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).

License/Disclaimer Statement
By downloading this document or using any information contained therein, you agree to the license terms outlined at https://scholarworks.iu.edu/dspace/handle/2022/8979, which explain terms governing use, creation of derivative research, and requirements for citing the document.

For additional information, visit the Ketterson/Nolan Lab community on the IUScholarWorks repository.
PRAIRIE WARBLER NOTES

1955

BLOOMINGTON, INDIANA

Val Nolan Jr.
<table>
<thead>
<tr>
<th>Pair</th>
<th>Page</th>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>h7</td>
<td>6</td>
<td>May</td>
<td>Pair found. h7F finishing nest.</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td></td>
<td>Egg</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td></td>
<td>Cowbird lodged in possibly incomplete nest.</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td></td>
<td>Situation at nest unchanged.</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td></td>
<td>Situation at nest unchanged.</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td></td>
<td>Nest (complete) now empty. Pair together.</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td></td>
<td>Pre-building behavior.</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td></td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td></td>
<td>h7F sings; h7F seen once.</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td></td>
<td>Nothing seen.</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td></td>
<td>Day-old nest found.</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td></td>
<td>Nest not advanced.</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td></td>
<td>Nest advanced.</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td></td>
<td>Nest lacks final lining.</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td></td>
<td>Nest unchanged; pair together.</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td></td>
<td>Nest unfinished, abandoned.</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td></td>
<td>h7F sings.</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td></td>
<td>h7F sings, bathes in stream.</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td></td>
<td>Long silence.</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>June</td>
<td>h7 gives anger calls.</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td></td>
<td>h7F builds day-old nest, male watching.</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td></td>
<td>Nest looks complete.</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td></td>
<td>Nest advanced. h7F sitting in it at 11:20. No eggs.</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td></td>
<td>Egg 1 and Cowbird egg.</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td></td>
<td>Egg 2.</td>
</tr>
<tr>
<td>Pair</td>
<td>June 27</td>
<td>Egg 3. 47F begins incubating at 2012.</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td>p. 158</td>
<td>28</td>
<td>Egg 4 laid, evidently after nest failed without evidence. Cowbird egg under nest. 47F carries food to nest. 47F may be near nest.</td>
<td></td>
</tr>
<tr>
<td>p. 163</td>
<td>29</td>
<td>47F sings.</td>
<td></td>
</tr>
<tr>
<td>p. 171</td>
<td>30</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>p. 220</td>
<td>July 7</td>
<td>&quot;</td>
<td></td>
</tr>
</tbody>
</table>
Pair h8

p. 7  May 10  Pair found.
p. 9  11  h8 sings.
p. 11  12  
p. 13  14  Pair seen.
p. 15  15  h8F building day-old nest.
p. 17  16  Nest looks complete.
p. 22  17  No eggs.
p. 23  18  
p. 25  19  Cowbird egg 1.
p. 27  20  No change at nest. h8 probably in long ritualistic flight with h9.
p. 31  21  No change at nest.
p. 33  22  Cowbird egg 2 and FW egg 1.
p. 34  23  FW egg 2. FW egg 1 gone. Both Cowbird eggs present.
p. 36  24  FW egg 3.
p. 40  25  Incubation.
p. 41  26  
p. 44  27  
p. 46  28  
p. 47  29  
p. 50  30  
p. 52  31  
p. 55  June 1  
p. 59  2  
p. 62  3  
p. 64  4  Both Cowbird eggs hatch. h8F eats shell, feeds.
Pair h8 - 2

p. 68, 71, 75 June 5 48's feed. 1 FW egg hatches after 1h43.
p. 76, 78 6 Second FW egg hatches by 0800. Nest holds 2 FW's, 2 Cowbirds.
p. 82, 85 7 FW nestlings gone at 1712.
p. 86 8 Breeding.
p. 90 9 Nestlings.
p. 94 10 "
p. 96 11 "
p. 100, 104 12 2 Cowbirds removed, banded. Mh8 caught.
p. 105, 109, 112 13 Cowbird fledglings near point of release;
1 dead.
p. 113 14 Mh8 tends Cowbird.
p. 121 15 48's tend Cowbird. Possible courtship.
p. 125 16 48's tend Cowbird.
p. 128 17 48's tend Cowbird. Courtship.
p. 132 18 48's tend Cowbird.
p. 137 20 48's tend, go on Th9, may court.
p. 139 21 Mh8 probably tends, once goes to h9F (A)’s
nest tree.
p. 141 22 Possible courtship. Cowbird present.
p. 144 23 Only Mh8 seen.
p. 147 24 h8F tends Cowbird. 07
p. 149 25 Silence.
p. 150 26 Possible courtship.
p. 157 27 Mh8 seen. Unknown female and large
fledgling on Th8.
p. 159 28 Mh8 sings. I give up search for second
breed attempt here, since h8F is un-
banded.
Pair 48 - 3

<table>
<thead>
<tr>
<th>Page</th>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>163</td>
<td>June 29</td>
<td>Mt8 sings as I pass.</td>
</tr>
<tr>
<td>166, 171</td>
<td>30</td>
<td>&quot;</td>
</tr>
<tr>
<td>197</td>
<td>July 3</td>
<td>&quot;</td>
</tr>
<tr>
<td>213, 214</td>
<td>5</td>
<td>&quot;</td>
</tr>
<tr>
<td>215</td>
<td>6</td>
<td>&quot;</td>
</tr>
</tbody>
</table>
Pair 49

p. 7  May 10  Pair found. Female (A) incubating.

p. 9  11  (A) has 3 well incubated eggs.

p. 11  12  (A) incubates.

p. 14  14  "  "

p. 15  15  "  "

p. 18  16  (A) incubates. Female (B) found. Pre-building behavior.

p. 21  17  (A) incubates. (B) builds.

p. 23  18  (A) nest fails without evidence. (B) builds.

p. 25  19  M\&9 with (A). (B) builds.

p. 27  20  (A) builds day-old nest. (B) builds, M\&9 nearby. M\&9 in long ritualistic flight, probably with M\&8.

p. 31  21  (A) nest possibly complete. (B) surely so.

p. 33  22  (A) nest complete. (B) has PW egg 1 and Cowbird egg.

p. 35  23  No activity at nest (A). Egg 2 in (B).

p. 37  24  No activity at nest (A). Egg 3 in (B). Female (B) broody, begins to incubate at 1950.

p. 40  25  No activity at nest (A). (B) holds 1 Cowbird and 4 PW eggs.

p. 41  26  No activity at nest (A). (B) incubates.

p. 44, 56  27  (A) fails, probably blown over; eggs under nest include 1 of Cowbird. (B) incubates.

p. 46  28  (A) not seen. (B) incubates.

p. 47  29  Building behavior by (A). (B) incubates.

p. 50  30  (A) builds well developed nest. (B) incubates.

p. 52  31  "  "

p. 56  31  June 1  No activity at nest (A). (B) incubates.

p. 59  2  (B) incubates.
Pair 47 - 2

p. 62  June 3  Mi:9 and (A) together. (B) incubates.

p. 66  4  (A) goes to nest (B) while female incubates.

p. 69, 72  5  (A) begins to incubate. Cowbird in (B) nest hatches; Mi:9 soon feeds it.

p. 76, 77, 78  6  (A) incubates. (B) has 1 FW nestling by 0752, another by 1150, 4 by 1602. Cowbird disappears between 0752 and 1145. Mi:9 attentive to nestlings. Female (A) goes to (B) nest while (B) broods.

p. 82  7  (A) incubates, (B) broods. Mi:9 near (A) once, very attentive at (B).

p. 86  8  (A) incubates. (B) and Mi:9 feed (only) 2 nestlings. (B) may have added to nest.

p. 90  9  (A) incubates. (B) and Mi:9 feed.

p. 94  10  

p. 96  11  (A)'s nest limb breaks off and nest fails; female stays near site. (B) and Mi:9 feed.

p. 100  12  (A) unseen. (B) and Mi:9 feed.

p. 105  13  (A) begins to build, once dismantles early nest. Mi:9 solicitous, also attentive to (B) young.

p. 113, 116, 117-119  14  (A) dismantles nest begun yesterday, builds new one. (B) and Mi:9 feed. 2 nestlings removed, banded. (B) caught.

p. 122  15  (A) builds; Mi:9 solicitous. (B) fledglings audible.

p. 125  16  (A) completes nest. Mi:9 near (A) at times and tends young. (B) tends.

p. 129  17  No eggs in (A) nest. Mi:9 tends fledglings; behavior details. (B) disappears.

p. 133  18  Both eggs 1 & 2 in nest (A). Mi:9 tends.

p. 136  19  Egg 3 in (A); female on at 1100. Mi:9 tends (B) young, fights Mi:8.

p. 137  20  Mi:9 tends (B) young, accompanies (A) to nest.

p. 140  21  (A) incubates. Mi:9 tends fledgling on Th:8.

p. 142  22  (A) incubates. Mi:9 sings.
Pair h9 - 3

p. 145 June 23  
(A) incubates. h9 sings.

p. 147 24  

p. 149 25  

p. 151 26  
(A) incubates. h9 tends (B) fledgling (behavior details), seems to meet (A) once during her inattentive period.

p. 158 27  
(A) incubates.

p. 159 28  

p. 163 29  

p. 166, 172 30  
2 of h (A) eggs hatch between 0900 and 1930. h9 tends grown (B) fledgling, goes into mild distraction display.

p. 173, 179 July 1  
(A) nest has 3 young at 1000; 4th egg hatches between 1315 and 1800. h9 tends (B) young.

p. 190 2  
Female (A) feeds. h9 tends fledgling.

p. 197 3  
(A) shades her 2 or 3 nestlings. h9 probably tends.

p. 212 5  
(A) feeds, invites copulation. h9 tends fledgling, probably does not feed (A) nestlings.

p. 215 6  
(A) and h9 feed the 2 nestlings. h9 also tends (B) young.

p. 220 7  

p. 222 8  

p. 225 9  
h9 feeds 2 (A) nestlings, which I remove and band. Both adults display.

p. 233 13  
Female (A) tends. h9 sings.

p. 234 14  
h9 sings.

p. 236 16  
h9 and female (A) tend (A) young.

p. 238 17  
h9 sings.

p. 249 24  

Pair 50

p. 8 May 11 Pair found. Abandoned nest fragment present.

p. 10 12 5OF builds day-old nest, invites copulation.

p. 13 14 5OF builds.

p. 17 16 Egg 1.

p. 22 17 Nest empty.

p. 23 18 New egg in nest.

p. 25 19 2 eggs.

p. 30 20 5OF incubates 2 eggs.

p. 31 21 "

p. 33 22 "

p. 34 23 "


p. 42 26 5OF builds. Recent nest fragment found.

p. 45 27 Nest looks complete.

p. 46 28 Nest feels complete.

p. 49 29 No eggs. 5OF near nest.

p. 50 30 No eggs.

p. 54 31 Egg 1.

p. 56 June 1 Egg 2.

p. 58, 61 2 5OF at nest at 0715, begins to incubate at 1920.

p. 62 3 Egg h and Cowbird egg; no PW eggs removed.

p. 64 4 Incubation.

p. 71 5 "

p. 81 6 "

p. 82 7 "

p. 86 8 "

p. 90 9 "
<p>| Pair 50 - 2 |       | June 10 | Incubation. |
|            |       |         |             |
| p. 94      | June 10 |         |             |
| p. 96      |         | 11      |             |
| p. 105     |         | 13      | Eggs intact. |
| p. 113, 119|         | 14      | Cowbird hatches before 1000. 4 FW eggs intact at 1815. |
| p. 120, 121|         | 15      | At 0910, 2 FW eggs are hatched and a 3rd is cracking; 4th hatches between 1400 and 1730. 1 nestling disappears by 1730. Both 50's feed, male probably carrying away egg shell. |
| p. 125     |         | 16      | 1 Cowbird and 3 FW nestlings. |
| p. 128     |         | 17      | &quot; |
| p. 132     |         | 18      | &quot; |
| p. 135     |         | 19      | 1 Cowbird and 2 FW nestlings. |
| p. 137     |         | 20      | &quot; |
| p. 139     |         | 21      | &quot; |
| p. 143     |         | 22      | The 3 nestlings removed and banded. |
| p. 146     |         | 24      | M50 tends; distraction display. |
| p. 149     |         | 25      | 50F tends. |
| p. 150     |         | 26      | &quot; |
| p. 157     |         | 27      | M50 sings. |
| p. 159     |         | 28      | 50F probably tends. |
| p. 164     |         | 29      | 50F is courted, explores for nest sites, may carry material. Both 50's tend. |
| p. 166, 172|         | 30      | Courtship, invitation to copulate. 50F tends. |
| p. 173, 179|         | July 1  | 50F begins to build second brood nest; feeds fledgling. |
| p. 181, 184|         | 2       | 50F builds, tends. M50 does not tend but is solicitous, drives other species from nest tree. |</p>
<table>
<thead>
<tr>
<th>Page</th>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>191, 198</td>
<td>July 3</td>
<td>50F builds, tends. M50 is solicitous, seems never to tend.</td>
</tr>
<tr>
<td>201</td>
<td>4</td>
<td>50F builds, flies at towhee, tends 50Y. M50 sings. Both tend at dusk. M50 goes to roost.</td>
</tr>
<tr>
<td>210, 214</td>
<td>5</td>
<td>50F builds. Both 50's tend 50Y off T50.</td>
</tr>
<tr>
<td>216</td>
<td>6</td>
<td>Nest complete. No sign of 50's.</td>
</tr>
<tr>
<td>218</td>
<td>7</td>
<td>M50 tends, may fight M51. 50F appears.</td>
</tr>
<tr>
<td>222</td>
<td>8</td>
<td>50F on nest, 16h6-1712. Others perhaps heard.</td>
</tr>
<tr>
<td>225</td>
<td>9</td>
<td>50F incubates, shades. M50 visits nest tree. 50Y calls.</td>
</tr>
<tr>
<td>228</td>
<td>10</td>
<td>M50 twice accompanies 50F at end of inattentive periods. 50Y calls.</td>
</tr>
<tr>
<td>230</td>
<td>11</td>
<td>Incubation. 50F may be molting.</td>
</tr>
<tr>
<td>232</td>
<td>12</td>
<td>Incubation.</td>
</tr>
<tr>
<td>233</td>
<td>13</td>
<td>Incubation. M50 may sing.</td>
</tr>
<tr>
<td>234</td>
<td>14</td>
<td>Incubation.</td>
</tr>
<tr>
<td>235</td>
<td>15</td>
<td>&quot;</td>
</tr>
<tr>
<td>236</td>
<td>16</td>
<td>&quot;</td>
</tr>
<tr>
<td>237</td>
<td>17</td>
<td>&quot;</td>
</tr>
<tr>
<td>239</td>
<td>18</td>
<td>&quot;</td>
</tr>
<tr>
<td>240</td>
<td>19</td>
<td>&quot;</td>
</tr>
<tr>
<td>241</td>
<td>20</td>
<td>50F feeds nestlings.</td>
</tr>
<tr>
<td>245</td>
<td>22</td>
<td>50F feeds. A male sings.</td>
</tr>
<tr>
<td>248</td>
<td>23</td>
<td>50F feeds.</td>
</tr>
<tr>
<td>249</td>
<td>24</td>
<td>50F feeds. 50Y present in full immature plumage. M50 sings.</td>
</tr>
<tr>
<td>252</td>
<td>25</td>
<td>Nest fails; too high to see evidence, if any. 50F goes to nest tree. I return to T50 several times in next few days, see no more of the 50's.</td>
</tr>
<tr>
<td>Page</td>
<td>Date</td>
<td>Event Description</td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>May 11</td>
<td>Pair found. Female builds day-old nest.</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Nest slightly advanced.</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>5IF builds nearly complete nest.</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>No eggs. Pair present.</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>No eggs.</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>Egg 1.</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>Egg 2.</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>Egg 3. 5IF begins incubating at 1946.</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td>Nest demolished.</td>
</tr>
<tr>
<td>33</td>
<td></td>
<td>5IF sings.</td>
</tr>
<tr>
<td>34</td>
<td></td>
<td>5IF builds day-old nest.</td>
</tr>
<tr>
<td>39</td>
<td></td>
<td>Nest looks complete from below.</td>
</tr>
<tr>
<td>46</td>
<td></td>
<td>No activity at nest.</td>
</tr>
<tr>
<td>49</td>
<td></td>
<td>5IF begins to incubate.</td>
</tr>
<tr>
<td>50</td>
<td></td>
<td>Incubation.</td>
</tr>
<tr>
<td>56</td>
<td>June 1</td>
<td>Nest has failed without evidence. Pair ranges widely.</td>
</tr>
<tr>
<td>58, 60</td>
<td></td>
<td>5IF builds 270 yards from last nest.</td>
</tr>
<tr>
<td>64</td>
<td></td>
<td>No activity at nest.</td>
</tr>
<tr>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td></td>
<td>5IF begins to incubate.</td>
</tr>
<tr>
<td>94</td>
<td></td>
<td>5IF not at nest.</td>
</tr>
<tr>
<td>96</td>
<td></td>
<td>Incubation.</td>
</tr>
<tr>
<td>105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>113, 119</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pair 51 - 2

p. 120  June 15  Incubation.

p. 125  16

p. 128  17  M51 carries feed prematurely.

p. 132  18  Adults near nest.

p. 135  19  Incubation.

p. 137  20  Both adults feed nestlings.

p. 139  21

p. 143  22  M51 sings.

p. 144  23  S1F at nest.

p. 146  24

p. 149  25  M51 at nest.

p. 150, 156  26  I remove nest with 4 small nestlings, replace it 30 minutes later. 51's resume feeding.

p. 157  27  51's feed nestlings.

p. 159  28  Nestlings present.

p. 163  29  Nest fails; too high to see evidence, if any.

p. 172  30  M51 sings.

p. 184  July 2  M51 sings.
Pair 52

p. 134  June 13  N52 found on XI.
p. 142  22  N52 sings.
p. 160  28  52's nest found; nestlings ready to fledge.
p. 162  29  14 nestlings removed and banded. Both adults caught. Broad-winged Hawk attracted to trap with nestlings in it.
April 15, 1955

Fair and warm after several similar days. University farm visited for 2 hours. No FW's present. The area is much changed, and since changes will affect bird distribution, they will be described.

III S - No change.

III - The fairway from VII has been cut through into the NW corner, this in 1954. Brush piles and blackberry tangles in this swathe have been cleared and the little north woods is thinned to the point where there are only a few scattered trees, no brush at all. Some brush and little trees cut as far south as mid-III, but there never was much in the center of III so the appearance is little changed. The row of cherries and all the little maples and thickets in the NE corner of III are gone, leaving a strip about 10-50 yards wide between the east tree row and this swathe still untouched. The north tree row and its brush are completely gone so that the dynamite shed is immediately at hand. Altogether, III and III S could easily still hold 2 pairs.

II - Nearly everything east of the road is cut down. West of the road about 2/3 of the way from the S end of II a wide path for a fairway has been cut through west to east.
All told, 1/4 or less of II is still intact. II could hold a pair if the W sides and the thinned woods on III were used as a unit.

Orchard - completely cut down all the way E to a generally N-S line that hits the rock - outcrop-water falls and goes on to the W edge of the pine grove on V. E of this line (the big hackberries and much of old T 4¼) is still good. Could hold a pair.

Brushy field - Completely thinned, plowed up and sown with a coarse grass; thus it's connected with II.

V - Untouched except for the field just mentioned. Could hold 2 pairs as always.

Enclosed woods beyond V - Untouched.

X - Untouched.

I - Cut over so that only part of the old N-S central tree row and the hawthorn thicket is present. Unlikely to hold a pair.

VII - Burned over last winter, thinned a good deal but would hold a pair if they could remain undisturbed.

IV S - The big trees in the valley are completely gone, as is everything W of them to a little strip of the old maple sapling grove. The east fringe and the good area
NE of this valley is untouched. The fairway ends on the SE corner of old T3. Almost all of T3 is untouched, with a little clearing on the W edge. The maple and walnut grove is untouched on its E edge, much thinned on the VI side. Could hold 2 pairs perhaps.

IV N - The west side, old T5, T21, T 39, is cleared out. A fairway has been put through from E to W at the N edge, i.e., cutting off almost 1/2 of old T6; in the remainder of the habitat S of this there is a cut for a power line, perhaps 10 yards wide. Will hold 1 pair above the ravine of old T5-T6.

The N brushy field - Cut and plowed last year. The habitat to the east is untouched, will hold a pair.

The triangle N of the road (T41), the orchard, and the brushy field to the W - The orchard and the field are completely cleared and plowed, the triangle thinned and cleaned up. The walnut grove S of the road is untouched to the big sedge power cut but in the broom/strip W of it trucks have worn a road. All this could hold a pair but the activity makes it unlikely.

VI - Completely cleared and plowed.

VIII - Untouched to the east, the west cut through by a path and a N-S ditch in which water mains are laid.
Could hold a pair but has never been favored.

IX - A high water tank is built in the center, so it's completely torn up.

All told, there might be 8 or 9 pairs.
No Bachman's singing.

April 16

Spent an hour with Paul Davis; saw and heard nothing.

April 17

Alan Garrett spent an hour or so and listened but heard no warblers.

April 18

Spent 1 1/2 hours, heard and saw nothing.

April 20

Present from 1600 to 1800 and found 3 unbanded singing males. One was on old T3, one N of him across the ravine, one in the far NE habitat. Mumford found P.M.s today for the first time in southeastern Indiana along the river, although he says they could have been there earlier.

April 26

Present w/ Duane Carmony from 1400 to 1600. Sunny but
cool with a brisk NW wind. Today was the first clear day after 3 days of very wet and rather cold weather.

III - A male w/ heavy red back streaks sings irregularly in the SW corner; his face and cheeks are medium-to well-marked. He stays in the higher trees and the heavy edge in the corner, later moves N along the W edge of III. Almost surely not mated. Song timed at 13-20 second intervals, sometimes less.

In the NW corner in the cut to VII and the little woods' remnants is a male singing a skid about 10 times, average interval about 17-18 seconds. Sits quietly 30' high and acts unmated. Disappears and for remaining 10 minutes that we are here he is silent.

II - A very raspy song by a male in the tops of the tall trees that remain of the E tree row. Song loud, at first irregular, then timed at 40-15-15-17-24. Stays in top of 40' maple and cherry. Well-marked, heavy black streaks. Surely not mated.

V - A male sings a type-8 song twice on the W part, falls silent. A/ male appears and feeds in blackberries. The male flies into the general area, beating his wings with rapid, shallow beats. Female silent, stays low, seems to react to our "pishing." The male song is irregular, infrequent, full volume.
IV S - A well-marked male sings a hoarse skid frequently and irregularly on the E part of the ridge. He stays about 15' high, feeds. In 10 minutes nothing is seen to suggest that he is mated.

IV N - A male sings a high skid across the ravine. We do not try to see him. Song loud, frequent.

1600 - We leave.

May 10

A cloudy, wet day after a clear spell, cooler in the last few days. Present from 1600 to 1800.

III and III S - Silent during 20 minutes.

I find a F.Sp. egg on the bare ground.

Orchard (I'll call the E edge of the old orchard by this term) - A male sings a dry skid, perching 35' up in a dead elm top. Disregards a Goldfinch sitting 6' below him, also a Palm Warbler which flies into the tree but calls before appearing. Male picks at an insect which happens to fly by him, misses. Song irregular, frequent, at least half the time sotto voce. Preena, moves little, staying quite near (20 yards) the cut-over strip of the orchard. Light face marks. A female appears but I lose her in a minute. I go to where the male sings,
still very faintly half the time, and never full volume. See a nest in a 12' scrubby elm used last year by 44 F. Nest is poorly concealed, 7' high, in a vertical fork of several twigs on a diagonal branch from trunk, 2' from the branch's fork w/ the trunk. Female brings down. Nest looks complete from below, is probably in the very last stage before lining.

I'll call this orchard male M 47.

V - Two males sing, apparently dividing the area as usual with a N-S line drawn about through the foxes' den or W of it. I'll call the W male M 48, the E male M 49. M 48 has a loud flat skid song, M 49 several songs; typically it seems to be an insipid step. I find M 49's nest moderately concealed, 4' high in a 6½' scrub elm, in a fork of the main trunk and well covered with leaves over the cavity. 49 F is at the tree as I find it, so I withdraw and watch. In 5 minutes she comes quickly and begins to incubate. I'll count the eggs later.

No effort to find the 48's nest. M 48 sings in the high tree tops at the NW edge of the clearing, i.e., in the woods.

1800 - I go straight home, hearing nothing on I or VII.
May 11

Cloudy with rain in the morning. Present from 13h5 to 1615.

IV N - A male sings a high skid once or twice in 15 minutes. I immediately find a nest poorly concealed, probably begun yesterday and still quite open at the bottom. It is 3 1/2 feet high in a 6-foot elm. Female brings material as I watch. I'll call the pair 51.

Field Sparrow nest, ground, 4 eggs, female incubating.

IV S - A male sings at the center of old T 3, a high skid and very irregular, with long periods (5 minutes or so) of silence. I look in the sugar maple tree used twice before here and find a nest, just begun, perhaps worked on for one day. It is 1/2 feet high in a 15-foot tree, built in a little fork of a diagonal branch, on the south side of the tree and well shaded and concealed. In 20 minutes there is no sign of a female at the nest. I can't tell much about the territory (call the pair 50) because M 50 quits singing. There may be a male west of here in the maple grove.

I - A male sings several loud, dry semi-skids in the hawthorns. I find him, attract him by hissing. In a short search for a female or nest, I see nothing. I can't imagine this will stand up as a territory.
T 48 - M 48 sings loud and irregularly over the territory.

In 5 minutes I find nothing.

T 49 - I frighten 49 F off the nest. There are 3 eggs; they look well incubated.

T 47 - M 47 sings loud. There is a Cowbird egg in the nest; it seems to be somewhat embedded in the bottom. Quite possibly the nest is incomplete; if so, it will be deserted.

III - A male sings near the remnant of the little N woods. I find and follow the female along the W edge of III, on the N 1/3. The male pays no noticeable attention to her, and she doesn't seem to be building. She feeds near and on the ground.

VII - A male may be singing here, or he may be the male from I.

1615 - I leave.
May 12, 1955

Warm, cloudy day with light showers from 1200 on. Present from 1330 to 1530.

T 51 - Nest still incomplete, bottom barely in but sides fuller; there has been little work on it since yesterday. M 51 sings his dry skid 4 times in 15 minutes, always near the nest. Once he goes within 15 yards of it. No sign of 51 F. All songs are full volume.

T 50 - M 50 sings faintly as I come on the territory. Nest not advanced over yesterday. 50 F flies into a 12' tree, perches a moment on a limb about 7' high; she is so well marked I first think she is a male. Suddenly she crouches by flexing her tarsus, leaning forward; she raises her tail to about a 45° angle and spreads it a little, drooping her wings very slightly. I see nothing and am surprised. Just then M 50 flies to the same limb, about 4' or less away, sings one short skid and flies away. I then see that she has a little nest material in her bill. She flies on. All this takes only about 2-3 seconds. The position was one inviting copulation; note she assumed it before his immediate approach.

I then go to where he sings, very irregularly, with some songs fragmentary and all but a few less than full volume; one is a short fragment. All but 2 are skids; 2 are step-buzz. In 10 minutes I see her and watch her
gather bast fibers of milkweed, take them to a nest about 20 yards away. It is 5' high in a 5'1" redbud with a little grape vine over the top of the tree, a well concealed nest begun today. The nest found yesterday is thus abortive.

M 50 gives no evident reaction to a soaring vulture.

IV N and S - At the road the male heard yesterday sings his dry skid. I follow him along the tree row toward VII as he sings loudly and frequently.

T h8 - M h8 is singing loudly, regularly, frequently from high trees in the woods to the north. No attempt to find the nest.

T h9 - h9 F incubates. M h9 is quite silent till I leave, then sings insipid steps.

T h7 - The nest still has only the Cowbird egg in it.

M h7 sings a few times to the northeast of the nest.

III - A male sings near the little woods, but I don't see him.

VII - Silence.

1530 - I leave.
May 13, 1955

A wet day with quite a fall of rain, lasting most of the 24 hours. Present from 1530 to 1715.

VII - Silence.

I - Silence as I pass south of it.

Orchard - a few trees remain in the very northwest corner on the north side of the hill. A male sings a skid here and between the songs (which are about 25 seconds apart) gives the anger call at a rate of 60-70 times per 20 seconds. I timed one series at 67 times, and this was typical. For perhaps 2 seconds before and after each song he was silent, the rest of the time calling. Perches 30' high. Perhaps this is the male from III.

T 47 - The nest still contains only the Cowbird egg. M 47 sings a skid well to the north, at the edge of the remaining habitat. I'd guess the nest is deserted. The nest tree is only 22 yards N of the plowed field to the E of III and S of the orchard, only 41 yards from the cut over area of the orchard to the W. I.e., it is by no means centrally located, is in the corner of the territory.

III - Silence for 15 minutes.

VII - Silence.

1700 - I leave.
May 14, 1955

Cloudy all morning with a little sun after 1300 shining through overcast; a gusty breeze from the east. Present from 1430 to 1715.

T 51 - The nest's been worked on and looks nearly lined. I sit to watch. M 51 sings Type-8, insipid steps, and a harsh skid. 51 F brings a large object to the nest after 10 minutes, perhaps a piece of a leaf. She leaves the nest tree, goes to the ground 10' away, takes a spittle bug from a golden rod. M 51 sings very irregularly with intervals of many minutes' silence, then a few quick songs.

T 50 - M 50 is silent. The nest is well-advanced, needs only the final lining. I can hardly say the rain has retarded its construction at all. 50 F comes to the nest as I watch it.

I - The male sings loud and regularly at 13-20-second intervals, moving over all the habitat left. No sign of a female.

T 48 - I spend 35 minutes here. M 48 sings only two or three times. Once I see 48 F move east from the pine trees but I can't follow her. Completely unproductive (and unsystematic) search of the open parts of the territory.
T 49 - M 49 sings high skids and steps. 49 F is incubating.

Enclosed woods - Silent during a 10-minute stay.

T 47 - The nest is now empty; no sign of how cowbird egg disappeared; there is a little depression in the bottom into which it had somehow been pressed. Nest looks complete, will doubtless be abandoned. In 30 minutes M 47 sang 3 times, once a very faint song. I followed 47 F for 3 minutes as she fed quietly along near the ground - no sign of M 47 at this time. After I see whether the nest is still active this behavior should be instructive.

Pilot black snake, 3 ½ feet, in the cut-over area to west.

III - Silent during 15 minutes. It will be interesting if this area is not used, in view of the fact I saw a male and female here. [It was used, young brought off.]

VII - Silent.

1715 - I leave.
May 15, 1955

A generally sunny day with a few thin clouds and a haze early; temperature about 60°; mild east breeze. Present from 0830 to 1000.

III S & III - In 20 minutes, complete silence. I am reasonably sure that no pair is nesting here.

T 47 - The nest is still empty. I search for the 47s. M 47 sings three times on the N part of the territory, is silent for 20 minutes. He then sings 7 times very faintly in the SW corner near the nest and I find 47 F near him. She moves quietly and leisurely in the low growth, goes to an osage orange and seems to pull fibres from it 2 or 3 times. She does not keep anything she pulls off; moves on. M 47 is still singing near her, undoubtedly watching (the faint 7 songs are his total number on this occasion). She goes to a creeper-covered hawthorn, evidently chases out Empidonax flycatcher - there is a series of sharp little calls. I leave after 40 minutes here. I'd say the nest is deserted and a new one has not been begun, at least is not being built very steadily.

Orchard - A male may be singing in the W remnant.

T 49 - 49 F is at the nest. M 49 sings.

T 48 - M 48 sings on the E edge of the open space, opposite the pines. I watch and immediately see 48 F carry nest material
to a new nest. It is 6' high in an 11' locust. I'd say it was begun today or more probably yesterday - just a beginning. Presumably the first nest failed during incubation.

I - Male sings here.

VII - A second male sings at the N edge of VII, very near I. His song is faint but frequent - possibly a migrant or wanderer. [This is probably the male that had a successful summer on II - VII.]

1000 - I leave.
May 16, 1956

A sunny day; temperature 76° at 1600. Present from 1600 to 1830.

T 51 - The nest is still empty and possibly is unlined. I find 51 F and follow her for 20 minutes as she preens and feeds quietly about 40 yards from the nest. She never gives any indication that she is building or is about to build a new nest, so I assume she is getting ready to lay eggs. All the time I watch her M 51 sings a type - 8 song, the first I have heard him sing. He ranges over the territory and seems to pay no attention to 51F.

T 50 - There is 1 egg, which I mark. Unfortunately 50 F is about 20 feet away from the nest and calls "tsu," probably in alarm, as I take out the egg. She watches me and moves nervously. I doubt if she will desert. M50 is silent.

I - The male sings here but I pass the territory by.

T 48 - The nest I found yesterday is 6' high in an 11' locust sapling, dead for the top 3'. It stands on the west edge of a grove of trees and others are to the west of it about 25'. The nest is well concealed, built in a leafy spot against the main trunk where several little short green branches are growing out. It looks finished
from the outside but probably is not. I watch it for 10 minutes but do not see 48 F. M 48 is singing type - 3 steps rather often, and several times he comes to sit at the top of locusts near the nest.

T 49 - M 49 sings type - 8 steps, as all the males seem to be doing today. 49 F is on the nest. I start to leave and see a Prairie Warbler fly to the ground. To my intense surprise it begins to pull fibres from a dead weed stalk, gathers a large billfull and flies some distance from me out of sight. All this occurs only about 40 yards from 49 F's nest.

I follow and see the same female (heavily marked with some red on the back) go to the ground again but lose her. Meanwhile M 49 is singing at full volume and moving quickly from tree to tree near the new female, never actually approaching her. That is, his behavior is quite typical of a male when mate is building, especially in his restlessness - some sing less frequently and not so loud but others act just as he is. Again I see the female with a few fibres in her beak. She goes to a little dogwood and carefully places them in an empty fork, wipes her bill. Thereafter I lose her. All her actions suggest that she hasn't yet begun a nest in earnest.
This is one of the most unusual things I've ever found, the second occasion of a male with two females. To be sure, I return to 49 F's nest, she is on it. The other female was quite differently marked and I saw her for too long a time to make it possible that she is an incubating bird. Also an incubating female off the nest would feed much more actively. So there seems to be no doubt that this is a case of polygamy.

T 47 - Silence for 10 minutes. Then M 47 sings on the N part of the territory. I start toward him and come on 47 F near the ground; she flies up as if startled. As I watch she pulls an insect cocoon or a fairly bulky webby material from a limb about 12' high, then flies nervously from tree to tree near me. At first I think I'm too near the nest tree, but she then carries the cocoon to a 2' hawthorn and evidently leaves it there. She flies away and acts as though she has no nest - she concentrates too little on any spot and gathers nothing else (note the site of today's acts are not near those of yesterday, so clearly no nest is very far along). She flies into a tree and M 47 pursues her. I can see her perched on a limb, M 47 fluttering below her and pulling her tail feathers in his bill; she flutters her wings. This takes perhaps 2 seconds;
then one bird, I'm almost certain its M 47, flies away. Just before the instant of physical contact M 47 sang a full quick skid, evidently in the air. Nothing else happens for 5 minutes and I must leave.

1830 - I leave.
May 17, 1955

Sunny warm day with a fresh east breeze; temperature about 72° at 1400. Present from 1400 to 1645.

I - I hear nothing as I pass by.

T 47 - M 47 sings a skid song during most of the 40 minutes I'm present; he moves constantly and restlessly from one high perch to another, pretty well circling the territory. I see 47 F once for 4 minutes but lose her. I'd say she hardly acts as though she is building, but I can't be very sure with such a brief look at her. He acts as though his female is building except that he moves around without concentrating his attention ever on any general area.

A Field Sparrow carries food.

T 49 - 49 F is on the nest. I begin to look for 49 F (b). A Prairie Warbler (sex?) flies up from near the ground but I lose it. M 49 sings type - 8 and skid songs (few of the latter) at 3/4 volume, moving a lot but within a restricted area on the territory. In about 25 minutes I find 49 F (b) building her nest near the spot the Prairie Warbler flew up from. The nest looks as though it had been begun today, and is 5' high in an 8' dogwood, moderately concealed. I now return to 49 F (A)'s nest, between 40 and 50 yards away by actual pacing, and
find her on it. In about 15 minutes she leaves and I inspect the nest; it still contains 3 eggs.

Note that M 49 has not been near this nest while I've been here (not unusual for a male whose female is incubating) and that his behavior is typical of a male during the nest building period, directed toward 49 F (B).

T 48 - The nest is still empty, the male flying in a normal way on the territory and singing a little. As I am near the nest he flies to a tree top close by and sings; there is probably no connection with my proximity.

T 50 - The nest is empty. Even if a cowbird took the first egg, a second should be present. No indication of the cause of failure. I walk over part of the territory for 10 minutes but see and hear nothing.

T 51 - The nest is still empty. M 51 flies over the whole territory, singing a little and in no way acting unusual. Most of the time he stays high, once perching in the 40' top of a dead tree for 2 or 3 minutes and singing at full volume. I spend 25 minutes on the territory without seeing 51 F or getting any idea from M 51's behavior that she may be building.

16:45 - I leave.
May 18, 1955

Sunny, warm day; temperature about 74° at 1500 to 1700.

III - Silence as I pass.

T 47 - For 35 minutes I cover the territory and see nothing. Just as I leave I see a male Prairie Warbler on the south edge of the open field that used to be grown up with blackberries. He sings type - 8 step songs in the high trees, a song M 47 has never sung. Impossible to tell what the situation here is.

T 49 - 49 F (A's) nest is empty without any indication of the cause. 49 F (B) is still building. M 49 sings two or three times as I come up, thereafter is completely silent during my 20 minutes here. I'll leave and try to find 49 F (A) tomorrow.

T 48 - The nest is still empty but a mirror shows it to be complete. M 48 is silent both while I'm on T 49 and for the 10 minutes I'm on T 48.

I - Silence.

T 50 - To my surprise the nest has an egg in it, raising the question whether it is the second or third. This is one of the very few times I've had a) a day's lapse between eggs laid or, b) eggs laid after the nest has
been preyed on by anything but a Cowbird. One or the other of these things happened here, almost surely.

M 50 sings a faint song as I leave the T.

T 51 - M 51 is silent. The nest contains its first egg, after several days' remaining empty. Note again the great irregularity of the period between nest completion and laying in first nests, and that the weather has been ideal for the last few days.

1730 - I leave.
A hot sunny day. Present from 0700 to 0915.

T 51 - There are two eggs today. Silence.

T 50 - Another egg is present today, a total of two. See yesterday's notes regarding whether this is a third or fourth egg. Silence.

I and VII - Silence.

T 48 - The nest has a Cowbird egg. M 48 is silent and I see nothing of either bird.

T 49 - 49 F (B) is still building, although I see her carry only 1 piece of grass in perhaps 15 minutes or more. M 49 sings a good deal on the south part of the territory, ranging west to the clearing north of the white pines. He moves a lot and is quite restless, his songs not quite full volume. I see 49 F (A) several times and follow her about without seeing her build or gather material. There is no doubt of her identity - she is much less heavily marked than 49 F (B). M 49 is clearly keeping her in view in the typical attentive way.

T 47 - Silence. I find the beginnings of a nest but I suspect it is not active any longer. It is in a fork of a 2'6" walnut, well concealed, about 2'4" high immediately under the canopy of this year's leaf growth. There is a
flimsy but well-defined shell, the walls not of full height; I'd guess it took 1 day to build. The tree is near the big osage oranges where I saw 47 F a day or two ago. Neither bird appears today.

0915 - I leave.
May 20, 1955

A clear hot day. Present from 1700 to 1830 and from 1915 to 2000.

T 47 - Silence. The nest looks no different than it did yesterday.

T 48 - Still only a Cowbird egg in the nest. See below under T 49 for activity of the pair.

T 49 - In a very interesting hour I see almost more than I can take notes on. I begin by trying to find 49 F (A) building and in about 5 minutes succeed. She flies north into the woods by the foxes' den and I gradually triangulate on her flights until I find the nest. It is about 10 or 15 feet beyond the fence and in the deep woods, built between two thick parallel grape vines that climb without support into the high trees above. The nest was begun yesterday, is moderately concealed in the few grape leaves that grow from the vines; it hangs out in the open about 15 feet or more below the woods canopy. 49 F(A) makes frequent trips at the usual rate. M 49 sings quietly in the trees over her and in the locusts and sink hole trees, moving frequently from tree top to tree top.

I then go to 49 F (B's) nest and find it apparently complete. As I start to leave the territory by going south and around T 48, I see a male Prairie Warbler fly toward the locust grove on the southeast. He goes into a little dogwood and sings quietly, sitting in an alert
position and watching the ground below him. His back is bent a little, his head lowered, the wings very slightly drooping. Quite obviously he is looking at something but for about 4 minutes I can't see what. Then a female flies up from the grass below him, carrying a little dead grass in her bill. She goes south to the rose fence and he follows in the general vicinity, still paying her close attention and singing faintly occasionally. She moves slowly and quietly near and on the ground. Then she flies into the locusts and he makes a pass at her, flying toward her and causing her to fly when he is some 10' away. She still carries grass, and suddenly she flies north in the direction of 49 F (B)'s nest. I follow and see her leave the nest in about a minute, so the female is 49 F (3). The male is in a tree top a few yards from the nest, though I didn't see him arrive. To be sure he is the mate of both 49 F's, I follow him as he then flies to the top of a tree in the foxes' den sink hole.

Suddenly he dives toward the ground and I see 2 Prairie Warblers engage in a close pursuit which ends on the ground; both birds remain there silent and out of sight in the grass for several (10?) seconds, then fly into little trees about 4' apart and quite near me. To my surprise both are males. They sit a few seconds with their backs hunched, bills open, and wings drooped, about 2-3' above the ground. Then begins a long fight that
lasts about 25 minutes and extends over about a 40 yard square area of ground. I am in the center of it, and time and again they fly right past me or light in trees a few feet from me.

In this long encounter, both males are almost totally silent; the only sound uttered that I am sure of was one or two "check" notes with a kind of kissing quality a little different from the typical "check." Once or twice they may have given the twittering notes that a male and female sometimes give, but on one occasion when I thought this occurred it turned out to have been Field Sparrows. The most conspicuous aspect of the activity was the flight, which went on and on, in and around trees, usually interrupted after a few seconds by the birds lighting for a moment in trees a few yards apart and opening their bills at each other. Sometimes they flew close together (3' or so) sometimes a good deal farther apart. As usual, one would initiate the attack and the other retreat, with the procedure then reversed and the attacker being pursued. Occasionally they would "flutter up" together almost touching or perhaps actually touching, reaching a height of 15 feet or more and then fluttering down to about 5' from the ground and separating. Twice more they went to the ground together silently disappearing in the high grass for 5 seconds or more. Sometimes one bird would start toward the other, perhaps 20 yards away; almost immediately the one approached would fly
out at a tangent, usually at about a right angle to the flight of the oncoming bird, which would turn in the air and fly behind the pursued bird. Flight was always slow and the impression given was that each bird was enjoying the game. Two methods of flight were evident although this is a very difficult point to be sure of: most commonly both beat their wings at full amplitude but irregularly, beating 2 or 3 times and then gliding, like a Goldfinch except without a fixed rhythm. The position of the body in the air was not parallel to the ground but was rather like this / , the head higher. The feeling I got was that the tail was a little spread during at least the gliding part of the flight; note that if I'm right the front male would then be showing a large surface of his body and the conspicuous male coloring to the pursuer. The second kind of flight is more difficult to be sure of, so far as accuracy of observation goes. I am reasonably sure that in the close steady pursuits both males fluttered their wings rapidly but with shallow wing beats.

Very significantly, 49 F (A), came up to the scene of the fight about half through it and began to hop around, apparently feeding, near and on the ground. Neither male paid her any attention, although she was only 10 yards away at the most. She called a quiet "chuck" infrequently but regularly.

Note M 49 has been attending both his females today,
at least being near 49 F (A).

Compare this performance with the long wren-like pursuit I saw last year between 2 males before the females arrived. Note the silence today.

The next question is the identity of the males. One was surely M 49. The other was either M 48 or a stranger. I doubt somehow that there is a third male on the territory here, and if not it seems unlikely that a transient would have fought so long or been accorded such respectful, ritualized treatment. I'll continue to study this, of course. [The male was M 48 I later decided.]

T 50 - The two eggs are warm, so I would guess that incubation is in progress. Silence.

T 51 - There are three eggs. M 51 is silent.

1830 - I leave.

1915 - I return to watch the beginning of incubation by 51 F. In 40 minutes I don't hear M 51 sing, a notable point. At 1946 daylight time 51 F quietly comes to the nest, immediately enters, rises a moment to poke at the contents with her bill, and settles quietly. At 1957 the sun sets completely.

2000 - I leave.
May 21, 1955

A rainy morning and sultry afternoon. Present from 1430 to 1700.

T 51 - The nest has been completely destroyed, large pieces of it hanging from different limbs of the little tree. I judge that a mammal is responsible. There is no sign of the eggs; I search carefully. Silence during 10 minutes.

T 50 - 50 F is incubating the two eggs. I check the eggs and then watch her enter the nest.

T 48 - This nest still contains only a Cowbird egg. M 48 is silent.

I find an Indigo Bunting nest complete; a Field Sparrow nest built on the ground, with the female incubating 4 eggs. A 3' milk snake is here, very near where I've seen milk snakes in each of 2 other years.

T 49 - Both nests look complete, and 49 F (B)'s surely is; the other probably is not. I follow M 49 for a long time and see him frequently go west to what I'd have thought was T 48, across the little ravine. I never hear a fight. He also goes well east along the woods edge of the territory. There is no sign at all of another male, so I think that at least it's safe to say there aren't 3 pairs here. M 49 is restless, moves most of the time through the higher trees, sings a step-buzz at nearly full volume. I
don't watch the nest, but look to see if M 49 is attending the females. I never see them, but he quite definitely is centering his activity on the area of 49 F (A)'s nest.

T 47 - To my great surprise the little nest I found in the walnut tree looks somewhat improved since I first found it. M 47 is silent and 15 minutes spent watching the nest do not reveal 47 F.

I remove the old nest and find it has a very distinct, egg-shaped hollow in the bottom where the Cowbird egg rested. Perhaps the wet weather at the time the egg was laid accounts for this.

III & III 3 - Silent during 15 or more minutes.

The area north of the north east-west road had a male singing repeatedly and loud today, evidently a bird that has moved off of or never had a territory. [Is my evidence for this guess good enough; no.]

1700 - I leave.
A rainy day after a night of heavy rain beginning at 2200. In the morning Carmony and I explored the Yellowwood region for a good Prairie Warbler study area; we had little success, partly because of the rain. At noon it cleared somewhat and at 1400 Sue, Val, and I looked for a study area near Morgan-Monroe. Present at the I.U. farm from 1700 to 1830.

T 48 - The nest contains a second Cowbird egg and a Prairie Warbler egg, three eggs altogether. The two Cowbird eggs are clearly the products of different females. M 48 is silent.

T 49 - 49 F (B)'s nest has a Cowbird egg and its first Prairie Warbler egg. This Cowbird female is again clearly different from either of those that parasitized 48 F. M 49 is silent; the nest of 49 F (A) evidently is complete.

I - A male is singing here. Probably he is mated; his silence for several days as I have passed is not significant in view of the general silence on all territories.

T 50 - 50 F is incubating, M 50 silent.

T 51 - M 51 sings in the strip between the fairway and the power line but I see no female.

1830 - I leave.
A very hot sultry day. Present from 1600 to 1830.

T 51 - M 51 sings at full volume and in bursts of 5 songs or more at regular intervals, followed by silence for several minutes. He concentrates his attention on one general part of his territory but doesn't stay quite as near one spot as some males do when the females are building; nor does he fly restlessly back and forth past the spot. Still I think I can guess about where the female is, so I watch. Finally she appears and I slowly trace her to her nest tree. At the very last she quits building so rapidly, so the final step is hard. I find the nest, begun yesterday at the latest, about 15' high in a 24' maple, well concealed and built on a diagonal branch, almost 2' from the trunk.

T 50 - M 50 sings once as I come on the territory. 50 F incubates.

T 48 - The nest contains the 2 Cowbird eggs and 1 Prairie Warbler egg, a new one. It is oddly shaped, with a little protuberance from the small end, projecting along the long axis of the egg, as though it had been constricted in an unusual way when laid. The shell here has 2 or 3 fissures like cracks in mud, although they occur only in an outer layer and do expose the egg's contents.

No sign of the pair.
T 49 - The nest has its second Prairie Warbler egg, thus a total of 3 are in it including the Cowbird egg. M 49 sings a few times. 49 F (A)'s nest looks complete, of course.

T 47 - The nest in the walnut is very much advanced and seems ready for a final lining, so clearly this territory is still occupied. I've not spent a lot of time here recently, but it's odd that the place would be so totally silent, as it is again today.

1830 - I leave.
A sultry day with a very heavy rain and thunderstorm at 1600 and lasting about an hour. Present from 1745 to 2000.

T 47 - A male sings loud for 4 minutes on the east edge of the meadow; possibly it is M 47. The nest is not advanced; the cavity is still being filled with soft material like broomsedge seed and it hasn't been pressed into compact shape yet. I see 47 F just by chance and follow her for 15 minutes as she moves through the grass and low growth feeding. M 47 is with her, i.e., he keeps her in view and flies along as she does, never pursuing her but simply following her around. Both are perfectly silent and there is no display of any sort. Once he flies into a low tree and perches only 3 feet from her, but they feed and go through no posturing. He never sings while I'm here. This is a useful bit of behavior, but I'll have to place it in the sequence of the nest cycle - is she still building?

A young groundhog waddles along in the wheat field; he is half-size, very tame.

T 48 - 48 F is on her nest at 1810, so I leave to return later. It occurs to me that she may lay a fourth egg tomorrow and that she has begun to incubate prematurely in order to protect the eggs from the rain. At 1900 she is at the nest again, so I have less confidence in my idea, i.e., she seems to be incubating in earnest. She is timid and
flies away when I'm about 10 or 15 yards from her, as
she did before. I examine the nest. It contains 2 Cow-
bird eggs and the second and third Warbler eggs. I don't
return, because of her shyness.

M 48 sings a little while I'm on T 48 & T 49, but I
learn nothing new about him.

T 49 - 49 F (A) is not at her nest. 49 F (B) is on the nest
when I come up. I sit to wait till she leaves. I'm
anxious to see whether she was on it during the rain.
At 1826 M 49 flies into a little tree 15 yards from the
nest and sings 4 songs. When I look toward the nest 49 F(B)
has left it, but I don't know whether she did so in response
to the male or whether he came up because he saw her leave
first. I then examine the cavity; it is quite dry and
contains 3 Prairie Warbler and 1 Cowbird egg. Obviously
she was on the nest before the heavy rain at 1600. The
next question is whether she began to incubate them be-
cause of the rain and/or the darkness, or whether she
simply began early. It will be impossible to learn if
rain or light was the cause of a premature beginning; but
if she stays off the nest now that the weather is clear
and the sun out, that will at least point to one of those
factors as the stimulus.

She does not return for 30 minutes so I begin to
move around on the territory. M 49 sings 24 times from
from a high locust tree in the grove south of the foxes' den. I do not see either female. At 1915 I return to watch the nest. 49 F (B) is not on it. At 1930 M 49 flies into a tree about 10 yards from it and sings several times. He moves around near the nest; then I hear him singing from 30 or 40 yards away. He returns again in 6 minutes and sings.

At 1947 49 F(B) flies into a locust tree about 5 yards from the nest, sits there quietly a minute or two, moves out of sight, and at 1950 begins to incubate. M 49 sings twice about 15 or 20 yards from the nest 2 or 3 minutes later. I leave the territory. The sun has dropped behind clouds and it is pretty dusky, with no red light in the sky.

I would say that 49 F (B)'s long absence from the nest after 1826 is pretty good evidence that true incubation had not yet begun and that her earlier presence was due to the weather. Of course this can be upset if there are only 3 eggs tomorrow; I would then have to face the possibility that incubation began last night for a 3-egg set.

Twice I see a large doe, once on V, once west in the cut for a fairway. This is the first deer I've seen here, although I've found tracks before.

2000 - I leave.
A day of variable weather with a light rain for a short time in the morning, mostly cloudy and sultry. Present from 1515 to 1630.

T 51 - Silence during 10 minutes. The nest looks complete. Note how little males sing in the early stages of the nest cycle.

T 50 - The nest has been overturned, the top torn from its foundation. There is no sign of the eggs.

M 50 sings loud and I find him. His songs are irregular, some loud, some barely audible, and some hurried, fragmentary, or uttered on odd inflections such as a falling one. He moves constantly from tree to tree. 5DF flies into a 20' dogwood and explores it in a rather cursory fashion, moving from bottom to top along the outer tips of the branches. She calls "chick" or "tsip" irregularly, about 6 - 10 times per 30 seconds. She moves to a nearby tree and explores it. Later near the ground she does not pick up nesting material. M 50 flies along behind her once, or rather follows a few seconds later in her path of flight between low bushes. He continues to move a lot in the center of his territory, his song very irregular, often silent for several minutes. I see her explore the high (20') branches of a cherry festooned in grape and Virginia Creeper. Again she calls "tsip" at the rate mentioned. M 50 is in the close vicinity, never very near her - I see no pursuits or courting flights. It seems unlikely that this nest
failed yesterday, although the matter cannot be established.

In 20 minutes I leave the territory.

T 48 - M 48 sings a step song ending in a rasp, perched in a 30' edge
dead tree at the edge of the woods. M 49 sings the same
song from the edge of the woods, some 25 yards to the
east. Evidently at this end of their territories,
the ravine is about the line between them. In 2 or 3
minutes M 48 falls silent. 48 F is on the nest.

T 49 - See above, under T 48. 49 F (A)'s nest tells me
nothing; at least the rains have not damaged it. 49F (B)
is off the nest, which contains the 4th Prairie Warbler's
egg and a Cowbird egg, 5 all told. Note that this Cow-
bird did not take a Prairie Warbler egg, a fairly unusual
thing. See yesterday's notes re beginning of incubation
here.

T 47 - The nest shows no progress over yesterday or the day before.
It's impossible to assess the situation yet. M 47 after
15 minutes of silence sings some ten times at full volume
on the west center of his territory, staying high. He
then flies N across the ravine and over the woods to the
tree tops at the S edge of the field where I found him
several days ago.

1630 - I leave.
May 26, 1955

A sunny day with a light overcast; temperature 68° at 0900. Present from 0930 to 1200.

T 47 - M 47 is singing when I arrive and continues to do so during most of the hour I am present. His songs are full volume, at intervals of 18 seconds on an average; there are occasions when he is silent for a few minutes at a time. He concentrates on the area just S of the ravine, where he seems to stay largely in the higher trees. His behavior is not nervous or restless, and nothing indicates that 47 F is nearby or building. A very large bulldozer is rooting out stumps about 100 yards away; its noise has no perceptible effect (it was here yesterday too).

The nest is as before, the cavity loosely filled with plant down. I see nothing of 47 F in 60 minutes of steady search.

T 48 - 48 F is incubating. See below under T 49.

T 49 - 49 F (A) is not on her nest and I don't see her.

An Indigo Bunting nest here has 1 Cowbird egg and 2 Indigo eggs. I take the Cowbird egg to compare with others found on V. It is quite different from the small egg in 49F (B)'s nest.

49 F(B) leaves her nest when I get too close. A few
minutes (2 or 3) later I hear a male singing a type-
8 step in the big elm in the sink holes in the open
field, to the S. At that moment a Prairie Warbler
flies past me quite high, heads out over the big woods
to the E, and circles to the N into the little enclosed
clearing which is Prairie Warbler's habitat. The flight
is easy and rather bouncing. This is fairly typical of
a male Prairie Warbler, to leave his territory for a long
flight, but the question is which P.W. is this. I go to
the sink hole and watch this male till he returns to
T 49 - it is M 49. I hurry to the nest and find 49 F(B)
still absent, so the bird that left may have been she.
[More likely the clearing male, M 52.] I then follow M 49
as he moves over the S end of his territory and goes well
W, near the E extremity of the white pine planting. He
then goes back to the sink hole. When I look at 49 F(B)'s
nest again she is there.

I then hear a male singing a dry, toneless skid on
X, N of T 48. Presumably this is M 48. 48 F is still
on her nest.

T 50 - A male, not M 50, sings just S of the territory in the
cut over area. Probably it is the I male, moving perhaps
because tree cutting and burning is going on on I.

M 50 sings loud on the N edge of the territory. I
watch him as he moves a good deal, most of the time in
the treetops, singing loud and irregularly and with frequent intervals of several minutes' silence. Soon I see 50 F carrying nest material to a dogwood on the center of the territory. She repeats several times but I'm afraid to go too close, so I'll defer examining the nest site.

I find a few shreds of nest material about 6' high in an elm some 25 yards from the new nest.

1200 - I leave.
May 27, 1955

A sunny day with heavy gusts of wind, evidently the aftermath of severe tornadoes in Kansas, Missouri, Oklahoma, etc. Present from 1500 to 1700.

T 47 - M 47 sings loud and regularly at 12-15 second intervals for well over half an hour. Nearly all his time is spent in the wooded area near the ravine, feeding or sitting rather quietly, not always in the tree tops. When I first find him he is just flying up from the stream and is very wet; this is the first time I've ever had evidence of direct bathing in water as opposed to fluttering against dew-covered leaves. He sings and also makes a very faint twittering noise that would be inaudible at even a slight distance; it sounds a little like the squeaking noises a gnat-catcher sometimes makes.

The nest is still incomplete, and my guess from all the circumstances is that 47 F is gone. I'll check regularly to confirm or disprove this.

T 48 - 48 F is on her nest. M 48 is silent.

T 49 - 49 F(A) is not at her nest, which swings a good deal in the wind. 49 F(B) incubates. M 49 is silent.

The Indigo Bunting nest from which yesterday I took a Cowbird egg today holds another of the same female's, plus 3 Indigo eggs. I take the Cowbird egg; I'm getting a series to try to find how many females lay in this area.
I - A male sings on I, actually just W of the road.
T 50 - The nest looks complete. M 50 is silent. The nest is 9'6" high, built in a fork on the outer end of a diagonal branch of a 16' dogwood. It is moderately concealed, on the E side of the tree.

1700 - I leave.

Found 2 Field Sparrow nests today, each built in grass, each with a female on h eggs.
An extremely rainy day. It began to thunder at about 0300 and at 0900 heavy rains fell, lasting until 1500. At 2100 it rained again. Probably 2 or 3 inches fell during the 24 hours, with a good deal of wind, thunder, and lightning. Present from 1630 to 1800.

T 49 - 49 F(A) is still not on her nest, which may have been abandoned. 49 F(B) incubates. M 49 is silent.

I find a Cowbird egg in a Field Sparrow nest built 4" high against a little 2' cedar trunk; also present is a Field Sparrow egg. The Cowbird egg is different from the 2 in the Indigo nest and the 1 in 49 F(B)'s (which is only 20 yards from today's nest), so at least 3 female Cowbirds use this immediate area of V.

T 48 - 48 F is incubating, M 48 silent.

T 50 - The nest feels complete. I pull the long, flexible limb on which it is built down to within my reach. M 50 sings a few times, and later I find him feeding by himself in the low growth E of the white pines; i.e., he crosses the ravine at least 20 or 30 yards.

T 51 - M 51 is silent. I try to climb the nest tree but find it too small to hold me. 51 F is not in evidence.

1800 - I leave.
A sunny cool morning with a southwest breeze; temperature 60° at 0900. Present from 0900 to 1200.

T 47 for 40 minutes - Complete silence. The nest is incomplete and quite sodden in the unfinished cavity.

A Sharp-shinned Hawk flies west across the T and into III.

T 48 - 48 F is near her nest at 0945 so I retreat to let her enter it. Her nervousness and the fact she is only 5 yards away indicate she is about to return. M 48 is silent.

T 49 - 49 F(A) is not at her nest. 49 F(B) is incubating. I walk over the territory without seeing or hearing M 49. I find an Indigo nest with 1 Cowbird and 3 Indigo eggs, 1' high against the trunk of a 3' maple.

T 48 - 48 F is incubating at 1010. I sit to wait for her to leave the nest. At 1020 she calls 'check' 2 or 3 times and appears from the opposite side of the nest. Evidently I missed seeing her leave. Since she is unusually shy I won't stay; I'm anxious to compare the Cowbird eggs in her nest with others collected on V.

From 1030 till 1100 there is an instructive series of events. I find a female which is almost surely 49 F(A), near the foxes' den. She calls 'check' twice and I lose
her. I then hear a toneless chatter skid on X and go there. A male sings in the high trees well north on X, loud and regularly. M 48 begins to sing on T48 and flies into a tall dead tree at the south edge of the woods; I can see him while the X male sings, so clearly they are different birds. I then conclude there have been 3 males here all along and go back to V. At the foxes' den is the same female. I follow her for 5 minutes as she quite surely explores for a nest site in the trees by the den. She disregards a male Indigo sitting 4' away from her. Finally she disappears and returns probably with spider webs, which she fixes in a tangle of grape in the trees growing west of the den; she settles down and acts like a female shaping a nest. She calls infrequently, perhaps 10 times altogether today. Meanwhile the X male sings there, ranging east and west on the far side of the trees. The female flies north into the woods and the male quits singing. In 3 minutes he comes to the south edge of the woods and the foxes' den trees and sings. He then flies due east and sings from the tree tops of the woods, due north of 49 F(B)'s nest and 45 yards from it. He returns to the den, where the female goes through nest-building motions in the same trees but a different spot. She settles down in a tangle, lowers her posterior end and moves a little from side to side.
The question is what male is this. I've never heard 3 males here; today he got no challenge from a male on the typical T 49, and he isn't M 48. I'll still say tentatively that this is M 49 who has 2 females and a large territory. It seems clear that 49F(A)'s nest has failed and she will build another near the foxes' den. [Above surmises probably correct.]

By 1110, when I leave V, I've still heard no song from T 49 proper.

I find an Indigo nest, 2 feet up in a 6' maple; it contains 2 Indigo and 1 Cowbird egg. This is the fourth Cowbird egg on V in addition to those in Prairie Warbler nests (3). It is from the female that laid the egg I found day before yesterday; I have 3 of her eggs. All told 3 females seem to use T 49.

T 50 - I go to the nest to reach in and 50 F begins to give a "check" alarm call from some red osier dogwood 10 yards away. I return in 10 minutes and find the nest still empty. Note her alarm and her proximity to the nest before egg-laying has begun. M 50 is silent.

T 51 - 51 F is incubating for the first time. M 51 sings 2 or 3 times in the territory.

1200 - I leave.
A cool day with rapidly changing weather, varying from threatening and cloudy to sunny, clearing toward evening; a gusty breeze in the earlier part of the day. Present from 1600 to 1830.

T 51 - 51 F incubates; M 51 sings about 30 yards away, normal volume.

T 50 - The nest is still empty. M 50 sings at the ravine.

T 48 - 48 F incubates. M 48 is silent.

T 49 - 49 F (B) incubates. I see her several times later as I walk over the territory. She is off the nest once, feeding toward the west edge of V.

At the foxes' den is a fairly complete looking nest in the dense tangle of grape and walnut 49 F (A) was exploring yesterday. In fact, it is so complete (although it is well concealed and difficult to see) that I wonder if I could possibly have overlooked it yesterday. I watch it for 30 minutes without seeing a female near it, but a male flies into the trees and sings faintly while evidently watching the general site where the nest is built. I lose him - he moves nervously - but later hear him sing from the north edge of the woods or possibly from X. I then explore T 49, X, and the enclosed clearing but see nothing of Prairie Warblers except 49 F (B). No male sings. I keep my eye on the foxes'
den, return to it several times, but 49 F (A) is never there. I still think this is a new nest and that this is an instance where the female has quit building temporarily. The odd thing is the speed with which she got the nest to this stage in about 30 hours of cool and windy weather, presumably not conducive to building.

I find an Indigo nest with 4 eggs (the first non-parasitized nest I've seen on V), 1' high in a 2' maple; the female is not on it.

1830 - I leave.
May 31, 1955

A cool, clear morning, calm and with a heavy dew, temperature 50° at 0700, 60° at 0930. Present from 0700 to 0930.

T 48 - 48 F incubates. M 48 sings on his territory, a faint type 8 step, at about 0800. I hear him from T 49, where I spend most of my time. Note how silent M 48 habitually is.

T 49 - 49 F(D) is on her nest. I then spend 1½ hours on T 49, X, and in the enclosed clearing, searching all the time and seeing and hearing nothing. The conditions for song would seem perfect. At 0830 I come from X to T 49 and see a male sitting in the foxes' den trees. He seems alert and is watching something below him, in the direction of the nest that I found yesterday. He moves a few feet toward it and I see him fly at a bird which I see to be a Prairie Warbler. Unfortunately I can't tell whether it came from the nest. It is a female and she moves along low, toward the south in the open space between the locust plantings. The male follows and I lose them. He sings for the first time now, a type-9 step at 3/4 volume. I hear him moving (i.e., singing) in the locust plantings, moving a lot. I sit to watch the nest. In 10 minutes the female appears from the little planting straight south of the den, carrying grass. She flies in short flights to one tree
after another, then to the den trees, then to the nest. 
(This series of short flights may be because of my presence, especially since I'm between the spot where she got the grass and her nest.) While she's on the nest the male flies into the den trees about 10 feet from the nest and a little above it; he sits tensely and watches her. In 45 seconds she flies from the nest and he immediately flies at her. She quickly lights in the nest tree and he stops his approach. She then flies south and he flies after her but not in pursuit. This is relatively rare, this full-scale close following of a female while she is building. He sings little today, perhaps only for 5 minutes or so while I'm here.

I think there can now be no doubt that this is M 49 with 2 females. Today's female is clearly marked and is 49 F(A). Note she gathered nest material perhaps only 25 yards from 49 F(B)'s present nest. So far M 49 has paid close attention to both females while they have built, but this has been in a continuous, almost a non-overlapping series, so I've had no chance to see how he'll divide his attention when there is about equal competition for it. I.e., I'd expect him to devote all time to a building female; the question is how will he feed two broods if the occasion arises.
I - A male sings here.

T 50 - The nest has its first egg. M 50 is silent and 50 F is not in sight.

T 51 - I skip this territory.

0930 - I leave.
June 1, 1955

A beautiful clear day after a cool night. Present from 1530 to 1815.

T 47 - M 47 sings in the remnant woods on the west side of the cleared orchard, a frequent, loud skid. Between songs he gives the hard, clear anger note. I watch him for 5 minutes as he moves slowly about in the high trees, then I go on to his territory. He falls silent for 10 minutes after which he sings from the territory. I follow him for 20 minutes or so because his song is frequently faint and several times he seems to be watching something. However, his manner is generally not restless and he moves over much of the territory, never concentrating on any part for long. He stays moderately high, falls silent for frequent irregular intervals. I suppose in general he acts like a mated bird. I had begun to think he had no female after 47 F's second nest petered out without reaching completion.

T 48 - 48 F is on her nest and I sit to wait for her to move; it is approaching the time for the Cowbirds to hatch. In 20 minutes I hear a faint song from the east; it could be either M 48 or M 49. Note again how silent V usually is.

I miss seeing her leave the nest (though I thought I looked right at it). It contains the original 4 eggs,
2 Prairie Warbler and 2 Cowbird.

T 49 - Silence. I examine 49 F(A)'s second nest more closely (the one that failed). It is 18' high. I find it on its side or nearly so, under it a fragment of Prairie Warbler egg and an unbroken Cowbird egg which I break just as I see it. I think it may safely be called a weather casualty; it was never well anchored and the heavy winds of several days ago probably upset it. I doubt if incubation ever began; I'd guess 2 or 3 eggs were laid. (The timing of the third nest indicates the second failed on 5/27, the day of very heavy winds.)

49 F(A) is not at her new nest.

A chipmonk calls, the second time I've heard one in the open on T 49.

49 F (B) is on the nest. I never hear M 49 although I'm on V for about 45 minutes.

T 50 - Silence. The nest contains 2 Prairie Warbler eggs.

T 51 - 51 F is not at her nest at 1730. I sit to wait. No sound from M 51. By 1745 nothing has happened and I've heard nothing.

1750 - I start to leave, hear a male Prairie Warbler sing near the white pines on old T 5. I see a female there and probably see her carry nest material but can't be sure. The male sings faintly on occasion, at irregular intervals
no matter what his volume is, and infrequently. He moves about a good deal but stays in the pine area. Presumably this is M 51; I'll check tomorrow.

1815 - I leave.
June 2, 1955

A slightly overcast day, beginning to become humid again; temperature 60° at 0700. Present from 0700 to 0830 and from 1715 to 1925.

T 50 - 50 F is at the nest at 0715; she leaves as I come up and I do not inspect for fear I'll disturb her. M 50 is silent.

T 51 - The second nest has failed I'm sure. I spend over an hour without finding the new nest, but I learn some things. Clearly the male and female seen last night were the 51's. M 51 sings by the second nest while I'm there and I follow him back to the vicinity of the pines. There he ranges east and west along the north side of the ravine on old T 5 and to some extent to T 6. The significance of this is in the demonstration of the extent to which the birds will enlarge their territories when not confined by neighbors. Compare the situation on III, 2 years ago.

I see 51 F once in the southeast corner of IV N. Unfortunately I can't be sure of the general area where she's building. M 51 sings irregularly with intervals of several minutes' silence. Only one or two songs are less than full volume skids.

0830 - I leave.
1905 - I return.

II - A male sings a skid song, sometimes quite faintly, in the
east tree row near its north-south center. This is about 40-50 yards from the orchard where M 47 sometimes sings and the song is like M 47's.

T 49 - 49 F(B) is on the nest, her breast very much lowered and her anal and tail area elevated. I.e., she sits with her weight seeming to rest on her breast instead of her belly, her bill just appearing over the nest rim. M 49 sings one or two times during the period I'm on T 48.

T 48 - 48 F is on her nest so I sit to wait till she leaves it. She too sits with her head low (which is typical; 49 F(B) just exaggerates it). M 48 sings very regularly and frequently during my 45 minutes on the territory, with occasional interludes of a few minutes' silence. His interval is typically about 13 seconds, his song ranging from his loud chatter skid, to a high toneless and rather, fink skid, to a step that begins with high insipid notes and ends as a buzz. The last is most frequent. He twice comes to within 25 or fewer yards from the nest and sings but gets no response from 48 F. Finally after 5 minutes of silence he sings a loud song 30 yards or more away and 48 F quickly leaves the nest 41 minutes after I begin to watch her. She flies 5 yards away and stops at nest level. Then she moves up through the branches to the top of the locust. Then she begins to call check 7 or 8 times irregularly and perhaps 5 seconds apart. M 48 flies into a tree top near her and I see her move on.
I can still hear her and in 1 minute I see them moving through the trees about 10 yards apart. She still calls occasionally. Her movements are nervous, rapid, vigorous.

I go to the nest with a mirror. It contains 2 Prairie Warbler eggs and 2 Cowbird eggs from females I've noted on V before. I'd say there are only 3 female Cowbirds here, from the eggs I've examined.

T 50 - The nest contains 3 Prairie Warbler and 1 Cowbird egg; the latter was laid today and there has been no Prairie Warbler egg taken yet. As I leave the nest I see 50 F feeding 35 yards away in the high grass and brush. She moves quietly, calls "chick" once. No male is near her and M 50 is silent. 50 F has noticeable red in her back feathers.

T 51 - As soon as I arrive I find 51 F building west of the pines. I'll get data later; tentatively the nest is 16' high in a 28' sugar maple. It is built on a branching limb in a fairly large vertical fork on the northeast side of the tree. The tree stands at the edge of the grove and is exposed to the northeast side. The nest looks well concealed. M 51 is not near so far as I can tell. The nest seems complete from below.

I go to the second nest and pull the limb down; the nest is empty and looks undisturbed. It is 270 yards from the new nest.
T 50 - I return to watch the beginning of incubation. The female is not on the nest at 1850.

1810 - A male sings 2 skids to the northwest; it may be M 51.

1917 - 50 F flies into a dogwood 5 yards or less from the nest tree and at nest level and clearly is looking at the nest but I lose her. I don't think she is on it. At the same moment M 50 begins to sing an insipid 4- or 5-note step, rather faint, on the east end of the ridge where the nest is. This goes on for 3 minutes.

1920 - 50 F flies quietly to the nest limb about a foot from the nest and without any sound or ado hops up to the nest and enters. The sun is still above the tree tops; 3 minutes later it begins to fall below them and the quality of the light changes. M 50 has fallen silent, from within a few seconds of the time 50 F began to incubate; I have no reason to connect any of his activity tonight with hers except that the times coincide.

1925 - I leave.
June 3, 1955

Clear hot day without any wind. Present from 1630
1800.

T 50 - The nest contains 4 Prairie Warbler and 1 Cowbird egg,
so the Cowbird has not returned to take a host egg yet.
I see and hear nothing of the 50's.

T 48 - M 48 is silent and 48 F is not on her nest. I hear
"tsu" as I approach it. At 1700 it contains the 4 eggs.

T 49 - 49 F(A)'s nest tells me nothing; the female is not at it.
49 F(B) is incubating. Silence.

The Indigo nest I found first in V is upset, the
2 remaining eggs gone. It is constructed in part of a
large snake skin, evidently a racer's or pilot black's.

49 F(B) sits with her bill open nearly 1/4" at the
tip. I watch her to see if M 49 will pay any attention
to her. She seldom closes her bill. For the first 10
minutes I'm here she sits with her head turned to watch
me. Then she seems to quit at least the constant sur-
veillance.

After 30 minutes of watching 49 F(B) I've seen and
heard nothing, so I set out to try to find M 49 and see
what he is doing.

Thirty-seven minutes after I arrive on the terri-
tory I hear M 49 singing a combination high step-buzz
rather faintly on the southwest part of his territory,
about 60 yards from the present nest. I go there and
immediately see 49 F(A) feeding very slowly and quietly
in a blackberry-grape thicket. She is silent and moves
so little that for 2 or 3 minutes at a time I don't even see her behind the leaves. In 10 minutes or so she covers 15 feet over the ground. Meanwhile he sits at the top of locusts about 15-20 yards away and sings the same song, frequently faint. The singing quits in 10 minutes or less. His interval is 15 to 20 seconds and after the first 2 or 3 songs he intersperses his song with sharp, angry-sounding "chick" or "tsep" calls (I say these are angry - they lack the vibrant "chur" note sometimes heard in a fight). I time a short sequence: song, 40 calls, song beginning 20 seconds after last one before, 30 calls, song beginning 20 seconds after last one before, 24 calls, song beginning 15 seconds after last one began, 40 calls, no song. For a minute there is silence, then a song, then he quits. I lose sight of both.

I don't know whether she is staying near him or vice versa; previous experience would indicate the male follows the female. I can't say, either, that he watched her constantly, but he was in a position to. All this lasted 12 minutes. He has now been silent 10 minutes and I must leave. This calling between songs is a phenomenon I must deal with; so far I cannot connect it with anything at all.

1800 - I leave.
June 4, 1955

A hot sunny day. Present from 1430 to 1715.

T 51 - The nest is well concealed, 17' high against a large diagonal branch. M 51 is silent.

T 50 - Two males sing insipid steps, one on the east part of the ridge, the other to the southwest. The nest is unoccupied, all 5 eggs intact. The ridge male sings for 5 minutes while I wait for 50 F. In 13 minutes after my arrival she flies into a big cherry near the nest tree, calls a sharp "check" 5 times in 30 seconds while moving toward the nest. She then enters; no male seen or heard. She came from the southwest; I doubt if I'm responsible for her calls. The territory is silent when I leave.

There are good racoon tracks in the side of the ravine between T 50 and T 51. On T 50 a large mammal runs quietly and silently away when I come up; probably a fox.

In the ravine en route to V a ground hog runs into the rocks at the little falls.

T 48 at 1510 - M 48 sings a step-buzz near me as I come up, then from farther away. 48 F is on the nest rim at 1512, holding half a Cowbird egg in her bill. I sit to watch, obviously worrying her somewhat. She eats the shell nevertheless and by 1513 seems to have finished it; she then reenters the nest. The manner of entering was vigorous; she sat quietly watching me, holding the whole big piece of shell
and biting at it as though fighting it a little, i.e., moving her head. She didn't take any away and I think didn't drop any (my vision was a little obscured by leaves). After she had finished the egg shell there were many tiny particles of it on her bill.

M 48 has been silent since 1512.

1526 - M 48 sings a faint Goldfinch-like song from about 25 yards away; then half of a step-buzz.

1527 - a full, faint step song, then a hurried faint step; full, faint step; hurried step; a loud chatter song at 1527 $\frac{1}{2}$, then again, and again at 1528. He has been moving but is still 25 yards from the nest. Three more songs.

1529 - No singing. 48 F is on the nest. Silence now.

1532 $\frac{1}{2}$ - 48 F backs a little off the nest, looks into it for 1$\frac{1}{2}$ minutes, pecking into it once. She still has egg shell fragments on her bill.

1537 - Female backs off the nest for 30 seconds, pecks violently into it. Once she seems almost to be pulled into it, as if she is about to fall on her face.

1539 - 48 F leaves the nest without my seeing her. The male sings twice to the west, loud, after she has left.
Again she calls "tsu" near the nest.

1540 - I go to the nest. The 2 Cowbird eggs have hatched; no shells. One Cowbird gapes. She calls once nearby.

1542 - 48 F is 10 yards from the nest, calling "tsu." She has a green caterpillar. I leave the territory.

T 49 - At 1547 49 F(B) is not on the nest; the eggs are intact. I sit to watch her return. At 1551 M 49 sings 2 insipid steps from south edge of the woods to the north; again at 1555. I decide to go see if this female is with him. He sits in the top of a 40' tree, sings insipid steps, a toneless and rather quiet skid, a step-buzz.

1604 - M 49 flies quickly to a dogwood 10 yards from the nest and sings 10 skid songs. 49 F(B) is already on the nest when he approaches in this way. Suddenly I see female (A) in the nest tree. She silently hops up to the nest level and for 15 seconds sits 3" from it, looking at it. Female (B) shows no response. M 49 is still sitting as before; he sings 4 times. 49 F(A) hops down into the grass 3' from the nest tree, remains there 1 minute. She then flies back into the nest tree at a level below the nest, hops up to the nest and sits 2" from female (B)'s head, this time on a different side of the nest than before. 49 F(B) turns her head away from female (A); neither postures. Female (A) sits thus for 20 seconds, silent and with no tail jerking, looking at the nest. She
then moves away in short flights and hops. During this second period M 49 is not in sight, is silent. I'm 20 yards from the nest with good view. Never the slightest sound or reaction by either female. I see nothing for 6 minutes, write out my notes in detail.

1620 - 49 F(A) is not on the nest; I didn't see her leave. I withdraw to watch return.

1632 - Female (B) still off nest. I move away.

1641 - M 49 sings faintly in the field east of the nest. 49 F(B) is on the nest. The male is in the southeast locust grove singing irregularly, a frequent, high, slow step. He moves into the field and sings full volume skids. I follow as he sings every 10 seconds, then sits 10' high in a dogwood and clearly watches some object below him and out of my sight. Probably it is female (A). He moves quickly to the locusts again.

1652 - I leave the territory. M 49 is singing faintly.

1715 - I leave.
June 5, 1956

Cloudy morning; temperature about 65° at 0700. Present from 0730 to 0915, from 1430 to 1630, and from 1845 to 1945.

T 48—M 48 is carrying food as I arrive at 0740. I go to watch the nest; 48 F is on it. M 48 flies to the ground 15 feet from me and bobs nervously. Goes halfway to nest from me (I'm 25' away.)

0746—Goes to nest; 48 F stays on cavity and he passes food to her, reaching to give it to her about 15 times. I can see small article pass only a few of these times; it looks almost as though he is regurgitating and trying to get it up, but I suppose that is out of the question. He hops to opposite nest rim, stays 1 minute all told, leaves. I think one bird, probably the female, gave a little call note as he came up; I can't recall how it sounded.

0756—Female sits up in the nest, looks into it, pokes, settles back in 10 seconds.

0759—48 F sits back from the nest and looks in for 10 seconds then quickly leaves, going out of sight. The nest contains the 2 Cowbirds and at least 1 intact Prairie Warbler egg; the other egg is probably under the Cowbirds.

0800—I leave the territory, meeting 48 F at the north
edge near the ravine.

T 49 - I heard M 49 sing 2 faint skids here at 0745 (M 48 was in view) and perhaps 1 step later.

0803 - 49 F(A) is on her nest for the first time.

0805 - 49 F(B) is on her nest, as usual crouching down very deep in it. I sit at a spot 20 yards away with good visibility.

0810 - M 49 sings once in the direction of 49 F(A)'s nest; again.

0812 - It is clearing to become a completely sunny day.

0815 - M 49 sings faint buzzing step of about 5 notes, near female (A)'s nest. Female (B) has not moved since I arrived so far as I can tell. Male sings again at 0817, 0818. All songs so far have been of the type described.

0832 - Female (B) still sits without having changed position. I think the male sings 2 faint high step songs to the northwest.

0839 - M 49 sings 3 faint step songs well to the west; 4 more by 0841\textsuperscript{\frac{1}{2}}. The female sits as before. Occasionally her head turns a little. She is so low I frequently can't see her eye above the nest rim.

0849 - I look at female (B). Her eye seems to close;
suddenly she opens it, jumps to the nest rim, and without looking to the nest at all flies straight away to the west into the locusts beside the nest tree. I go to the nest, evidently without being seen by her. It contains the 4 Prairie Warbler eggs and 1 Cowbird egg, all intact.

0853 - M 49 begins to sing short chatter skids east of the nest about 30 yards; 4 songs, the last one faint. He has moved into the north end of the locust grove; 2 very faint short sings, 1 louder. Faint one; louder; again; again.

It is 0855 now. Female (B) may be calling beside me but just out of sight, a loud "check" with a kissing quality, about once a second or maybe 3 in 5 seconds.

I may just have seen 2 Prairie Warblers chase each other in the locusts; very quick and short. At 0858, M 49 sings 6 loud chatters in the locusts in the direction from which the chase started. Then he moves west toward female (A)'s nest and sing faintly and frequently for 3 minutes.

0901 - While the male sings, a female goes to the dogwood right by the nest. Stays a few seconds and leaves. Male is 50 yards or so away.

0905 - M 49 has been singing faintly to the west. Now he draws closer, is due north of the nest, probably at the edge of the woods. He then moves west again.
0907 - While M 49 sings, 49 F(a) flies quickly straight to the nest, looks in, hops onto a branch above it, moves rather nervously. She may have opened her bill once. I leave for fear I'll disturb her too much. The male still sings his short song, about 3/4 volume; I'd judge he is sitting in a tree top at the edge of the woods. Now he's in the locusts near the nest.

0912 - 49 F(A) is on her nest. Note how M 49 has begun to sing now that she is incubating. His rate at the moment is every 13 seconds, regularly.

VII - A male sings a loud chatter here as I pass. [See afternoon notes.]

T 50 - 50 F is incubating.

T 51 - M 51 sings one song while I am on the territory.

0915 - I leave.

1430 - I return. It is sunny, sultry with a strong south-west wind.

VII - The same male chatter song as this morning is heard here, the bird then moving north on to I west. So I suppose this is the male I've heard here all spring.

T 48 at 1443 - M 48 is carrying food to the nest. He stays at it for 2 minutes (48 F is not present) then leaves and moves well away. It looks as it did this morning. M 48
sang once as I came on the territory.

T 49 - Female (A) is on the nest at 1450.

Female (B) at first seems not to be on her nest and I walk up. Unfortunately she is there; she flies quickly away toward the ground, her tail feathers slightly spread and her wings probably fanning a little. The nest contains a Cowbird, 4 Prairie Warbler eggs, no shells. I retreat to let her settle down before I begin watching. Each time I return to begin watching she calls from away from the nest; at 1508 I retire for a while.

Meanwhile at 1502, M 49 begins to sing; at 1509 he has done so regularly, loud, and frequently ever since. He is perched in the high woods-edge trees, moves around some. His interval averages 10 seconds. He continues to sing for 15 minutes but less regularly.

1520 - Female (B) is back on her nest and I sit to watch. She sits a great deal higher on the nest than she did this morning.

1522 - M 49 sings near the nest (perhaps 15 yards), moves on south into the field and sings. The female sits with her bill open; I'd guess it is 85°.

1528 - 49 F (B) sits back a little and looks into the nest.

M 49 still sings irregularly and loud, a chatter, in
the field south of the nest. I'll omit mention of his songs unless something of note happens.

1530 - A female Indigo Bunting flies quickly into the nest tree just a few inches below the nest and 49 F(B) leaves silently and suddenly. The Indigo sits about 30 seconds. She carries grass. Female (B) evidently comes into the little tree near me and calls loud "chick" or "tsip" calls with a kissing sound. Again I leave to let her go back. M 49 sings, I think near the nest.

1540 - I return again. She is on the nest. M 49 sings loud about 15 yards from the nest. In 2 minutes he moves farther away, then back again, then away.

Female (B) sits deep down on the nest as she did this morning.

1547 - M 49 falls silent.

1552 - He sings a high skid about 20 yards east of the nest. Sings seven times and is silent.

1555 - M 49 silently flies to the nest tree with a small bit of food. He sits below the nest 3" or so for 15 seconds, perhaps because of me. He then hops up to the nest and female (B) quietly leaves, coming somewhere near me and calling. Then male stands on the nest rim for a minute without doing anything; I'd guess he doesn't feed
unless the young gapes to him. Then he feeds, seems to
eat something, leaves by short hops to the south. In one
minute he sings two faint songs in the locusts to the west
of me, i.e., the grove by the nest.

1600 - A Prairie Warbler flies straight to the nest, then
immediately flies away. In two minutes 49 F(3) flies to
a tree by the nest tree carrying food. She calls "tsu"
for a minute and eats the food, so I withdraw again.
When I return in five minutes she is just going to the
nest; she leaves and calls, so I retreat.

1610 - Female (A) is on her nest. M 49 sings slightly
faint insipid steps in a big walnut about 25 yards from
her. The songs get louder. He continues to sing here
for several minutes.

1617 - Female (B) is back at her nest. At 1618 she leaves
it and calls near me. I leave the territory for a while.

T 48 at 1627 - M 48 sings near the woods. Probably 48 F is in
the locusts where I hear "tsu" calls. I see her carrying
food.

I decide to leave rather than cause these two pairs
to desert.

1630 - I leave.
1845 - I return. It is calm and cloudy.

II - A male sings a loud chatter. Almost surely this is the male from VII and I west. II is now connected with those areas by openings.

T 49 at 1855 - 49 F (A) is on her nest.

At 1900 49 F (B) is sitting low on her nest. I stay to watch her.

1927 - M 49 sings for the first time, to the west.

1929 - Female (B) sits upon the nest a minute, then settles down.

1930 - She quickly flies from the nest to the locusts, dropping in altitude. I check the nest. It is as before, with only the Cowbird hatched.

T 48 - At 1935 there is a young Prairie Warbler; no egg shells. Another egg is still present.

1945 - I leave.
June 6, 1955

A cloudy morning that will probably clear; temperature 66° at 0615. Present from 0615 to 0800, and from 1145 to 1210, and with Paul Davis from 1530 to 1630.

I - A male sings a high skid as I pass.

T 48 - M 48 sings; 48 F is brooding.

T 49 at 0630 - 49 F(A) is incubating. M 49 sings a loud skid in the clearing south of her nest.

49 F (B) is on her nest; I sit to watch.

0650 - A Field Sparrow flies into the dogwood by the nest tree and hops around. Female (B) sits quietly.

0650 - M 49 begins to sing very faint insipid steps near nest A. He approaches from the west, singing about six times, then is silent.

0654 - M 49 goes quickly to the nest and female (B) silently leaves. He offers food several times, sees me, leaves the nest a few inches, returns, then leaves and goes to another tree where he hops nervously about, still carrying green caterpillar. In four minutes female (B) comes without food and flies restlessly back and forth near the nest calling. As usual I have to leave for a while.

T 48 - 48 F is on the nest. M 48 singing at 0710.
T 49 at 0715 - M 49 sings the same faint steps, about five notes, at the edge of the woods near the foxes' den. I go to female(B)'s nest; she is on it. M 49 still sings at 0718; I think from nearer this nest. He sings until 0724, from the locust; his interval is 9-11 seconds.

0730 - As interesting evidence of my concealment and of the timidity of this pair of warblers, a full-grown doe just came out of the locusts and walked to within 10 yards of me. Then it saw me (I'm sitting against a dogwood trunk with the branches projecting around me), shied a little but slowly moved away.

0732 - Female (B) backs off the nest, looks in, pecks with her head in the cavity for 30 seconds, settles down.

0737 - Repeats.

0738 - M 49 flies quickly and silently to the nest. Female (B) sits without rising for 10 seconds, then backs off. They stay together for 10 more seconds and he leaves. She seems to feed, then settles down. He sings 30 seconds later from the field to the east, 4 full-volume skids, then another fainter one, then is silent.

0746 - Exact repeat of the watching-picking performance by female (B); lasts 20 seconds. Again, 2 minutes later. Again at 0749.
0750 - Male sings faint short skids. She again looks into nest. Again in 1 minute. Again at 0752.

0752 - M 49 has sung 18 songs since 0750. 49 P(B) suddenly leaves the nest, flying from the rim, to which she jumps from the cavity. She goes straight away. The nest contains 1 Cowbird, 1 Prairie Warbler without any shells, 3 Prairie Warbler eggs.

T 48 - The nest now has 2 Prairie Warblers and 2 Cowbirds. M 48 is carrying food at 0800.

0800 - I leave.

1145 - I return in a very light rain after a heavy rain at 1030.

VII - A well-marked male is in the cut-over area next to I.

T 49 - The male comes to the nest at 1145; evidently 49 F(B) left without my seeing her, for she was on the nest a moment before. (It's raining enough to cause me to skip on notes). He has a hard time getting a large caterpillar accepted.

1150 - I go to the nest. To my great surprise the Cowbird is gone; I don't see it under the tree but I haven't time for a real search. There are 2 young Prairie Warblers, 2 eggs, no shells.
The male sings a regular short song in the field.

1155 - 49 F(B) flies straight and silently to the nest, I think without food. Note that she left it exposed during a slight rain.

1157 - Female (A) comes silently to female (B)'s nest while the latter is sitting on it. She looks at it, then hops to the ground and I lose her. This all takes 20 seconds and neither female reacts in any way to the other.

M 49 is singing a faint chatter song nearby during the above.

1202 - I may have just seen 2 Prairie Warblers pass.

1203 - M 49 sings from the direction of female (A)'s nest.

1205 - Female (B) looks into her nest.

1206 - It begins to rain very hard and I leave, getting home in a real downpour.

1530 - I return with Paul Davis. It's sunny occasionally after a heavy shower at 1400.

II - A male sings as we pass

T 48 - Silence.
T 49 - Female (A) is on the nest at 1535, and M 49 is singing faint steps south of her. Paul stays to watch this nest.

Female (B) is on her nest at 1540. M 49 is singing west of the locusts.

1545 - Female (B) backs off the nest and looks in for 15 seconds, settles.

1548 - She backs off and picks at something in the cavity, almost seeming to tug at it and struggle with it. In 30 seconds she settles. Repeats at 1550, again at 1552 with distinct tugging or pecking.

1552 - to 1600 - She has twice changed her position on the nest after picking at something in it. For the first time she faces other than west; first she faced north, then in a minute turned east, then again more to the north. She constantly looks in the nest, sometimes backing off it.

1602 - After seeming to look out of the nest toward the ground for 15 seconds, she jumps out to a little limb an inch or so away, then flies north almost toward me. She disappears and I inspect the nest: It has 4 Warblers, no shells. One bird looks very recently hatched; it lies still in the bottom of the nest.

1609 - 49 F(B) returns very quickly and enters the nest.
silently. I'd guess she brought no food; I didn't see it, but she got back very quickly. I leave this nest.

Paul watched female (A)’s nest. At 1557 she left it, returning at 1602. No sign of the male. Both he and I heard very faint singing at about 1550, probably from the locusts that separate these 2 nests.

T 50 - 50 F incubates

T 51 - No sign of the pair.

1630 - We leave.
June 7, 1955

A cloudy day with a rain at 1330 and a light rain during much of the rest of the day. Present with Paul Davis from 1500 to 1715.

T 51 - No sign of the pair as I pass.

T 50 - 50 F incubates

I - The male here sings a regular skid.

T 48 - 48 F is brooding as I pass to T 49.

T 49 - I can't tell whether female (A) is on her very well concealed nest.

Female (B) is on her nest, facing west, when I arrive at 1552 and begin to watch it.

1554 - She sits back from the cavity, picks in it, leaning way in and tugging.

1555 - M 49 sings a faint step, then 3 more within a minute. He is to the east.

1557 - Female (B) sits up a little from the nest. M 49 comes straight to the nest; I don't know whether there is a connection. She leaves immediately to the west. He sits 2½ minutes on the rim and picks in the nest many times, then flies straight away northeast.

1600 - 3 insipid step songs.
1600 - The female returns directly from the west, probably calls "chick" once, enters the nest without food. Note it has rained lightly while she has been gone.

1607 - 4 very faint steps from the east.

1609 - Male flies straight to the nest, landing as before on a branch north of it and 3" away and coming in in flight from a little below nest level. He transfers food to the female, leaves in 5 seconds to the west. She feeds for 1 minute, settles on the nest. All meetings between the pair so far have been silent.

1615 - She sits up and picks in the nest for 30 seconds, leans way in, settles.

1625 - It begins to rain again after 10 or 15 minutes' lapse.

1626 - Female (3) leaves the nest without any preliminaries, goes southwest. Flies straight away at nest level. It's raining a little.

1630 - M 49 sings 6 very hoarse Golden-wing-type songs east of nest; the interval is 12 seconds. Rain has stopped.

1631 - M 49 silently brings several food objects to the nest from the east, using a different path. Sits for 2 minutes on the nest rim, picks in it many times.
1632 - Female (B) brings food from the east. Male hops away several inches, carrying something in his bill; probably food and not a sac. She feeds for 30-45 seconds; he goes west 15 seconds after her arrival. I don't know how he disposed of the object he had. She enters the nest; no fecal sacs. All this in silence.

1645 - She backs off nest, pokes into it for 10 seconds.

1647 - I think I hear 4 very faint step songs to the west near female (A). (Note I'm mentioning every song heard here today.)

1652 - I leave female (B)'s nest.

(Paul Davis has the following data for nest A:

1616 - Female leaves nest to south-southwest

1620 - She returns alone, flying indirectly to nest tree and remaining in it for 15 seconds before entering.

1646 - M 49 comes to a dead branch 8' from the nest, flies to within 3' of it, stays 15 seconds. Seems to leave to northwest. Female (A) remains. All this in silence.

1648 - Female leaves to the south-southwest.

1656 - Female (A) returns. Calls check 2 or 3 times, enters nest.)
(1657 - Paul and I are together. M 49 sings several (about 10) step-buzz songs at regular 15-second intervals, to the south. Singing as we leave.

T 48 - At 1700, 48 F is brooding.

1712 - She leaves silently; 10 seconds later M 48 sings to the south, brings food to the nest, stays 1 minute.

I go to the nest. It contains only 2 Cowbirds (which can now call); no sign of young Warblers.

1715 - We leave the territory.
June 8, 1955

A cloudy day with rain in the morning till 1200. Present with Paul Davis from 1300 to 1615.

T 51 - 51 F is not on the nest. Silence.

T 50 - M 50 sings 4 skids from a big cherry 20 yards from the nest. 50 F is incubating.

T 48 - 48 F is brooding. M 48 is silent.

T 49 at 1440 - Both females are on their nests. Davis watches A, I take B.

Nest B:

1441 to 43 - M 49 sings 7 faint skids from about 30 yards west.

1443 - Female (B) quickly and silently flies straight in the direction she faces as she sits. In 10 seconds M 49 comes to nest from the east, carrying 2 or 3 caterpillars. He offers them about 7 times before they are all eaten. He eats a fecal sac, stays on rim 2 minutes all told. He then hops 2" above nest, then flies straight north, dropping in flight below nest level. In 15 seconds he skids faintly. By 1448 I've heard 6 songs from the field to the east.

1453 - M 49 may be singing faint step-buzz and step songs near nest A.
1454½ - Female (B) flies into top of locust tree in grove west of nest, calls sharp "tsip" or "chip" for 2½ minutes. This may be due to her seeing me, if she does. She goes to the nest and quits calling a second or two later. Feeds young for 45 seconds, enters nest facing east. No fecal sac.

M 49 has been singing to the west since last noted. At 1458 he comes to the locusts and sings insipid steps, faint, about 5 notes. He's about 25 yards from the nest, probably about 20' high in locust tops. By 1502, 17 songs. He moves out into the field near the nest and east of it and me. By 1504, 8 songs from 25 yards. Then he quits singing.

1511½ - Female (B) backs off the nest, picks in it, settles.

1513 - It begins to thunder, having clouded over very darkly 20 minutes ago.

1516 - I may hear faint skids. Sun appears through overcast.

1518 - Female backs off the nest, probes in it for 30 seconds. Had been facing north, now east.

1521 - Again she backs off and probes. As has frequently been the case, her feet hold the nest rim and she seems to be tugging at something in the cavity; she puts a good deal of effort into it.
1527½ - She repeats her probing, jerking vigorously 3 or 4 times.

1528½ - She looks into nest for 20 seconds.

1530½ - She looks into nest for one minute, pokes into it gently.

1530 - M 49 may have begun to sing very faint steps to the west.

1533½ - Female (B) looks around alertly, rises in the nest a little, jumps out and silently and immediately flies straight north toward me, dropping in flight a little below nest level.

I check the nest. Only 2 young are in it; both gape. A red feather, probably a Cardinal's, is in the nest rim. I think it has been added or I'd have seen it before.

1537½ - M 49 sings 12 loud skids in the field northeast of the nest, the first five songs quite abbreviated.

1539½ - M 49 flies to the nest from the east and lights on the south rim for the first time, offering food from that direction. He offers at least one large green larva 12 times before he succeeds. No sac. He stays one minute, looks into nest for 15 seconds after food is accepted. He leaves to the east, 20 or 30 seconds later singing three times. (When offering food he kept taking it back.)
1554 - 49 F (B) calls "chip" or "tsip" near me, goes to the nest tree. She's very nervous, so I leave. She brought no food with her but would have gone to the nest.

(Davis re nest A:

1452 - Female A leaves, going west-northwest.
1457 - She returns alone from the south.
1516 - She leaves to the west.
1521 - She returns from the south-southwest.
1525 - A small bird, probably a Prairie Warbler, flies into the trees at the den, leaves quickly.
1550 - Female A leaves to the south-southwest.
1555 - She returns from the south-southwest. Note that her method of leaving is always to drop quickly and straight from the nest and fly away at a lower level.)

1600 - We leave the territory.

1615 - We leave.
June 9, 1955.

A humid day with a rain in the early morning, cloudy but clearing a very little at 1400; temperature 67° at 1430. Present from 1445 to 1645.

T 51 - 51 F is incubating for the first time. M 51 is silent.

T 50 - 50 F is incubating. M 50 sings on the south part of the territory, a skid.

I - A male sings across on IV south, almost up to the north end of the cleared area.

T 48 - A Prairie Warbler, presumably 48F, is at the nest at 1510. It says till 1520 when M 48 comes (without singing) and brings food. He stays one minute and carries away a fecal sac. I examine the nest; it has 2 Cowbirds with feathers breaking through and eyes partly open, quite noisy when being fed.

T 49 - 49 F(A) incubates at 1523.

T 49 - No adult is at nest B at 1525. At 1530 a male sings a high insipid step to the west, about five times. At 1532 I am nearly sure I hear two males singing on T 49, one to the west and one north of me near the woods. I see two small birds dart from west to east about a yard north of the nest and in 15 seconds 49F (B) goes silently to the nest with food, from a position where the two little darting birds would have been. She feeds, offering three or four times
and to two young, eats a fecal sac, and at 1533\(\frac{5}{8}\) enters the nest and broods.

Meanwhile the high songs go on occasionally near the woods and then to the southwest, in the fields south of the locust plantings.

1537 - 49 F (B) draws back and looks into the nest.

1540 - M 49 begins to sing high and faint steps near the nest, I'd guess from 20 to 35 yards away; i.e., he has moved. Some songs are abbreviated. By 1545 he has sung 14 times, irregularly.

1545 - Without singing M 49 brings a green caterpillar to the nest. Female (B) draws back but doesn't leave; she still sits at the nest. He offers food to a nestling, takes it back, gives it to the female. She feeds the nestling as he looks on. In 35 seconds he leaves quickly to the east. He takes no fecal sac. I don't know the direction he came from. The female continues to brood; I heard no sounds between them.

[When I arrived on T 49 today some four or five Crows were chasing a Red-tailed Hawk. A few minutes later the hawk circled over the nest field calling but I wasn't in position to see what if any reaction this produced in female (B).]
1551 - The female draws back and pokes into the nest for 30 seconds.

1600 - M 49 sings an almost inaudible 3- or 4-note step, quite near me, i.e., 30 yards north of the nest. By 1601½ there have been 6 songs; then he stops.

1601½ - Female (B) withdraws and probes gently in the nest for 20 seconds.

1605 - Female (B) rises up a little, preens her breast feathers vigorously about 12 times with a nodding motion, looks into the nest about five seconds, and settles down after some 20 seconds.

1607 - She rises, probes for 15 seconds, settles back into her almost invisible position. She has faced north all the time I've been here.

1613 - Female (B) rises, looks into the nest for three seconds, then silently flies away a little west of north. She drops slightly in flight as she goes.

A good point to try to make in my final write-up is to see if there is any correlation between numbers of nestlings and adult feedings and periods on and off the nest.

1621 - 49 F(B) comes into the small trees behind me and calls "chip" about four times per five seconds. I'm clearly keeping her off the nest, so I go. I suppose I
can only use her intervals off the nest as supplementary data since I may be influencing them. She probably would have entered the nest by 1622 had I not been here. I leave the nest at 1625.

T 49 - 49 F(A) is incubating at 1630.

1645 - I leave.
June 10, 1955

Rainy day with rain during my period here; temperature 59°F at 1600. Present from 1615 to 1815. Notes somewhat curtailed by the rain.

T 51 - Silence for 15 minutes, during which I see no warbler; i.e., 51 F is not on the nest. Due to the rain I go on.

T 50 - 50 F returns to the nest to incubate as I pass. M 50 is silent.

IV S - The male sings a faint step.

T 48 - The nest contains two Cowbirds. The female is not on the nest and the male is silent.

T 49 - Nest A at 1650: I think female (A) is not on the nest.

Nest B from 1700 on:

1700 - Female (B) is on the nest.
1706 - M 49 brings food and the female leaves to the north.
1711 - Female (B) flies silently to the nest tree and after ten seconds goes straight to the nest and enters. She almost surely has no food.
1722 - 49 F(B) silently and with no preliminaries flies east from the nest.
1725 - Female (B) returns quickly from the east.
She stays ten seconds on the rim, then enters.

It seems hardly possible that she brought food and gave it.

1737 - M 49 comes from the west to a dogwood just south of the nest tree. She rises, then settles again. He comes to the nest, gives her a green larva; she offers it two or three times to a young bird. The young eats, excretes; female (♀) takes the fecal sac and gives it to the male. I can't see whether he eats it or carries it away; he goes west. She looks into the nest, settles on it. He was here for 40 seconds, she off the young for one minute. All this occurred in silence.

1745 - Female (♀) leaves the nest quickly, goes west.

1750 - She returns from the west to the nest tree, then goes right into the nest. She brings no food.

1800 - M 49 comes and 49 F(♀) silently leaves it. He stays 30-45 seconds, leaves without a fecal sac.

1806 - Female (♀) comes to the nest without food, I think. She looks in for three seconds, enters.

1810 - I leave the territory.

1815 - I leave the area.
June 11, 1955

Another rainy, cool day with things getting pretty well soaked by this time. Present from 1800 to 2015.

T 51 - 51 F is on her nest. Silence.

T 50 - 50 F goes to her nest. Silence.

T 48 - The two Cowbirds are alive. M 48 is silent as I pass through, and I don't see 48 F.

T 49 at 1830 - Nest A is destroyed as the result of the breaking of the dead branch or stub which supported the grapevines the nest was built in. I think it is almost sure that the stub broke off because it became water-soaked at a time when the vines on it were in leaf and exerted a great weight as they were covered with rain. The nest, which had been 20' high in the 24' grape-covered walnut, is now on its side, 12' from the ground. Two broken eggs are under it.

49 F(A) comes to the nest tree, calls "chick" or "teik" twice, hangs nervously around the nest area. She leaves after 20 seconds; she is bobbing her tail a lot. She goes to the brush to the south. M 49 flies from her to a tree top 20 yards away, then toward nest B. Silence.

When this proximity occurred she didn't fly at or to him but to a point in his general direction and within 15 yards of him.
1845 - Female (A) has returned two more times to the nest tree. She calls faint "ticks," hops around in the vines but (n.b.) always at the old nest height. She stays in the vines or within 15-20 yards most of the time. The tree must have broken very recently.

Nest B at 1845:

1845 - Female (B) is brooding.

1845 - M 49 comes with food. She backs off and both sit on the rim; he feeds. In 25 seconds she flies west; she in ten more does the same. She may have received something from him before flying - a sac?

1854 - Female (B) returns suddenly and without food from the west, sits on a branch 2" away for ten seconds wagging her tail; enters and faces west.

1856 - She rises and moves slightly as thought settling.

1902 - M 49 sings three skids in 30 seconds.

1903 - M 49 lands 6" below the nest and hops up to it. Female (a) seemed to rise from the nest about two seconds before he came to the tree. She flies west; he sits ten seconds on the rim, takes a fecal sac, goes east.

1907 - Female returns quickly and straight, from the west, without food. She lights 2" away, calls "tsik" twice, bobs tail, enters and faces east. Calls probably due to me.
(98) [Has the male a fixed visit rate and does the female Prairie Warbler increase her food collection as the young grow?]

1912 - There's a faint skid to the east and she rises a little. Male comes to the nest; she hops 3" away and sits facing more to the side than into the cavity. He feeds for 20 seconds, goes east. She hops to nest and settles facing east.

1921 - M 49 to the nest tree from the west, staying 4" below the nest for six seconds; then to nest rim. Female (B) leaves to the north. Male stays on rim feeding for 24 seconds, takes a sac, goes southwest. He was present 40 seconds or less.

1925 - Female(B) comes to the nest tree from the east. Calls "tick" twice, goes to nest and feeds for ten seconds; hops to the other side and bobs her tail for five seconds, hops to rim and settles. It is now getting a little darker, still raining of course.

1929 - M 49 comes suddenly, silently, and without warning from the west. Female (B) backs off the nest and both sit on the rim. She takes part of the food from him and both offer it to the young, who eat it. In 15 seconds he drops toward the ground and goes east. She sits on the rim for
15 seconds, settles facing east as she was before his visit.

1933 - M h9 comes without warning from the east. He gives food to the female, who offers it to the young. In ten seconds M h9 takes it from the young and himself offers it. Female (B) eats a fecal sac. M h9 sits for a total of 30 seconds, flies toward and past me to the north. The female looks into the nest for 15 seconds, seems to eat an object, not a sac. She settles facing east.

1955 - Nothing has happened. It's getting pretty dusky, with heavy clouds in the west. It's a fair guess she'll stay on the nest now. I leave.

2000 - Female (A) is still going to the site of her ruined nest, twice in three minutes. She calls quiet "tick" notes.

2015 - I leave.
June 12, 1955

A rainy cool day; temperature 58° at 1400. Present from 1400 to 1715.

VII - A male sings a chatter skid.

T 48 from 1415 to 1550 - The nest has 2 Cowbirds; M 48 sings. I am going to band them so I take out the young Cowbirds, tether them in the center cell of a 3-cell Potter trap and retire. The details are hardly worth repeating. The young birds escaped once and I recaptured them. M 48 entered the trap freely and several times failed to spring it. 48 F never would quite enter it. I sat within 10 yards under cover much of the time, sometimes retired. There was much displaying and persistent food carrying. The experience proved to me that the adults are very unlikely to desert and that I'll do better if I don't stay to watch the trap. I caught M 48 twice.

The band data: The two Cowbirds were banded on the right leg with 52-112401 and 112402. The male Prairie Warbler was banded only with a numbered band, 51-68202, on the right leg.

T 49 - At 1530 I heard M 49 begin to sing on the southwest part of his territory near the white pines. I found him there at 1755, followed him to the foxes' den, then the locust grove near female (B). He sings a high regular insipid
step.

1605 - I begin to watch nest B. The female is on it, the male silent.

1607 - M 49 sings. 49F (B) leaves the nest, goes west. In three seconds he arrives, feeds for 15 seconds, comes north past me. Twenty seconds later he sings and continues irregularly.

Female (B) comes to the locusts and calls kissing "checks," probably sees me. She comes to me and calls quite nearby; he sings 20 yards away; two songs are loud rasps. After two minutes she quits calling.

1612 - Female (B) goes straight to the nest, feeds for ten seconds, comes toward me and calls.

1615 - M 49 goes to the nest, feeds young for 10 seconds, carries a fecal sac northeast. Female (B) is not near the nest.

1618 - M 49 sings to the west. Female (B) comes to the nest (with food?). Stays 15 seconds, goes west. I'd guess I'm not a factor.

1618 - Female (B) brings food, stays 10 seconds, goes west to the locusts, then comes toward me and calls a kissing
"check." M 49 is singing loud rasping songs in the locust all this time.

1625 - M 49 is drifting east, still singing as before.

1627 - Female (B) brings food from the northeast, feeds for 15 seconds, wags her tail nervously. She goes northwest. No indication I bother her.

1628 - Female (B) brings a green larva from the west. She is nervous, going to the nest, retreating, returning and feeding for 15 seconds. She takes a fecal sac northeast.

1632 - Female (B) goes to the nest with food; it takes her one minute to go (from the northeast) as she calls nervously, leaves the nest tree and hops around, returns, feeds. She then enters the nest and broods, facing east.

1632 - M 49 begins to sing rasps to the west, near the den.

I just saw the two nestlings' heads over the rim.

1638 - M 49 rasps from the locusts; again in 20 seconds; again in 20 seconds, this time a short song. He goes to the nest tree and the female leaves toward the south just before he lands. He feeds for ten seconds, flies east.
1641 — M 49 rasps to the east in the field; he continues at 15-second intervals, getting closer to the nest.

1643 — M 49 to the nest tree with a green larva, landing a few inches north of the nest and hopping around to the south of it. He feeds for ten seconds, goes east. In 30 seconds he rasps to the west near the den; again. This continues loud and regular at about 15-second intervals until about 1650.

1648 — Female(B) is back, she calls "check" three or four times but goes to the nest in 20 seconds; she feeds for ten seconds, flies to southwest getting higher as she goes.

1652 — The female comes straight back without hesitation and in silence. She gives food for ten seconds, then broods facing west.

1657 — F(B) rises and quickly settles.

It is very nasty weather, getting dark and with a wind from the west.

1702 — Female (B) rises a little, looks under her for 45 seconds. Evidently she is moving the nestlings with her bill.

1704 — She repeats for 45 seconds, but this time she pokes or picks vigorously.

1705 — I leave the nest. All is quiet at the moment.
T 48 - The adults are feeding the liberated young Cowbirds.

1715 - I leave.
June 13, 1955

A cool day with a slight mist and strong, gusty northwest winds; temperature 54° at noon. Present from 1215 to 1830.

T 51 - 51 F is incubating, M 51 silent as I pass.

T 50 - 50 F is not on the nest, but the eggs are intact. M 50 sings.

T 48 - I find the two Cowbirds near the place I banded them, #52-112402 dead. I try to catch 48 F by tethering the young bird in a bow net, without luck. (See just below).

T 49 at 1330 - Female (A) is building a fourth nest in a 10' redbud tree, about 6' high; the nest was begun today, is near the foxes' den as all hers have been. M 49 is behaving typically, singing frequent insipid steps, irregular, and rather faint, flying to the tops of the locusts and then den trees.

( I return temporarily to T 48 to try to catch 48 F.)

At 1420 I sit to watch female (A) build and to see the male's behavior:

1422 - She brings material, stays 20 seconds. M 49 has been silent for two minutes.

1423 - Trip from east; stays 20 seconds; to southeast.

1425 - Trip from southeast; 20 seconds; to southeast.

1426 - Trip from east; 18 seconds; to east. The last
three trips seem to have involved gathering quite nearby.

1427 - He sings high steps in the tree tops above the nest; faint, about 20 yards from it.

1428 - Trip from southeast; 20 seconds; to east.

1429 - Trip from southeast; 25 seconds; to east. M 49 is still singing above the nest.

1430 - Trip from east; 20 seconds; to ground to east. Songs go on, faint and very faint.

1431 - Trip from southeast; 20 seconds; to south. I'd guess she's gathering within 30 yards or less. The song rate is 8-20 second intervals, average 15.

1434 - Trip from southeast; 10 seconds; to ground to northwest.

1435 - Songs stop.

1438 - Trip from east; 30 seconds; to east.

1439 - M 49 sings the same song once in the locust tops to the southeast.

1440 - Trip from southeast; 25 seconds; to northwest but very close.

1447 - Trip from southeast; 20 seconds; to east. At the
same time M 49 begins to sing faint steps to southeast in the big field near nest B.

1448 - Trip from east; 25 seconds; to south. Male still singing as above.

1449 - I suddenly note that 49F (A) is dismantling her first nest, which is 20 yards from the current one. She spends one minute taking material from it, goes to the new nest at 1450; 20 seconds; to the north. M 49 as before.

1452 - Trip from east; 20 seconds; stays ten more seconds in nest tree; to southeast. M 49 now silent.

1454 - Trip from east; 18 seconds; to northwest just below nest.

1454 - Trip from below nest and southeast of it; 25 seconds; to south.

1456 - Trip from south, 22 seconds; to south, probably a little farther than the 25 yards which seems to be the chief radius of the collecting circle.

1457 - Trip from south; 20 seconds; to south.

1458 - M 49 sings once in the field to the southeast.

1458 - Trip from south; 15 seconds; to south. Note that the woods is only 15 yards away to the north and this limits
her gathering in that direction.

1500 - Trip from southeast; 18 seconds; to southeast.

1501 - Trip from southeast; 15 seconds; to south. She usually lights about one foot from the nest, then hops or flies to it.

1504 - Trip from south; lights low in tree, flies up; 34 seconds; to south.

1507 - Female (A) and M 49 come together to a clump of trees and shrubs 25 yards from the nest and he sings high step songs of five and six notes. She goes to the nest; 20 seconds; to south. He keeps on singing, at full volume. He is now in the locusts southeast of the nest.

1511 - M 49 still sings loud 7-8 note songs. He moves south to the little grove in the open.

1512 - Trip from south and M 49 moves closer to the nest, sings; 40 seconds; to ground to west. M 49 immediately falls silent; I can't see him.

1514 - He sings well to the south and probably to the east of the nest. Becomes quiet.

1515 - Trip from east and closely; 35 seconds; to ground to southeast.

1516 - Trip from just below nest; 20 seconds; to ground.
At the same time I see M 49 fly from the edge of the locusts with food in his bill to nest B. I think he had a green larva.

1517 - Trip from below nest; 10 seconds; drops to west. He sings in the little south grove.

1518 - Trip from below nest; 25 seconds; drops to west. He still sings to the south, insipid frequent steps.

1522 - Trip from southeast; 45 seconds; to northwest; flying low. M 49 is still singing, now high loud steps from the locust grove to the west between the two territories.

1523 - I go to territory 48.

T 48 from 1530 to 1700 - I try to catch 48F in a Crow net. M 48 enters it seven times but 48F never.

T 49 at 1700 - I watch nest B from 1700 on:

1700 - Female (B) is not on the nest.

1703 - She comes from the east with food, sees me, leaves without feeding.

1704 - She returns, feeds, comes to within 10 feet of me and calls "check" and loud "tsu" notes. M 49 not seen or heard.

1706 - M 49 skids to the west near nest A, comes closer.
Female (B) is still protesting to me; the "check" call is the most frequent, seven times per 15 seconds, sometimes as many as ten times.

1709 - M 49 still sings high skids.

1713 - 49 F(B) takes two minutes to take a green larva from the nest tree into the nest. Nestling raises its anus; she takes fecal sac, carries it east.

1713 - M 49 sings faint insipid steps in the locusts. After five songs, at 1715, he goes to the nest with food. He waits 15 seconds after feeding, takes a fecal sac and flies low with it to the north.

1723 - Female (B) to the nest tree; calls "tsu," moves nervously, leaves the tree.

1724 - She takes food to the nest, stays 15 seconds looking into it. Comes north toward me and now calls near me, "tsu" and sometimes "check."

1726 - M 49, silent since last feeding, sings faint insipid steps to the west, seems to get closer. Songs are very faint, have buzzing ending. Probably he's attending female (A).

1734 - Female (B) to tops of nest tree, then to nest. This trip was silent, lasted only ten seconds. She feeds, re-offering two or three times, for 15 seconds. Leaves, sits five seconds about one foot from nest. Flies west to tops of locusts.
Female (♀) appears in locust tops near me with food. She moves slowly and nervously to the nest, stopping half way between me and nest tree. At 1740 she goes to the nest, feeds 15 seconds, goes west.

(A Field Sparrow is feeding a young Cowbird. On T 43 I saw one feeding a full-grown Cowbird, probably the first brood of the female's that laid in the Prairie Warbler's nest here).

The female flies straight to the nest from the locusts on the west, feeds for ten seconds, carries a sac southwest.

He 49 sings high faint steps in the field to the southeast. At 1748 he flies in high to the locust tops, carrying food. There he sits and sings six loud (note the ones away from nest are faint) stop songs at ten-second intervals. Goes straight to nest, feeds. Nestling raises anus, he takes sac and goes south; all this in ten seconds. Note the rate of excreting; there are two young, evidently excretion pretty close together in time.

He 49 sings step songs (volume?) three times in the field to the southeast.

He comes to the nest and she arrives simultaneously. Each feeds. He leaves in five seconds, to southwest; she goes due west 15 seconds later.
1755 - M 49 sings one high faint step near nest A.

1756 - Female (3) goes to nest tree from somewhere near me, to the north. She sits quietly with food, 6" above the nest. This may be due to a fox or a dog moving somewhere near and behind me. In one minute she goes to the nest, feeds, begins to brood facing east.

1759 - Female (3) backs off the nest, picks in it, settles on it. M 49 sings one faint, high, insipid step near nest A.

1800 - I leave T 49.

T 48 - I make another unsuccessful attempt to catch 48 F for 30 minutes.

1830 - I leave.
June 14, 1955

Sunny morning after a rain at night; northwest breeze; temperature 55° at 0900. Present with Carmony from 0945 to 1530 and alone from 1800 to 1830.

T 51 - A male sings across the fairway in the walnut grove on II N. This is not far from the present nest. The female is not on the nest.

T 50 - At 1000 the Cowbird egg has hatched and the shells are gone; the young bird does not look as though it just hatched. M 50 sings skids near the nest. I'll return.

T 48 - M 48 sings and carries food, so the Cowbird survived my operations yesterday. We go on without disturbing them.

T 49 at 1030 - Duane sits to watch the building of the new nest of 49 F(A). While I'm with him, five minutes, nothing happens. The nest is a very flimsy shell; it has taken shape but is still only a few fibres.

I go toward female (B)'s nest. M 49 is singing loud step songs with rasping final notes, irregular in frequency and interspersed with calls between the songs. He is in the southwest corner of the territory near the white pines. I see him hopping actively around about 6-7' high in a thicket. His songs there are audible from 1030 to 1040.

By 1044 I'm at nest B:
1040 - M 49 now sings high skid songs from the
locusts to the west; they are fairly loud and continue
for some time.

1046 - 49 F (B) comes from the west with food. She
goes straight to the nest, stays ten seconds, and
carries a fecal sac to the west. She seems to climb
high in flight as she leaves.

1048 - The male is still singing, louder and closer;
he's about 20 yards from the nest.

1049 - M 49 goes to the nest, landing below and
climbing to it. He carries much food, sits on the
rim one minute. Then he hops one foot away, sits
for 30 seconds. Next he hops higher in the nest
tree, moving slowly and deliberately. Finally he
moves to the larger dogwood three or four feet from
the nest tree. At 1050 he sings from there, then
moves south and sings faintly.

1055 - M 49 sings to the west near nest A.

110h - M 49 sings skid songs to the west, coming to
the locusts.

1107 - The female brings food without paying atten-
tion to me - she may not see me - and stays 15 sec-
onds, then goes north. Meanwhile the male is still
singing the series begun at 110h; he sings 18 times
by 1108½, falling silent about when the female leaves
the nest and flies in his general direction.
Field Sparrows occasionally land in the tree by the nest tree. No reaction is seen.

1112 - I think I see a Prairie Warbler fly high toward the southeast locust grove.

1113 - The male sings high skids west of the south end of the locusts. He approaches me, i.e., moves generally northeast, singing regularly every 15 to 20 seconds till 1116.

1116 - I think a Prairie Warbler has just flown from the south into a tree above me; it may be a gnat-catcher. The male is singing again to the west of the locusts. At 1121 he moves into the locusts and begins loud skids.

1121 - After three songs the male goes to the nest tree, sits 25 seconds 1' from the nest, perhaps watching me. He then goes to the nest, feeds, stays 30 seconds and leaves at 1122. In 30 seconds he is singing skids in the clearing near nest A; this lasts two or three minutes.

1126 - Female (f) flies straight to the tree, lights 1' above the nest, goes to it without hesitation. One young rises up to take a big green larva; it then raises its anus and excretes. She carries the sac east, staying at the nest about 20 seconds. The young are clearly audible begging when the adults go to the nest; I'm about 20 yards away.
1133 - The female flies from the east into the locusts by the nest. In 20 seconds she goes to the nest, feeds, takes a sac, and flies north with it. This is completed by 1134.

1133 - The male begins to sing to the west; he's been silent about eight minutes. Now he's in the clearing near the den, I'd guess. He is moving southeast, singing faintly. Sometimes his songs are full volume but he stays near the nest A area. The singing stops at 1140, begins one and a half minutes later.

1142 - M 49 sings near the nest in the locusts. Now he has moved almost to me. The songs are loud, eight times.

1145 - 49F(B) goes to the nest, feeds for 20 seconds, leaves to the south.

I'll now go to clear a place to put a Potter trap.

At 1150 I rejoin Carmony. He has not seen female (A) at the nest during a one and a quarter hour vigil. M 49 has come and sung near the foxes' den on several occasions.

We return to nest B, catch the young and put them in the 3-cell Potter trap, the adults, unfortunately, looking on. For two hours we wait without having any luck. Part of the time we are within sight of the trap's location. The female is by far the most active and attentive parent, probably feed-
ing the young (which beg vociferously) through the mesh. Often the male just sits and sings in the wood-edge trees near us. Finally I go to the young, tether them near Carmony who is under my dogwood-tree blind, leave, get the bow net and return. I set it and leave Carmony to do the trapping.

I go to the nest A area and at 14:15 see female (A) at her new nest. Then at 14:25 she goes to a dogwood tree about 20 yards from that nest and from me and works on still another nest. At 14:27 she carries to it again. When she leaves she flies to the nest of yesterday, pulls material from it and takes it to today's nest. This is more than casual dismantling as yesterday's behavior may have been; she seems to be actively using yesterday's nest as a source for material.

14:32 - M 49 sings faintly from nearby. Note that both he and female (B) were greatly alarmed by and displayed before me when I tethered the young. I.E., he is spending a good deal of time with female (B), her at least when we cause/to call and attract attention.

14:40 - Carmony calls me to nest B. He had trapped the female and she escaped. We try again.

14:45 - Back on the A area. M 49 flies over the den going west, then sings three songs in the west
grove on the territory line.

Female (A) takes material from yesterday's nest and puts it in the new one.

1450 - Carmony catches female (B) and we band her left leg with number 21-62040, her right leg with green, and weigh her: 8 grams, 280 mg. M 49 carries food around as he protests, so we reset the trap to try to catch him. I return to female (A)’s nest.

1500 - Female (A) is still building. Evidently the furor on B area doesn't distract her. At 1508 she flies directly from the nest to yesterday's and takes material, the fourth time I've seen her do so. I'm not in a good position to time all her trips. The new nest looks very flimsy and surely was begun today.

1513 - She dismantles again.

1513 - She dismantles again.

1515 - M 49 comes into the big walnut from area B and sings faint insipid steps near female (A). At 1515 she again gathers material from the old nest. M 49 is in the locusts about 15 yards from her, singing.

I go to Carmony and we release and band the young and leave. Our numbers are 21-62041 and 42. Both adults protest and display as we handle the young and Carmony says the female came quite close
(119)  6/14/55  Bk III

to the young immediately after she was banded.

In passing 49 F(A)'s nest of yesterday I note it is almost completely gone. This must all have been removed sometime between 1130 and 1500, for it was intact at 1030 and Garmoysaw no trips to it during the next hour. This is a very unusual experience.

1530 - We leave. It rains at 1645.

1800 - I return.

T 51 - 51 F is on her nest.

T 50 - The nest still holds the young Cowbird and four intact Warbler eggs, at 1815. 50 F sees me handle her nest and protests, but will not desert.

1830 - I leave. It rains hard at 1900.
A sunny wet morning, the temperature 60° at 0830. Present from 0845 to 1235 and at 1400 and 1730.

T 51 - 51 F is on her nest, and M 50 sings skid songs nearby.

T 50 - At 0900, M 50 is singing type - 8 steps and 50 F is on the nest. I take up a good observation position under a dogwood.

0910 - She leaves nest, M 50 stops singing. I find the nest contains the Cowbird, 2 Prairie Warblers, 1 intact egg, and 1 egg with a 1/8" crack all around it, no shell. M 50 has food and watches me examine the nest, almost without protest. When I retreat he goes to it immediately. It seems to me he leaves carrying a large object but I can't see him long enough to be perfectly sure.

0915 - 50 F returns to the nest. M 50 sings type - 8 steps nearby (25 yards) quite regularly. She backs off to look in occasionally.

0920 - She leaves quickly. M 50 immediately falls silent.

0935 - She returns with food. She calls two or three faint "checks," goes to the nest, feeds, settles. I'm pretty sure she doesn't know I'm here.

0927 - M 50 sings a type-8 and a skid to the northeast; he continues this, singing quite faintly and almost alternating his songs.
0950 - M 50 brings food to the nest tree. In 15 seconds 50 F leaves. He hops slowly to the nest, feeds (the Cow-
bird), and in 30 seconds leaves. She calls "check" about
10 yards away for a minute. I'm sure she is vaguely
alarmed by my presence, but I doubt that she knows where
I am.

While M 50 is at the nest the faint skid song comes
from the north, so that must be M 51. He sings 30 seconds
after he leaves the nest.

0959 - He goes to the nest, stays 15 seconds, leaves; I
don't know if he took food. She is calling "check" while
she forages on the ground 10 yards from me.

1000 - She goes straight to the nest, feeds, settles on
it in 30 seconds.

1001 - He sings one type-8 song and then a succession of
skid songs, probably in the tree over my head. Then he
altersates skid and type - 8's, singing very faintly.

1013 - She quickly leaves the nest to the south, the
direction she faces this time. Other departures have
been to the north, and she has faced north and east.

1019 - The male comes silently, feeds, eats a fecal sac,
and hops to the top of the tree before flying from it.

1026 - She returns with a very small food object, feeds
and settles facing north. She came to the nest slowly
and nervously, doubtless due to me.

1041 - She rises, looks in the nest a second, flies north.
1054 - M 50 sings two high skids 15 yards from the nest. In 30 seconds he goes to the nest tree, hops slowly (20 seconds) to the nest, and feeds for 10 seconds. The Cowbird seems to get all the food. He then hops around in the nest tree for one minute, leaves, immediately sings one time.

10574 - 50 F flies straight to the nest, looks in and feeds for 15 seconds, settles facing north.

1114 - She leaves and goes north. I examine the nest. It now holds three young Prairie Warblers and no broken egg shells. I have had it under constant observation, and the female has eaten no shells. Therefore I can say with assurance that what I thought was a shell when the male removed it at 0910 was one in fact. Note that he took away both shells and that as yet I've seen the female dispose of shells only by eating.

They come to the nest when I inspect it. Again I note a high twittering note that I can recall having heard only on occasions of alarm or when the male and female suddenly approach each other.

IV S - A male sings a chatter skid here just east of the cleared area.

T 48 - I see M 48 as soon as I arrive. Then 48 F appears near him and he chases her in the dense pines. She comes to the locusts, calls a light "chick" regularly every two
or three seconds. She flies north with an object in her bill; it looks like a larva. I hear no young bird, but in ten seconds she appears without the object. The male is with her again, moving along after her; both move quickly and don't seem to concentrate on any spot. I have the idea she is moving over the ends of the branches in an exploratory way, as though searching for a nest site.

Altogether the situation is obscure here and will require some time to clear up. I'll work on it tomorrow.

T 49 - Two Red-tailed and one Broadwinged Hawks soar overhead.

On the B area I hear a fledgling's begging call and soon find one, about ten yards from where I released him. No adults are in sight during ten minutes here, but clearly all is well.

I return to the A area to see if female (A) gets any attention as she builds her nest. The nest begun on 6/13 is completely gone. She is building her newest which looks well along from the spot where I sit.

1149 - One high skid song to the east.

1200 - Two high skids to the east. I'll not try to time the female's nest building trips except roughly:

1202 - Staying two minutes.

1208 - She enters and shapes the cavity busily for two minutes. This she does by lowering her belly and breast into the nest several times and
turning or settling down; she faces several directions. After two minutes she simply sits quietly in the nest for nearly ten minutes, till 1220. Occasionally during this period she seems to be shaping a little, or picking at the rim with her bill, but these are very brief movements. Highly interesting bit of behavior.

1223 - M 49 is singing a step-buzz to the southwest. He moves into the little locust grove west of the foxes' den and sits singing in the very top of a tree.

1225 - She comes to the nest tree and is engaged in a chase with a Field Sparrow; I can't tell which pursued. Another Field Sparrow sits in the nest tree with food and female (A) hops about the tree carrying nothing for two minutes. She and the sparrow look at each other; she seems to be concerned at its presence but she is silent. M 49 sits and sings, watching (or able to see) all this from 25 yards away. The sparrow leaves and in one minute she goes to the ground near the nest. M 49 quits singing for one minute; starts again. Some songs are abbreviated, most of them faint. He moves to the edge of the woods, sings two or three times, falls silent.

1232 - She comes to the nest.

I'd say he is attending her to some degree,
about as much as he was yesterday.

1235 - I leave.

T 50 at 1400 - The last egg is still unbroken.

T 50 at 1730 - The egg has hatched and the shells are gone. One Prairie Warbler nestling has disappeared, presumably already starved.

Note that the timing of 50 F and 49 F(n)'s incubation periods may be affected by the fact that both nests contained Cowbird eggs.
June 16, 1955

A sunny dewy morning; temperature 61° at 0800. Present from 0800 to 1130.

T 51 - 51 F is incubating. The male is silent.

T 50 - M 50 sings. I inspect the nest despite the nearby presence of an adult. The nest holds one Cowbird and three Prairie Warblers. All gape.

T 48 at 0830 - M 48 sings three or four half-hearted songs at 0840 and by 0855 I have traced him to the young Cowbird. Both he and 48 F are carrying food; I leave because she displays alarm at my presence. Note that the courtship (?) chasing I saw yesterday occurred while the pair was feeding a fledgling. The Cowbird is evidently in the high weeds or blackberries in a dense thicket.

A box turtle is eating the dead Cowbird, the other nestling. When I return 15 minutes later the turtle and the bird’s body are gone; evidently the turtle removed the body, perhaps because I had walked up to it.

For another half hour I watch the open areas on T 48 in which I believe a nest building female would gather material. I see nothing.

T 49 at 0930 - I find female (B) in ten minutes. She immediately begins to call "tsu" over and over, so I conclude that the young are alive and that I'll make future observations more difficult by remaining to alarm her. She follows me
to the locusts which seem to be the north-south line between M 49's two "sub-territories." Meanwhile he sits in the locusts and at the edge of the woods and sings six or seven high, faint, insipid steps.

**0945 -** I sit to watch the nest of female (A).

[Two male Indigo Buntings chase each other slowly and silently around this clearing for two minutes, keeping about 15' apart. Then each sings from the two adjacent locust plantings and one starts the fight again for a few seconds.]

(I suddenly recall that after the failure of female (A)'s most recent nest I found fairly well developed embryos in the eggs. This precludes the idea that M 49 has not actually mated with both females.)

**1007 -** M 49 comes to the foxes' den trees, sings three high step-buzz songs, and moves into the lower growth on the west edge of the clearing. He sings and eats. I follow him to see if female (A) is with him; she is not. He goes on southwest to the tip of the locusts that project out into the clearing bounded by the white pines. He sings till 1013, then moves back to the little locust planting on area A and sings till 1015. At 1020 I see him fly high from the foxes' den area to a big tree at the woods' edge, far onto area B. He is carrying a big larva, so clearly he is feeding. I would say the recent singing trip to area A is more like a patrol of his territory than a display of interest in the female here. Of
course I haven't seen her, so this is a natural conclusion; he may have been moved to come over here because it's the center of female (A)'s activity.

By 1030 I've seen nothing of female (A) at her nest, so I go to get a mirror and inspect it. I return in five minutes and find M 49 singing his faint step-buzz and female (A) hopping very quietly and leisurely along near the ground. I follow her for ten minutes, losing sight of her for a minute or more at a time. M 49 always moves along at a 15-25 foot level and stays perhaps 15-20 yards away. He obviously is watching her. Most songs are very faint. In ten minutes she hops up with nest material and starts to the nest tree. I'm close, so I retreat. This behavior is all typical of the final day of building.

Note he is feeding young too.

I now feel that I know all that is going on on T 49 except this: Is female (A) ever feeding the young of female (B)? I'll check this when I can watch without causing so much alarm.

VII - A male sings a loud chatter skid.

1130 - I leave.
June 17, 1955

A sultry day, sunny nearly all the time; temperature 76° at 1330. Present from 1400 to 1800.

T 51 - M 51 is at the nest, sitting 5" away, carrying food. He leaves it when I arrive and goes to nearby trees from which he calls "check" and occasionally "tsu." He comes quite close to me, calling loud. 50 F is not in view. Evidently the young have hatched, although the dates should be checked; I did not expect them yet.

T 50 - The nest contains the Cowbird and three young Warblers. All seem healthy, gaping and, I'm pretty sure, all calling. M 50 sings skids nearby.

T 48 - at 1430 - For most of 3/4 of an hour I watch the two adults engaging in behavior that almost surely is the preliminary of a second mating. They stay together nearly constantly; I think that M 48 is the one that does the active following but I can't be sure that this is always the case. He flies along after her only two or three feet behind. When he does separate, he quickly flies right to her. She stays high in the locusts, possibly looking for a nest site and in any event moving quickly and actively over the outer branches. All movements of both are rapid and darting. They take off for quick high flights at tree top level, then almost immediately return. Although they concentrate on one spot, they range out from it a good deal. Each carries food at least once, so I think the Cowbird is at the
point to which they return. There is a good deal of irregular calling "chick" and "check"; I think the male is responsible for most of it, but their staying together prevents my knowing. Just before I leave, 48 F carries food and calls, probably at me. Otherwise I'd say I had nothing to do with any of today's behavior. (The calling comes in little spurts of once every two seconds or so, seven or eight times, then silence for a minute or more. Or sometimes one or two calls alone will be given.) No singing.

T 49 at 1530 - Nest A is complete, empty. For 20 minutes I hear nothing. Then M 49 begins to sing type-3 steps from the locust grove that divides areas A and B, and I find him there. At 1600 he goes to a fledgling perched 10' up in a dogwood, so I sit to watch this young bird. My purposes are to observe the rate of feeding, its behavior, and most of all to see if female (A) helps feed (the bird is only about 40 yards from her nest).

1602 - M 49 feeds. He then calls "check" nearby and sings a high skid.


1606 - M 49 falls silent and I lose sight of him.

1614 - Feeding. Sings, goes into the locust grove.

1618 - Feeding, the young bird begging in a high squawking voice somewhat like the notes adults give in fear or on meeting. This is the first time the young has begged.
1618 Feeding.

1619 Feeding. The young preens completely, breast, back, wings, back, exactly like an adult. It then scratches like an adult; stretches up, raising wings out to the side; stretches up without moving wings.

1622 Feeding.

1623 Feeding. Young begs as before.

1626 Young preens left wing, shakes out its feathers. Male sings near nest A.

1628 Feeding. Male sings one faint step.

1636 Young stretches up, standing to full height for one second.

1636 Feeding. Male has been silent since last noted. Now sings one song of three step notes, then three step-buzzes.

1638 Young thrusts head forward, raises wings over back a little.

1639 Young stretches one wing, then thrusts head forward.

1640 Feeding. M 49 then sings a faint step-buzz.

1645 I quit watching the young. It has not moved from its perch, has not called except when the adult has come to it. No female has appeared. It seems unlikely that M 49 is spending much time with either female. Also, can you say that it is likely that the male-female association during the pre-laying period is largely because the male follows the female? If the female maintained the association, wouldn't
female (A) be in the vicinity with M 49?

I see a big racer. Find an Indigo nest 2½' high in berries, the female incubating three Indigo and one Cowbird egg. The Cowbird egg differs from all found so far, and seems to represent a fourth female on V. I find a Field Sparrow incubating four eggs in a ground nest.

I next walk around on T 49 for 3/4 of an hour looking for any sign of female (B). I have no success, nor do I see the second fledgling. M 49 sings a few step-buzzes in the southwest corner of the territory, otherwise is silent.

I find female (A) and follow her for ten minutes. She behaves typically for this stage of her cycle, keeping completely silent and moving very slowly and calmly along on or near the ground. No tail moving, no sign of alarm at my close presence. M 49 does not appear. This all occurs in the clearing just south of the new nest, about 30 yards from it.

1745 - I leave T 49.

II - A male sings a dry skid from the corner of II west near VII.

1800 - I leave.
A clear day with a light dew; temperature 66° at 0800.

Present from 0845 to 1300.

T 51 - Both adults are near the nest. 51 F comes to the tree without food; she calls "chick" when she sees me, hops slowly over the nest tree. M 51 calls "tsu." I assume the nest is active. M 51 sings skids. The female showed no reaction when a gnatcatcher lit 10' from the nest.

T 50 - Neither adult is in evidence. The nest is as it was yesterday, the young vigorous and the warblers quite definitely calling when I jar the nest.

T 48 at 0930 - I sit to write, hearing no songs by 0943 when I begin to search for the birds. At 0950 M 48 begins to sing high insipid steps, many of them faint. I see him feeding in some locusts, a few minutes later singing from a locust top. No sign of 48 F. At 1005 I find 48 F, which immediately begins to call "chick" at me. She catches a larva and carries it around. M 48 comes to the vicinity (which is not far from where he was) and either sits quickly or moves near 48 F. Most of the time he stays within ten feet of her, but males will do this when the pair is disturbed, e.g., when the young have been caught. I decide to leave and return later if I have time. I'll learn nothing when she is alarmed.

Five male Cowbirds posture and sing in a tree top at the edge of the woods. A female is in another tree 40 yards away.
T 49 at 1020 - M 49 sings three faint, high, insipid steps from
some high point near the foxes' den as I come on the
territory. He then falls silent; I don't see him.

Nest A contains two Prairie Warbler eggs, the first
time I have ever found two laid on the same day. To make
sure, I remove and examine them; they are clearly both
female (A)’s, whose eggs I have seen before (a shell from
nest three was saved for this purpose of comparison).
In case only two should be found tomorrow, I mark today’s
eggs. (should have marked all anyway)

At 1045 I find a fledgling 49 by following M 49 to
a tree from which are coming "tsu" calls much like an
adult. The bird moves around a good deal in the tree
for about three minutes, hopping clumsily up branches
till it finds a satisfactory perch. I sit to watch and
see if any females will appear. M 49 shows mild alarm,
two or three calls and an occasional reluctance to take
food to the bird, because of me. He feeds it five or
six times by 1100. In the intervals he sings faint steps
occasionally and at 1055 begins to sing a loud regular
chatter-skid, at least the fifth different song I've
heard him sing. Once a bird comes in from the south-
east locusts and there is a pursuit back to them; I
can’t tell if they are Prairie Warblers, but I’ll check
later. No female comes up. At 1103 M 49 is singing ab-
 abbreviated steps and chatter skids within 20 yards of the
fledgling.

I begin to cover the rest of the territory to look for female (B). I continue this until 1245, without success. M 49 goes to the east end of the territory, near the northeast corner, and sings softly for ten minutes, so I concentrate here. Then I go to the enclosed clearing and find a male, presumably M 49 (error – it is M 52), singing type-8 steps there for five minutes. The most careful search fails to turn up the female, but when I then go into the woods and look in the little clearings there I see a Prairie Warbler that may well be she. This bird is in sight for only a few seconds, too little to let me see any bands.

My present guess is that female (B) is rebuilding in the northeast area somewhere, probably in the wood. I think only one young is alive. It is still where it was earlier when I pass to leave, and M 49 is singing step-buzzes. Between each song (interval eight to ten seconds), he gives six to eight loud angry-sounding call notes. As usual, I cannot tell why.

1300 – I leave.
June 19, 1955

A very hot still day; temperature 70° at 0800. Present from 0845 to 1245 with Paul Davis.

T 51 - Both adults are absent when we arrive, then both appear and call at us. In five minutes 51 F goes without food to the nest and broods. M 51, as usual with him, sings skids when he comes to the nest vicinity.

T 50 - There are only two Prairie Warblers with the Cowbird today, the other probably having starved. Both young warblers call as I touch the nest limb. The male is silent.

T 48 - We cover this territory for 30 minutes, finding both adults in the locusts east of the nest site and quite close to T 49. This locust grove has a small narrow north-south clearing in it. The 48's stay high in the canopy and after seeing both carry food I finally find the Cowbird up there. Neither adult seems to pay any special attention to the other. The most interesting thing is that M 48 and M 49 get into several territorial fights at about the line of the little clearing mentioned above. These involve repeated series of sharp calls at each other and chases back and forth across the clearing, all very typical. As always, the female does not participate although she is feeding the fledgling Cowbird within a few yards. I later find M 49's fledgling being fed by him in the little thicket at the southwest corner of T 49 where the locusts project out and where
he sings sometimes. It is a clear case of the two males being involved in fights because their young force them to come frequently into proximity.

T 49 - There is an Indigo Bunting (male) - Prairie Warbler pursuit at the foxes' den when we come up, but I can't see if M 49 is the pursued or the pursuer.

I find an Indigo nest 2½' high in a 3½' locust, the female incubating three of her own eggs and those of two different female Cowbirds. I've found these types of Cowbirds' eggs before. Note that I seem to be in a Cowbird egg-laying period again.

49 F(A)'s on the nest when we arrive. Later I examine it and find three eggs, and still later, at 1100, she is incubating. So this is a three-egg set and the three eggs were laid in two days.[7]

We then spend two hours looking for 49 F(B) without the least success. A male sings twice for five-minute periods in the enclosed clearing but I see no female. Paul sits in the little opening in the woods, and we also examine X, so our coverage is good. M 49 once or twice sings high in the east and north edges of the territory (and presumably in the clearing) but nothing happens.

See above for M 48-M 49 encounters. I see the 49 fledgling; I think only one is alive.

1245 - We leave.
A sunny dewy morning; temperature about 70° at 0700.

Present from 0730 to 1030.

T 51 - Both adults are carrying food, the male singing.

T 50 - The nest is as before. I see neither parent and hear nothing.

T 48 for 45 minutes - Both adults are carrying food about where they were yesterday; I don't see the Cowbird. Later on T 49, I see 48 F at the east edge of the redbud-locust grove which grows along the ravine and separates the two territories; i.e., she is on T 49. Still later when I'm leaving I find both 48's at the same place and then in the tall woods-edge trees just to the north. M 48 is watching 48 F as she moves, keeping about three feet or a little more away. Once she flies up and sits quietly on a limb 15' high, and when she starts to fly from it he swoops on her from above and chases her several feet. Both are silent. M 49 is not in evidence. This looks like courtship.

T 49 - When I come up 49 F(A) is off the nest. In five minutes she and M 49 fly straight and silently to the nest tree, she a second or so ahead of him. She lights about 4' from the ground, immediately flies up and enters the nest. He sits in the tree at the same 4' level for two seconds, moves out to nearby blackberries, and in five
seconds more goes south. He sings from the little locust
grove there.

I follow him and see that he is carrying food a
little east of where the young was yesterday. I don't
trace it.

In an hour and a half on all possible habitat for
T 49 I see no sign of 49 F(8), nothing in M 49's behavior
that tells me anything.

1030 - I leave.
June 21, 1955

A changeable day, sunny till 1530 when it becomes very threatening and thunders; by 1630 it is clearing and only a very few drops fall. It then clears completely. Temperature 87° at the hottest. Present from 1700 to 1930.

T 51 - M 51 sings presumably as he comes up to the nest carrying food. This is his almost invariable habit. 51 F has food too.

T 50 - The nest still holds the Cowbird and two Prairie Warblers. I see and hear nothing of the adults.

T 48 - In one and a half hours spent moving back and forth on this territory and T 49 I see M 48, once carrying food, but never 48 F or the Cowbird. M 48 does a very interesting thing several times, i.e., he flies across the clearing of T 49 (the one by the foxes' den) and is never challenged by M 49. He does not sing on these trips and I later find M 49 feeding his fledgling on the south end of T 48; this explains his not seeing M 48. Once M 48 goes to 49 F (A)'s nest tree and sits there for ten seconds. She is on the nest, but I can't say whether M 48 sees her or goes to the tree because of her; certainly she does nothing to repel his invasion of T 49.

Most of the time M 48 is in the locusts that divide the territories, on several occasions singing series of skids. Some of this singing is at times when M 49 is singing skids too. I look a lot for 48 F without success.
T 49 - See above. M 49 is feeding the young bird back at the southwest corner of V, well on to T 48. 49 Y itself sits at the south edge of the locust thicket, about 2' high. It lets me walk right by within 3' and doesn't fly. Its outer rectrices are perhaps one-half inch long and are white; presumably they don't molt. M 49 gathers food in the westernmost locusts and the white pines. He sings in the general area and never draws a fight. This whole picture of the effect of fledglings on territory lines is interesting.

49 F(A) incubates, coming to the nest once while I'm here. I walk carefully over V without seeing 49 F(B).

1930 - I leave.
June 22, 1955

A fine sunny day, in the low 80's but fresh and pleasant. Present from 1000 to 1430 and with Paul Davis from 1530 to 1630.

T 47 - For the first time in weeks I go to T 47 and sit to listen. In 15 minutes M 47 sings and I begin to follow him to see if he has a female or is carrying food. He stays within a restricted area, moving quickly on a more or less circular course and staying in the tree tops some 25-40' high. He sings frequently, very occasionally a faint skid but usually at full volume. In ten minutes a female flies by me with nest material and I trace her to a 2' dogwood standing alone in the weeds. The nest is about 18' high and since it is at about the level of the surrounding weeds, is well concealed except from above; even from that angle it is inconspicuous. It was probably begun yesterday, has taken on full shape but is flimsy. She makes trips about every two minutes, so it should be complete tomorrow.

M 47 seems to sing without regard to a vulture soaring overhead.

T 48 for 1½ hours - Things are quiet here, but before I go I see the two Prairie Warblers and the Cowbird. M 48 several times flies to the 40-foot top of a dead tree at the edge of the woods, sits quietly or sings two or three times, and then quickly goes south into the locusts.
After he's done this twice I watch carefully. On his third trip he sings a very faint song and I see 48 F feeding about 12' high in the locusts nearby. She leaves to the south and M 48 immediately darts after her although he doesn't catch up with her. I then watch for signs of building but see none; M 48 doesn't return to the spot.

I then walk all over T 48 and see M 48 several times; he doesn't concentrate on any spot and he stays in the locust canopy singing irregularly but frequently. As I'm leaving he sings near the west pines so I go there and find the Cowbird, now at least three-fourths grown and well able to handle itself like an adult. It is quite wary.

I'd guess that 48 F may be beginning to renest.

T 49 for one hour - 49 F(A) is on the nest; I think that once she stands over it. In any event her bill is open and she is clearly affected by the heat.

M 49 sings at the southwest part of his territory and in the little south locust grove. I never see him carry food, but I make no real effort to follow him. I walk all over T 49 and to the little enclosed clearing. In the clearing a male sings an abbreviated song that begins with two high step notes and changes to a Golden-wing type song. He feeds along near the grove and I follow him almost to the southwest corner of the clearing, i.e.,
to the recognized part of T 49. I think this male is K 49.
No sign of female (B).

T 50 - Both adults are feeding and the nest looks so full that
I'm afraid to wait till tomorrow to get the young. I
therefore set up a bow-net and leave to get help.

T 51 - The male sings near the nest.

1430 - I leave.

1530 - Davis and I return and I take the young of the
50's and tether them in the net. Paul sits to pull the
trap but the adults never quite enter. We leave after
an hour and I weigh and band the young:

Cowbird: 52-112404, weight

Prairie Warbler: 21-62043, weight 5 gm 820 mg

Prairie Warbler: 21-62044, weight 5 gm 870 mg

The numbered band is on the right leg, a yellow one
on the left.

1630 - We leave.
A fine sunny morning with a southwest breeze after a rain during the night. Present from 1100 to 1230 and from 1330 to 1600.

T 51 - 51 F is at the nest.

T 50 - I catch all three young and put one in a top-entrance trap, the other two in a Potter. The adults, of course, display and remonstrate while I do so. One warbler was on the ground, one a foot high on a weed, and the Cowbird was 5' high in a thicket of red osier dogwood. The Cowbird is quite active and it's moving around in the trap will probably let the adult feed it through the mesh.

In 30 minutes I check the trap; nothing has happened that I can see. Again in 30 more. I go home at 1230, return at 1330. At 1330 an adult is in the Potter trap but the gate is unsprung so it escapes. I reset the traps and go to V.

T 48 - I stay here 45 minutes without seeing 48 F or the Cowbird. M 48 sings only a very few times, and the only time I see him he's sitting high in the dead tree at the north end of V. This occurs just after he sings across the wooded strip and on X; he then sings from the big tree. I cover X and also the clearings on T 48.

A Field Sparrow nest 3 1/2' high in a 7 foot red pine contains three eggs, female incubating.
T 49 - M 49 sings from the little locust grove south of the foxes' den. His songs are loud and frequent but he falls silent for long intervals, singing less than he is silent. I don't see 49 Y or female (B), although I cover the territory and the enclosed clearing. I really make little effort to find 49 Y or to keep M 49 in view. Once he flies to the big elm in the field, falling silent when he lands. I lose him there.

Female (A) incubates.

T 47 - The nest is lined and looks complete. M 47 is silent during the few minutes I'm present.

T 50 - At 1500 I return and find 50 F caught in my Potter trap, a 4' racer in the center cell, the Cowbird gone, and the other Prairie Warbler in the center cell immobile and with its eyes closed. I kill the snake and open it; 18" from the head is the Cowbird, swallowed whole, head first, its feet extended out behind it.

I then weigh the female: 7 gm. 120 mg; she has worn some of the feathers off her forehead in her terror, so possibly she has lost a good deal of weight for the same reason. I band her with 21-62045 on her right leg, a yellow band on her left. She flutters to a nearby tree and the male flies to her. I release the young and leave.

1600 - I leave.
A cloudy day; the temperature is 64° at 0800. Present from 0845 to 1200.

T 51 - 51 F is at the nest.

T 50 - M 50 is singing on the west edge of his territory when I come up, the broad open hillside and top. His song is a short, weak skid. He then goes to the ravine. I move toward the spot where I had the young to see if 50 F is here and the young alive. When I am 30 yards away, M 50 flies to the little maple where so many nests have been built, and I turn to watch him. He moves over the tree with a slight crawling motion and several times seems to flutter his wings slightly exactly like a young bird being fed; they are only very slightly extended from the body. He repeats this at 8' and 2' levels; he is 40 yards from the nest site.

I go to the banding area and in a minute M 50 sings from above me. I find a young bird sitting 8'' high and just at the moment M 50 begins a full-scale distraction display, extending his wings, fluttering them rapidly, and lowering and spreading his tail. He calls "check" and creeps along the ground and low vegetation. I now realize that the begging motions of a moment ago were probably low intensity distraction display. The resemblance to begging suggests the origin of the true display (note this).
I don't stay to look for 50 F, who has suffered enough from me.

T 48 for 30 minutes - M 48 sings only four or five times, always from the southwest corner of his territory near the dense pines. Finally I find 48 F there feeding the Cowbird. M 48 is near but in the tops out of sight.

T 49 for one hour - M 49 is singing at his usual spot, the little locust planting, when I arrive. 49 Y may be calling. I don't see M 49 for several minutes and then he flies east and I lose him. 49 F(A) is incubating.

I make a careful search of the territory (including X but not the clearing) but do not see female (B). M 49 spends at least 20 minutes on the east edge, first singing weakly in the little pines and low trees, then after five minutes flying into the tops of the tall woods trees. In five more minutes he repeats this. When I approach him in the field he calls "check" two or three times. I'd guess either that he is feeding the fledgling in this general area, which I doubt, or that female (B) is somewhere near here. His songs are occasionally rather faint, always slow and spiritless; on the east part of the territory all are skids.

A Field Sparrow incubates three eggs in a nest two feet up in a 4' maple.
T 47 - M 47 is singing skids when I come on the territory. At 1120, 47 F is sitting on the nest in an incubating position. I watch her. In three minutes three dogs come by chasing a rabbit; they pass her within five yards, yapping noisily. She does not respond. At 1127 she leaves the nest and I find to my surprise that there are no eggs. The nest is a little more heavily lined with grass than it was yesterday at 1430, so possibly 47 F is still making trips to it. On the other hand, she could have lined it to the present state in the remaining daylight hours yesterday. If there are eggs tomorrow then today should be the idle day, and her presence will be evidence that the female visits the nest sometimes during that day and even sits on it. If tomorrow the nest is still empty, she may still be building today. Her sitting on the nest may be because I came up although I don't think I alarmed her; she acted as though she were sitting quietly when I arrived.

I watch for 15 more minutes and nothing happens so I leave the territory. M 47 sings infrequently.

1200 - I leave.
June 25, 1955

A rainy morning with a heavy fall till 1030 or 1100; temperature 66° at 0730. Present from 0730 to 0900.

T 51 - M 51 is at the nest.

T 50 - I squeak and both adults immediately come to me and call the "check" note. This is the first indication that 50 F didn't desert after I trapped her.

T 48 - Silence as I pass.

T 49 - 49 F (A) is incubating; M 49 sings once.

T 47 - The nest contains a Prairie Warbler and a Cowbird egg, both of which I mark. See notes for yesterday; evidently 47 F was sitting in an empty nest.

As I leave I hear males on III and on II. The former is one I've not heard before recently. There are at least three males here that may be unmated and that I haven't studied because they are on areas where construction is going on. The other is on I and IV S.

0900 - I leave.
A fine clear morning with a heavy dew; temperature 56° at 0600. Present with Paul Davis from 0600 to 1200 and alone from 1400 to 1600.

T 51 - I climb the tree, accompanied by the protests and displays of both adults (the male displaying just as the female does) and take out the nest with the young in it. When I open the sack (dropped to the ground) I find to my chagrin that the four young are at most six days old. The male was thus premature in his food carrying 10 days ago. We put the young, silent and their eyes barely open, in a Potter trap and leave. In 25 minutes we return; the adults are in the nest tree and pretty clearly do not see the motionless young. At Paul's suggestion I climb the tree and put the nest back firmly in its site with the young in it. Both parents protest as I climb. We then leave the territory to return later.

T 50 - The two adults are feeding the young (how many?) and protest mildly as I come closer.

IV S - A male sings frequently.

T 48 - M 48 is singing west of the pines. When we arrive, a loud chatter skid. We then watch him for five minutes in the Virginia pines and since he seems to stay in one spot we begin to look for the female. In a few minutes we see her,
feeding about 10' from him in the weeds and low pine branches. She feeds very actively and nervously and he always stays within ten yards except for two intervals of almost a minute when he flies to the tops of locust trees about 25 yards away and sings. For 20 minutes he sings perhaps half the time, falling silent for periods of three or four minutes, singing about the same length of time. Meanwhile 43 F continues to feed at the edge of and in the pines. Then she goes to a branch 20' high and he seems to pursue her to it; we lose sight of her and he remains silent thereafter. I have the feeling both went to X.

We leave. I can't tell what the situation is here, but it hardly seems as if the Cowbird is still being fed. We saw no signs of it in one-half hour.

T 49 at 0845 - 49 F (A) is on the nest and Paul sits to watch her while I try to follow M 49. At 0855 I find him just south of the foxes' den clearing, i.e., within 30 yards of female (A), feeding the fledgling. I sit to watch this; the young bird is perched almost 2' up on the limb of a 7' cherry tree. It is nearly feathered with the gray juvenile plumage though bare areas still appear around the neck. It is about three-quarters adult size and frequently sits with its tarsi extended like an adult.
0858 - Male brings a big caterpillar and 49 Y takes it silently. Male sings a skid from a few feet away in ten seconds.

0900 - Male flies high to the southeast corner of the undisturbed part of V. Y sits and preens fully till 0905.

0905 - Y pecks at something on a leaf beside it, seems to eat. It then very clearly watches an insect flying slowly about a few inches away, turning its head to follow the flight. Then again it pecks at something several times, bobs its tail like an adult, sits quiet.

0908 - M 49 sings to the southeast. In one and a half minutes he comes silently to Y, feeds it without any calling by either. Y hops to another branch a few inches away. M 49 stays within 15 yards, foraging and singing a frequent skid song till 0917. Interval: 21-30-25-28. He continues to move silently within 20 yards.

0920 - M 49 flies to the top of a locust. A female calls two "checks" in the grove opposite to the east and he flies to her. She flies north toward female (A)'s nest and Paul sees female (A) go to her nest 20 seconds later (the departure he missed). The male did not go within Paul's sight.
0924 - I return to see if Y is still there; it is, 20" high.

0927 - Male brings food silenty, then flies to a nearby tree, sings, and begins foraging within 15 yards. He sings short skids: 23-17-61-19.

0930 - M 49 brings food and ten seconds after feeding begins to sing skids: 12-14 (faint) - 11 (faint) - 10-17-21-16-11, etc. Note the irregularity. He stays within 20 yards.

49 Y seems to be preening, scratching, or stretching all the time.

M 49 has moved to the southwest where he still sings his skid.

49 Y scratches like an adult, raises both wings to about one-half their length over its back, then extends itself to its full height. (Sequence may be error). It then perches like an adult, tarsi extended.

0936 - M 49 falls silent to the west.

0938 - Y stretches its left wing, raises its wings over its back, stretches fully upward twice, raises wings over back (sequence correct).

0940 - Y scratches its left side.
0941 - M 49 sings seven yards away, feeds 49 Y, hops down into the brush, and in ten seconds sings two skids and one fragmentary high step.

0942 - 49 Y stretches up, scratches its right side (toward head, therefore tarsus over wing), preens its breast. Now it sits with tarsi folded like a young bird. Preens breast. In 20 seconds it flicks its tail from side to side.

0942 - M 49 falls silent, probably flies west.

0950 - A Cooper's Hawk flies over the plowed field to the south.

M 49 has been silent and 49 Y motionless since noted.

0951 - 49 Y stretches its left foot to the side and rear, its wing too. It then rises up on its tarsi a little, raises its wings slightly over its back.

0952 - M 49 brings a larva to the top of a locust 20 yards away, sings two four-note step songs. It then flies to the ground 3' from 49 Y. 49 Y scratches its right side; M 49 flies to it. 49 Y defecates, shakes its tail vigorously from side to side three or four times, feeds. M 49 goes to the ground. 49 Y calls three or four faint "tsu" notes.

0953 - M 49 brings food caught within 10' of the young.
0954 - Repeat.

0956 - Repeat.

0954 - 49 Y flies 1½' to a blackberry cane, quickly returns to its original tree.

0956 - M 49 is singing, a chatter skid in the top of a tree 10 yards from 49 Y, which calls two or three times faintly. I can no longer see the fledgling though it's still in the same tree.

0958 - A second male is singing high insipid steps near the foxes' den and M 49 still sings near me. There is no challenge.

1000 - I go to the cherry tree. 49 Y is still there and lets me get within 6'. Then it flies to the top of a 12' cherry. Note that at this age it is still passive and evidently changes location very little.

M 49 goes to the tree tops at the foxes' den; the other male seems gone. He then flies southeast.

When we first came on T 49 a strange female was in the tree near the den; she flew straight northwest to X. Later two Prairie Warblers flew east past me and in a minute a strange female returned from that direction and flew west off T 49. Female (A) was on the nest at these times and the female I saw was not banded. Perhaps the stranger was 48 F.
T 47 - The nest has a second egg.

T 51 - The adults are feeding the young in the nest I replaced, a remarkable example of their tolerance of interference.

1200 - We leave.

1400 - I return.

III - The male here is feeding full grown young with traces of yellow in an inverted V on the breast. They are vociferous, probably 30-plus days old. The female is with them and feeding actively.

II - The male with the chatter skid is singing and also feeding young about 30-plus days old, quite noisy.

I'd guess the success of these unstudied pairs was promoted by the very intense construction activity on the areas. It would surely scare away mammals, probably snakes. Both areas have large cleared patches, and stumping machines and bulldozers have been active there all summer (not every day).

1600 - I leave.
June 27, 1955

A fresh, hot, clear day, with the temperature in the 80's; 74° in the shade at 1700. Present from 1700 to 2030.

T 51 - The adults are feeding, the male singing.

T 50 - M 50 sings.

IV S - I find the male and begin to search the territory. I hear a Prairie Warbler calling frequent "checks" and see a female that stays in one area. She is beginning to molt, her throat and chin looking very frowzy; this is the earliest date I've got for molting. Soon I see her carrying food and trace her to a fledgling about the size of 49 Y or a day or so younger. Here's another successful pair on an area much worked and disturbed; there must be a correlation.

T 48 - I find nothing so I squeak and M 48 and a female come to me and call. In a minute they fall silent and begin to feed near me, the female moving quietly through the low brush. I assume this is 48 F. In ten minutes I hear a note like a young Prairie Warbler's and ultimately find a female feeding a full-grown young bird with yellow feathers in the typical inverted V. The female (unbanded) may or may not be the one I just saw; the place is the same. The young bird could just conceivably have strayed from II; it is the right age and I can't think there has been
a brood raised elsewhere near V.

A few minutes later M 48 is singing at the south end of his territory.

T 49 - 49 F(A) is incubating.

T 47 - At 1930 the nest has three Prairie Warbler eggs and one Cowbird egg; I mark the last egg and sit to watch the beginning of incubation. The eggs are cool. M 47 is silent.

1936 - A male sings one faint song, possibly on II.

1940 - Again, two songs.

1945 - Again, very probably on II. The songs are repeated now, the chatter type. The evening is completely calm and clear, the temperature falling as the sun sinks below the trees at 1950.

1956 - The sun is out of sight behind the trees.

1957 - M 47 begins to sing; four songs.

2005 - The sun seems actually to set.

2012 - 47 F suddenly, quietly, and alone flies to a bare blackberry stem 1' from the nest. She calls one faint "check," in five seconds hops to the nest tree, looks into the nest, moves a little to the side, and enters. This all takes 20 seconds. The male is silent.
2015 - I leave the territory. It is now dusk; things are still completely visible but in gray light.

2030 - I leave.
June 28, 1955

Another clear fresh day with the temperature in the 80's. Present from 0800 to 1130.

Area north of the north road - A male sings here and has done so since at least June 26. I watch him for 20 minutes today as he sings a loud high skid from the tree tops. I doubt if he has young.

T 51 - The nest is still active.

T 50 - I find 50 F foraging for feed very near her nest tree, about 10 yards from it. She seems to be feeding a young bird there; I hear but don't see it. I watch her for 30 minutes without seeing her move more than 20 yards away, or receive any attention from M 50, or act as though she is ready to nest again. Once she sits quietly and preens for six or seven minutes. M 50 never appears though I hear rather faint songs from a few yards north, around the ravine, which must be his.

T 48 - M 48 sings. I see no female and decide that since 48 F is unbanded I will not try to cover this territory looking for a new nest. Finding one would not prove conclusively that females raise second broods.

T 49 - 49 F (A) returns alone to her nest as I watch. M 49 is N singing occasionally on the center of the territory; I do not see 49 Y nor do I see the male carry food. I be-
gin to look for female (♀) and with that in mind go to the enclosed clearing. A male sings there and I find him carrying food. Soon he goes to a 20' dogwood on the east edge of the clearing and I hear young calling with the typical nestling call. I sit and the female also brings food. It takes me 15 minutes to see the nest even after I know where it is; it is 18' high in a vertical fork, quite near the tree top. It is very well concealed. This pair is clearly one I've overlooked, thinking the male I've heard here was M 49. I'll call these birds 52. The young have their heads out of the nest and are surely in their last day or so of nest life. I'll try to band them tomorrow.

T 47 - At 1120 the nest contains only 1 egg, an unmarked Prairie Warbler egg which was laid today. Probably the egg was laid after the others were taken, which may have occurred when the female left the nest at dawn just before laying. Under the nest is the Cowbird's egg, unbroken.

A Prairie Warbler, I think the female, calls "tsu" in the tree above me when I arrive. I sit to see if the nest is still active and at 1125 to my surprise M 47 appears carrying a large green larva. He is a little nervous because of me, but in a minute he takes the food to the nest. I can't see him because of the weeds; in 30 seconds he flies up without the food; which he must have eaten
(it isn't left in the nest). He then sings near me for a minute and flies very high and far to the west, I'd guess to the north end of II-west. It is possible that he and the male on II are the same, that 17F is the parent of the brood on II. But this is unlikely because the distances are so great.

In 20 minutes there is no more activity at the nest, which has surely been deserted.

1145 - I leave.
June 29, 1955

A clear sunny day with a heavy dew, temperature in the 80's. Present from 0545 to 1200 and from 1630 to 1730.

T 52 - I arrive with my traps and prepare to take the young. The nest is very inaccessible and I try to pull down the limb by attaching a rope to it. The young sit motionless while I climb the tree and while the limb is being bent (the nest is 18 feet high); the adults protest and display. The rope breaks at the last minute, catapulting the young as much as 20 yards. It takes me 30 minutes to collect them. This is clearly the tenth day in the nest; all can fly, although those that I find immediately after the break are too surprised to try to fly. I then put the young in a Potter trap and leave. Not until 1000 do I catch both adults; in the interval I get the female three times. I band the female and the young with silver on the right, red on the left, the male red over silver on the right. The weights and numbers follow:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>M 52</td>
<td>21-62051</td>
<td>7 g. 100 mg.</td>
</tr>
<tr>
<td>52 F</td>
<td>21-62016</td>
<td>7 g. 100 mg.</td>
</tr>
<tr>
<td>52 Y</td>
<td>21-62017</td>
<td>6 g. 150 mg.</td>
</tr>
<tr>
<td>52 Y</td>
<td>21-62018</td>
<td>6 g. 100 mg.</td>
</tr>
<tr>
<td>52 Y</td>
<td>21-62019</td>
<td>6 g. 100 mg.</td>
</tr>
<tr>
<td>52 Y</td>
<td>21-62050</td>
<td>5 g. 150 mg.</td>
</tr>
</tbody>
</table>

While I'm still trying to catch the young, I find a Peromyscus mouse sitting head down on the side of a tree, conceivably attracted by and watching the commotion. It occurs to me that mice might sometimes be the predators...
on the warbler eggs. The last time I return to the trap an adult Broad-winged Hawk flies up from the ground as I approach. The trap and the grasses placed around it are undisturbed, but I'm sure the hawk was right at it. The birds are quite noisy, of course.

I leave the territory at 1000, and I have also made trips from it earlier while I've waited for my traps to be sprung.

T 47 - M 47 sings on the west edge of the territory and finally flies across the cleared area to the fence row east of II. The nest is as before and I see nothing of the female in some 25 minutes.

T 48 - M 48 sings occasionally on the territory, but I make no effort to track the situation down.

T 49 - 49 F(A) is still incubating. Female (B) is not in sight, and M 49 moves around a good deal. Because he sings loud and regularly in the southeast corner I cover this area pretty carefully looking for female (B)'s nest. It seems possible that she built in the locusts there. I don't see the young but I don't try to trace it.

T 51 - The nest has failed. It is upside down and there is no sign of the young or the adults. I feel sure that a predator is responsible; if the nest had simply over-turned
the young are quite old enough for some at least to survive. The male is silent.

T 50 - The most interesting development is going on here. At 1100, 50 F is feeding the young bird in a little tangle of grape, dogwood, and maple on the north side of the hill. She makes several trips. I leave for a minute and return. M 50 seems to be fluttering a little in flight, flying a little slowly and beating his wings quickly. Also he perches with his wings slightly drooping and watches 50 F. She occasionally calls as she seems to be foraging for food for 50 Y. M 50 is quite nervous, flying from tree top to tree top at and near the ravine; his songs are usually faint, some almost inaudible, and frequently much abbreviated. When 50 F moves away from the tangle, he follows closely (staying above her) and alertly, again flying with a mild courtship flutter once or twice. She begins to move around in the forks and leafier branches of trees, going rather quickly and occasionally calling. Her manner is pretty much that of a female searching for a nest site.

Finally at 1140 I see her very distinctly squat down in the three-way fork of an elm branch, turn a little from side to side, and spread her tail somewhat. I.e., she clearly acts as though she is looking for a place to nest. When she leaves, M 50 chases her a few yards.
A few minutes later I see her with a whitish object in her bill at the same tree; I think it is nest material and not food since she does not carry it toward the young's spot. Meanwhile M 50 continues to shadow her, singing his very typical whisper song and drooping his wings. Most of this activity takes place at the ravine, 35 yards from where the fledgling is. For at least 20 minutes the adults disregard 50 Y. At 1200, 50 F goes back to the young and carries food to it twice. I leave the territory, quite sure that the adults are behaving as though a second brood may be tried.

1200 - I leave.

1630 - I return.

T 50 - The young is where he was this morning. The adults are behaving much as then, with M 50 once "fluttering" away from 50 F, i.e., flying the usual moth-like flight though not in a very pronounced form. She waits a few seconds and then flies toward but over and beyond him; possibly her flight is a little slow and exaggerated too. While I'm here both adults feed 50 Y. 50 F stays close to 50 Y during the 15 or 20 minutes I have her in view.

1730 - I leave.
A very hot sunny day with temperatures in the 80's.
Present from 0845 to 1200 and from 1600 to 1900.

II - The male sings as I pass. I'd say his voice is unlike M 47's.

T 49 - At 0900 49 F(A) is on her nest, perhaps backed off it a little. At 0908 she leaves and a mirror shows four unhatched eggs. This surprises me, since she seemed to be incubating when there were only three eggs. The first eggs should hatch today. M 49 sings type-8 steps on the center of the territory.

T 48 - As I pass, M 48 sings one type-8 step and several loud chatter skids.

T 50 at 0925 - M 50 is singing faint skids from the center of the territory on top of the hill, then switches to full volume. I find him after some time, perched high in cherries and behaving as he was yesterday, nervously and often drooping his wings slightly while looking toward the ground.

I hear a low call or two and 50 F appears in an apple-sassafras-dogwood thicket, hopping busily over branches as though foraging and hovering before leaves to remove insects. M 50 droops his wings and bends his head down to watch her. She stops and preens for three
or four minutes. He suddenly dives at her as she perches and she begins to flutter her wings like a young bird.

Very interestingly, this inviting position suddenly changes into a side wing stretch, repeated two times, then to an upward stretch. This seems a clear substitute or displacement reaction. At the time of this encounter, during which the male never quite stopped or landed on the limb with 50 F, one of the two adults called like a young bird.

0940 - There is a young bird's call: M 50 sings. He then flies out of the thicket and shakes his feathers. Either he fed 50 Y or this could be a post-copulation reaction. 50 F appears and calls quietly two or three times. M 50 is in the tree tops over the thicket, she beneath him near my eye level, calling. He swoops down but not near her, passes over me. 50 F still calls. M 50 chases a Prairie Warbler with an object; the pursued bird is not 50 F, is probably M 51.

0952 - 50 Y calls. 50 F stays near the young, remaining in the thicket all of the time so far. M 50 sings to the south.

0953 - I see 50 F in the thicket below the cherries M 50 is singing in. She is preening fully and scratching. She calls one or two times per five seconds, quietly and clearly not because of me (I'm about five yards away). He sings
full volume about ten-fifteen times in the tree top.
50 Y is still in the thicket; why does she stay so close?

0956 - I have lost the adults.

1000 - He sings to the north on the hillside, regular skids. I go there to see if both have moved away from the fledgling.

1005 - M 50 chases 50 F about 25 yards, very fast. She lights on a limb 10' high, flutters her wings, and he lights beside her. She flies on in one or two seconds.

1006 - She appears in the tree above me calling "check" (not at me) and feeding. She quickly flies toward 50 Y's thicket; M 50 immediately follows ten yards behind her, lands 20 yards from her and sings faint skids. His flight is normal. I return to 50 Y's thicket.

1008 - The male sings to the southeast. 50 F is not in sight.

1010 - M 50 falls silent.

1017 - Both adults hop quietly in the thicket, a foot apart. I lose them. They must have come in from the north or west.

1020 - The male is in the tree top, his wings dropping. He sings, flies north. I go north where I see nothing, but I stay there.
1024 - The male falls silent to the north.

1027 - I am seeing little. M 50 sings once to the west.

1029 - M 50 sings twice to the northwest, goes to the sassafras clump there. In a minute he sings; a minute later again a faint short song; in 30 seconds again. Then he falls silent.

1031 - Where are they?

1040 - I leave the general area of the thicket where 50 Y is and go northwest where they were yesterday, near the ravine.

1050 - M 50 sings twice near 50 Y; I'd heard nothing for ten minutes.

1057 - 50 F is quietly hopping over sassafras branches in a thicket to the southeast (where 3 F nested in 1952). I see her for one minute.

1102 - M 50 seems to have moved S, where he sings. I go to the thicket of 50 Y to see when adults will return.

1104 - M 50 flies to the tree top just south of the thicket and sings 15 or so loud songs. After the first six or seven songs 50 Y calls loudly, from one to five calls. This is the first time I've heard a young bird beg for food in the absence of the parent and simply as
a reaction to the male's song. After the first few songs 50 Y quits responding. M 50 is silent; 50 F out of sight.

1115 - M 50 sings to the southwest, loud short songs about 20 yards away.

1118 - One faint song east of the thicket.

1120 - M 50 sings to the southwest. 50 Y calls once.

Again. M 50 flies to the trees above the thicket, carrying no food. He sings and then gives the anger call.

Again he calls angrily(?), the call quickly blending into a short Farula-like skid song.

1121 - 50 F comes to the thicket without food. 50 Y begins to call constantly, then flies out to the edge of the thicket and quickly back in again.

1125 - 50 Y is calling 10-15 times per five seconds. It sounds as though he is being fed. I wait to see how long the parents stay with him.

1131 - Female is feeding 50 Y. The male has done nothing today which even resembles feeding, which is interesting since he'll have to do it all if she renests. 50 F is completely unconcerned at my presence.

1136 - 50 F is feeding, the male singing almost inaudibly.

1140 - M 50 flies to a tree near me, spreads his wings,
looks toward the ground, flies east. M 51 may have come onto T 50.

1145 - 50 F just quit feeding 50 Y in the thicket.

1150 - I leave.

1600 - I return

T 47 - In 45 minutes I see no sign that 47 F is here. After about 30 minutes M 47 appears west of the cut-over area and sings near the remnants of the old stile. After five minutes here he goes east to T 47 proper, where he sings.

T 48 - M 48 sings but I don't search.

T 49 - 49 F (A) is on her nest. M 49 is singing about 30 yards south of her and I go to watch him. He displays a little at me, fluttering his wings (the left wing seems to go into action first). I stand to watch and see him carrying food. Finally I see 49 Y, now full-sized and perched like an adult but evidently still moving little and not feeding much for itself. It sits quietly about 15' from me. M 49 feeds it four times in 15 minutes, catching the food within about 15-20 yards and singing loud skids.

All told I have female(A)'s nest in view 40 minutes, during which the male takes no interest in it. When 49 F(A)
leaves I examine it. There are two young, two eggs, no shells at 1930.

T 50 at 1740 - I learn nothing new in 25 minutes here. M 50 continues to sing faintly and to display a great interest in 50 F. There are no pursuits. 50 F feeds 50 Y, which is where it was this morning, and spends an interval of five minutes preening while sitting quietly about 6' high.

T 51 - In 40 minutes I see nothing of 51 F. M 51 sings over the whole of the south half of his old territory but he concentrates little or not at all that I can discern.

1900 - I leave.
July 1, 1955

A cloudy morning threatening rain and beginning to rain at 0830; at 0930 it clears and the rest of the day is hot and sunny. Present from 0830 to 1315 and from 1745 to 1845.

T 49 at 0945 - 49 F(A) is on her nest and I sit in the rain to wait till she leaves; my purpose is to time the hatching of her last eggs. M 49 is singing occasionally and crossing the clearing here frequently, sometimes carrying food, but in 75 minutes he never goes to female (A)'s nest or displays any interest in it. Clearly he's feeding 49 Y.

I miss seeing female (A) leave and not till 1000 do I get to look at the nest in her absence. It contains three young, one egg. She sees me waiting for her to leave, of course, and her departure is interesting: She suddenly drops almost straight down from the nest, her movements thus being screened by the dogwood nest tree. I'll return.

T 50 at 1010 - I go to the area of yesterday's activity but see nothing.

1018 - 50 F is calling in a sassafras stand about 20 yards northwest of the center of yesterday's area. M 50 is following her silently, i.e., moving along within 15 feet and keeping her in sight.
1020 - I see 50 Y nearby. 50 F feeds it at 1022, probably again at 1024. The male is high; he sings a faint step.

1026 - 50 F feeds the young. She may have explored a little in the vines where she caught the food.

1027 - 50 F feeds 50 Y. The male is singing a faint step.

1029 - M 50 drops toward the ground and perches with drooping wings. The female seems to be exploring vines near 50 Y, which calls noisily. A Red-eyed Vireo is feeding a full-grown Cowbird here, so noises are hard to sort out.

1032 - There is a pursuit, probably of two Prairie Warblers.

1034 - The adults are quite close to each other and near 50 Y; they are hopping in the low thicket about 2' apart, but apparently paying no special attention to each other. The female is feeding the young, the male probably is too.

1036 - M 50 sings a three-quarter volume skid.

1037 - 50 F flies higher up into a cherry (30'), and M 50 flies out from the clump of trees to a tree 20 yards away; possibly he flutters a little. He returns immediately. A male Summer Tanager chases one of the
Prairie Warblers, which goes toward the ground.

1039 - The male sings one high step from a tree top.

1040 - I've lost the adults; they went north or west.

1048 - I find the male near the ravine, probably the female is here too. I lose them immediately.

1056 - I check back on 50 Y; the parents are not there. M 50 stays silent.

1058 - 50 F returns to the cluster of trees where 50 Y is. She was at the ravine. M 50 goes back to the clusters too, one minute later.

1100 - M 50 sings faintly. I sit to watch the ravine.

1101 - M 50 is in the grass near me on the hillside. 50 F flies from the place where 50 Y is, carrying nest material. She goes to a 25' cherry tree in the ravine; it is covered with grape. M 50 immediately follows her into it. She stays one minute in the tree, drops to the ground, hops in the ravine, then flies to other leafy and vine-covered spots in nearby trees. M 50 follows one or two feet behind her. Both are silent. I'll watch the cherry, though there is probably no nest begun yet.

1110 - Both adults are out of sight and silent.

1111 - 50 F goes to the cherry. M 50 sings near her. I
don't see her leave. M 50 flies south past me and perches with wings drooping, alert. After one song he goes on.

1115 - The female flies low to the cherry tree, but I can't tell whether she carries nest material. In ten seconds the male follows. She goes to the usual spot, stays one minute, flies to the ground. I don't see the male.

1117 - The female returns to the same place in the cherry, stays 20 seconds, drops to the ground to the east (50 Y is west of the cherry). M 50 sings near or in the cherry.

1119 - M 50 sings a faint song, one-half of a step, then two step notes.

1119A - 50 F takes nest material to the tree, stays 40 seconds, goes to a little Virginia creeper - covered tree five yards away. Is she exploring there as though for a nest?

1121 - 50 F takes nest material to the cherry from the ground under the little tree. She stays 15 seconds, goes to the ground below and east of the cherry.

1121A - 50 F takes nest material, stays 15 seconds, drops east to the ground.

1122 - 50 F to the nest for 20 seconds, dropping east.
She is gathering from the ravine, always quite close to the cherry. I don't know where the male is.

1124 - Repeats the trip of 1123.

1125 - 50 F to the nest for 20 seconds, having gathered within 10 yards. She goes away a little farther on leaving.

1127 - M 50 sings a full skid near 50 Y to the West.

1130 - 50 F to the nest from near 50 Y. She stays 15 seconds, drops to the ground below.

1132 - M 50 flies to within two feet of the nest, sits ten seconds; then I lose him.

1134 - A male, probably M 51, sings a faint step-buzz to the east.

1139 - I move down to look at the nest. It is so insubstantial I can't see it at all.

1146 - 50 F with nest material. I have moved into a new position, from which I can see where she is putting the material, but I still can't see the nest. I probably quite literally saw construction begin this morning.

1148 and 1150 - 50 F makes trips to the nest. I go to 50 Y to see if the female will feed it. At 1155 I sit to watch. 50 Y calls. A male, probably M 50, sings near the new nest.
1159 - After 50 Y calls, M 50 flies to the tree top above it, sings an almost inaudible skid. 50 Y calls especially loud and frequently after these songs. I don't see the female nor do I see either adult feed the fledgling. M 50 quits singing at 1200 after five songs.

1203 - I move a little to watch 50 Y.

1206 - 50 Y after three minutes' silence begins irregular calling.

1208 - I think 50 Y moves toward the nest. M 50 sings a faint type-8 nearby to the southwest.

1211 - I can see the nest tree, but not 50 Y.

1217 - I've still not seen 50 F feed 50 Y. M 50 probably sings two faint steps.

1220 - M 50 sings a faint type-8, half-way between 50 Y and the nest.

1222 - M 51 flies to the nest tree. M 50 chases him silently to T 51. 50 F goes to the nest tree for the first time since I began to watch from my new position at 1155. She stays 20 seconds.

1224 - 50 F takes a lot of webs to the nest, from the east.

1226 - M 50 sings two faint type-8's.
1227 - 50 F goes to the nest for 20 seconds, flies west.

1230 - M 51 probably flies on to T 50; I see no fight. Note 50 F's irregularity in building.

1237 - 50 F takes material, stays 30 seconds, goes east. M 50 sings faint type-8's there. I've seen nothing of 50 Y since it moved; 50 F must be feeding it.

1245 - I've been looking for 50 F without success. M 50 is still singing regular type-8's, many times loud. 50 F seems to stay near M 50 though I haven't seen her. 50 Y's silence suggests it is being fed and is with the adults.

1245 - I leave the territory.

T 49 - I return, frighten female (A) from the nest, and find that it still contains 1 egg.

1215 - I leave.

1300 - I return.

T 50 from 1800 to 1825 - 50 F makes two building trips at 1800 and 1803. Then she goes to the sassafras clump about 15 or 20 yards to the southwest. There she catches a green larva and feeds 50 Y, which is in the clump. She feeds it for 20 minutes or so, irregularly and with pauses. This is my first assurance that the female feeds her young while
building her new nest.

M 50 sings faintly nearby but I see no feeding by him.

T 49 - at 1830 - The nest contains four young, no shells.

1845 - I leave.
July 2, 1955

A hot sultry day, the temperature in the 80's. Present from 0830 to 1025 and from 1500 to 1800.

T 50 at 0845 – M 50 is singing half-volume three-and four-note type-8's at the top center of the hill. I sit to watch the nest.

0851½ – 50 F brings nest material, stays 30 seconds, goes to the ground under the tree. M 50 still sings where he was, irregularly and faintly about 40 yards from the nest tree.

0853½ – M 50 flies to the nest tree, perches ten seconds 3' from the nest, catches a big larva, climbs to the top of the nest tree, flies north to a tree top in the ravine, eats the larva, flies back on to T 50 proper, sings a faint step of type - 8. This takes one minute. At 0858 he's still singing faint 8's, most of them three or four notes long. He's perched 50' up in a big sycamore. At 0900 he falls silent, continues to sit quietly and motionless. 0902 – He begins to sing irregularly again; same perch.

0903½ – 50 F brings material from the east and goes back that way after 40 seconds. M 50 is on the same high perch 20 yards from the nest tree and above it; goes on singing faintly. He is clearly watching something below him. At 0908 he drops to the ground, falls silent.
0910 - M 50 returns to the identical perch and begins to sing as before.

0913 - 50 F to the nest tree, pausing for a moment in a redbud 10' away. She stays one minute, drops to the ground under the nest. Calling there is almost surely 50 Y, right below the nest. M 50 sits as before and 50 Y (if I'm correct) calls repeatedly for two minutes. M 50 has moved out of sight, sounds as though he's still in the sycamore. His song is still irregular in interval. A young chickadee climbs in the nest tree unmolested.

0922 - M 50 becomes silent. Note that no courting behavior has appeared today, or really since building began.

0926 - 50 F comes from the north, stays 15 seconds, flies west along the ravine. M 50 begins his faint type-3's from west of the nest just after she has gone that way.

0929 - A Broad-wing flies over low.

0929 - 50 F to the nest tree. I think she waits a full minute before going to the nest, or she enters and reenters a minute later. M 50 flies to a tree ten yards away while she's in the nest tree, then on to the big sycamore where he sings once, leaves. 50 F probably stays 40 seconds; departure time is uncertain.
0939 - M 50 sings a faint, three-note, type - 8. I think I hear two Prairie Warbler "check" notes, quiet and like a female's, near him. He sings three more times. Note that his behavior today is typical of a male whose female is building (faint songs, stays near nest tree), except that he exhibits no jerky, nervous demeanor accompanied by frequent flights from tree to tree.

0945 - I think M 50 is singing occasionally. A male sings a skid with a high ending, twice; then an abbreviated one. All are faint. More full, faint skids till 0946½. Silence then.

0952 - 50 F to the nest. While I watch for her to leave, she comes again at 0953. I miss both departures.

I'm going forward to look at the nest after having timed for about an hour. It is extremely slight, a flat little platform without any cup yet. It is different from the hollowed outline of fibers sometimes seen. At 0958 50 F comes with material while I'm at the tree, so I retreat. M 50 is singing to the west, his faint type - 8.

I'll spend a few minutes looking for 50 Y's whereabouts.

I go to the pine grove and look south. In six minutes 50 F goes twice to the nest. Once M 50 goes to the nest tree and looks toward the nest from a distance of 10', bobbing his tail and exhibiting nervousness. 50 F may be present at the time. He is silent most of the time, occasionally
singing his usual faint song.

I think I hear 50 Y calling in the ravine just about seven yards north of the nest. This is correct, although I don't see it. M 50 sits 20 yards from the nest and sings faintly.

Note that 50 F seems to be going into an interval of more frequent building.

1020 - I leave the territory.

T 51 - M 51 sings loud skids for two minutes near the last nest site.

1025 - I leave.

1500 - I return.

T 50 at 1515 - M 50 is silent. I sit to watch to rate of building.

1520 - A Prairie Warbler is across the ravine, 20 yards north of the nest.

1524 - A Prairie Warbler sings a faint four- and five-note Golden-wing type song just across the ravine.

1525 - 50 F to the nest, staying 15 seconds. The male still sings. A skid to the east and across the ravine is probably M 51.

1531 - 50 F again, staying 15 seconds and dropping to the sassafras clump where 50 Y was last evening. The faint
Golden-wing songs continue at 13-second intervals.

1523 - 50 F to the nest, staying 30 seconds, going to the sassafras tree 15 yards from the nest to the west. The song comes from that general direction.

1527 - Female to the nest for 35 seconds, back to the sassafras.

1530 - Female gathers a whitish substance 15 yards from me, goes to nest for 35 seconds, then to east. M 50 sings as before. At 1540 he goes north across the valley, then drops from the sycamore to the nest tree.

1540 - 50 F to the nest for 20 seconds. M 50 flies from the nest tree when she enters. His flight is the bouncing, tail-hanging sort sometimes seen, as though all flight were accomplished with the wings alone. She drops to the Sassafras. He sings one Golden-wing, then 14 loud skids near me, 25 yards from the nest. M 51 is singing, so M 50 may be responding. At 1547 he quits singing; one Golden-wing song was interspersed. His perch was 30' up at the top of a cherry.

1548 - 50 F to nest tree and in five seconds to nest. She stays 45 seconds, drops to east under trees.

1551 - 50 F flies to the nest tree. M 50 flies along parallel
to her and cuts off to a tree across the ravine. She stays 20 seconds, drops north into the ravine.

1552 - Female to nest for 25 seconds, then to the southeast. Male silent since indicated.

1554 - 50 F to nest with webs; stays 15 seconds. She drops to the north and 50 Y begins to call loudly and in bursts there; almost surely being fed. M 50 flies to a tree top across the ravine and looks down, then goes to the sycamore and sings faint type-8's.

1557 - 50 F to the nest for 15 seconds. 50 Y is less noisy then. It begins loud calls when she drops.

1558 - Female with nest material, dropping east after 15 seconds. M 50 sings alternate skids and type-8's, perching nervously 15 yards west. His tail jerks, his wings droop. The songs are three-quarter volume. 50 Y is silent till 1600, i.e., two minutes.

1601 - M 50 flies to sycamore, behaves nervously.

1601 - 50 F to nest for 25 seconds, drops under tree and 50 Y calls for ten seconds. Note M 50 seems never to feed the young.

1604 - 50 F to the nest for ten seconds; drops north. She seems to do all gathering within 15-20 yards.

1605 - 50 Y gives a burst of calls. 50 F climbs up to the
nest in two or three flights from beneath the nest tree, stays ten seconds. M 50 sings loud or three-quarter volume type-8's in the sycamore.

1607 ¾ - 50 F from below, staying 17 seconds and going north-east into the ravine.

1609 ½ - 50 F to the nest for 45 seconds. She leans out and works on the bottom. Then she drops and 50 Y goes into a burst of calls. M 50 sings as before.

1611 - 50 F brings nest material and stays 60 seconds. M 50 is sitting in the sycamore. Two young but full grown Field Sparrows fly to the nest tree, about 15' up. M 50 flies at one from the sycamore and drives it a few feet. M 50 then flies back and forth between the two sparrows, still in the nest tree, for a few seconds; then he chases another one.

1632 - 50 F comes again with material and I quit watching to take notes.

During the 20 minutes that no trips were made M 50 sang constantly. The first ten minutes he circled back on the hillside south of the nest. Then he sat motionless in the sycamore. All songs were loud type-8's. He never fed the young. 50 F on the other hand almost surely fed 50 Y for about seven minutes. The young bird's call came in four or five bursts with a running series of much less frequent calls; it was unquestionably the sound of a fledgling being fed,
and M 50 was not doing it. After seven minutes or so, 50 Y became silent. I'd interpret all of 50 Y's sounds as meaning that it is sitting in the thicket at the base of the nest tree, calling every time it sees 50 F nearby. Most of the time she passes on with nest material, but at least once and probably twice she stopped to tend to 50 Y. Probably after doing so she rested and ate.

The nest is much farther along than this morning, now having walls and something of its ultimate shape. It is built entirely in a grape vine.

After 1631, 50 F began her frequent trips to it again, so the 20 minutes was an interlude. Note the greatly accelerated pace since 1000.

At 1645 M 50 is still singing loud regular type-S's, now from the sycamore. He has hardly quit (if at all) for 45 minutes. During a good deal of this time M 51 has sung loud skids northwest of the pines. He has been silent five or ten minutes. It's interesting that M 50 is not tending 50 Y.

1647 - A Cooper's or Sharp-shin flies westward to the north.

I haven't timed 50 F for 15 minutes, but she has distinctly slowed down her trips. I'll watch a while longer. M 50 still sings, 50 Y is silent.

1654 - A titmouse spends a minute in the nest tree without drawing an attack. M 50 is not near; he's begun to

Bk IV
over the whole north side of his hill.

1653 - 50 Y begins to call; two bursts within a minute.

1658 - A Field Sparrow (immature) perches 2' from the nest and M 50 flies at it and drives it away. He has never quit his loud singing.

A Carolina Wren spends much time in the ravine by the nest tree. Its imperfect song suggests a young bird.

1701 - M 50 dives at something at the base of the nest tree.

1703 - I see 50 F foraging for food at the top of a 30' elm across the ravine. I soon lose sight of her.

1707 - M 50 attacks the Carolina Wren in the nest tree. The wren falls back a little, probably in surprise, then holds its ground. M 50 quits attacking, just watches it and sings faintly; they both leave in a minute.

1707 - 50 F has not appeared in 25 minutes. In an hour she has made two trips that I've seen; even if I missed some, it is unlikely that she's come more than four or five times in an hour. Note this irregularity. Probably the feeding of 50 Y is a disruptive factor in her building pattern of behavior.

1710 - I leave the territory. M 50 sings insipid steps on the hill top.
T 49 at 1722 – M 49 sings a step-buzz at the southwest corner, then goes northeast.

Female (A)'s nest has a nestling with its head on the rim, very unusual for such young birds.

1729 – M 49 sings insipid steps 15 yards from the nest, but he goes on southwest. (My object is to see if he is feeding the nestlings.) He now sings loud and frequently there, interspersing his songs with hard angry-sounding calls.

1738 – Female (A) brings food (a whitish moth?), and feeds it. She leaves in a minute.

1740 – 49 Y calls loud and frequently in the locust east of the nest. M 49 feeds it. The young bird had the inverted yellow V two days ago (the quills at the apex not quite broken through yet). Today its breast shows yellow throughout, though the appearance is messy and somewhat patchy.

1745 – I leave the territory. Probably M 49 is not feeding the nestlings.

II - The male sings here.

1800 – I leave.
A hot sunny day; temperature in the shade is 82° at 0930.

Present from 1000 to 1240 and from 1600 to 1845.

T 50 at 1015 - Silence. I sit to watch the nest. Since nothing is happening I go forward to look at the nest: It looks as it did last night, pretty well shaped; progress will probably be impossible to detect now. It is well concealed and especially hard to see from below...

1027 - 50 F goes to the nest, builds, comes 20 yards south.

1028½ - 50 F to nest for 20 seconds; comes south again.

1031 - 50 F to nest for 30 seconds; probably drops to ground below tree and to north.

1032½ - 50 F to nest from southwest of it; 30 seconds; goes northeast across ravine into heavy growth there, probably 20 yards or more.

1036 - M 50 sings for the first time, two loud skids from the center of the hilltop. He then flies north to his sycamore, sings one loud high skid, another a little fainter in 45 seconds. He has a 45-50' perch in the sycamore where he sits most of the time he's there. It is a bare limb. He sings two more slightly faint skids, then begins to sing almost inaudible high skids. At 1040 he's sung those mentioned plus five more, is in the sycamore.
1041 - 50 F to nest for 35 seconds. She drops southeast. M 50 stays on his perch, gives the impression of watching intently.

1042½ - 50 F to nest; drops to ground under it. Length of stay in nest not known.

1045 - M 50 still on perch; four faint skid songs since last count.

1046 - M 50 flies high to east end of his ridge, moves west toward me, sings two loud skids and quits.

1055 - Nothing has happened since last noted. I may hear 50 Y across the ravine and east of the nest, near his location of yesterday.

1104 - M 50 sings a faint skid and I see him on his sycamore perch. He'd probably just landed, but I don't know this. He now sings extremely faintly, perhaps because the skids are so high. He watches something below.

1109 - M 50 still on his perch, has sung a total of 13 songs.

1110 - 50 F goes to the nest; I miss it until she moves. She leaves and goes southeast. M 50 has sung four more skids. He leaves his perch when she leaves the nest. Did he follow her?

1112 - M 50 begins to skid, location unknown.
1112 - 50 F goes to the nest, stays 20 seconds, goes north-east across the ravine. M 50 is singing near me on the hillside.

1113 - 50 F to the nest, staying 25 seconds and going south-west to a sassafras stand. M 50 still sings skids (someloud) to the east of me.

1115 - M 50 returns to his sycamore perch.

1116 - 50 F to the nest, staying 10 seconds and dropping to the north.

1117 - M 50 has sung 18 songs in five minutes. He sings two more, leaves the perch, falls silent.

1118 - 50 F goes to the nest. Stays 15 seconds, flies east. M 50 sings once. I hear either Prairie Warbler anger calls or 50 Y; almost surely the latter. Hear an occasional almost inaudible skid, which may be M 51. At 1122 the harsh calls continue.

1123 - I see 50 F carry food across the ravine. M 50 sings to the east, and 50 F's bands are seen. The harsh calls are 50 Y.

1125 - 50 F brings soft material to nest, stays 28 seconds, drops south 25 yards from nest, to a point west of me.
1128 - 50 F from south with a piece of leaf; stays 31 seconds, drops to east five yards from nest.

1130 - 50 F from below nest tree; stays 55 seconds, returns to below nest tree as before.

1132 - 50 F from below, stays 30 seconds, flies southeast about 15 yards.

1133 - M 50 silent since noted, begins loud skids, then becomes fainter.

1134 - 50 F from southeast; stays 30 seconds, flies back southeast as before.

1136 - 50 F to nest for ten seconds, flies to ground to north, near nest tree.

1137 - 50 F to nest for 30 seconds, then to north across ravine.

1139 - M 50 quits singing, flies across ravine.

1141 - 50 F to nest for 35 seconds, dropping to ground to north.

1142 - 50 F for 25 seconds; to north.

1142 - M 50 begins to sing at ravine east of nest.

1143 - 50 F to nest for 28 seconds; flies northeast 15 yards across ravine. M 50 is still singing. Till 1144 he sings ten songs, then falls silent.
1145 - 50 F with a large piece of plant fiber. She stays 25 seconds, flies back northeast.

I've timed building for one and a half hours. I'll now see if I can find 50 Y and watch him for a little while. At 1147 as I move, 50 F brings material to the nest.

I have good luck: At 1153 I come into the pine area from the north. At 1155, 50 Y calls for food. He is 10 yards from me and 15 yards (or less) from the nest, just out of my sight in a stand of 3' clover. I can see the nest from my position. 50 F comes near me and 50 Y begs. She gathers about ten fine strips of grape vine bark while perched about three and a half feet high. She is about 4' from 50 Y, whose begging she disregards. At 1158 she returns and feeds 50 Y. Till 1207 she forages both at ground level and as high as 25 feet, feeding 50 Y about five times. At each feeding 50 Y begs and gives a burst of calls, it also calls intermittently in between. 50 F then disappears from view but does not go to the nest. At 1211 she returns and feeds 50 Y two times. She then goes northeast from us (and the nest) and I lose sight of her; she isn't far though. At 1215 she flies up from 15 yards away and takes material to the nest. I leave. She thus fed 50 Y about eight times in 20 minutes, making no building trips between 1155 and 1215. Meanwhile, M 50 has been singing in the tree tops directly above me. His song, for the first time this morning, has been not a skid but a faint insipid step, sometimes
abbreviated and sometimes (rarely) breaking off halfway to become an odd hurried skid or buzz. He never feeds 50 Y, although I think 50 Y sometimes calls especially loud after a song. At 1225 as I write, M 50 is singing the same step song, louder occasionally; he has also sung a skid.

1230 - I leave the area of the 50's.

1240 - I leave.

1600 - I return. It is 87° in the shade.

VII - The II male is feeding his young here. They are full grown, in nearly perfect immature plumage (the head is still juvental). One bird is east of the cut from VII to III, the male and one bird are west. All are at the edge. The east bird calls and flies out toward the west, about 25' high. The male flies east to meet the immature and they meet half way and fly west. The male gives twittering notes as they meet, the usual notes of that sort (rarely heard). The young then starts east again and the male flies along in front, again twittering. The young of course needs no escort; it is big. I have the feeling the male's notes were to encourage or guide the young on the last occasion - he was 15 or 20' away from the young bird at the time.
T 49 at 1655 - Female (A) is sheltering her young by standing on the west rim of the nest. A male, probably M 48, is singing to the west.

1700 - A step-buzz to the southwest is probably M 49. He sings every ten to 15 seconds, gradually getting nearer the nest. At 1706, he is still 30 yards away. At 1707 he falls silent. I inspect the nest; it contains two or at most three nestlings. She is gone when I go up; it is almost impossible to see her movements at this nest because it is built inside the outer leafy covering of the dogwood tree.

At 1711 M 49 begins to sing a loud, slow step to the south; he continues for two minutes.

1714 - Female (A) takes at least two green larvae to the nest from the northeast. I think she stays on the rim.

1721 - Both M 48 and M 49 are singing loud, M 48 to the west, M 49 to the south. M 48 sings a hoarse chatter skid, M 49 a slow insipid step.

1722 - Female (A) brings food to the nest.

1723 - 49 Y is calling from M 49's vicinity. They are both in the little locust grove south of the foxes' den. It seems unlikely that M 49 is feeding female (A)'s nestlings, so at 1725 I quit watching and leave V.
T 50 at 1740 - I sit to watch the nest. M 50 is silent.

1742 - M 50 flies into the sycamore, sings a faint insipid step.

1745 - M 50 is in the sycamore again (still?). He sings a very faint step.

1754 - M 50 sings faint steps and skids to the southeast, on the narrow end of his ridge. Distance is nearly impossible to judge.

1756 - 50 Y calls in a dogwood - grape tangle back on the south side of the ravine, where the adults were four days ago. I watch the spot, 25-30 yards from the nest. The young calls as though being fed.

1757 - 50 F flies to the nest from the young's spot. She carries the axis of the inflorescence of some fine grass, so the nest must be well along. In 30 seconds she returns to the same spot.

1759 - 50 F to the nest for 45 seconds, returning to 50 Y's spot. Meanwhile M 50 is singing a short faint step every five to seven seconds, sometimes with a longer interval. He moves on the hillside.

1803 - 50 F to the nest from behind me, staying 70 seconds
and going to 50 Y. 50 Y calls vigorously for a minute, falls silent. M 50 moves north of the ravine, is still moving and singing rapidly.

1808 - 50 F to nest with spider webs. She stays 55 seconds, returns to the usual spot. 50 Y is silent. M 50 switches to loud skids at 1810. 50 Y begins to call; I can see 50 F near 50 Y's position.

1811 - 50 F with grass, staying ten seconds and flying to the ground ten yards from me. She catches and eats food and at 1815 carries food to 50 Y, which has been silent since she disregarded him and built a few minutes ago. 50 F called three or four sharp "checks" when near me.

1816 - 50 F to the nest, duration not seen, then south past me, i.e., at least 25 yards from the nest. M 50 falls silent from his series of five-second insipid steps. He is near 50 F.

1821 - 50 F to the nest with plant down. She stays 20 seconds. Because she calls "check" at the nest tree, I retreat to 40 yards away. She is now (1823) catching food 30' up in a cherry 40 yards from me, calling "check" every second or two. This insect catching (sometimes on the wing) goes on until 1830, with a call at least once every two seconds. I'm completely out of sight, so I assume I have nothing to do with the calling. She is very active and
intent on eating, flying quickly and nearly constantly. At 1830 she is still foraging in the big cherry but her calls become less frequent and at 1831 she grow silent. M 50 sings one loud skid near 50 Y. In 30 seconds 50 Y utters begging notes. Possibly M 50 feeds it. By 1832, 50 F is out of the cherry, 50 Y is calling, M 50 is singing quite faintly near 50 Y. The adult feeding 50 Y is 50 F; I see her.

1836 - M 50 flies high from the top of one tree to another along the north line of his territory.

1837 - 50 F flies from 50 Y to a dead apple tree, holding grass in her bill. She sees me and calls three or four low "checks." Since I've been here an hour, I leave so that I'll not frighten her. Her behavior toward me is odd in view of her complete disregard on many occasions in the last four days when she has been only a few yards from me.

1845 - I leave.
A hot sultry day after a thunder shower sometime during the night; temperature about 80° at 0930. Present from 0930 to 1200 and from 1830 to 2035.

T 50 at 0940 - A Broad-winged Hawk is sitting in a tree on the center of the territory when I arrive. I sit 65 yards from the nest, so I may miss some details today.

0943 - 50 F goes to the nest from the southwest. M 50 is silent.

0949 - 50 F from the southwest, staying 55 seconds and returning probably 25 yards to the southwest. I think she takes plant down.

0955 - 50 F from the southwest with plant down. She stays 15 seconds and returns southwest. She has been pausing five or ten seconds in the nest tree at various distances from the nest before going to it. She did this yesterday afternoon too.

0958 - 50 F to the nest for 30 seconds. It is sometimes impossible to tell directions today.

1001 - 50 F from the southwest for 50 seconds; she returns southwest.

1004 - M 50 sings one loud skid.
1004 - 50 F from the southwest for 15 seconds, returning southwest. I'd say she is gathering at about 20-25 yards from the nest.

1004½ - 50 F from the southwest for 10 seconds, returning southwest.

1011 - 50 F from the southwest for 15 seconds, returning exactly as before, always the same distance.

1012½ - 50 F from the southwest for 15 seconds. She hops west into the nest tree. Her trips to the nest have been direct and without pause the last three or four times.

1014 - 50 F from the southwest for 30 seconds, returning 20 yards southwest.

1018½ - 50 F directly from the southwest for 30 seconds. She hops out into the nest tree, so I don't see direction of departure.

1021½ - 50 F directly from the southwest for 37 seconds, flying some distance southwest, perhaps to a tree top 20 yards away.

1024½ - 50 F from the southwest for 15 seconds, flying 20 yards southwest.

1027 - 50 F to a limb just above the nest for two seconds, to the nest for 50 seconds, then 20 yards straight south.
She carried plant down.

1030\textdegree{}F - 50 F with plant down from the south. She hops to three or four limbs to get to the nest, taking five seconds.

After 55 seconds in the nest, she hops west into the tree.

1036 - 50 F to the tree. In five seconds she goes to the nest, stays 55 seconds, flies 20 yards straight south.

1039\textdegree{}F - 50 F to 1' above the nest, pauses two seconds.

She goes in, stays 25 seconds, flies 15 yards south.

1041\textdegree{}F to nest tree, pauses five seconds below nest, enters for 30 seconds, flies 10-15 yards south.

1044 - A male Towhee flies to the nest tree and sings 7' from the nest. Instantly 50 F flies to the tree at the same level as the Towhee and sits 10' away bobbing her tail, the first time I've seen a female "defend" the nest. In 30 seconds the Towhee leaves; she stays 30 more seconds, then flies southeast to where 50 Y was yesterday.

At 1049 she flies west to the sassafras tree where she seems to be gathering nest material.

1048 - M 50 sings once.

1053\textdegree{}F - M 50 sings high skids, three-quarter volume. By 1056\textdegree{}F he has sung 10. He then stops 45 seconds, sings
three more by 1058, stops.

1057 - 50 F flies west to the sassafras again.

1103 - 50 F to the nest for 35 seconds, then to the southeast.

1104 - 50 F to the nest for 55 seconds, then east a short distance (10 yards?).

1107 - 50 F goes to the nest tree, flutters a second at one of the leaves that screen the nest, as though picking off an insect. She then enters the nest, stays 60 seconds, hops west into the nest tree.

1110 - I quit timing and will move in to see if I can find 50 Y. All sounds heard in one and a half hours have been mentioned and no trips to the nest were missed.

I have the nest generally in view between 1110 and 1122. 50 F makes at least one trip, probably not over two. M 50 sings one step-buzz, but since M 51 is probably singing I can't be sure of more. By 1130 I have not found 50 Y. I am pretty sure it is neither north of the ravine nor in the sassafras thicket southwest of the nest, the general area in which 50 F gathered by far the largest amount of her nest material today. M 50 has sung some, most songs faint.

I'm wrong. At 1135, 50 Y calls southwest of the nest and I see 50 F feeding it. She does so for five minutes, sees me, and begins to call mild but frequent "checks" at me. I
immediately leave. Note M 50 doesn't seem to be feeding 50 Y.

II - VII - Male sings frequently.

III - Male sings once or twice.

1200 - I leave.

1830 - I return.

T 50 at 1835 - M 50 is singing frequent insipid steps at the hill-top and I find 50 Y there, where I sat this morning. It has moved 60 yards since noon. 50 F is feeding it frequently and actively while M 50 stays high and sings. 50 Y calls loud at each feeding and occasionally in between. I approach the nest, stationing myself half-way between it and 50 Y; if I stayed near 50 Y I'd surely throw 50 F off her routine.

1846 - 50 F probably feeds 50 Y. 50 Y then falls silent. M 50 has just become silent too.

1853 - 50 Y calls as though being fed.

1903 - 50 F goes to the nest, direction unseen. She stays 30 seconds, drops 20 yards southeast.
1907 - 50 F to the nest from the southeast, carrying much plant down. Departure unseen. M 50 begins to sing type-8 steps at not quite full volume, from the hill side.

1909½- 50 F with much down, coming from behind me to the south at least 40 yards. Departure unseen; she must be staying at the nest only three or four seconds.

1911 - M 50 quits singing.

1912 - I may have missed a trip by 50 F.

1922 - 50 F goes to the nest from the southeast for 30 seconds. She hops out to a bare limb, sits alert and nearly motionless as though watching something, for 30 seconds, and flies east in the ravine 20 yards, not dropping lower than the nest level. I think she lights in a tree. It is nearly sundown, a little hazy.

1928 - 50 Y is calling. The rate is about 30 times every 15 seconds until 1938. At 1938, 50 Y moves west and a little toward me and continues its calling. 50 F may discover me as a result of this.

1940 - 50 F goes to the nest, possibly from the north. In 20 seconds she drops east.

1940 - 50 Y becomes silent. A bird flies by me from 50 Y's direction; it may be a Prairie Warbler and if so it must be

1949 - 50Y calls for five seconds.

1957 - 50Y calls for one minute.

2005 - It is pretty well along toward dark, so I quit watching the nest after one and a half hours.

2010 - I find both adults with 50Y in the sassafras thicket at the top of the hill, the center of the territory; this is the position from which I watched the nest this morning. I don't actually see M50 carry food, but he is very active about 2 feet from the ground and right beside 50Y. I think it safe to say he is feeding.

I then watch him to try to see him carry food. He forages in the tops of goldenrod, moving very quickly and actively and eating what he catches. His wings droop very slightly and he cocks his tail at a 45° angle. This goes on till 2015. At that time I see 50F feeding in the goldenrod, broomsedge, and low herbs about 2 feet from M50. M50 droops his wings and follows her a few feet, all his movements jerky and quick. She calls "check" one time. He pursues her about 3 feet at an altitude of 1 foot, and I lose them.

At 2019, M50 flies into a tree near me, faces north, and goes to roost, the first time I've succeeded in seeing this. The "tree" actually is two sassafrases at the north-
west edge of a cluster of sassafras. One is a dead seven and a half pole, the other a 3' tree pushing out northwest for light. On beyond to the northwest are only herbaceous plants, so he thus selects a fairly open spot. The branches of the larger trees of the grove overhang the little 3' roost tree, providing shelter from above. M 50 rests near the top of the little diagonal live tree, 34" high; at this point it looks like a little branch of the dead tree. It is one-fourth inch thick, extends one and a half feet out from the dead pole, has no leaves except some eight or ten at the very end of the branch (the real tree top). There are no other branches growing from the dead tree on this side; the live canopy is eight feet or more up. M 50 goes to the spot 14" out from the pole of the dead tree, i.e., among the leaves. He is thus sheltered among them. He sits perfectly quietly, his tarsi flexed like a young bird's. Note that the height of his limb puts him just at or a little above the level of the top of the surrounding vegetation. I watch him for 15 minutes, until it's nearly too dark to see his outline, and then leave. At this time the following are still audible: Field Sparrow; Indigo Bunting; chat singing very occasionally; Bob-white and Summer Tanager singing regularly; Whip-poor-will singing after 2026; Towhee, Cardinal, and Wood Thrush calling.

Note how suddenly the warblers became inactive. 50 Y quit.
calling at 2014. It was about two feet high, so I judge it is roosting at that level. M 50 and 50 Y were about 15 yards apart when activity stopped. 50 F presumably was nearby.

2035 - I leave.
July 5, 1955

A slightly overcast morning after a somewhat cooler night; temperature 72° at 0715. Present from 0720 to 0845 and from 1730 to 2030.

T 50 at 0730 - Silence. I sit where I did last night, 35 yards from the nest tree, 25 from where 50 Y was.

0738 - M 50 flies to his sycamore, then west along the ravine, high. Silence.

0810 - 50 F goes to the nest with material. She moves around for one minute then settles down and stays six and a half more minutes, dropping 20 yards to the south at 0817½. Note this occasional resting in the nest, at least from the late building stage on.

0824 - 50 F is foraging near me in a 6' elm. She calls "check" very quietly. M 50 is moving actively ten yards from her, and when she flies south he follows. She eats what she catches.

0830 - I leave after one hour. All activity and Prairie Warbler sounds have been noted.

As I go southwest I find both adults feeding a begging nestling, 50 Y, nearly full size but for its tail, in the remnants of the maple grove between IV and VI. M 50 sings faint insipid steps but is only three or four feet from the ground, moving rapidly. 50 F also carries food.
This spot is about 100 yards west and south of the nest, perhaps 80 yards west of last night's roost. Note how much 50 Y moves; it flies readily now to follow a parent. I suppose its distance from the nest explains why I heard so little today.

0845 - I leave.

[An adult male Black and White sings in our woods today]

1720 - I return.

T 50 at 1735 - 50 Y is now about 20 yards southwest of the nest, calling and begging almost constantly with loud bursts when an adult is near or feeds. Both adults are present with 50 F evidently doing most of the feeding. 50 F calls occasionally as she forages.

1740 - M 50 flies east from 50 Y and sings one faint step, a minute later a faint Golden-wing type song.

1743 - 50 Y moves on north to the ravine, a distance of 20 yards, still calling. It is now ten yards from the nest.

1745 - 50 Y falls silent.
1835 - I have heard and seen nothing more. It seems certain that the nest is complete, as I would have expected. Probably the whole family is on T 51, which is extremely large and perhaps undefended, because of the 51's shifts. I'll check this when 50 F is laying and incubating. I leave the territory.

T 49 at 1850 - The young of female (A) are alive.

1855 - M 49 sings short steps 45' up in a walnut at the edge of the woods to the north. At the same time female (A) arrives at the nest with food. She calls at me and perches 15' up in a locust. M 49 has food. He starts to fly south, seems to turn and dive a little suddenly to land by female (A) (three feet above), about 20' from the nest. Female (A) immediately goes into a position inviting copulation: She raises her tail to a 35° angle, spreading it very slightly, perhaps one-eighth to one-quarter inch wider than normal. Her wings droop a very little and she thrusts her head stiffly forward and slightly upward so that her bill is about 30° or so off the horizontal. Her tarsi bend so that she is crouching and I get the impression that she vibrates almost imperceptibly. This lasts two seconds, goes on in silence and without any response from M 49. Note the date and the stage of the nest cycle. M 49 hops two or three feet away and 49 F (A) in
one second follows him the same distance. He flies south with his food and she stays here, going to the nest after three or four minutes. He stayed here 25 seconds in all.

Female (A) came in from the east and a little to the north on her first trip.

1915 - M 49 has sung to the south, is now singing step-buzzes about 30 yards away. He goes on south.

1917 - Female (A) comes from the east with food. Exact times and departures here are of no value because of my presence, but the number of trips should be useful.

1920 - Female (A) flies to within ten feet of me and eats the food she's carrying. M 49 sings chatter skids to the south.

1924 - 49 F (A) takes food caught a few yards from me to the nest. She leaves to the south in one minute. She no longer calls in my presence and seems to be getting used to me. M 49 sings to the south; he is difficult to hear.

1935 - M 49 sings three abbreviated step songs from the edge of the woods. In a minute he sings chatter skids to the south. I think I hear a young bird calling there — I do for sure. M 49 is now singing step-buzzes, and the young bird is calling irregularly. M 48 sings quite close to me to the west, on or at the edge of T 49.
1943 - Female (A) brings food, two green larvae.

1950 - I quit watching the nest. I'd say that M 49 is feeding the nestlings very little if at all. It seems most likely that any feeding occurs when he happens to be nearby, and that 49 Y is still getting his attention.

T 48 - M 48 sings loud and actively all over the south end of his territory.

T 50 - I return to see if M 50 will use the same roost tonight. He does not. There are two droppings a few inches from the spot he perched on last night but no others; so clearly this is no regular roost. If a regular roost were used at any time during the summer it is quite possible I'd have found piles of droppings sometime during the last four years. The Prairie Warbler probably roosts where it happens to be at the appropriate time.

2030 - I leave.
July 6, 1955

A sultry day with a faint haze; temperature 76 at 0830.

Present from 0900 to 1300.

T 48 - M 48 sings as I pass.

T 49 - I sit at 0907 to watch female(A)'s nest.

0910 - Female (A) probably visits the nest.

0912 - M 49 begins to sing a loud but short skid to the east, draws gradually closer, and at 0915 after about 15 songs goes to the nest with a green larva. He does not see me, so I'll stay to see how regularly he feeds. He does not sing after leaving, goes low to the southwest.

0923 - Female (A) goes to the nest. Simultaneously M 49 begins to sing (some songs with a loud buzzing ending) in the tree tops of the little locust grove south of the nest. After four minutes of this he flies straight east. Female (A) stays 45 seconds. Her arrival and M 49's song seem unconnected. After leaving the vicinity M 49 apparently falls silent.

0942 - Female (A) goes to the nest, stays 30 seconds, drops southwest. At the same time M 49 begins to sing skids in the locusts to the east. After 11 songs, at 0945, he flies to the nest tree with a large black larva. A second or so later female (A) arrives with food. She hops toward the nest and the male leaves without feeding. She leaves in
30 seconds and a minute later I again see a Prairie Warbler leave, presumably M 49.

1000 - M 49 begins to sing at the top of a locust 15 yards to the east. He brings no food, catches a larva, eats it. At 1001 female (A) comes with food to a tree ten yards from the nest, perches there and calls "tsu" for three minutes; I am sure she doesn't see or react to me. At 1004 she goes and feeds the nestlings for one minute. M 49 continues to preen and sing on his perch; his songs are mostly chatter skids, but one or two are step-buzzes, and a few of the earlier ones start insipid and end with a loud buzz. M 48 is singing straight west and not far away (40 yards?). After 33 songs in nine minutes, M 49 moves a few yards in the locusts and continues to sing, three more times. He's clearly not feeding very actively.

I check the contents of the nest: It contains two nestlings.

I then spend one and a quarter hours making my last long search for some sign of 49 female (B), of which I have seen no sign since about June 16. I learn nothing today.

M 49 seems still to be attending 49 Y, so evidently he is now feeding the young of both his females.

T 50 from 1130 to 1300 - I range slowly over the whole territory, hearing and seeing nothing of the pair, which seems to have fallen silent now that the new nest is finished (if I'm cor-
rect that it is - I saw no work on it today during perhaps 45 minutes spent at or near it. Evidently 50 Y's increased mobility plus the nest completion has caused the 50's to wander off the fringe of the territory or beyond it.

Once I thought I had found 50 Y when a young bird began to call on the south part of the territory, just north of the ravine there. After a good deal of difficulty I satisfied myself that this was one of the fledglings from the unstudied territory to the south. It wandered back south, well onto its own territory, always staying just ahead of me. The male was feeding it.

1300 - I leave.
July 7, 1955

Sunny day. Present from 1530 to 1940.

T 50 at 1540 - After a short time on the territory I find M 50 and 50 Y in the area of the pines across on T 51, or at least on the edge of T 50. 50 Y at 1600 is about 6' high in a little vine-covered tree.

1600 - M 50 feeds 50 Y.

1603 - M 50 sings short high step songs in the immediate vicinity, eight times. 50 Y hops and moves along a few inches on the limb he's perching on, then returns to his original spot.

1608 - M 50 feeds 50 Y, retaking the larva from it and softening it in his bill, then giving it back again. 50 Y begs, trembling a little (compare adult behavior in connection with copulation).

1608a - M 50 sings one skid and a second abbreviated song. 50 Y wipes its bill like an adult.

1612 - No sign of M 50.

1614 - M 50 sings a high skid to the northeast on his hillside. He continues to sing and draws closer.

1616 - 50 Y preens, stretches, scratches, all like an adult.
1619 - 50 F appears for the first time today, calls "tsu" two or three times about 15' from 50 Y. M 50 is still singing. 50 F moves out of my sight without having attended 50 Y.

1622 - 50 Y moves, probably only a few yards or feet, but I lose sight of it. I think that it may be a little north of its spot of a few minutes ago, in the sumac thicket on T 51. I search without finding it.

1633 - I find 50 Y near its original perch, M 50 feeding it.

1636 - M 50 feeds 50 Y.

1701 - M 50 feeds, I think. I then hear faint songs near the sumac thicket. I think this may be M 51.

1710 - There are all the sounds of a fight between two males, in the sumac and the apples. The density of the cover prevents my seeing anything. Calls are loud. I'd guess M 50 and M 51 fought. Afterwards when I find M 50 again, he is in the sumacs singing and interspersing his songs with anger calls.

1715 - I leave the territory. I've been in the immediate vicinity of 50 Y all the time for nearly one and a half hours. 50 F appeared once, never fed it; there were no indications of male-female association, although I suppose
of course they see each other frequently.

T 47 - M 47 skids on his territory. The nest that failed is as before. [I look for arrowheads.]

T 49 at 1850 - M 49 gives a buzz-song at 1853 as I station myself to watch the nest.

1854 - Female (A) brings food to near the nest.

1855 - M 49 approaches the nest tree, goes to the ground under it, perhaps hops up into it. At first I think he feeds nestlings; now I think not. Female (A) goes to within one foot of him near the ground. Neither displays and he flies on away. At 1857 she goes on to the nest and feeds.

1858 - M 49 sings a buzz song near the nest. In a second I see him in the locust tops to the east. He forages, catches a larva, flies southeast with it.

1859 - M 49 sings to the south in the locusts. I see him in the tops, where he sings without food until 1901.

1901 - Female (A) is eight feet from me, calling "tsu" and "chick." She catches a larva, eats it. 1902 - She leaves me.

1905 - M 49 sings buzzes in the east locusts; the song seems really to be step-buzz with a very prominent buzz.
1927 - M 49, with two large green larvae, flies to the nest tree. He is nervous and leaves without feeding. 49 F (A) calls "tsu" near me. Both are so nervous and disturbed by me that I leave at 1910.

Note that M 49 was almost surely feeding both 49 Y and female (A)'s young today; I think it was certain.

1930 - I leave.
July 8, 1955

Another sunny day. Present from 1530 to 1800.

T 49 at 1545 - I go to watch the nest. Female (A) is at it. In a few minutes I decide to see if I can see what the other Prairie Warblers on the territory are doing.

No sign of female (B). I find M 49 with food in his bill. He may have gone on to the nest. I continue to move around in the general nest area.

M 49 sings a high skid. I find him and 49 Y in a 50' walnut tree near the edge of the woods to the north. 49 Y is following M 49, begging from him; the adult sings frequently. Both are 30' or so high. Female (A) appears in the same tree; 49 Y approaches her and either chases her or follows her and begs, I think the latter.

M 49 carries food to the nest tree, sits in the top of it and sings with the food in its bill. I can't be sure he feeds the nestlings, but I think he does.

1630 - I leave the territory. It seems obvious that M 49 is caring for both young, just as though the nestlings were a second brood.

T 50 at 1640 - 50 F is near the ravine as I come up. She is foraging, eating what she finds; she calls an occasional mild, quiet "check," I think not directed at me.
1646 - 50 F flies to the nest; I can't see that she takes anything. I sit to watch.

1712 - 50 F quickly and without any preliminaries leaves the nest.

1717 - A male begins to sing rather faintly near the white pines. First he sings skids, then step-buzzes. Then for ten minutes there are irregular and faint songs, a variety of skids and steps.

1728 - I think I hear 50 Y calling on the northwest part of territory near the ravine. The calls move southeast up the hill. Probably 50 Y.

1732 - A male sings a very faint skid to the west, perhaps in the maple grove. Then it sings south of the nest on the hill top, so it must be M 50. Then I hear step-buzzes there; then step-buzzes, moving east. The last six or seven songs have been loud. I don't see him or 50 Y.

It looks as though 50 F's going to the nest was not part of her regular incubation and that that phase hasn't begun yet. More detail about her movements: She first came in sight 15 yards east of the nest, moved slowly 25 more yards east and then began to work back west in the low shrubs and bushes; always near the ravine. Then she went to the nest as indicated. Do females go to the nest during the
laying period when they happen to be near it and suddenly "recollect" it?

I leave the territory without having learned any more.
Another sunny day. Present from 0630 to 0945 and from 1330 to 1515.

T 49 - I go on the territory to band nestlings and trap the adults if I can. As I come on M 49 is feeding the nestlings, an important fact.

In the nest are two young, which I weigh and band with green/over silver, right leg. The data are as follows:

#21-62052 - 4 grams 550 milligrams
#21-62053 - 3 " 990 "

Both parents display and show alarm, both carry food around. For one and a half hours I leave the Potter trap baited with the young, returning occasionally. I have no luck, so I release the young. M 49 was attentive during this period, calling when I come up, but his interest was not as great as female (A)'s. Conceivably he was able to work off his energy by feeding 49 Y.

T 50 at 0850 - 50 F is on the nest.

0922 - 50 F leaves the nest.

0931 - She returns and I leave the territory. Incubation has begun and I'll have to spend some time here.

0945 - I leave.

1330 - I return.
T 50 at 1340 - 50 F is on the nest. For five minutes M 50 sings irregular, infrequent loud skid songs on the hilltop. 50 F is almost surely standing over the nest in the shading position used on hot days.

1355 - She leaves the nest, dropping into the ravine to the east.

1405 - 50 F flies straight back to the nest, probably standing over or out of it in a shading position. M 50 has been silent since 1345.

1419 - A Broad-winged Hawk flies over as it also did this morning; an adult.

1420 - 50 F is definitely standing over the nest.

1423 - 50 F drops to the ground ten yards from the nest, to the north-northeast in the ravine.

1431 - She returns to the nest tree, sits for 15 seconds one foot above it, enters.

1430 - M 50 begins to sing at the east end of the hill, does so for two-three minutes.

1436 - An adult Cooper's Hawk soars and flaps over the woods east of the hill top, coming west and passing over me at 1439.
1444 - M 50 sings a high insipid step, then a loud skid, at the east end of the hilltop.

1447 - M 50 flies to the nest tree, lands three feet from the nest. For one minute he hops around above and below the nest, several times getting within one foot of it. At these times he seems to spread his wings a very little. 50 F sits quietly, and both remain silent so far as I know. M 50 then flies 20 yards east. 50 F never moved except to turn her head to look at him; he looked down at the nest when he was near it.

1450 - 50 F leaves the nest; I can't know if the male influenced this.

1457  - M 50 sings one high step on the east end of the hilltop.

1506  - 50 F flies straight to the nest and enters.

1507  - I now hear 50 Y calling to the east on top of the hill.

1508  - I go to the nest to see 50 F's position. She is sitting in the nest; conceivably my approach may have caused this.

1515  - I leave the territory and the area.
Sunny morning after light rain at night. Present from 0630 to 0830.

T 50 at 0640 - 50 F is on her nest. M 50 sings loud skids and step-buzzes frequently at the east end of the hill. He then moves west but I don't see him.

0657 - 50 F leaves the nest. M 50 is silent.

0709 - M 50 begins regular and frequent songs.

0721 - M 50 and 50 F fly into a tree 20 yards from the nest, remaining close together but not displaying toward each other. In a few seconds 50 F flies to the nest and perches a few inches away; M 50 flies along after her a few feet. They remain together in the tree, about a foot apart for 15 seconds. She then enters the nest and begins to incubate; he stays another 15 seconds, then turns and leaves. Both are silent throughout.

0753 - M 50 sings for the first time since last noted.

0754 - 50 F leaves the nest, dropping quickly out of sight.

0755 - I can hear 50 Y calling on the hill side to the east.

0810 - Both adults fly to the nest tree and the female immediately enters the nest. M 50 stays for five seconds a few feet from her, then flies southeast, where 50 Y is calling.
0815 - I leave the territory.

0830 - I go home.
Sunny and hot. Present from 1745 to 2030.

T 50 at 1750 - 50 F is on the nest.

1822 - 50 F dives to the ground to the northeast, about ten yards from the nest and in the ravine. M 50 has been completely silent so far.

1833½ - 50 F begins to call "check" about 45 yards south of the nest, on the hill and behind me. In one-half minute she flies alone, straight and fast, to the nest; in five seconds she enter it.

1920 - She drops quickly and without warning to the ground to the southeast, landing probably 15 yards from the nest.

1931½ - 50 F flies straight and quite fast to the nest tree, from a point southeast of it and on the top of the hill. She sits quietly for 30 seconds one foot from the nest, enters it at 1932. She was alone, silent. M 50 has not sung yet.

2011 - 50 F drops from the nest and flies low to the southeast, landing at least 35 yards up the hillside.

2021 - 50 F flies into a dead apple tree 15 yards from me, 20 from the nest. She calls "check" and bobs her tail for 30 seconds, then goes to the nest and enters it at 2021½. She is alone.
There has been no sign of M 50 or 50 Y today.

One of 50 F's upper tail coverts has been loose for the last two days.

2030 - I leave. It is quite dusky.
July 12, 1955

Sunny with a strong east wind blowing in gusts. Present from 1230 to 1400.

T 50 at 1245 - 50 F is on the nest.

1301 - 50 F drops to the southeast near the valley.

1303 - I think I hear a male singing, probably on T 51. Half a minute later a male sings, location unknown.

1310 - 50 F flies alone into the nest tree from a position nearly directly under it. She goes to a perch 6" from the nest, enters it in 15 seconds.

1330 - A strong east wind is blowing, swinging the nest tree and the vine the nest is in; I can see 50 F when the foliage is blown back.

1346 - One minute after an especially strong gust, 50 F drops southeast, probably landing 15 yards from the tree on the hill side.

1357 - 50 F flies into the nest tree, coming in on a high flight and landing in a place I can't locate (again, the wind). In 30 seconds she enters the nest.

1400 - I leave. There has been no sure evidence of M 50's presence.
July 13, 1955

A hot, sunny day with the thermometer 84° in the shade at 1530. Present from 1600 to 1830.

T 49 from 1615 to 1645 - M 49 is singing, 49 F(A) feeding her fledglings. I see neither female (B) nor 49 Y, her young.

T 50 at 1705 - 50 F is off the nest.

1730 - 50 F calls sharp "checks" near me on the hillside, flies to a cherry tree 20 yards from the nest, then goes fast and straight to a point one foot from the nest. She enters immediately at 1731. Note her very long absence, probably begun just before I got here.

1733 - I may hear one male song.

1744 - A Sparrow Hawk flies over twice.

1801 - 50 F drops from the nest to perhaps 15 yards away from it to the southeast.

1805 - A Sparrow Hawk and a Broadwing fly over, the latter landing in a tree on T 50.

1812 - Just as before, 50 F begins to call "check" near me on the hill top. She goes on for one minute, then flies to the nest tree and immediately begins to incubate, at 1813½.

1814 - I start to walk around the territory. In one minute I probably hear M 50 sing once, but I don't find him.

1830 - I leave.
July 14, 1955

A sultry slightly overcast morning; temperature about 73° at 0700. Present from 0730 to 1015.

T 49 from 0730 to 0815 - M 49 sings a step-buzz with considerable regularity. I look for female (B) without success; female (A) not looked for.

T 50 at 0822 - 50 F is incubating.

0908 - 50 F leaves, dropping quickly to the southeast. She must just have gone to the nest when I arrived.

0920h - 50 F flies quickly to a perch one foot from the nest. She sits there 30 seconds, moving her tail a little and facing away from the nest. She then turns and enters at 0921.

0956 - 50 F drops as usual to the south and east.

1012h - 50 F returns precisely as before, entering the nest at 1013.

1015 - I leave.
A hot, sultry, sometimes cloudy, day after heavy thunder showers all night from 1700 on. It is thundering today in the late afternoon. Present from 1700 to 1915.

II - The male here sings several chatter skids.

T 50 at 1723 (thundering) - 50 F is on the nest.

1800 - She leaves.

1819 - After three or four "check" calls in a tree 10 yards from the nest, 50 F goes directly to the nest and enters immediately. The calls were not at all likely to have been due to my presence. It is now threatening to storm from the west.

1845 - A Sparrow Hawk flies over and calls.

1900 - 50 F drops to the east-southeast. It is dark and thundering in the west, as it has been for 50 minutes.

1911 - 50 F flies to the nest and enters without pause.
She came silently.

1915 - I leave with the weather the same. No sign of M 50 or 50 Y today.
July 16, 1925

A fresh, changeable day, sometimes bright but almost raining at 1705; there was a heavy rain last night. Present from 1630 to 1850.

II - The male sings as usual and his young are calling.

T 49 - Female (A) is feeding her young, and I think M 49 is too. Female (A) is slightly alarmed at me; she calls and M 49 comes to her. He is singing loud type-8's all over the territory. In 40 minutes I see nothing of female (B), although I make a fair search.

T 50 at 1730 - 50 F is on the nest.

1753 1/2 - 50 F leaves very quickly to the east-southeast.

1812 - 50 F appears at the top of M 50's big sycamore, calls "check" five or six times, flies to the nest tree. She perches out of sight for 25 seconds, then flies to within one foot of the nest, catches two larvae and eats them, enters at 1813.

1846 - 50 F leaves exactly as before.

1850 - I must leave without timing her interval.
A clear day until 1200, when it clouds over; at 1400 it threatens to storm and at 1430 there is a light rain, thereafter heavy clouds; temperature 80° at 1500. Present from 1515 to 1820.

II - The male sings his usual loud chatter and one type-8.

T 50 at 1545 - 50 F is on the nest.

1605 - 50 F drops east-northeast into the ravine. No sign of M 50 (or of M 51), as has been true during most of incubation.

1616 - 50 F is just south of the ravine and west of the nest about 15 yards. She calls five times, flies low to the nest tree, enters quickly at 1616 1/2.

1648 1/2 - She drops east-southeast. It has just cleared enough for the sun to shine briefly.

1707 - 50 F begins to call "check" on the hillside southeast of me, i.e., toward the top of the hill and the center of the territory. During the next two two minutes the call moves about a little. She calls 24 times in two minutes, at 1709 flies 25 yards straight to the nest, entering immediately. I may have caused the calling.

1743 - She drops southeast, less quickly than usual. (Is the reason that the periods off the nest are less regular than
those on it due to the distractions met while off?)

1753 - She flies without pause straight to the nest and enters.

1755 - I leave this territory.

T 49 at 1800 - M 49 sings. No sign of female (B).

1820 - I leave.
A rainy, stormy day after rain last night. Present from 1750 to 1940, during which a moderate drenching rain falls steadily.

T 50 at 1809 - 50 F is on the nest.

1921 - She leaves the nest for the first time. The rain became a little lighter three minutes ago, which may have no significance.

1929 - 50 F returns quickly and silently from a point in the ravine, ten yards east of the nest. She enters without pause.

1930 - I leave.
A very changeable day after a rain last night; rain for 40 minutes at 1300. Present from 1520 to 1700, during which it thunders and threatens.

T 50 at 1520 - 50 F is not on the nest.

1522 - 50 F appears 15 yards from the nest, calls "check" mildly, about ten times in 30 seconds; she probably has not seen me. She hops about feeding during this 30 seconds, moving very actively and nervously. She then flies straight to the nest and enters at 1522½.

1552½ - 50 F drops to the east-southeast. A bird, possibly a Field Sparrow, begins to call "check" near the nest, so I withdraw a good distance to be safe.

1617 - 50 F flies to the nest tree from the northeast, across the ravine. She perches one foot away on a bare branch for ten seconds, enters.

1638¼ - She leaves, dropping quickly to the southeast.

1651 - She begins to call "check" 20 yards from the nest, flies to a branch one foot away, enters at 1651½. She called six times in all, but all of these were before going to her tree. While she was off the nest the thunder became rather constant and loud, this at about 1641.

I have no explanation for the changes in her timing today.

1700 - I leave with a storm about to break.
A hot sultry day, partly cloudy. Present from 1500 to 1715.

T 50 at 1515 - 50 F is not on her nest. Today should be about the time the eggs hatch.

1523 - 50 F returns silently and directly, entering the nest 20 seconds after landing a few inches below it and out of sight. I am fairly sure she carried no food.

1526 - 50 F flies from east to west past me (I didn't see her leave the nest) and forages in golden rod. She must have young.

1538 - She flies to within a foot of the nest, coming in high from behind me. She has food; sits nearby motionless for 45 seconds, goes to the nest.

1545 - A Broad-wing flies over.

1547 - 50 F drops southeast.

1601 - I hear four "check" calls southeast of the nest.

1603 - 50 F carries food to within one foot of the nest, waits ten seconds, enters.

1604 - An adult Field Sparrow hops about for one minute within three feet of the nest; nothing happens.
1615 - She drops about ten yards to the southeast.

1616 - She returns directly to the nest, flying quickly from ten yards below it; I can't see whether she has food.

1619 - She drops low and flies south toward me, turning west and going out of sight; she flew at least 40 yards.

1622 - She returns with food, lands a foot away from the nest, goes to it after ten seconds. I've seen no fecal sacs yet; she must be eating them.

1625 - She drops east-southeast, probably 15-20 yards.

1626 - She flies straight back with food.

1627 - She leaves exactly as last time.

1629 - Returns with food, pausing for 15 seconds one foot from the nest.

1633 - She drops east, no more than ten yards.

1633 - Returns with food, straight to nest.

1636 - She leaves the nest, but may still be in the nest tree, out of my sight. She went west or north if she left the tree.

1642 - She flies straight to the nest from some distance west.
1644½ - She leaves and flies to a redbud ten yards from me. Here she feeds for one minute, calls "check" at me; flying past me to another tree ten yards from me, she calls "check" twice and then opens her bill. She goes on ten more yards, calls twice, opens her bill. Her bill was open no more than two seconds each time. She stays out of sight for one minute, flies to the top of a 15' tree 15 yards from me, carrying food. She is silent.

1648 - Continuing the above series, she goes straight to the nest from me. At 1648½ she may be hopping away from the nest.

1657½ - She leaves and goes at least 20 yards, straight east.

1700 - She returns without pause from the southeast.

1702 - She drops nearly straight down and to the nest.

1712½ - She brings food from the east, returning as though she has been perching in one of the trees there higher than the nest.

1714 - She leaves.

1715 - I leave. In two hours, no sign of M 50.
July 21, 1925

A hot sultry day. Impossible to be present.
July 22, 1955

Hot, sultry, with a heavy rain from 1500 to 1600. Present from 1610 to 1815.

T 50 at 1615. - 50 F is at the nest and I sit to watch it.

1620 - She drops ten yards east-southeast.

1625 - Returns straight and high from the southeast. It is thundering.

1627 - A male sings in or near the maple grove to the west; two step-buzzes. This is the first sign of a male in several days.

1629 - The male sings one or two songs, rather quiet as were the others.

1631\frac{1}{2} - 50 F drops ten yards east (note, not toward the singer).

1633\frac{1}{2} - The male sings a Golden-wing-type.

1635 - Two short, rasping step-buzz songs.

1640 - 50 F flies straight to the nest from the east.

1645 - It is dark and thundering very loud.

1650\frac{1}{2} - She drops about 15 yards southeast. Thunder still loud.

1656\frac{1}{2} - She flies to the nest from somewhere near it to the southwest.
1700 - It rains a little, in two minutes beginning to do so steadily but lightly. Thunder very loud.

1702 - She leaves the nest and goes east a few seconds after the rain begins.

1704 - Only a few drops are falling. She flies straight back.

1717 - She drops east-southeast 15-20 yards. The rain has almost stopped.

1720 - She returns directly to the nest.

1720 - She leaves and comes south to a redbud 15 yards from me. There she feeds for two minutes with great rapidity, evidently taking objects on the bark. She then goes south. In the second minute near me she called "check" five times. It is raining lightly; violent thunder and lightning.

1724 - She is calling near me to the south, probably in a 20' elm 15 yards away. The "checks" are loud, irregularly spaced at two to five seconds.

1726 - She is now east of me, nearer the nest. She calls here for four minutes. Still raining a little.

1728 - I see 50 F catch food and in one half minute carry it directly to the nest. In view of her behavior that I saw during this interval off the nest, I'd guess she fed
intensively.

1742 - She drops quickly about 20 yards east.

1744 - It rains for one minute after a ten-minute break.

1747 - It begins to rain steadily though lightly.

1749 - It begins to rain harder. She flies in high from the south, entering the nest without food, I think.

1803 - She leaves while the rain falls steadily.

1805 - She returns and either enters or sits on the nest rim.

1815 - I leave. She is still at the nest.
July 23, 1955

Hot, sultry, cloudy and thundering but without rain. Present from 1800 to 1905.

T 50 at 1800 - 50 F is on the nest.

1817 - She drops 15 yards to the southeast. I can hear her calling "check" quietly every three to four seconds; I doubt if she is reacting to me.

1822 - She goes to the nest from the west.

1830 - She drops 15 yards east-southeast.

1836 - She flies to the top of a 20-foot cherry 15 yards east of the nest. She perches for 15 seconds, bobbing her tail, goes to the nest and feeds the young for 30 seconds from the nest rim, then at 1837 broods.

1842 - She drops ten yards northeast into low trees in the ravine.

1903 - She returns directly from the east.

1905 - I leave. Note the different intensity of feeding yesterday. Is it a difference in the hour of the day, the age of the young (now presumably with temperature controls) or is it chance?
July 24, 1955

A cloudy morning and very sultry afternoon after a heavy cloudburst last night. Present from 1500 to 1720.

T 49 - During my 30 minutes here, M 49 sings four times, all soon after I arrive. He then flies southeast across the field and I see him no more.

T 50 at 1600 - 50 F leaves the nest and goes east into the ravine as I come to my observation post.

1604 - She returns directly, stays 20 seconds, drops to the ground out of sight.

1608 - She goes directly to the nest, stays 30 seconds, flies northeast across the ravine.

1613 - She returns and possibly broods.

1615 - I hear a young bird calling to the east, go and find 50 Y there in full immature plumage. I lose it immediately; the spot is 50 yards from the nest. At 1616, 50 F appears there near me, feeds for five minutes on small objects and one big larva. She then preens herself for two more minutes, forages, returns to the nest at 1625. Since she has been here in sight of me, my leaving the nest did not cause me to miss any of her trips to it until 1625.

I set out to look for 50 Y, which called for only one minute, as indicated. I think I see an adult, but I can't
be sure; no chance to see sex. I fail to find either 50 Y or M 50. (Seeing 50 Y today is interesting; do the male and the first brood young always come back to the territory or the nest area when the second brood are near fledging?)

1633 - I begin to watch the nest after an eight minute gap.

1636 - 50 F returns to the nest, probably broods.

1639 - She drops east about 25 yards into the ravine.

1641 - A male sings a faint insipid stop to the east, two times. I think 50 Y calls there.

1642 - A male sings two steps on the hillside.

1650 - The male, surely M 50, has sung 16 more high insipid steps on the side and top of the hill, to the east near where 50 Y was. 50 Y has been silent since 1641.

1651 - 50 F goes to the nest. The male still sings, now south of me (and, of course, of the nest).

1653 - 50 F drops to the southeast.

1654 - The male has sung 11 more times.

1656 - 50 F goes to the nest.
1657 - She leaves and flies south past me.

1657 - The male falls silent after having sung four more times.

1704 - A Prairie Warbler flies high into the nest tree. In 15 seconds it goes to the nest and remains for 15 seconds, then goes west. It may have been a male, probably was 50 F.

1707 - 50 F comes with food to a point south of the nest and near me. She sits silently but nervously for 30 seconds, goes to the nest tree and in 20 seconds to the nest.

1710 - I quit watching the nest. The situation seems clear: 50 F is hardly brooding at all; 50 Y and M 50 are back, the male feeding 50 Y and the female possibly doing so; I don't know if M 50 is feeding the second brood.

1720 - I leave after ten minutes' unsuccessful search for M 50 and 50 Y. It is quite dark and the wind is blowing, so it is difficult to do much.
July 25, 1955

A very hot, sunny, sultry day. Present from 1905 to 2015.

T 50 at 1912 - 50 F is not at the nest. Silence. By 1940 nothing has happened so I go to the nest; I see no signs of damage but none of nestlings or of the adults.

1946 - 50 F comes to within 15 yards of the nest as I sit about ten yards from it to watch her. She carries no food, is completely silent, exhibits no alarm. After about 30 seconds she drops out of sight near me.

1949 - I retire to my regular spot. 50 F is 15 yards from the nest near the grounds, still without food. I walk up to within seven yards of her and she flies silently and without nervousness to the southwest. I assume she would protest if she had living young.

1957 - 50 F comes to the nest tree and lands about three feet below the nest. She moves little but in 45 seconds she hops in small advances to within four inches of the nest; no food. In a few seconds she goes to the nest for one second, retires to the west, still in the nest tree but out of sight.

1959 - She is still in the nest tree, within one yard of the nest. I lose sight of her for good. She never made a sound.
2012 - The nest has clearly failed within the last 24 hours. No sign of M 30 or 30 Y.

2015 - I leave.
Late July, August, September

I made occasional very brief trips to the area but never saw or heard a Prairie Warbler again this year.
APPENDICES
APPENDIX I

REPRODUCTIVE SUCCESS BY PAIRS

The following do not necessarily include all nests built by any pair; nests found are treated as though they were the only ones built. Pair 52 is excluded altogether.

**Pair 47**

Nests complete - 2  
Nests incomplete - 1  
Nests successful - 0  
Eggs per clutch - 0, 4  
Young fledged - 0  
Stage at failure - 1: pre-laying 2: egg  
Total: 4 eggs  
Cause of failure - 1: probably Cowbird's laying 2: unknown  
Cowbird parasitization - 2 in 2 known  
Cowbird eggs per nest - 1: 1 2: 1

**Pair 48**

Nests complete - 1  
Nests incomplete - 0  
Nests successful - 1  
Eggs per clutch - 4  
Young fledged - 0 (2 Cowbirds)  
Stage at failure - (1 egg taken by Cowbird, 1 removed later, 2 nestlings starved)  
Total: 2 eggs 2 young  
Cause of failure - (egg removal, starvation)  
Cowbird parasitization - 1 in 1  
Cowbird eggs per nest - 1:2
Pair H9

**Female (A)**

- Nests complete - 4
- Nests incomplete - 1
- Nests successful - 1

<table>
<thead>
<tr>
<th>Eggs per clutch</th>
<th>Total: 14 eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, (3), (4), 4</td>
<td></td>
</tr>
</tbody>
</table>

- Young fledged - 2

<table>
<thead>
<tr>
<th>Stage at failure</th>
<th>Total: 10 eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: egg</td>
<td></td>
</tr>
<tr>
<td>2: laying</td>
<td></td>
</tr>
<tr>
<td>3: egg</td>
<td></td>
</tr>
<tr>
<td>4: (2 nestlings died)</td>
<td></td>
</tr>
</tbody>
</table>

- Cause of failure - 1: unknown
  - 2: wind
  - 3: rain, indirectly
  - 4: (unknown)

- Cowbird parasitization - 1 in 3 known

- Cowbird eggs per nest - 2 : 1 at least

**Female (B)**

- Nests complete - 1
- Nests incomplete - 0
- Nests successful - 1

- Eggs per clutch - 4

- Young fledged - 2

<table>
<thead>
<tr>
<th>Stage at failure</th>
<th>Total: 2 young</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Cowbird nestling disappears, 2 FW's disappear later)</td>
<td></td>
</tr>
</tbody>
</table>

- Cause of failure - (unknown)

- Cowbird parasitization - 1 in 1 known

- Cowbird eggs per nest - 1 : 1
Pair 50

Nests complete - 3
Nests incomplete - 2
Nests successful - 1
Eggs per clutch - 3, 4, (3)  Total: 10 eggs
Young fledged - 2
Stage at failure - 1: egg
  2: (2 nestlings died)
  3: nestling  Total: 3 eggs

Cause of failure - 1: unknown, nest demolished
  2: (unknown)
  3: unknown

Cowbird parasitization - 1 in 2 known
Cowbird eggs per nest - 2 : 1

Pair 51

Nests complete - 3
Nests incomplete - 0
Nests successful - 0
Eggs per clutch - 4, (4), 4  Total: 12 eggs
Stage at failure - 1: egg
  2: egg
  3: nestling  Total: 8 eggs

Cause of failure - 1: unknown, nest demolished
  2: unknown
  3: unknown

Cowbird parasitization - 0 in 2 known
APPENDIX II

SUMMARY OF REPRODUCTIVE SUCCESS

Many calculations made in previous years are omitted because my data are not sufficiently numerous. Pair 52 is excluded.

Nests:

Nests complete - 11
Nests incomplete - 4
Nests successful - 4

Pairs:

Pairs successful once - 3, plus 49(B)
Pairs successful twice - 0
Pairs unsuccessful - 2

Eggs:

Eggs, total laid - 46
Egg failures in egg stage - 27
Egg failures in nestling stage - 15
Eggs successful - 6
Clutches known to contain 5 eggs - 0
Clutches known to contain 4 eggs - 7
Clutches known to contain 3 eggs - 2
Average size of known clutch - 3.77
Incomplete clutches - 2 (47F's first, 0 eggs;
49F (A)'s second, probably 3 eggs)

Fledglings:

Fledglings, total - 6
Fledglings, as to breed size - 0 of 1
3 of 2
0 of 3
0 of 4
Fledglings per breed, average - 2
Of breeds successful, number totally so - 0
Of breeds successful, number losing 1 egg or nestling - 0
Of breeds successful, number losing 2 eggs or nestlings - 3
Of breeds successful, number losing 3 eggs or nestlings - 0

Cowbirds:

Total nests of which Cowbird status is known - 11
Total nests parasitized - 6
Parasitization according to probable succession of nests -
First nests parasitized, 2; unparasitized, 2
Second nests parasitized, 2; unparasitized, 1
Third nests parasitized, 2; unparasitized, 1
Fourth nests parasitized, 0; unparasitized, 1
Cowbirds (continued):

Parasitization by more than 1 female - 1 second nest, 2 eggs
Total number of Cowbird eggs - 7
PW eggs removed per Cowbird egg laid - 1
  egg for egg - 1
  2 PW eggs for 1 Cowbird egg - 0
  0 PW eggs for 1 Cowbird egg - 5
situation not clear - 1
Effect of parasitization on PW's -
  failures directly due to parasitization -
    1 nest without eggs (pair 47)
    1 egg (pair 48)
    4 nestlings (pairs 48, 50)
failures after but unrelated to parasitization -
  1 nest to predator (pair 47 - 1 Cowbird and 4 PW eggs)
  1 nest to weather (49F (A) - probably 1 Cowbird and
    3 PW eggs)
Cowbird success - 3 fledglings from 7 eggs laid in 6 nests
  egg failures as eggs - 3
  egg failures as nestlings - 1
  egg failures due to self-imposed risks - 1 (premature laying)

Note that heavy Cowbird parasitization this year, if real
and not apparent, may be attributable to a concentration of
parasites on a decreased population of hosts. That is, if Cow-
birds returned in much the same numbers as in past years while
host species were suffering declines comparable to that of the
Prairie Warbler, parasitization of the remaining hosts would
be high.
APPENDIX III
NEST SITES

The following do not necessarily include all nests built by any pair; nests found are treated as though they were the only ones built.

Pair I

nest 1 - 7 feet high in a 12-foot white elm, built in a vertical fork of a diagonal branch, 2 feet from the branch's base on the trunk. Concealment poor.

nest fragment - 2 feet ½ inches high in a fork immediately under this year's leaf canopy of a 2-foot 8-inch walnut. Concealment good.

nest 2 - 18 inches high in a 2-foot dogwood. Concealment good because nest is below level of top of field cover.

Pair II

nest 1 - (successful) - 6 feet high in a 11-foot black locust, built in a leafy spot where several short green branches leave the trunk. The tree is on the west edge of a locust grove (5). Concealment good.

Pair III

(A)

nest 1 - ½ feet high in a 6½-foot scrub white elm, in a fork of the main trunk, the cavity well covered with leaves. Concealment medium.

nest 2 - 18 feet high, built between 2 thick parallel grape vines that climb without support into high woods trees. Nest 15 feet into deep woods, 15 feet below woods canopy. Concealment medium from few leaves growing out of vines.

nest 3 - 20 feet high in grape covering a dead 2½-foot walnut stub. Concealment good.

nest fragment - 6 feet high in a 10-foot redbud.

nest 4 - (successful) - 7 feet 10 inches high in a bushy 12-foot dogwood, standing alone in a locust clearing (2-3-4). Built in a typical fork of 1 of several leaders, in the southwest center of the tree. Concealment medium.

(B)

nest 1 - (successful) - 5 feet high in an 8-foot dogwood just east of a grove (2), built in a vertical fork of a main leader, in the north center of the tree. Concealment medium.
Pair 50

nest fragment - 1 2/3 feet high in a 15-foot sugar maple, built in a little fork of a diagonal branch on the south side of the tree; well shaded. Tree is 3F's first nest site. Concealment good.

nest 1 - 5 feet high in a 5-foot 6-inch redbud with a little grape vine growing over it. Built in or just under the leaf layer. Concealment good.

nenest fragment - 6 feet high in a white elm.

nest 2 - (successful) - 9 feet 6 inches high in a 16-foot dogwood, built in a fork on the outer southeast end of a diagonal branch. 8 yards to the southeast is a similar dogwood. Concealment medium.

nest 3 - (second brood) - 20 feet high in a 25-foot cherry, built 3 feet east of the main trunk in a leafy cluster of cherry and grape; shaded by these leaves. Concealment good.

Pair 51

nest 1 - 3 3/4 feet high in a fork of a 6-foot white elm. Concealment poor.

nest 2 - 15 feet high in a 21-foot sugar maple, built on top of a diagonal branch, 2 feet from the main trunk. The tree is closely surrounded by other maples of the same size; nest always shaded. Concealment good.

nest 3 - 17 feet high in a 28-foot sugar maple, built in a fairly large vertical fork of a diagonal branch extending northeast from the main trunk. The tree is on the east edge of the maple grove, exposed to the northeast but with trees closely in all other directions. Concealment good.

Pair 52

nest 1 - (successful) - 18 feet high in a vertical fork of a 25-foot dogwood, in the center of the tree just under the leaf layer. The tree is just west of the mature woods. Concealment good.
Summary of Nest Sites

Trees and vines selected -

- flowering dogwood - 5
- white elm - 3
- sugar maple - 2
- redbud - 1
- black locust - 1
- grape sp. - 1
- black walnut - 1
- black cherry - 1

Statistics on heights -

- median - 7 to 8 feet
- mean - 10.75 feet
- average - 10.76 feet
- mode - omitted

Note - nest fragments not included in calculations.
### APPENDIX IV

**DISTRIBUTION OF NEST SUCCESSES BY HEIGHTS**

<table>
<thead>
<tr>
<th>Height of nest</th>
<th>Successful</th>
<th>Failed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 feet</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2-3</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3-4</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4-5</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5-6</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6-7</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7-8</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8-9</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9-10</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10-11</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11-12</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12-13</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13-14</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14-15</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15-16</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>16-17</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17-18</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>18-19</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>19-20</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20-21</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total** | 5 | 10 | 15

Percent of success by units of height not computed.

The 52's are included in Appendices IV and V. To exclude them, omit 1 nest, successful, begun in Period 4, 18-19 feet.
## DISTRIBUTION OF NEST HEIGHTS AND NEST SUCCESSES BY PERIOD WHEN BUILDING BEGAN

May, June, and July are each divided into three 10- or 11-day periods, numbered from 1 to 9.

<table>
<thead>
<tr>
<th>Heights in feet per period</th>
<th>Periods</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>3-4</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4-5</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>5-6</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>6-7</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>7-8</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>8-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>9-10</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>10-11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>11-12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>12-13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>13-14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>14-15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>15-16</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>16-17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>17-18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>18-19</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>19-20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>20-21</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

| Total                      |         | 3 | 4 | 3 | 2 | 1 | 1 | 1 | 0 | 0 | 15   |

### Successes per period -

- **successes**: 0 2 1 1 1 0 0 0 0 0 5
- **failures**: 3 2 2 1 0 1 1 0 0 0 10
### APPENDIX VI

**SUMMARY BY PAIRS OF HEIGHTS, SUCCESSES, PERIODS, PARASITIZATION**

<table>
<thead>
<tr>
<th>Pair</th>
<th>Success</th>
<th>Height</th>
<th>Period</th>
<th>Cowbird</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>nest 1</td>
<td>no</td>
<td>7-8</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>nest 2</td>
<td>no</td>
<td>1-2</td>
<td>6</td>
</tr>
<tr>
<td>48</td>
<td>nest 1</td>
<td>yes</td>
<td>6-7</td>
<td>2</td>
</tr>
<tr>
<td>49 (A)</td>
<td>nest 1</td>
<td>no</td>
<td>4-5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>nest 2</td>
<td>no</td>
<td>18-19</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>nest 3</td>
<td>no</td>
<td>20-21</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>nest 4</td>
<td>yes</td>
<td>7-8</td>
<td>5</td>
</tr>
<tr>
<td>49 (B)</td>
<td>nest 1</td>
<td>yes</td>
<td>5-6</td>
<td>2</td>
</tr>
<tr>
<td>50</td>
<td>nest 1</td>
<td>no</td>
<td>5-6</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>nest 2</td>
<td>yes</td>
<td>9-10</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>nest 3</td>
<td>no</td>
<td>20-21</td>
<td>7</td>
</tr>
<tr>
<td>51</td>
<td>nest 1</td>
<td>no</td>
<td>3-4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>nest 2</td>
<td>no</td>
<td>15-16</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>nest 3</td>
<td>no</td>
<td>17-18</td>
<td>4</td>
</tr>
<tr>
<td>52</td>
<td>nest 1</td>
<td>yes</td>
<td>18-19</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX VII

NEST SUCCESSES AND DEGREE OF CONCEALMENT

<table>
<thead>
<tr>
<th></th>
<th>Good</th>
<th>Average</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failures</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Successes</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Of 4 nests built in Virginia creeper or grape, all failed.

The above figures include Pair 52. To exclude them, subtract 1 successful nest, well concealed.
APPENDIX VIII

TERRITORY SIZES, 1955

T47 - not clear, largely because of the construction
T48 - 2.30 acres
T49 - 5.90 acres; utilized territory about 3.2 acres
T50 - 3.50 acres
T51 - 4.13 acres; utilized territory considerably smaller
T52 - 3.28 acres
## APPENDIX IX

**RECORDS OF BIRDS BANDED**

<table>
<thead>
<tr>
<th>Bird</th>
<th>Date</th>
<th>Number</th>
<th>Colors</th>
</tr>
</thead>
<tbody>
<tr>
<td>M48</td>
<td>June 12</td>
<td>51-68202</td>
<td>silver R</td>
</tr>
<tr>
<td>49F (♀)</td>
<td>June 14</td>
<td>21-62040</td>
<td>silver R, green L</td>
</tr>
<tr>
<td>49Y (♀)</td>
<td>June 14</td>
<td>21-62041</td>
<td>probably like 49F (♀)</td>
</tr>
<tr>
<td>49Y (♀)</td>
<td>June 14</td>
<td>21-62042</td>
<td>probably like 49F (♀)</td>
</tr>
<tr>
<td>50Y</td>
<td>June 21</td>
<td>21-62043</td>
<td>silver R, yellow L</td>
</tr>
<tr>
<td>50Y</td>
<td>June 21</td>
<td>21-62044</td>
<td>silver R, yellow L</td>
</tr>
<tr>
<td>50F</td>
<td>June 23</td>
<td>21-62045</td>
<td>silver R, yellow L</td>
</tr>
<tr>
<td>M52</td>
<td>June 29</td>
<td>21-62051</td>
<td>red over silver R</td>
</tr>
<tr>
<td>52F</td>
<td>June 29</td>
<td>21-62046</td>
<td>silver R, red L</td>
</tr>
<tr>
<td>52Y</td>
<td>June 29</td>
<td>21-62047</td>
<td>silver R, red L</td>
</tr>
<tr>
<td>52Y</td>
<td>June 29</td>
<td>21-62048</td>
<td>silver R, red L</td>
</tr>
<tr>
<td>52Y</td>
<td>June 29</td>
<td>21-62049</td>
<td>silver R, red L</td>
</tr>
<tr>
<td>52Y</td>
<td>June 29</td>
<td>21-62050</td>
<td>silver R, red L</td>
</tr>
<tr>
<td>49Y (A)</td>
<td>July 9</td>
<td>21-62052</td>
<td>green over silver R</td>
</tr>
<tr>
<td>49Y (A)</td>
<td>July 9</td>
<td>21-62053</td>
<td>green over silver R</td>
</tr>
</tbody>
</table>
## APPENDIX X

### WEATHER, APRIL THROUGH AUGUST, 1955

<table>
<thead>
<tr>
<th></th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H</td>
<td>L</td>
<td>LPH</td>
<td>LPH</td>
<td>LPH</td>
</tr>
<tr>
<td>62</td>
<td>1</td>
<td>44</td>
<td>41</td>
<td>83</td>
<td>74</td>
</tr>
<tr>
<td>66</td>
<td>2</td>
<td>44</td>
<td>41</td>
<td>86</td>
<td>21</td>
</tr>
<tr>
<td>75</td>
<td>3</td>
<td>45</td>
<td>45</td>
<td>90</td>
<td>26</td>
</tr>
<tr>
<td>75</td>
<td>4</td>
<td>41</td>
<td>41</td>
<td>89</td>
<td>56</td>
</tr>
<tr>
<td>111</td>
<td>5</td>
<td>52</td>
<td>52</td>
<td>85</td>
<td>58</td>
</tr>
<tr>
<td>66</td>
<td>6</td>
<td>51</td>
<td>51</td>
<td>82</td>
<td>25</td>
</tr>
<tr>
<td>68</td>
<td>7</td>
<td>37</td>
<td>37</td>
<td>83</td>
<td>54</td>
</tr>
<tr>
<td>62</td>
<td>8</td>
<td>29</td>
<td>29</td>
<td>67</td>
<td>98</td>
</tr>
<tr>
<td>68</td>
<td>9</td>
<td>31</td>
<td>31</td>
<td>76</td>
<td>55</td>
</tr>
<tr>
<td>60</td>
<td>10</td>
<td>44</td>
<td>44</td>
<td>72</td>
<td>52</td>
</tr>
<tr>
<td>58</td>
<td>11</td>
<td>55</td>
<td>55</td>
<td>67</td>
<td>49</td>
</tr>
<tr>
<td>61</td>
<td>12</td>
<td>55</td>
<td>55</td>
<td>62</td>
<td>53</td>
</tr>
<tr>
<td>61</td>
<td>13</td>
<td>59</td>
<td>59</td>
<td>60</td>
<td>55</td>
</tr>
<tr>
<td>68</td>
<td>14</td>
<td>53</td>
<td>53</td>
<td>72</td>
<td>54</td>
</tr>
<tr>
<td>66</td>
<td>15</td>
<td>50</td>
<td>50</td>
<td>82</td>
<td>52</td>
</tr>
<tr>
<td>69</td>
<td>16</td>
<td>48</td>
<td>48</td>
<td>86</td>
<td>52</td>
</tr>
<tr>
<td>60</td>
<td>17</td>
<td>55</td>
<td>55</td>
<td>80</td>
<td>51</td>
</tr>
<tr>
<td>61</td>
<td>18</td>
<td>55</td>
<td>55</td>
<td>78</td>
<td>43</td>
</tr>
<tr>
<td>66</td>
<td>19</td>
<td>66</td>
<td>66</td>
<td>78</td>
<td>52</td>
</tr>
<tr>
<td>72</td>
<td>20</td>
<td>61</td>
<td>61</td>
<td>88</td>
<td>52</td>
</tr>
<tr>
<td>70</td>
<td>21</td>
<td>59</td>
<td>59</td>
<td>80</td>
<td>52</td>
</tr>
<tr>
<td>69</td>
<td>22</td>
<td>59</td>
<td>59</td>
<td>86</td>
<td>52</td>
</tr>
<tr>
<td>66</td>
<td>23</td>
<td>58</td>
<td>58</td>
<td>78</td>
<td>52</td>
</tr>
<tr>
<td>70</td>
<td>24</td>
<td>57</td>
<td>57</td>
<td>70</td>
<td>56</td>
</tr>
<tr>
<td>77</td>
<td>25</td>
<td>46</td>
<td>46</td>
<td>77</td>
<td>55</td>
</tr>
<tr>
<td>66</td>
<td>26</td>
<td>45</td>
<td>45</td>
<td>84</td>
<td>52</td>
</tr>
<tr>
<td>77</td>
<td>27</td>
<td>44</td>
<td>44</td>
<td>86</td>
<td>52</td>
</tr>
<tr>
<td>68</td>
<td>28</td>
<td>45</td>
<td>45</td>
<td>74</td>
<td>53</td>
</tr>
<tr>
<td>59</td>
<td>29</td>
<td>41</td>
<td>41</td>
<td>88</td>
<td>53</td>
</tr>
<tr>
<td>65</td>
<td>30</td>
<td>41</td>
<td>41</td>
<td>80</td>
<td>52</td>
</tr>
<tr>
<td>65</td>
<td>31</td>
<td>45</td>
<td>45</td>
<td>80</td>
<td>43</td>
</tr>
</tbody>
</table>

**TOTAL PH:** 7.48

*Note: The table data indicates weather conditions for April through August in 1955, with columns for each month and columns for low (L), high (H), and precipitation (P). The numbers represent temperature and precipitation values.*

---

Red above are from Chestnut data. Data for 'P' from record. T from Chestnut data. 80% of all data are from Chestnut data. 90% of all data are from Chestnut data.