with Board from 1400 to 1645.

IVN - We cover T59 and the whole of IVN, spending over 90 minutes and touching on all the edges and thin woods where PW's might be. We find only 1 bird, an unbanded adult female which has completed her molt. She is feeding silently and alone at the S end of old T6, in the thick growth of red-buds and other low trees. The spot is typical of all PW locations at this season. She stays between 2 and 6 feet, responds (but not quickly or excitedly) to squeaking.

T57 - We cover all PW habitat here for 40 minutes, seeing nothing.

1645 - We leave.

977
8/22/56
VN

August 22, 1956

A day just like yesterday. Present from 1600 to 1800.

V - At the W edge of 1 I come on 53F feeding about 5 feet up in the low locusts and edge growth. Near her are the young of her second brood. During the minute or two before they fly on into 1 I see her eat several caterpillars. The young call "checks," move almost all the time, feed themselves, sometimes approach her. They range between 4 and 10 feet. Once she flies near (possibly to) one, and it gives a burst of calls. She may have fed it, but the action is fast and not very near us.

I then cover 2 and 3 and the 3 parts of 4 and 5. In the pines at the W edge of V are the 60's, the female still tending the brood. The young are periodically noisy, sometimes falling silent for a minute or two (probably when she is out of sight). They also follow her about.

60F seems unchanged in plumage, i.e., her tail is full and the body feathers are at most only slightly molted. The young still have the faintest of divisions between the 2 sides of the ventral tract; it is probably just a gap where the feathers fail to meet, rather than a trace of the juvenal plumage. The rear part of the belly and possibly the under tail coverts seem white instead of the yellow of the fully immature. The head and neck are still imperfect.

153 - See above.

978
8/22/56
VN

T60 - See above. In 30 minutes on the territory proper
I see no PW's.

1800 - I leave.

August 23, 1956

Still another day of fall weather with a coolness at night, not so much dew as yesterday, and bright hot sun during the day. Present from 0930 to 1130.

V - I cover only the E half of the area. In the dogwoods at the NE corner of 2 I find both the 53's and the 60's, then pick the 2 families up again later.

The young 60's are calling typical food calls about 75% of the time, and I'd say that they range between 2 and 15 feet, 90% under 8 feet. 60F feeds as actively as ever, maintaining silence except just possibly for occasional contact "tsu" or "check" notes. All 3 young are present. Once I see two sitting a foot apart, 10 feet high. Another time two approach within a few inches, one flying in and landing by the other; one of these turns and opens its bill, but the action is too fast to recall which. Still another time there is a chase; I don't know whether the participants are 60's, 53's, or are mixed. The young 60's behave typically, sometimes following the mother, about as often sitting concealed by their immobility until they dart away to the mother or to a new perch. All forage for themselves.

feeding
typical
food
calls

As to plumage, 60F looks unchanged. (It's beginning to be pretty late for this delay in molting; it will be interesting to see how late she and 53F stay here.) The young show some progress: The breast is fully yellow, and either I was

wrong yesterday or the under tail coverts are yellow. The rear part of the belly still seems too white for post-molt young. The auriculars, nape, occiput, and neck aren't neat looking yet. Most important is the fact that I notice for the first time that the molt now involves the wing coverts. On 1 bird there are 2 rows of feather sheaths for the secondaries ^{primary and} ~~coverts~~ and tertiaries, while on another the feathers seem to have broken through but not come to full size.

I later (30 minutes or so) see the 60 family in the thick brush and small redbuds 15-20 yards E of the fox den.

My first sign of the 53's is of a young bird feeding 10-12 feet high. Soon I spot a second, and finally I locate 53F both low at the W edge of 2 and in the locust planting in the top. She looks ragged, but her tail is still entire and the raggedness is more a general impression than the result of any specific loss of feathers. She moves quickly and silently, and at this time I see no feeding. feeding

About 25 minutes later I locate 3 young 53's and the female scattered in the edges of 2 and 3 at the point where the two are only 4 or 5 yards apart and separated by rather thick brush. All are foraging from 5 to 15 feet high. As I watch 53F she is catching and eating caterpillars and the young are silent except for periodic single "check" notes. Although I can detect no external stimulus, 53F suddenly begins to feed; the first sign of this is that she does not eat a brown caterpillar she catches, but instead carries it. She calls a few faint

"tsu" notes, and I think it's likely that she doesn't do this until she has the food. Thus, the calls may be a food signal to the young. At the same time the young begin to give more rapid "check" calls, which may be a reaction to the female's notes (or they may well see her with the food). 53F flies to a bird 12 feet high in a sycamore and delivers the food. Unlike the young 60's, which still flutter their wings, on at least some of the occasions when they are fed, this young simply calls more rapidly. Its notes don't reach the frequency of a "burst" and they aren't prolonged; possibly it calls 10 times in 5 seconds but I can only guess. More significant, it does not simply open its bill and swallow what the female inserts, but instead it takes the caterpillar in its own bill and holds it for a second or so, then eats it just as if it had caught the food itself.

Call
situation

method of
feeding
Z

53F feeds twice more within a few seconds so that there are 3 deliveries to the same bird (I'm nearly sure it's the same) within 1 minute. A little later I see at least 1 more feeding.

note

Today's experience makes it look as though the female at the tail end of the period of tending returns to feeding behavior without any special stimulus from the young (cf. her neglecting to respond to the approach of an offspring and to its calling 2 or 3 days ago) and may move into full and active attentive behavior for brief intervals. It looks like an all or none proposition; she either feeds quickly and often or not at all.

N 13

Regarding the notes uttered by both generations, I can't be sure of myself. Action is fast and the birds are so close together that sources are hard to identify. Once as the female came up with food there were repeated adult-like "checks," maybe two a second. The young I was watching and that she finally fed didn't seem to be moving its bill, but I can't be sure the caller was the female. The food in her bill prevented her opening it far enough for me to see, and possibly another young out of my sight was calling for attention. It is sure that the young at this age still do accelerate calling in what amounts to begging; the note is a nearly adult "check" without the juvenile vibrations. It is probable that the adult female calls contact "tau" while carrying food, and several days ago she was clearly doing so while foraging for herself, but in the presence of her family.

call

call for food

151 - See above.

154 - I don't see the male.

160 - See above.

Note again that the immatures from elsewhere are very probably gone from V. Note too that other migrant Dendroicae haven't been seen yet. With Board I saw 3 or 4 Empidonax flycatchers that were probably migrants and a Worm-eating Warbler in the redbud edge growth on IVS.

6:57 PM eating

1130 - I leave.

August 24, 1956

A sunny morning and an afternoon with occasional clouds passing over; windless; temperature in the 80's. Present from 1530 to 1900.

II - I move S along the W side of the habitat left here. I've thought on August 18 and 23 that I may have heard FW food calls here, but brief inspections have revealed nothing. Today I hear 2 "check" calls almost immediately and find 59B. It is in full immature plumage, and since I see it off and on for an hour I'm sure it is alone. At first it is 15 feet up, but it flies into a large patch of giant ragweed in the moist area along the little stream. For 6 minutes it feeds silently here at from 3 to 4 feet, almost 1/2 mile from its nest. I leave it and move S to continue to search II, and in 20 minutes I find 59B again. It is feeding low in ragweed 25 yards from the first spot. About 30 minutes later I see it yet again, perched 4 feet high in a little tree on the E edge of 2, preening silently. It pays no attention as I approach to within 15 feet or so. Earlier it disregarded my squeaking.

I would guess that the 59's have been here, S of the nest, during the last 2 weeks or more.

V at 1700 - I work along the edges of 1 to the NE corner of V. Here I find 53F with at least 3 and more probably 4 young. In the 20 minutes or so that I watch them the birds are at heights of from 1 to 15 feet, 90% of the time under 5 feet.

point
B7

88

find

53F feeds a young bird just as I come up; both are silent. The state of her molt I check carefully: She is losing feathers from her forehead just above the bill, from her tarsi near the point where the horn begins, from her back and flanks, and from the ventral tract (with the molt evidently beginning at the top near the throat and higher breast). The tail is complete.

I see no further feeding during 20 minutes. Once a young bird comes to within 1 foot of 53F, and she preens while it forages silently. Twice I feel pretty sure I see her fly at young and supplant them, i.e., drive them from their perches near her. This may be a stage in the dissolution of the bond between them. During this period 53F is silent, the young are foraging very actively and in 15 minutes call "check" 3 times. No attention is paid to a Tennessee Warbler that at times gets to within 2 feet of the PW's.

I see 1 interesting thing, although it happens fast and my view is a little obscured: A young PW is 10 feet high on a limb. A second one flies up and calls a series of faint "tau" notes just as it lands, about a foot from the first. The first bird goes into a crouch and stays thus for about 2 seconds. It raises the tail quite near the vertical, so I get the very definite idea that this is the female's coition or invitation-to-copulate position. Nothing happens, and the 2 birds go their ways in 2 seconds.

The young 53's then go 3 at the E edge of V, toward L.

note

own
of attack, 4/4?

ign Time

insects
Cop by
87

53F calls "check" 2 times and flies after them. I hear the sound of a PW brood at the N edge of 1 and go there half expecting to find the 60's, because the calls sound like food calls. However, the noise comes from 53F, 1 young in a tree about 2 feet from her, and the rest, which are out of sight but close by. I think 53F was uttering the feeding notes just as the young were.

The family moves S into 1 and I lose them.

I cover V fairly carefully for about 1 hour more but see nothing.

T53 - See above under V.

T59 - See above under II.

T60 - I don't find these birds today.

1900 - I leave.

986
8/25-26/56
VN

August 25 and August 26, 1956

I miss these days, the first I've failed to go to the area since April 1. The weather is clear, cool at night, in the 80's during the days.

August 27, 1956

A sunny day with temperatures in the high 80's and a SW wind strong enough to make it hard to see PW's. Present from 1430 to 1800.

V - In 1 I find a fully molted adult male foraging in the edge locusts at from 6 to 18 feet. He moves steadily but not quickly; on 2 or 3 occasions his bill is open, presumably because of the heat. I quit looking at him and move on, in 10 minutes hear a faint and nearly complete insipid step. Two minutes later there is a 1-second loud burst of vibrant flight calls, given by 2 males I'm sure. From 1540 to 1620, I search to find the second male, but without luck (see below).

bill open

insipid

fight call

During my coverage of 1 I get a glimpse of 53F, 3 feet high in the edge growth at the W fringe of 1. A full immature PW is 2 or 3 feet from her. 53F goes down, and I lose sight of her without ever having seen her tail or the condition of her plumage. The young bird is in view for 1 minute. I see no feeding, hear nothing, and am sure there are no other young around. It seems likely that 53F and her second brood are just splitting up.

I cover the E half of V and see nothing till I hear the 60's feeding at the very W edge of V in the pines. I follow them for 10 minutes and leave them then 25-35 yards farther E in 5. They are at 5-10 feet when I discover them, but in 5 they stay in the locust tops at 25 feet or so.

feeding

988
8/27/56
VN

The young 60's are noisy, and feeding is clearly going on at a rapid rate, accompanied by the usual calls of the young. 60F is messy looking, molting on her sides and back *male* but I think not her tail. The young have just arrived at full immature plumage; one looks perfect, while another still is perhaps a little new-looking (but not ragged or messy) on the head and shoulders. Oddly, an immature that is not a member of the family is with the 60's; it is in the tree tops and seems to be moving with them. *odd bird w/ family* The young 60's, of course, do not maintain constant close contact; at any time the family is likely to be spread out over an area 15-20 yards across. The bond seems to be maintained both by the common attraction of the parent and by the young's interest in each other.

I return to 1 and hear 2 fragments of a PW step; they occur close together in time and from different locations, *insig* so possibly there are 2 singers. I soon see M54 5 feet high at a point from which a song came. I lose him immediately. *calls* In 10 more minutes I see 1 or 2 completely molted adult males. One calls contact "tsus" regularly at 2-second intervals as he feeds through the locusts from 10 to 15 feet high. Once or twice he also calls "check."

T53 - See above.

T54 - See above.

T60 - See above.

1800 - I leave.

August 28, 1956

A clear dawn with a slight dew and a breeze rising at 0630; mid-day temperature hits the high 80's. Present from 0600 to 0830.

V - I hear a young PW giving a food call at the S end of 2 as I come onto V. I go to see it and encounter a lot of action, nearly all of it in the open fields there, one of the few times in recent weeks I've seen PW's away from the thickets and tree clusters. *leaves*

First comes an adult male just completing the molt; quills are still visible on the crown, which must be the last place to acquire new feathers. Nearby are at least 1 and probably 2 immatures calling "check" from time to time. These 2 or 3 birds are extremely active and restless, chasing each other frequently. *molt* *call*

Next I see a banded PW and chase it for 15 minutes trying to get a good look at the bands. The bird flies from small dogwood to dogwood in the pine field, sitting quietly after landing and until I flush it. As best as I can tell, it is a post-molt male with a silver band on the left leg. If I'm right it was banded prior to last year and as a nestling; but I get a poor look at it.

There are 4 clear insipid steps, rather quiet and faint, from 1, but I don't see the singer. Then an unbanded young calls several "checks" from the bare ground where a tree has been removed, flies up to a dogwood at the NE end of 2, and *insig* *begging*

on into the pine field. Here it goes into a full scale food begging performance, calling as though still under adult care but not moving the body as a juvenile would. In about 30 seconds another FW flies up, and the 2 birds stay 2 or 3 seconds, 10 feet high and about 2 feet from each other. They then engage in a chase, but I can't tell which is the pursuer. I don't know what caused the begging calls; the adult was unbanded and probably approached out of curiosity or some similar drive. The young may have been a 53. chase

I continue exploring 2 and get a 2-second glimpse of M53, my first in some days. He is 3 feet high in the NE part of 2 where the cover is fairly dense because of dogwood and blackberries. During my look he is silent. His new tail feathers are about 1 inch long, his upper breast and belly yellow, the rest of the tracts patchy-looking and messy. 7

From the W side of 2 I see the young 60's, feeding from 5 to 15 feet high at the E edge of 4. Probably a fourth immature bird is with them. All young are in full immature plumage, food-calling frequently but not at peak intensity. I don't see 60F, and in 3 minutes they go W into 4. Just before they leave, two get within 1 foot of each other; the lower bird crouches, opens its bill at the upper, and there is a pursuit. 60F fly from

I now go to 1, where I immediately see an adult male (unbanded, post-molt) and a full immature foraging about 15

feet up in the locusts near the edge. They are 10 yards apart. M54 appears in a dogwood near the edge, flies out to the field between 1 and 2, sings 2 insipid steps while perched 7 feet up in a tree. (He probably was the singer heard earlier.) As I watch a FW flies by within a few feet of M54, who instantly pursues the passer-by out of sight. 81 -
Note what seems a renaissance of territorial behavior in M54, with a return to singing from perches in the open.

I return to 2. M54 and an immature (no band) are feeding 15 feet up in a locust. The young one goes to within 2 feet of M54, which seems to watch it; the young one then chases M54. There are faint "tsu" notes and a "check" but the source is impossible to identify.

I go W along the S edge of the locust plantings. At the E edge of 5 are the male with the quills on the crown, 1 or 2 unbanded full immatures, and all the 60's. After 3-4 minutes all but the 60's go N into the plantings. 60F is feeding the young, which alternately forage for themselves, sit a minute calling to be fed, or follow after the mother and beg. The young utter begging notes most of the time, range from 5 to 20 feet high (mostly at 15 feet). 60F forages at the same height but at times drops into thick growth 2 or 3 feet high. I see her well; her body feathers are coming out but not her rectrices. imm
aggr
NB - are
you more
of them
also?

but

m/s

I'd say that today there were present M53, M54, 60P, all the young 60's, 2 or 3 unbanded young, 3 or 4 adult males.

T53 - See above.

T54 - See above.

M60 - See above.

0830 - I leave.

August 31, 1956

Cloudy most of the day after rain during the night; the sun comes out at 1600 as I arrive. (It clearly has rained heavily sometime during the last 2 days.) Present from 1600 to 1800.

I hear PW food begging as I pass the SW corner of V by the white pines. A young bird in a pine top flies a little to the N out of sight. I enter this extremely dense growth and after 10 minutes manage to glimpse 60L (lost band) and 1 or 2 other PW's all moving near each other at from 6 to 15 feet. The young 60 may have a slightly grayer head than it did a few days ago. The birds call nearly constantly but at the steady rate rather than that of extreme excitement or the even higher rate given during feeding. Sometimes I hear the 2 higher rates, so clearly feeding is going on. There are also occasional contact "tsu" notes.

In the W edge of I is an unbanded immature. I see nothing else during a pretty careful search of the W half of V.

T53 - Nothing seen.

T54 - Nothing seen.

T60 - See above.

1800 - I leave.

99h
9/1/56
VH

September 1, 1956

A rainy day after heavy rains at night. Present during rain from 0900 to 1115 and from 1500 to 1630.

V at 0900 - In 1 there is a silent unbanded adult female, post-molt, feeding in the W edge at 8 to 15 feet.

In 2 I see 60B foraging actively but silently for 5 minutes in the locusts 10 to 20 feet high at the NE corner of the planting. It then goes into the center of 2 and for some 7-10 more minutes I see it silently foraging in the locust tops. Significantly it is alone; note too that it is not in the SW corner, which seems clearly to have been the center of activity or headquarters of the 60's when they were under the care of the female. I then lose 60B. 60's

653 is foraging silently in the tops of the locusts at the center of 2, and I watch him for 15 minutes. His plumage is well molted thus: The breast and belly feathers are completely replaced. Quills show on the crown, but the rest of the head plumage is completely new. The neck may be messy at the sides. The tail is being replaced, with the center feathers 1/4 inch short of normal and the outer feathers only about 1 inch long. 653 does not respond to squeaking and I lose him; I think he goes 4. molt

At the S end of 3 is 60B. In a minute I locate 60L and perhaps 60U but not 60P. There are occasional "check" calls but no food sounds during 15 minutes. I'd guess the 60's are breaking up and have left the mother. The parents are 60A & 60B. 60's

to 5 feet high in the rather dense edge growth.

I see a Canada Warbler, nothing else.

T53 - See above.

T54 - Nothing seen.

T60 - See above.

1115 - I leave.

1500 - I return.

II - I search the W side of II for an hour and find 59Y in a giant ragweed patch in the low moist area along the wet-weather stream. It is silent, moves deliberately, stays between 3 and 6 feet high. In 10 minutes while I have it in sight none of the other 59's are noted.

Posed
59's

I think that this area is clearly the center of 59Y and the 2 young she tended. I probably heard the brood 2 or 3 times; it must have broken up just a day or so before I found a young bird here in late August.

T59 - See above.

1600 - I leave.

September 2, 1956

A fine sunny windless morning with a heavy dew. Present from 0900 to 1230. All my time is devoted to V, which I cover thoroughly.

In 1 I first see a silent unbanded adult female foraging in the marginal growth at from 3 to 10 feet. She does not respond to squeaking. Sometime later I see this bird or another in the blackberry thicket in the center of 1; she is from 1 to 4 feet up.

I hear 3 faint but complete insipid steps from the pine field, and I find M5h there. He is foraging from 1 to 6 feet up in a dogwood in the clearing between 1 and 2, moving on to 2. Later I return to the thicket in the center of 1 and find him there. Note how 1 seems to be the center of M5h's activity. (The fact that there is such a center seems pretty clearly established, a very interesting development.) M5h gives no response to a squeak, makes no sound except for the songs mentioned above.

insipid

I then move carefully over V, seeing nothing till I get to the very SW corner. Here moving in the pine-locust area are 60B and an unbanded immature that may be 60U. The 2 birds are within 20 yards of each other; then they close to within 5 yards, then drift apart. They are silent and their height range is pretty evenly distributed between 5 and 25

60B

feet. I never see 6OF though I look carefully. (Do females leave the area where they tended their young, possibly to escape feeding them? Almost surely no.)

T53 - Nothing seen.

T54 - See above.

T60 - See above.

1230 - I leave.

September 3, 1956

A fine sunny, dewy morning but hotter than yesterday and with a SW wind. Present from 0845 to 1245.

In the pine field N of 1 I hear a "check" call and find an unbanded immature bird in a little dogwood. It quickly flies W, and I lose it.

I then go to T60 and cover it. In the SW corner just as I arrive I find M5h silently foraging in dwarf sumacs and staying between 1 and 3 feet high. In a minute or two he goes into the W woods edge, and I lose sight of him at 8 feet in height.

When I reach the SE corner some 10 or 15 minutes later I hear 1 type-3 song and about 6 skids, all faint, perfect, uttered unnaturally close together (once without a pause). I find M5h feeding 40 feet up in a tulip; he covers the branches actively, and his height and song are reminiscent of spring behavior. I lose him in 2 minutes.

+8
skid

About 25 minutes later I'm in the little clearing in 1, back on V, and I see the same male silently hopping among the berry bushes only 2 feet high. Still later, at 1200 and after an hour or more, I find M5h feeding in the 20-to 25-foot locust tops at the S end of 2; he is silent.

Careful coverage of the rest of V reveals only 1 silent P1, an unbanded immature in the SW corner. Have 60P and 13P left the area to molt? [No; see later September dates.]

I get 6CF's nest to see if by any ^{chance} it is unusually large, which might account for the long nestling period. It is normal size, 46.5 mm. across the top, 43 mm. across the middle of the cavity, 35 mm. deep. Outside dimensions are normal too.

On II I spend 30 minutes but see nothing.

T53 - Nothing seen.

T54 - See above.

T59 - Nothing seen.

T60 - Nothing seen.

1215 - I leave.

1000
9/10/56
VN

September 10, 1956

A day of only occasional sunshine with strong gusts of wind, mostly from the SE. In the morning there were even a few drops of rain. The wind makes visibility bad, motion hard to detect. During the preceding week the weather has been generally fair but cool; there have been night temperatures in the 30's. Present from 1330 to 1545, when the winds made me give up.

In V, I go first to L. An unbanded immature bird, probably a male, is in the B edge. In 4 minutes I find 53F for the first time in a number of days. She is silent during the 5 minutes I watch her. She forages, ranging from 2 feet high in the dense berry growth to 20 feet high in the locusts; once she makes a little flycatching flight of 1 foot. 53F is molting; this doesn't seem to affect her ability to move.

flycatcher
more

53F's plumage: Tail - the 2 central feathers are about 1-3/4 inch long, a little shorter than those of M53 when I last saw him; the marginal white rectrices are from 1/2 to 3/4 inch, the others somewhere between the 2 extremes. (Evidently tail feathers come in in pairs.) Head - quite messy, with feathers missing on the sides and the top but with some few quills showing on the crown. Breast and belly - completely molted except that at the sides of the throat the appearance is ratty. Under tail coverts - somewhat messy. Back - complete.

1001
9/10/56
VN

Tarsi - messy. Wings - primaries not quite full length;
coverts are new and look complete but a row may be missing.

[See notes of September 11.]

At least 1 immature (and maybe 2) is with 53F. It stays
within 5 feet to 15 yards of her, calls "check" 2-3 times on
1 occasion, possibly calls contact "tau" notes. It is unbanded,
could be her young. *calls*

I lose the 2 PW's in the W part of the locusts of 1.
Note 53F is where I last saw her, her old headquarters.

At 1500 I see an unbanded young alone in 1, lose it and
see it again. I don't see 53F with it.

Note that PW's seem to be seen more in the centers of
the locust plantings, not along the edges as a few days ago.
The foliage is considerably thinned by caterpillars and is
also dropping. *habitat*

T53 - See above.

T54 - Nothing seen.

T60 - Nothing seen.

1545 - I leave. I explored only 1 and 2 today.

1002
9/11/56
WI

September 11, 1956

A generally sunny morning with a few periods of cloudiness; a SW breeze until 0930, then calm. Present from 0830 to 1230.

V - In 1 I find 53F in and near the little clearing in the center. She is silent during the 10 minutes I watch her, staying within 5 feet of the ground and once preening for a minute. I have a fine chance to watch her and check my plumage observations of yesterday. I'll repeat and to some extent supersede those here. The whole head and throat have black spots, and no quills are visible; very messy. The belly and under tail coverts are all new but not quite fully in; therefore there is a slightly thin look with perhaps a sort of gap down the center of the belly. The 2 center tail feathers are 1-1/2 inch long, none of the rest over 3/4 inch, the shortest only 1/2. I'm not sure whether I was right yesterday re the length of the primaries and the state of the flight coverts. *helt*

After 25 minutes I see 53F again, 15 feet high in the center of 1. She is completely unresponsive to squeaks today.

T60 - I find an unbanded full-plumaged male near Black and white, Magnolia, and Chestnut-sided Warblers. They are from 2 to 7 feet high. The PW is involved in a chase, with the Magnolia I think; he is probably a migrant in a mixed flock. They all stay in the sumacs and low trees on the S edge, are responsive to squeaking. *in c*
helt

1003
9/11/56
VN

V - In 2 are an unbanded female, a Magnolia, a Black-throated Green. They are silent as they feed in the locusts and the understory from 5 to 15 feet high. The 3 birds seem to move along in contact with each other, probably are migrants. A Tennessee sings its full song 4 times, all rather faint.

*Ther
song*

I now cover 3, 4, and 5 carefully. In the W end of 5 is a completely molted unbanded female. She is silent, stays from 4 to 15 feet high, moves quickly like all birds seen today. At the S end of 5 I find M53 for the first time in about 2 weeks. He is feeding in the locust tops, never much away from 20 feet high. In 5 minutes he is always silent, leisurely in movements. His molt is now complete and he's in full plumage.

insider

T53 - See above.

T54 - Nothing seen

T60 - Nothing seen.

1230 - I leave.

1004
9/12/56
VN

September 12, 1956

A sunny day with a light SW wind; it was cloudy last night and a little shower fell in the early hours. Present from 0830 to 1200.

II - In 1-1/4 hours, I find no sign of the 59's or other PW's.

V - I begin in the SW corner and cover the W half of the area with care. I see nothing till I scare 53F up from the blackberry thicket S of 4 and E of 5. She flies up from a 1-foot high perch, drops into the thicket, calls 2 loud "checks" there. For the next 15 minutes she hops silently in the berries, never exposed and never out of a 1-to-2-1/2-foot height range. I glimpse her enough to see that her head shows a few quills on the sides. Her neck is still messy, her tail a little longer, her under tail coverts coming in but not yet complete. I see the wings well: The primaries reach to the base of the tail, are thus a shade under full length.

At 1100 I hear faint insipid step songs from 3 and go there. There are about 10 songs at irregular intervals, some of only 5 seconds. The singer moves to 2 and I follow. In 2 are several PW's in addition to the singer. At 1115 there are 15 more songs, at 1130 about 15 more. I see at least 2 immature females, 1 and probably 2 immature males, possibly

insipid

immatures

1005
9/12/56
VN

an adult female, and the singer (still unidentified) in the tree tops. Also present are Magnolia and Wilson's Warblers, probably others. There is constant chasing between PW and PW, PW and Magnolia, PW and Wilson's. In a PW - PW chase the two fly at least 15 yards from a height of 15 feet down into the low growth of 2. I can't tell the pursuer in the PW chases involving the other species. Once an immature male (with gray eyes) and an adult male Mourning Warbler disregard each other at a distance of a few feet. I hear an occasional faint "tsip," can see that an immature female gives it at least once. The birds range from 3 to 20 feet, the PW's tending to stay in or near the tops of any vegetation layer they are in (i.e., in the tree tops or the upper parts of the understory). They show no height preference.

At 1130 when I hear the songs again I at last find the singer, M5h. He is in the pine field E of 2. Present too are an immature male and female. M5h chases the immature male for 20 yards, then lands on a perch 10 feet high where he gives 2 or 3 anger calls. At this moment he hunches his head forward and spreads his wings very slightly away from his sides.

The immature birds respond to squeaking and come close to me.

The date of this discovery of M5h is especially significant since he long ago finished molting.

T53 - See above.

T54 - See above.

do Wilson
img
PW

hearing
large
zone

♂ - ♂
flying

get good
bird / 100
in 100
200

1006
9/12/56
VN

T59 - Nothing seen.

T60 - Nothing seen.

1200 - I leave.

1007
9/14/56
VII

September 14, 1956

A cloudy, threatening day after sunshine yesterday, which I missed. Present from 1400 to 1530, when a heavy shower begins.

II - I stay here and cover the habitat carefully. There is an immature male in the very S and in the remnant of the little woods that used to project into III. It stays out in rather open situations, 6 to 10 feet up; 2 or 3 times it calls "check." I squeak and it responds well. *CAW*

About 20 yards to the W is a second immature, probably a male.

There is no sign of the 59's.

1530 - I leave.

1003
9/15/56
VN

September 15, 1956

A day that is alternately sunny and dark after a very heavy storm last night. Rain is never very far off, and at 1300 there is a violent electrical storm with rain and hail. Present from 1400 to 1600.

V - As I come on to the area a Great Horned Owl is calling to the 3.

I find 53F in the patch of high, luxuriant blackberries at the N end of 2. Here she stays for 10 or 15 minutes while I watch her and doubtless she remains after I quit. Her behavior is interesting. She is silent, moves little and then without much energy or speed, stays at heights between 1/2 and 3 feet. Although she thus never comes up to the top of the berry layer and in that respect seems to be skulking and shunning the open, she doesn't show nervousness. She is so close to me I can't use my glasses. I sometimes lose sight of her as she sits quietly for as much as a minute; tail bobbing is only occasional. She and a Wilson's disregard each other.

53F's plumage: Quills show in the crown, and the sides of the head are messy. Her back and breast feathers are completely renewed. Primaries are full length (I may have been wrong in thinking that they were a little short last

mal N
+ B

1009
9/15/56
VN

time). The 2 (perhaps 4) central rectrices are of nearly full length, possibly 1/4 inch short; the outers are an inch shorter than this, and the others are intermediate in their developments.

The only other PW seen today is an unbanded immature male which comes in when I squeak at the W edge of 5 between the locusts and the pines. It seems to be with a large flock of migrant warblers; at any rate about 20 or more fly up at the same time to inspect me. Among them are Ovenbirds, Redstarts, many Tennessees, Magnolias, Wilson's, a Golden-wing, a Yellow-throat, and Black-throated Green. (The last species has a call note that is probably indistinguishable - at least by me - from a PW "check.") The PW is involved in a chase: I think it is the pursuer of a Magnolia.

*Don
ascend*

*call of
B792
1009*

T53 - See above.

T54 - Nothing seen.

T60 - Nothing seen.

1600 - I leave.

1010
9/16/56
VM

September 16, 1956

A sunny day after a heavy rain and hailstorm last night, the hail not severe. Present from 1445 to 1600.

V - There are 2 unbanded immatures in 1, both males I'm pretty sure. (I think that a male can sometimes be distinguished from a female at this age by the presence of red in the back and by the better defined face markings. Both sexes show the grayish-white around the eye.) The 2 birds are near each other, one 25 feet high and the other 14 feet. Both respond to my squeaking. The lower one twice wipes its bill with an unfamiliar motion, by pushing it forward against a twig with the mouth open. It soon flies from the N edge of 1 into the locusts, giving a little "tsip" as it moves. There is a small loose flock of Magnolias and others here. Either a Magnolia or a Nashville pursues a Prairie for 2 feet.

bill
wiping -
open

one bird in
nest

I go to the E edge of 1 and in the woods edge trees there, about 20 feet high, is M54. He feeds silently for 1 minute and I then lose sight of him among the leaves. There are many warblers here and all through 1. Ovenbirds seem to be having a big flight.

In the pine field is a completely molted adult male P4, unbanded. It feeds silently in the little dogwoods, staying about 6 feet high.

1011
9/16/56
VN

I work through 2 carefully, then do the field 3 of 3, 4, and 5 rather cursorily. M54's presence tells me enough to make the day very successful.

T53 - Nothing seen.

T54 - See above.

T60 - Nothing seen.

1600 - I leave.

1012
9/20/56
W

September 20, 1956

A sunny morning, nearly calm. Present from 0830 to 1130.

V - I cover the area with care and see no PW's until I get to the little blackberry thicket S of 4. Here I find M53 feeding silently about 2 feet from the ground. I have him in sight for 2 minutes as he moves in a leisurely way in the low cover, somewhat as 53F did in the thicket W of 2 the last time I saw her. M53's plumage is perfect.

1130 - I leave.

1013
9/22/56
VH

September 22, 1956

A sunny calm day. Present with Ted Chandik from 0900 to 1115.

V - We cover the entire area with great care, finding the usual migrant warblers of the season but no PW's until we are nearly ready to leave.

In the 3 part of 5 we see ME3 feeding in the tops of the locusts. Note that he is not at the edge of the grove but in the center. He is very active, moves quickly, and seems somewhat nervous. He calls "tsip" several times and after about 2 minutes he flies away from us, possibly 15 or 20 yards to the S. I think he utters a "check" or two at this time. We see him in the SW corner of V, in the locusts, about 10 minutes later. *falls*

In the low locusts in the very SW corner, just as we move out into the pines, we see 60F. This is the first time I've seen her in about 3 weeks and it's interesting that the location is here where she seems to have made a family headquarters after moving off T60. (The location of every sighting of a banded adult ought to be plotted or tabulated for the last 6 weeks or so.) *molt*

60F is molting, of course. I don't get a very good look at her, but I can be sure that her head and neck are patchy looking. Her new tail feathers are coming in and I'd say that the longest center pair is 1-1/2 inches long, possibly

1011
9/22/56
VM

a little more. She seems to be a few days behind 53F's molt schedule.

Note that both females that I've followed carefully eventually were seen on their usual areas and during their molts. It seems clear I was wrong in my first thought, that females moved into the woods or away from the places where they have been feeding young. I'd guess that my relatively infrequent sightings at this time are due to shyness and skulking on the birds' part and the difficulty of finding 1 or 2 females among 7 acres of brush.

[This was the last sighting of a banded PW in 1956, although probably both 53F and 60F remained for several days. Their plumages would not have been complete for at least that long.]

T53 - See above.

T54 - Nothing seen.

T60 - See above.

1115 - We leave.

1015
9/25/56
VH

September 25, 1956

A sunny still day with good observation conditions.

Present from 1430 to 1630.

No PW's seen on V.

1016
9/28/56
VII

September 28, 1956

Another in a long series of good days. Present from
1430 to 1630.

V - In the edge of the woods N of V, between 2 and 3,
an unbanded immature male PW is feeding on the outer limbs
of a big walnut tree, about 35 feet high. He is active and
moves down to as low as 10 feet, then climbs again. He seems
to keep returning to one large limb about 7 inches thick,
but I can't see any reason for this. The PW is silent.

I cover V and see no more. [This turned out to be the
last PW seen in 1956.]

1630 - I leave.

1017
9/29/56
VN

September 29, 1956

A clear morning with a slight chill in the air. The last week the moon has been nearly full and there have been many migrants; a heavy flight came through last night. Present with Paul Davis and Ted Chandik from 0830 to 1100.

We search V carefully, dividing to get a more thorough coverage. No PW's.

September 30, 1956

A sunny fine day. Present with Jerry Svetanoff (a photographer) from 1345 to 1445 and alone from 1530 to 1730.

Svetanoff and I take a series of nests and habitat pictures, with the former our true goal. The following are our shots:

1. The IVN nest (59F's?), a close-up.
2. The same at 10 feet.
3. The same at 15 feet.
4. The same at 17 feet.
5. 59F's successful nest a close-up.
6. The same to show the surroundings.
7. The same.
8. 53F's unused second brood nest, close-up.
9. The same, its supporting branch pulled down to give a portrait affect.
10. The same to show terrain and surroundings (without my hand pointing).
11. The same with my hand pointing.
12. 53F's successful first brood nest, close-up.
13. The same but with flash bulb.
14. The same.
15. A panoramic shot of T57 looking E from a tree just N of the orange grove. Taken from a height of 15 feet.
16. The same.
17. A habitat shot of III, the SW corner.
18. The same.

1019
9/30/56
VI

We would have taken more nest shots but several nests have disappeared, e.g., those on T57 and T53.

I return alone after leaving Svetanoff and cover V carefully. No PW's seen.

1730 - I leave.

1020
10/7/56
VN

October 7, 1956

A sunny day. The past week was sunny and dry except for some rain, not heavy, on October 3. Present from 1500 to 1700.

No PW's seen. I conclude that they have surely gone; only an erratic might occur now. I shall make no more systematic searches for PW's this year.

APPENDICES

APPENDIX I

REPRODUCTIVE SUCCESS, BY PAIRS AND SUMMARY

Pair 53

Nests complete - 4
Nests incomplete - 0
Nests successful - 2
Eggs per clutch - 0, 4, 4, (4) Total - 12 eggs
Young fledged - 7
Stage at failure - 1: pre-laying
 2: nestling (1 died)
 3: egg (second brood)

Total - 4 eggs, 1 nestling
Cause of failure - 1: wind
 2: unknown
 3: Cowbird (1 egg), man (3 eggs)

Cowbird parasitism - 1 in 3
Cowbird eggs per nest - 2: 1

Pair 54

Nests complete - 2
Nests incomplete - 3
Nests successful - 1
Eggs per clutch - 4, 0 Total - 4 eggs
Young fledged - 3
Stage at failure - 1: egg (1 broken)
 2: pre-laying
Total - 1 egg
Cause of failure - 1: man (1 egg)
 2: eggs never laid
Cowbird parasitism - 0 in 1

Pair 55 (omitted)

A I - 2

Pair 56

Nests complete - 0
 Nests incomplete - 1
 Nests successful - 0
 Eggs per clutch - 0
 Young fledged - 0
 Stage at failure - 1: building
 Cause of failure - 1: Blue Jay
 Cowbird parasitism - 0 in 0

Total - 0

Pair 57

Nests complete - 2
 Nests incomplete - 0
 Nests successful - 1
 Eggs per clutch - (?), 4
 Young fledged - 3
 Stage at failure - 1: unknown
 2: fledgling (1 died)
 Cause of failure - 1: unknown
 2: unknown
 Cowbird parasitism - 0 in 1 known

Total - 4

Pair 58

Nests complete - at least
 Nests incomplete - ?
 Nests successful - 0
 Eggs per clutch - 3 or 4
 Young fledged - 0
 Stage at failure - 1 egg, 2 nestlings
 Total - 1 egg, 2 young
 Cause of failure: egg died; man
 Cowbird parasitism - 0 in 1 known

Total 3 or 4

Pair 59

Nests complete - at least 2	
Nests incomplete - unknown	
Nests successful - 1	
Eggs per clutch - 4, 4	Total - at least 8
Young fledged - 3	
Stage at failure - 1: egg	
2: egg (1)	
Cause of failure - 1: man	
2: wind	
Cowbird parasitism - 0 in 2 known	

Pair 60

Nests complete - 1	
Nests incomplete - 0	
Nests successful - 1	
Eggs per clutch - 3	Total - 3
Young fledged - 3	
No failure	
Cowbird parasitism - 0 in 1	

I studied too few pairs and interfered too much to make any general summary meaningful. About the only useful figures are the following:

Egg sets known to contain 5 - 0
 Egg sets known to contain 4 - 6
 Egg sets known to contain 3 - 1
 Average size of known sets - 3.85
 Fledglings per nest successful 3.16
 Fledglings as to size of brood - 5 of 3, 1 of 4
 Of broods successful, number and per cent totally
 so - 2 of 7, or 28.5%
 Of broods successful, number and per cent losing
 1 egg or nestling, 5 of 7, or 71.5%
 Total nests of which Cowbird status is known - 9
 Nests parasitized - 1, or 11.1%
 Total number Cowbird eggs - 1
 Warbler eggs removed per Cowbird egg laid:
 Egg for egg - 1

Effect of parasitism on PW's:

Failures directly due to Cowbirds - 1 egg;
Cowbird then laid, but nest had already
failed.

Cowbird success - 0 in 1 egg, failed as egg due
to self-imposed risk; laid too late.

APPENDIX II

NEST SITES, BY PAIRS

Pair 53 -

241.3
5/6
Nest 1: 95 inches high in 15-foot yellow pine, built into needles of 2 touching, independent branches. Nest on S side, 2½ feet from trunk. Tree within 5 or 10 yards of other, smaller trees and 15 yards E of mature woods. Nest sheltered till 0730, never thereafter; probably little shade. Concealment medium.

83.8
5/9
Nest 2 (successful): 33 inches high in 38-inch maple which is 10 yards SW of pine tree nest. Nest wedged between a leader killed by cicadas and a new diverging upright leader. Scattered 15-foot yellow and Virginia pines, nearby, and weedy, briary field cover. Pine 5 yards SE gave morning shade and nest tree shaded fairly well. Concealment poor when built, good when tree leafed out.

223.5
6/15
Nest 3 (second-brood): 88 inches in 15-foot dogwood, in a 3-twig crotch of a diagonal branch, S side and 2½ feet from tree center. Tree 41 yards NW of nest 2, 3-5 yards from similar dogwoods and a cedar to the E, W, and N. No shade from S, where there are small redbuds, maples. Nest thus nearly in open. Concealment medium to poor.

259.1
6/22
Nest 4 (successful second-brood): 102 inches high in 12½-foot dogwood, 1 foot from center of tree in a fork of a diagonal going S. Other similar dogwoods 12-15 yards away, but pretty good shade from a larger diagonal branch of nest tree growing S. Concealment good.

Pair 54 -

134.6
Nest fragment - 53 inches high in 7-foot elm, built in a creeper-covered fork of 1 of 2 diagonals into which leader splits, in the center of the tree. Tree on the NW edge of 2, open on the W,

shaded only in the early morning. Moderate shade from the nest tree. Concealment medium.

119.4 Nest fragment - 47 inches high in a 7-foot haw, built in a 4-way crotch 2 feet SE of the center of the tree. No shade except from 3's locusts 15 yards W; otherwise the tree is among scrub growth of its own height. At time built, little shade from haw leaves; shade never good. Concealment medium to poor.

55.9 Nest fragment - 22 inches high in a 2½-foot maple, weak and stunted by cicadas. Nest tree among small pines and sumacs, but not shaded by other trees. Field cover later in the season would shade a nest then. Concealment medium to poor. (Note nest is 184 yards E of the nest which was next begun.)

238.8 579 Nest 1 (successful): 7 feet 10 inches high against the E side of the leader of an 8½-foot red pine, in the top whorl. Tree on E edge of W planting, with Virginia and red pines N, W, S of it; exposed to the E. Nest well shaded by nest tree. Concealment good (pine needles).

238.8 6/15 Nest 2 (second-brood): 94 inches high in 13-foot dogwood, 2 feet from the tree's center in the crotch of a diagonal growing NNE. Other shorter trees within 5 yards, but only nest tree would shade nest; leaves of nest branch give moderate shade and after 1400 nest tree gives full shade. Concealment moderate to poor.

Pair 55 -

All beginnings were between 8' and 12' in dogwoods.

304.8 5/14 Nest 1: 10 feet high in a 20-foot dogwood, 5 feet from the center of the tree, in the fork of a diagonal branch growing SW. Big tulip and ash to NW and E, but only shade is from leaves of nest tree. Concealment medium.

Pair 56 -

119.4 1723 Nest - 47 inches high in elm and creeper which has pulled one leader of Y-fork of elm over till it nearly touches the ground. Sassafras groves

and an 18-foot elm are within 5 to 8 yards NE to SE to S, with scrub trees of 5 to 20 feet scattered to the S and W. Little shade from the W, but vine and E trees would shade nest all day. Concealment good.

Pair 57 -

35.6 Nest 1: 14 inches high in a 2½-foot cherry, built between 2 upright leaders. No shade from surrounding growth, except that increasingly dense and high field cover would shade and conceal it as season advanced. Concealment poor at the time built, never good when in use.

48.3 5/25 Nest 2 (successful): 19 inches high in 2½-foot blackberry, where 2 stems cross; built against and on these stems. Sheltered a little and at times by walnut 10 yards S, more by other blackberries and by weeds growing around it; thus below top of field cover. Concealment medium.

Pair 58 -

216 Nest - 18 inches high in a 3-foot elm, built in a little fork in the center of the tree. The tree is not sheltered by other trees, is 15 yards W of the road cut; some shelter from field cover. Thin shade from nest tree foliage. Concealment medium.

Pair 59 -

142.2 6/13 Nest preceding: 56 inches in a 10-foot elm covered with creeper, built in the SE-center of the tree in a diagonal fork of 1 of several leaders. Tree sheltered only to the W, where there are 17- to 25-foot dogwoods and elms, 4 yards away. Shade from nest tree and creeper. Concealment good.

226.1 6/28 Nest studied (successful): 89 inches in a 20-foot dogwood, built toward the end of a branch growing S, in a diagonal fork, in the sun. Nest tree is NW of a 10-foot cedar, NE of a 25-foot dead walnut, and is close between 2 clusters of cherry, honey locust, etc.

some 35 feet high. I.e., nest is on the S side of a tangle of trees. Moderate shade. Concealment medium.

Possible early 59 nest: 46 inches high in a 12-foot maple, built 2 feet from the trunk (2 trunks really) in an almost horizontal fork near the tip of an ESE branch. A few trees 7-10 yards away, 5- to 12-feet high; no shelter. Concealment medium.

Pair 60 -

Nest - 12 feet 10 inches high in a 16-foot dogwood, built in the upright fork of a branch diverging from the leader, in the S-center of the trees. Nest tree 15 yards ~~S~~ of mature woods; in the clearing no tree of comparable size within 6 or 7 yards. Nest moderately shaded by its own tree. Concealment good.

APPENDIX III

SUMMARY OF CERTAIN NEST DATA

Nest sites, excluding in this Appendix all incomplete nests but the final attempt of 55F, were selected as follows:

flowering dogwood - 6
white elm - 3
sugar maple - 2
black cherry - 1
blackberry - 1
red pine - 1
yellow pine - 1

Two nest trees were covered with Virginia creeper.

Concealment was good for 6 nests, medium for 7, poor for 1.

Nest heights were at 1-2 feet (3 nests), 2-3 feet (1), 3-4 feet (2), 5-6 feet (1), 7-8 feet (5), 8-9 feet (1), 10-11 feet (1), 12-13 feet (1).

The following are the facts about the 6 successful nests:

53 (1) - 2-3 feet, period 1, good concealment.
53 (2) - 8-9 feet, period 6, good concealment.
54 - 7-8 feet, period 1, good concealment.
57 - 1-2 feet, period 3, medium concealment.
59 - 7-8 feet, period 6, medium concealment.
60 - 12-13 feet, period 7, good concealment.

APPENDIX IV

TERRITORY SIZES

Territories 56, 58, and 59 were affected by the construction of the golf course, which left wide swathes for fairways cut between PW habitat. Males of these pairs often crossed fairways without in any way using them; yet they would have defended them. In the following figures the territory sizes for Pairs 56, 58, and 59 represent utilized territory at the time I was studying them, and fairways are not included.

- T53 - 2.5 acres; UT same.
- T54 - 5.50 acres; UT not greatly smaller, probably because 54F was on 1 side of the territory and the closest neighbors on the other.
- T55 - 2.75 acres; UT same.
- T56 - 3.75 acres.
- T57 - 3.20 acres; UT same.
- T58 - 3.20 acres.
- T59 - 3.00 acres.
- T60 - 2.75 acres; UT same.

APPENDIX V

RECORDS OF BIRDS BANDED

55F	May 14	21-62054	SOG-R
53R	June 3	21-62038	S-L; G above-R
53Y	June 3	21-62055	S-L; G above-R
53B	June 3	21-62057	S-L; G above-R
54S	June 3	21-62058	S-R; Y below-L
54G	June 3	21-62059	S-R; Y below-L
54Y	June 3	21-62060	S-R; Y below-L
M54	June 4	21-62063	G-R; S-L
M53	June 5	21-62062	GOS-L
53F	June 5	21-62064	S-R
58F	June 11	21-62061	SO Brown - L
M58	June 16	25-66098	SO Brown - R
58Yg	June 16	25-66096	SOB-L; Y-R
58Yg	June 16	25-66099	SOB-L; Y-R
57Yg	June 19	25-66092	S-L
57Yg	June 19	25-66094	"
57Yg	June 19	25-66095	"
M57	June 22	25-66097	B-R; S-L
57F	June 23	25-66091	B-R; S-L
59Y	July 20	25-66001	S-L; R below-R
59G	July 20	25-66002	S-L; R below-R
59B	July 20	25-66003	S-L; R below-R
M59	July 26	25-66005	SOY -R
59F	July 26	25-66004	SOY -R
60F	July 30	25-66006	S-L; Y-R
60B	July 30	25-66007	SOY-L; B-R
60R	July 30	25-66008	SOY-L; R-R

APPENDIX VI

Prairie Warblers Banded in the United States

The following is from the official records at Patuxent and was given me by C. S. Robbins when I was at Patuxent on October 2, 1956.

Prior to 1950 there were 387 PW's banded.

Banding totals for 1950 and later years were:

1950 -	13
1951 -	10
1952 -	26
1953 -	59
1954 -	44
1954*-	30

*These totals are attributed to the Fish and Wildlife Service's official periods. Thus, the banding year ran from May 1 to April 30 and was designated by the calendar year in which the latter date fell. For example, the 59 birds shown for 1953 were banded during the year that ended April 30, 1953. In 1954 the system was changed, and the banding and calendar years made to correspond. Thus the second listing of 1954 includes the birds banded from May 1 to December 31 of that year. Records for 1955 and subsequent years were not given me, and before publication I should probably ask for a re-check of the second part of 1954.

APPENDIX VII

Prairie Warbler Banding Returns

Except for my own records, data obtained at Patuxent on October 2, 1956 show that there has been only 1 retrap, recovery, repeat, or return. On April 4, 1933, Mrs. Herman Betz banded a male with H 54122 at Dunedin, Florida. She recaptured this bird at the same place on May 25, 1934.

APPENDIX VIII

Prairie Warbler Stomach Contents

Records of U. S. Fish and Wildlife Service, Patuxent

1. Glen Echo, Md., 5/13/98

Taken in Pinus inops being defoliated by Lophyrus.

Stomach 1/2 full. Animal matter 100%.

1 obscure small black weevil - 2%

Crepidodera and other Chrysomelids - 15%

3 black ants - 25%

2 small Heteroptera - 5%

3 small Ichneumonids, 2 spp. - 20%

Shells of Coccids (brown) - 25%

Spider - 3%

Caterpillar, long, striped - 5%

Several parasitic Hymenoptera were matted (?)

No Lophyrus

2. Glen Echo, Md., 5/13/98.

Taken in a locust tree among sassafras in a hedge row along a road.

Stomach full. Animal matter 100%.

16 Crepidodera in fragments (very abundant) - 95%

1 Scolytid beetle - 5%

3. Marshall Hall, Md., 5/13/00 (?).

Stomach full. Animal matter 100%.

1 large common black ant - 10%

2 minute black Bruchids, neither bean nor flea weevil - 14%

1 other beetle - 10%

Remains of several spiders - 75%

4. Marshall Hall, Md., 5/13/03

Stomach 1/2 full. Animal matter 100%.

2 Rhynchyrtidae (spelling?)

2 spiders

A few minute Diptera and miscellaneous insect material

5. Marshall Hall, Md., 5/13/03.

Stomach 1/10 full. Animal matter 100%.

3 spiders - 50%

Miscellaneous insect material, including remains of a weevil, some minute Diptera and their eggs, and a mandible of an ant - 50%

6. Marshall Hall, Md., 5/13/03.

Stomach 1/3 full. Animal matter 100%.

2 spiders - 40%

2 weevils - 40%

Miscellaneous insect material

7. Eau Gallie, Fla., 4/14/10.

In a clearing.

Stomach 1/4 full. Animal matter 100%.

Coccid fragments - 75%

Hemiptera debris - 5%

Frag. of 1 Lepidoptera larva - 5%

Frag. of 1 Chrysomelid (?) - 5%

Spider debris - 10%

8. Eau Gallie, Fla., 4/18/10.

In a thicket.

Stomach nearly full. Animal matter 100%, plus trace of "gravel, etc."

1 frag. of Eupelmid, plus other Hymenoptera fragments - 5%

1 frag. of Drosophilid, plus egg fragments of a Dipteron - 5%

Frag. of 3 Catocalinae larvae - 73%

1 frag. of adult Lepidopteron - 6%

1 frag. of Phyllotreta sp., trace.

1 frag. of Cryptocephalus sp.

Frag. of Chrysomelid debris - 8%

Spider fragments - 3%

9. Eau Gallie, Fla., 4/19/10.

In a pine barren.

Stomach 2/3 full. Animal matter 98%, vegetable 2%.

1 frag. of Acridid nymph - 12%

Frag. of 2 adults, 2 larvae, 2 pupa cases, 14 eggs, all of Lepidoptera - 57%

3 Hemiptera eggs and frags. - 3%

1 frag. of Cryptocephalus, sp. - 7%

Metachroma sp., 1 Attalus circumscriptus, Cyphon sp., and other Coleopterous debris - 18%

1 frag. of Pompe(i?)linae (?) - 10%

Frag. spider - 7%

Plant fibers - 2%

10. Eau Gallie, Fla., 4/22/10.

In a pine barren.

A VIII - 4

Stomach nearly full. Animal matter 99%, vegetable 1%.

Frag. 3 adult Lepidoptera - 16%

Frag. 1 Lepid. larva - 5%

Frag. 3 Odonata (damsel) - 11%

Frag. 3 Gypona sp., 1 Cercopid, and Hemiptera
debris - 15%

Scale debris - 25%

Frag. Diptera and 70 eggs - 3%

Frag. Metachroma sp., 1 Curculionid, and other
Coleopt. debris - 9%

Frag 2 Hylaeus sp., 1 Serphid, 1 Eupelminae - 11%

Insect debris - 3%

Spider frag. - 1%

Bud scale and vegetable debris - 1%

11. Eau Gallie, Fla., 4/22/10.

In a pine barren.

Stomach 4/5 full. Animal matter 100%.

Frag. 3 Lepid. larvae - 16%

Frag. 2 adult Lepid. - 9%

Frag. 1 Lepid. pupa case - 5%

Frag. 1 Camponotus sp., 1 Synergus sp., 7 pupae
of Chalcidids - 17%

Frag. 1 Phaoninae (Dipt.) - 6%

Frag. 2 Membracids - 9%

Coccid debris - 17%

Frag. Metachroma sp., Coenocara (ant) sp.,
9 Apion sp., and Coleopt. debris - 16%

Frag. spider - 5%

12. Tidewater, Ala., 4/6/12.

In Timber

Stomach well filled. Animal matter 100%.

Remains of Hymenoptera

A number of Dolerus sp.

13. Sand Mountain, Ala., 6/24/13.

In old field.

Stomach 2/3 full. Animal matter 100%.

Ground up insects, probably Hemiptera except
about 5%, which are Hymenoptera

14. Tuscaloosa, Ala., 4/6/14.

In upland woods.

Stomach 1/2 full. Animal matter 100%.

Remains of Hymenoptera, apparently not ants, all
ground up

15. Jasper, Ala., 4/29/14.

In upland woods.

Stomach 1/2 full. Animal matter 100%.

A hash of Chrysomelids and Hymenoptera in about
equal proportions

16. Melville, Ala., 5/1/14.

In brushy field.

Stomach 2/3 full. Animal matter 100%.

Finely ground insects, maybe Hymenoptera or
Diptera or Hemiptera, or all mixed.

17. Melville, Ala., 5/1/14.

In brushy field.

Stomach 3/4 full. Animal matter 100%.

Remains of *Anthaxia quercata* (Buprestid) - 8%

Bits of beetles and Hymenoptera - 92%

18. Passage Key, Fla., 5/10/18.

In mangrove.

Stomach full. Animal matter 100%, trace vegetable.

Frag. 6 *Paracampus subtropicus*, undetermined
Curculionid, 1 *Cyphon* sp., 1 *Cryptorhina*, sp.,
1 Chrysomelid, 1 Oedemerid, and other
Coleopt. debris - 30%

Frag. 1 *Lucilia* sp., 1 Syrphid - 40%

Frag. 2 Lepid. larvae - 8%

Frag. 1 adult Lepid. - 2%

Frag. Hemipt. - 1%

Frag. Hymen. - 1%

Spider debris - 6%

Frag. bivalve - 12%

Plant fiber - trace

19. Pass a grille, Fla., 5/13/18.

In a swamp.

Stomach 1/2 full. Animal matter 99%, vegetable 1%.

Frag. 4 or more Fulgorids, 1 *Hydrometra* sp., and
Hemipt. debris - 50%

Frag. 1 Lepid. - 10%

Insect debris - 10%

Frag. 2 or more spiders - 29%

Plant tissue - 1%

20. Florida City, Fla., 6/15/18

In mangrove.

Stomach 1/2 full. Animal matter 100%.

Frag. Lepid. larvae - 56%

Frag. Membracid larvae - 10%

Homopt. debris - 18%

Frag. Hymenopt. - 5%

Insect debris and egg frag. - 5%

Spider frag. - 6%

21. Andote Key, Fla., 5/21/18.

In pine land.

Stomach full. Animal matter 99%, vegetable 1%, plus trace of gravel, etc.

Frag. Odonata - 25%

Frag. 2 Cryptorhina sp., 11 Copidita sp. - 49%

Frag. 6 Cercopids, 10 Fulgorids and other Hemipt. frags. - 20%

Frag. 1 Dipt. - 2%

Frag. 2 Attid (spider) - 2%

7 - undetermined mites, Acarina - 1%

Plant fiber - 1%

22. Sanford, Fla., 4/16/28.

In palmetto and oak woods, near celery fields.

Stomach full. Animal matter 100%, trace gravel, etc.

Frag. several small moths, probably *Phlyctaenia rubigallis* - 33%

Frag. 1 caterpillar - 28%

Frag. at least 9 *Gymnopa tibialis* - 21%

At least 3 *Sciara* sp. (Mycetophilid) - 2%

Frag. at least 1 other Dipt. - trace

1 Cicadellid - 5%

Frag. Coccid (?) - 2%

Frag. 1 Dire(c)lomis basalis (Curculionid) - trace

2 Diachus auratus - 4%

Frag. small Cerambycid - 1%

Frag. 1 Attid and at least 1 other spider - 4%

23. Rockbridge Co., George Washington Nat'l Forest, Va., 6/8/37.

Stomach full. Animal matter 100%.

4 Plagiodera versicolor - 35%

1 Ichneumonid - 2%

Metriopis bivittata - 1%

Cicadellid - 2%

Attid (Araneida) 1%

Curculionid - 3%

4+ insect eggs - 8%

3+ small moths, Heterocera - 48%

24. Rockbridge Co., George Washington Nat'l Forest, Va., 6/9/37.

Stomach full (.4cc). Animal matter 100%.

2 Lina interrupta - 28%

1 Nodonota puncticollis - 2%

3 Plagiodera versicolor - 31%

1 Camponotus sp. - 3%

1 Membracid - 2%

1 Cercopid - trace

1 Lepid. larva - 2%

Frag. Dipt., probably Chironomid - 32%

25. Rockbridge Co., George Washington Nat'l Forest, Va., 6/11/37

Stomach full (1.1cc.). Animal matter 100%.

15 *Hypera punctata* - 59%

4 *Sitona hispidula* - 4%

1 Carabid - 3%

7 *Systema taeniata* - 7%

4 *Aphaenogaster fulva* - 9%

3+ *Euschistus* sp. - 18%

1 *Lebia pulchella* - trace

1 *Chalepus dorsalis*

APPENDIX IX

Nest Construction Data from Patuxent

C. S. Robbins gave me the following analyses of PW nests, all of them from Patuxent, Maryland:

1. Inside layers 50%, outside 50%.

Composition of inside: pappus of Cirsium prob. lanceolatum, 50%; feathers, all contour (?), of Flicker, Blue Jay, Red-bellied Woodpecker, 35%; fine pieces of stems and inflorescence of grass, 15%.

Composition of outside: grass seeds, 15%; shredded bark of Apocynum, 25%; grass stems and leaves, including Andropogon virginicus, 60%

Measurements:

Inside diameter - 1-1/4 - 1-1/2 inches

Outside diameter - 2-3/4 - 3-1/4 inches

Inside depth - 1-1/2 inches

Outside depth - 2-1/2 inches

2. Inside layers 40%, outside 60%.

Composition of inside: grass seeds, mostly Andropogon, 40%; down from Osmunda cinnamomea, 40%; rachises of grass inflorescence, 15%; plant fibers (pappus?), 5%.

Composition of outside: Shredded fibers of bark of Apocynum cannabinum.

Measurements:

Inside diameter - 1-3/4 - 2 inches

Outside diameter - 1-3/4 - 2-1/4 inches

Inside depth - 1-3/4 inches

Outside depth - 2-3/4 inches

3. Inside layers 40%, outside layers 60%.

Composition of inside: coma of Apocynum canna-
binum, 95%; shreds of pods of A. cannabinum,
4%; bits of grass, .5%; seeds of Andropogon,
.5%.

Composition of outside: Outer bark of Vitis, 20%;
inner bark of A. cannabinum, 80%.

Measurements:

Inside diameter - 1-1/2 - 2 inches

Outside diameter - 3 x 2-1/2 inches

Inside depth - 1-1/2 inches

Outside depth - 2-1/2 inches

4. Inside layer 5%, middle layer 70%, outside layer 25%.

Composition of inside: Sporophyte setae of moss,
with some capsules and some gametophytes,
25%; very fine stems, leaves, and rootlets
of dried grasses, 75%.

Composition of middle layer: seeds of Andropogon,
mostly virginicus, 70%; pappus of composites,
probably Lactuca, 20%; grass stems, 5%; downy
animal hair, probably under coat, 5%.

Composition of outside layer: shredded bark of
long silvery fibers of Apocynum, 95%; pieces of
grass stems and leaves, 4%; miscellaneous plant
fibers and bud scales, 1%.

Measurements:

Inside diameter - 1-1/2 - 1-3/4 inches

Outside diameter - 2- 2-3/4 inches

Inside depth - 1-1/4 inches

Outside depth - 2-1/4 - 3 inches

Location: wedged into fork of maple sapling, bound
to 1 branch and to 1 leaf blade.

5. Inside lining 10%, middle layer 40%, outside layer 50%.

Composition of lining: fine grass 70%; animal hairs 30%.

Composition of middle layer: hairs from seeds of A. cannabinum, with seeds, 85%.

Composition of outside layer: shredded bark from old stems of A. cannabinum.

6. There are a few data of the foregoing kind for other nests, but those copied are typical and comprise the bulk of the information.

APPENDIX X

Nest Data from Patuxent

C. S. Robbins let me copy the following data on nests found on the Refuge:

1. 6/2/49; woods margin; Carpinus fork; 7-1/2 feet; 2 young.
2. 6/9/49; roadside growth; Carpinus sapling; 4-1/2 feet; 2 eggs.
3. 6/10/49; sweet gum field; sweet gum, Virginia creeper; 9-1/2 feet; female sitting.
4. 6/3/43; scrub pine fallow field; scrub pine; 3-1/2 feet; 3 young.
5. 6/10/43; scattered sweet gum and pine composite field; sweet gum sapling; 5-1/2 feet; 4 eggs.
6. 5/25/43; thicket; against main stem Robinia sapling, with Vitis and Parthenocissus; 4-1/2 feet; empty.
7. 5/31/45; sweet gum field; maple sapling fork; 20 inches; 4 eggs.
8. 6/9/45; sweet gum-pine field; 7-foot sweet gum, in crotch; 3 feet; 3 young.
9. 6/9/45; abandoned (sweet gum) field; red maple with twining Smilax; 1-1/2 feet; empty.
10. 6/9/45; abandoned (sweet gum) field; black gum sapling; 22 inches; 4 eggs.
11. 6/9/45; abandoned (sweet gum) field; sweet gum; 5-1/2 feet; 4 eggs.
12. 7/8/42; abandoned (sweet gum) field; Carpinus; 4 feet; 4 young.
13. 6/20/45; abandoned (sweet gum) field; red maple crotch; 4-1/2 feet; 4 young.
14. 6/3/45; planting at edge of abandoned drive; laurel; 2-1/2 feet; 4 eggs.

15. 6/8/50; hedgerow; red maple sapling; 2-1/2 feet; 3 eggs.

Robbins tells me that Kirkwood's A List of the Birds of Maryland (1895) states that the highest nest found was 6 feet, the lowest 33 inches. Types of tree mentioned were holly, Vitis, hickory, oak, chestnut, dogwood.

APPENDIX XI

WEATHER, APRIL THROUGH SEPTEMBER, 1956

	April						May						June					
	8:00	11:30	4:30	MAX	MIN	PRE	8:00	11:30	4:30	MAX	MIN	PRE	8:00	11:30	4:30	MAX	MIN	PRE
1							43	60	68	70	40		54	58	57	59	53	
2							55	65	70	73	54		46			68	40	
3	64	73	77	81	59	.10	54	68	75	77	45		45			65	43	
4	48	54	60	61	48	.22	53	59	65	67	52		57		74	77	45	
5	47	66	67	71	40		52			80	49		62	77	79	83	55	
6	55	63	68	70	50		70			82	65				79	83	60	
7	35				36	.58	50	50	64	67	50	.47	64	80	82	86	56	
8				42			47	60	65	69	40		69		83	85	66	
9	38	44	50	52	36		62	71	74	78	49		69		87	89	59	
10	39	41	42	43	39	.12	68	74	78	82	67		70			93	60	
11	40	57	63	65	38	.02	71	83	80	85	65		69	90	90	92	65	
12	46	60	65	70	40		75			88	70		73	91	89	93	65	
13	46	59	64	67	40		73			89	68		72	87	87	90	67	
14	47			71	40	.09	61	69	67	73	61		72			82	68	
15	48			60	41	.33	55	56	54	56	54	.25	71				68	.73
16	42	45	47	50	40	T	46	56	59	62	43	.17						.21
17	39	46	49	49	38		58	71	69	75	45	.24				89	68	
18	38	41	49	50	35		55	69	74	77	45		73	82	75	90	68	.01
19	42	59	61	66	32		55			78	45		69	81	81	84	65	.39
20	36	49	55	61	32		53			76	42		71	70	84	85	70	.58
21	52			71	36		65	74	78	82	55		72	85	87	92	71	.08
22	54			66	36	.08	72	80	87	88	70	T	70	70	72	85	67	.45
23	38	48	52	55	33		65	63	68	75	62	.21	73			89	68	.55
24	38	52	56	58	34		51	62	67	70	42					91	68	
25	44	54	49	57	40	.21	51	70	74	75	45		71	81	85	89	67	T
26	49	54	65	66	49	.24	51				47	.12	71	77	82	85	71	.23
27	64	77	83	84	44					79	66	.05	67	80	83	86	62	.48
28	72				64	.78	67	79	81	86	57	.05	67	79	79	83	66	T
29				68			70	82	84	88	65		63	75	79	80	57	
30	40	46	53	55	38					88	73	.04				86	60	.08
31							68	72	72	75	64		89					

TOTAL PRECIP 3.80

5.45

3.75

* RAIN, SNOW, SLEET

AV. DAILY MEAN 51.2

65.7

	July						August			September		
	8:00	11:30	4:30	MAX	MIN	PRE	MAX	MIN	PRE	MAX	MIN	PRE
1				95	68	90	70			70	64	
2	77	88	88	95 ⁸⁴	73	87	71			78	54	
3	78	86	85	88	72	89	68					
4				89 ⁷⁹	69 ^T	96	70					
5	72	79	78	82	69	99	76					
6	64	68		86	65	85	68					
7				89	69	91	60		73	46		
8				84	60	89	64		78	44		
9	67	76	70	76	62	85	70		^T 82	49		
10	62	79	79	84	58		67		^{.07} 79	58		
11	65	72	85	86	57	90	65		82	58		
12	67	71	72	74	57.16	90	69		90	62		
13	69	73	75	77	67 ^{1.11}	94 ^{.15}	73		^{.08} 92	64		
14				85	63.29	91	66		^{.75} 82	68		^{.50} ^{.25}
15				75	62.39	92	64		81	58		^{1.35}
16	70	78	79	80	67 ^{.17} ^{.06}		63		92	65		^{.53}
17	66	75	80	85	65				78	60		
18	61	75	79	84	57				^{.03} 73	47		
19	66	71	80	81	64 ^{.12} ^{.93} ^{.93}	91			^{.08} 74	52		
20	67	79	81	83	63.27	76	58		66	40		
21				93	60	72	53		75	42		
22				82	60	79	52		87	58		
23	71	75	72	76	62.02	78	58		74	67		
24	68	76	79	83	67	86	57		81	47		
25	69	80	83	87	66	83	54		82	47		
26	75	86	90	93	71	84	55		80	50		
27	81	92	95	97	78	86	66		75	47		
28				95	75	92	66		77	46		
29				83	67	87	69		84	47		
30	66		80	85	57	86	67		^{1.1} 75	45		
31	65	78	85	86	60	87	67		^{.07}			

TOTAL PRECIP 2.46

2.01

Note -

Precipitation figures in red represent reports of Lake Central at airport. I include them only for days where IU record shows no rain and L.C. record shows rain, and I have not tried to include all such disagreements (real or apparent?).

APPENDIX XII

HIGHEST WIND SPEEDS DURING NEST BUILDING

The following highest daily wind speeds during the building season are from the National Weather Records Center and are stated in terms of knots and central standard times.

- May
- 1 - E 11 at 1128.
 - 2 - E 10 at 1128; ENE 12 at 1628.
 - 3 - E 6 at 0928; E 4 at 1128.
 - 4 - NE 15+24 at 1028; NNE 15+20 at 1128.
 - 5 - SSE 10+20 at 0928; SE 6 at 1128.
 - 6 - SSW 15+25 at 1128.
 - 7 - NE 15 at 1128; NE 15+20 at 1628.
 - 8 - E 15 at 0828; E 10 at 1128.
 - 9 - SW 15+21 at 1128; SSW 20+30 at 1528;
S 20+30 at 1928.
 - 10 - SW 15+20 at 0628; SW 13 at 1128.
 - 11 - SW 15+20 at 1128; SSW 20+30 at 1528;
SW 20+30 at 1728.
 - 12 - SW 15 at 1128; SW 17+24 at 1528.
 - 13 - SW 15+20 at 1128; SW 15+22 at 1528.
 - 14 - NW 17+27 at 0828; NW 12+22 at 1128.
 - 15 - SE 17+24 at 1128.
 - 16 - NW 14 at 0728; N 14 at 0928; N 13 at 1128;
WNW 14 at 1528.
 - 17 - NW 20+26 at 1128; N 25+40 at 1828.
 - 18 - N 4 at 1128; SW 15 at 1628.
 - 19 - WSW 15 at 0528; NNW 15 at 1028;
N 12 at 1128.
 - 20 - SE 12 at 0828; SE 7 at 1128.
 - 21 - SW 7 at 1128; S 13 at 1828.
 - 22 - SW 15 at 1128; SW 17+24 at 1628.
 - 23 - NW 20 at 1128.
 - 24 - E 13 at 1128.
 - 25 - ESE 14 at 0928; E 7 at 1128.
 - 26 - S 12 at 1128; S 15+22 at 1728.
 - 27 - SW 15+23 at 0628; SW 11 at 1128.
 - 28 - N2 at 1128; S 15 at 1928.
 - 29 - SW 7 at 1128; SW 16 at 1828.
 - 30 - SW 13 at 1128; NW 40 at 1828.
 - 31 - SW 8 at 1128; NW 18+30 at 2028.
- June
- 1 - N 12 at 1128; NNE 20+30 at 1728.
 - 2 - NW 5 at 1128; N 10 at 1528.
 - 3 - W 2 at 1128; NW 8 at 1528.
 - 4 - SW 10 at 0728; W 5 at 1128; E 10 at 1628.
 - 5 - W 5 at 0928; NW 5 at 1028; W 2 at 1128;
NE 5 at 1728.

- June 6 - SE 6 at 1028; S 4 at 1128.
 7 - SW 7 at 1128.
 8 - N 6 at 1128; S 14 at 1728.
 9 - NE 7 at 1128; NW 9 at 1628.
 10 - NE 5 at 1128; N 7 at 1628.
 11 - NNE 5 at 0928; NW 3 at 1128.
 12 - SW 5 at 1028; SW 2 at 1128.
 13 - SW 6 at 1128; NW 7 at 1828.
 14 - SE 6 at 1128; S 15 at 1928.
 15 - S 5 at 1128; NE 8 at 1628.
 16 - S 8 at 1128; S 10 at 1528.
 17 - S 5 at 1128; SW 12 at 1528.
 18 - W 10 at 1128; NE 17 at 1728.
 19 - S 3 at 1128; S 14 at 1728.
 20 - NW 4 at 1128; W 10 at 1728.
 21 - SW 10 at 0828; SW 7 at 1128.
 22 - SW 25 at 1028; SW 12 at 1128.
 23 - SW 7 at 1128; SW 9 at 1728.
 24 - SW 12 at 1128; N 17 at 2028.
 25 - SW 7 at 1028; W 7 at 1128.
 26 - S 9 at 1128; W 30 at 2028.
 27 - WNW 14 at 1128; W 15 at 1528.
 28 - N 12 at 0928; NE 10 at 1128.
 29 - SSE 6 at 1128; S 8 at 1728.
 30 - S 7 at 1128; SW 11 at 1628.
- July 1 - SW 15 at 1128.
 2 - SW 6 at 1028; S 5 at 1128.
 3 - SW 4 at 1128; W 10 at 1728.
 4 - E 5 at 0728; NW 5 at 0828; N 5 at 0928;
 NNW 5 at 1028; WNW 5 at 1128.
 5 - W 8 at 1128; NW 12 at 1528.
 6 - NW 7 at 0828; N 2 at 1128.
 7 - SSE 8 at 1028; S 5 at 1128.
 8 - SW 6 at 1128; SW 14 at 1528.
 9 - W 15+25 at 1128.
 10 - NW 9 at 1028; NW 5 at 1128.
 11 - SW 2 at 1128; SW 8 at 1728.
 12 - SE 3 at 1128; SW 12 at 1628.
 13 - SW 7 at 1128; SW 15 at 1628.
 14 - N 9 at 0928; N 5 at 1128.
 15 - SSW 7 at 1128; NW 17 at 1528.