

Year? 1934?

The Nesting of the Least Flycatcher.

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Howard F. Wright. 1934

Summary of Events Observed in the Nesting of
The Least Flycatcher (*Empidonax minimus*)

On June 27th and 28th three nests of the least flycatcher were found along the south side of the upper ^{drive} at the ends of B, C, and D streets respectively. All of these nests were in white birch trees, two being at heights of $11\frac{1}{2}$ ft. and one at 11 ft. All of them were later found to be in the crotches of the trees where two other limbs branched off the main trunk, the trunk being here not more than $1\frac{1}{2}$ -3 inches in diameter. They were bound onto the limbs very tightly seemingly only by strands of plant down wrapped about the smaller branches. All of these nests were in the trees not far from the drive itself, two of them being just up on the embankment and one back perhaps ten feet from the drive.

An examination of the nests after the birds had left, showed that the greatest bulk consisted of various plant fibers, most of which I could not place any more definitely than that they were leaves of grasses, fibers from the bark of trees other than birches etc. Plant down, evidently from the fruits of the shrubby willow (*Salix Bebbiana*) growing near, was usually next in abundance. Although in the one finally studied there was a much greater abundance of feathers, feathers forming a minor part of the nests of the other two. The feathers were not alone to be found in the lining, but were scattered through the whole structure. The few feathers present in the other nests were in the lining, otherwise the lining was mostly fine grasses. Definitely determined other materials in the nests were coarse rootlets, birch bark, grass stems, and in one a considerable quantity of toilet tissue and newspaper. The birch bark tended to be concentrated on the outside and formed a sort of trimming. Among the very minor parts of the nests were such things as string, cloth, long hairs, and leaves. It is interesting to note that even ^{the} nests varied in the amount of the individual items, the proportion of coarse materials to the softer ones approximated about the same in all three.

It is to be regretted that all three of these could not have been studied more intimately for purposes of comparison as the situation in each case was similar. But two of them were deserted later for undetermined reasons. At the time of finding them, however, all three birds were apparently incubating. The first nest contained two eggs and the the other two, three each. ~~Three~~ ^{five} days after finding the third nest, which was deserted five days later, a fourth egg was found in the nest. This situation would have made the comparative study even more instructive as that would have made the nests contain two, three and four young, had they all hatched. The two eggs in the first nest were removed one at a time and several days apart by some marauder, and when the third nest was examined some time later, all the eggs were gone.

The few observations made of the remaining nest during incubation brought out the following conclusions:

(1) apparently the female did the incubating, although the tower was not up as yet and I had not learned to distinguish between the two as yet.

(2) the male spent most of his time elsewhere as far as I could observe. He was never observed near the nest, and did not sing nearby, although several could be heard on the hill above quite often.

(3) the female spent but about 60% of the time on the nest. Because of this seeming nervousness, I decided not to observe her too closely until the tower was up. Often she spent only four or five minutes on the nest and would stay off as long as five or ten minutes. A male

Nesting of the Least Flycatcher (cont.)

robin, whose nest was just across the street, kept up a continual din as long as I was present, which probably added to her restlessness.

(4) She made use of the time off the nest to catch a few insects, to preen herself and to exercise her wings. The purpose of leaving the nest, at least several times was to convince some intruder that this was her domain. Once she flew at the robin mentioned before, snapping her mandibles sharply to emphasize her point that his place was across the street.

(5) she never left the immediate vicinity of the nest while she was away, but spent most of her time on a limb not two feet from the nest. When she was ready to return, she would fly directly to the nest and settle on the eggs without further ado.

(6) whether she turned the eggs, or how, I was unable to determine as I was on the ground several feet higher than the base of the tree and some distance away, while she was still about nine feet up in the air. Several times she made a number of wriggling motions with her body, which seemed to indicate that that was what she was doing.

According to Chapman the least flycatcher has from three to five eggs. They are pure white, and unmarked, measuring .63 inches and .51 inches across the two diameters. They are slightly more pointed at one end than the other. My eggs measured 16 x 13.5 mm., 15.5 x 14 mm. and 16 x 14 mm..

On July seventh towers were put up near nests number one and two. Females left both these nests as we approached. The third nest on the day before had apparently been deserted, although the eggs were still in the nest. The first nest at this time had only one egg in it. The next day nest number two had two young in it, twelve days after it had been discovered. Since the incubation period of this bird is about fourteen days, the nests must have been discovered shortly after the eggs were laid. The first nest at this time was deserted and empty. Several days later the third nest was found to be empty and also deserted, suggesting that it was not the intervention of the human animal, that had caused the desertions, but rather some small nest robber. The nests themselves, however, were not badly destroyed. If the desertion had not been accompanied by the disappearance of the eggs, we might be justified in thinking we had been the cause of their leaving. In spite of the fact that the desertion of the third nest was not immediately followed by the disappearance of the eggs, if the robbers were chipmunks, they must have known the nest was there before the birds left, because so far as my knowledge of these animals is concerned, I don't believe they go prowling around in trees unless they are pretty certain of finding something. Of course if the robber was some animal which is ordinarily found in trees and assuming we were the cause of the desertion, they might have been found after the birds had gone.

How the egg-shells were removed was not discovered, because it was a class-day and the birds had probably been out for some time when I returned in the evening.

The nestlings weighed 1.6 grams and 1.65 grams respectively. Both birds had a covering of down on the head and above the eyes as well as along the flanks and down each side of the back. The skin was a pale pink and the edges of the mandibles quite yellow. While measuring one of them, I was a bit rough and he picked at my finger with remarkable accuracy, considering his sightless condition.

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Nesting of the Least Flycatcher (cont.)

The birds were marked on the right and left outer toes with pink nail polish to distinguish them. This proved later to be poor policy, as the next day the collodion had glued the two outer toes together on one of the birds, and was constricting the outer toe. Attempting to remove the polish with alcohol proved successful so far as separating the two toes was concerned, but not in removing the bit constricting the toe. On the following day the toe was inflamed, due to the operations of the day before. The tipp later blackened and dropped off. The bird thus never had a toe-nail on that toe, which for purposes of identification was ideal. So far as the bird is concerned, I imagine it will make little difference, since it is a perching bird and nails are not as important as if it were a terrestrial bird.

The next day the third bird had hatched. This bird was smaller than the other two weighing only 1.5 grams. This may simply have been because it had hatched out later in the day. This bird eventually came to weigh more than the other two. I did not mark this one. Hereafter this bird was weighed every day and the other two were weighed every other day.

By the third day the skin on the head and neck of the birds had darkened considerably and the down feathers were much thicker. The edge of the wing was very much blackened indicating the beginning of development of the primaries. By the fourth day feather tracts were showing down each side of the back, along the flanks and on top of the head, where down feathers were first observed. The rest of the body by now had quite a considerable covering of down. By the seventh day the eyes were open and the feathers beginning to unsheath. The bristles at the base of the bill were beginning to show by the eighth day and the feathers were beginning to show their colors. By the tenth day the brownish tips of the wing coverts were forming distinct wing bars. The feathers on the sides of the flanks and breast were showing buffy as well as the under-tailcoverts. By the eleventh day the eyes were wide open, the primaries were well developed, the back was well feathered and the whitish down feathers on the top of the head were largely replaced by olive-brown true feathers.

My observations on the care of the young brought out the following points so far as my birds were concerned:

(1) The male did most of the feeding of the nestlings, bringing food to the nest almost five times to the females once. The times that she fed were mostly confined to the early morning and late evening. I quite early learned to distinguish between the parents, because the male always looked more prim, was darker on the back and lighter on the breast and belly. He also had a short whitish extension of the eye ring behind the eye.

(2) Feeding began at five o'clock and ended about eight thirty.

(3) The average number of feedings per hour was about nine. The feeding was usually done oftenest early in the morning. One morning the young were fed seven times in a half hour. Feeding was done less often during the hot part of the day, although this was not pronounced.

(4) The feeding was irregular. They might feed two or three times in less than ten minutes and then not again for fifteen minutes to a half hour. Once I thought I had found evidence that the male bird realized how many birds there were to feed, for he would feed three times in a little more than five minutes and then not again for fifteen or twenty minutes. This happened four times in an hour and a half, but then I found that he was not feeding them in succession, and might feed the same one twice. So I was not so sure of my conclusion.

Nesting of the Least Flycatcher (cont.)

(5) I was not able to observe much during rainy weather, but what observations I did make then, made me think that the feeding was none the less regular, except that the female stayed closer to the nest.

(6) Nest sanitation was watched very closely, the excrement being removed as often as two or three times an hour. This was generally done by the male, and usually just after feeding. At first it was swallowed, but later it was carried away. None was ever found in the nest, even when it was torn apart at the end of the nesting. The excrement was always ~~in~~ enclosed in a membranous sac.

(7) Most of the food was so small that the legs only could be seen, and since the male never tarried long while feeding it was very difficult to see exactly what he had. The following larger insects were observed at various times, - may-flies, ichneumon-flies, ant-lions, a soldier bug, a spider and a cricket.

Once the male was noted to put the food in one bird's mouth and when it was not swallowed, he immediately took it out and put it in another. Another time, when he tried to feed the cricket, finding it was too large, he removed it, champed on it several times with his mandibles, and put it back. But it was still too large, so he had to repeat the operation. Another time a large fly had to be tucked into the bird's mouth before it could be swallowed.

At first the feeding procedure was as follows: The male would alight on a tree to the left of the blind and a little below the nest. He would then give a soft "chebec", and hop up to a limb just above the nest. The female would then look around several times and finally fly off with a soft "chir-r-ip" as the male alighted on the edge of the nest. The actual feeding was done with dispatch, the parent bird sticking his bill quite far down the young bird's throat. He would then look for excrement and if there was none, would look around several times (at least once at the blind) and then fly off toward the top of the hill. Three or four minutes later the female would return to the nest and brood the young.

To the male this feeding process seemed to be a sort of routine, - something to be done with and finished as soon as possible, and always it was done in much the same way. This may, however, been simply because I was present and he was more shy than the female. Later on the "chebec" announcing his arrival was often omitted. I always knew when it was feeding time, though, because I could hear the whir of his wings as he approached. She evidently could also, for even though not facing his way, and to all appearances not paying any attention, would presently leave and allow him to feed.

The female always found her own food while off the nest, but seldom returned with any. If I could get into the blind without disturbing her, she would be facing the street. But when she returned after the next feeding, she would then face the blind and watch it carefully all the time I was there. The direction of her comings and goings were much less regular than those of the male. During the early part of the nesting, she spent the greater part of her time on the nest. When it was very warm, she would sit on the edge of the nest with her back to the sun, often spreading her wings to shade the young. While perched in this way, she would often remain there while the male bird fed, watching the process in an unconcerned way. Toward the end she spent less and less time on the nest, and on the last day she spent the entire hour I was watching off the nest, and helping to feed the young.

The young birds did quite a lot of shifting around in the nest, and were seldom still even for a short time. Their chief occupation when not feeding or looking for food, was picking at themselves, either to relieve an itching caused by bird lice or to remove scales from the developing feathers. I say this latter because quite a quantity of these scales was discovered in the nest when it was examined later, and the old birds were never observed to pick at the young. They seemingly were able to stay in the nest when they became so large that the nest could hardly contain them, only because they instinctively grasped the nesting material tightly with their toes. When they began to do this, it was quite difficult to remove them from the nest. The last two days of observation found them doing quite a little bit of exercising, consisting of wing-stretching, gawking around and occasionally flapping their wings vigorously. When one would do this it would work its way above the others, and apparently standing on tip-toe, would act as though it were ready to take off. On these two days they were noticing things, and when a tractor went by on the road, one of them poked its head over the edge to investigate. Another bird picked at an ant in the nest, but did not take it. The evening before they left, I could hardly keep them on the scales to weigh them, and when I put one on the ground, he was able to fly about two feet.

On the morning of July 21st, after it had been raining a good part of the night, and was still at it, I visited the nest before breakfast and found it empty. It had been thirteen days since they had hatched, and with all the nice weather we had been having they had to take a day to leave the nest when the weather was most inclement. I could not find them anywhere close and since I had a class that day, I could not look for them anymore then. I returned several times, but was unable to locate them.

Since I was not able to find out how the old birds induced the young to leave, Larry Bowman invited me to watch his birds when he thought they were about to leave. At five o'clock shortly after we got to the nest, the female left as usual. The young were not fed nor hovered for an hour and twenty minutes after we arrived. All this time the old birds were close around, and the "chebec" call was heard a number of times. Several times the young opened their mouths to be fed, but the old birds were persistent in their starving process. Finally the old birds apparently weakened and fed all three of them in a short time. They evidently had decided that they were not ready to fly. Since they did not leave for several days afterward, it would seem that the nestlings had found that they would be fed if they waited long enough, and therefore stayed in the nest several days longer than usual.

Howard F. Wright.

Summary of Events Observed in the Nesting of
The Least Flycatcher (*Empidonax minimus*)

- June 27th 1934- Nest #1 found by Mildred Campbell along upper drive at the end of D Street. It was 11½ ft. up in the main fork of a birch tree. It was compactly built of plant fibers, birch bark and grasses, and lined with finer grasses and feathers. There were ~~three~~ ^{TWO} white unspotted eggs in the nest when found.
- June 28th 1934- Nest #2 and #3 found at the ends of C and B streets respectively also along upper drive. These were also in the main forks of white birches. #2 was 11 ft. high and #3 11½ ft high. They were made very similar to the other nests. Number 2 besides having birch bark woven into the bulk of the nest, had some toilet paper woven into it. Each of these nests had three eggs in them when found.
- June 30th 1934- All birds apparently incubating, no increase in number of eggs.
- July 1st, 1934- Nest #3 was found to contain a fourth egg.
- July 5th 1934 - Observed Nest #2 for a period of one hour, fully exposed. Whether because of my presence or because the day was warm the female seemed restless. During the hour she spent but 60% of the time on the nest. Seemingly she flew off to chase other birds out of her territory, twice another flycatcher and once a robin. While she was off the nest she usually caught a few insects, and after preening herself a while on a limb not two feet from her nest would settle back on the nest and watch me carefully. While she was off the nest she paid little attention to me. During all this time the male bird was not seen near the nest, so far as I could determine. At least he never sang near the nest.

Because my presence might be the cause for her restlessness, and because it might cause her to desert the nest, I did not observe any more till the eggs hatched. The time of my observation was from 8:43 till 9:43 A.M.

- July 6th, 1934 - Nest #1 was found to contain but one egg, while to all appearances nest #3 was seemingly deserted, the female not being observed near the nest, though visited several times during the day.
- July 7th, 1934 - Towers put up near nests #1 & #2. Females left each of these nests as we approached. Nest #3 still deserted, eggs cold.
- July 8th, 1934, - 7 P.M. - Two young were found in nest #2, 10 days after nest was discovered. Nest #1 found empty and deserted. Nest #2 with the eggs still in the nest but no birds around.

The nestlings were weighed and measured. Bird #1 was found to weigh 1.6 grams and to be 30 mm. long. This bird was marked on the toes with pink nail polish (right foot). Bird #2 was found to weigh a trifle more, - 1.65 grams, but to be also 30 mm. long. Both birds were quite well covered with down feathers on the head and above the eyes. The rest of the body was almost naked except for lines of down along the wings, flanks and down each side of the back. Their eyes were closed, but bird #2 picked at my finger when I was a bit rough. Bird #2 was marked on the left foot with the nail polish.

- July 9th 1934 - A third bird was found in the nest when observed at 7 P.M. This bird weighed but 1.5 grams, but to be 34 mm long. This bird was not marked.

Bird #1 had increased in weight .6 gms and was 5 mm. longer. Bird #2 had increased .77 gms and had lengthened 8 mm. Both birds were found to have their toes glued together by the polish. It was washed off with a weak solution of alcohol, and the toes separated.

- July 10th, 1934 - Only birds #2 and #3 were measured, at the same time. #2 had increased .92 gms and lengthened but 1 mm. The skin on the head and back had darkened considerably and the down feathers were

Observations of Nest and Nestlings of
Least Flycatcher (cont.)

much thicker. The edge of the wing was very much blackened indicating the beginning of the development of the primaries. The toe which had been separated (inner left) was found to be inflamed.

July 11th 1934, - Observed nest from blind from 7:25 A.M. till 9:00 A.M. Five minutes after entering blind the female was back on the nest. She remained on until 7:46, watching me very carefully all this time. At that time male lit in the tree, gave one "chebec" and approached the nest. The female looked all around and left giving a little chir-r-p as she left. Essentially this same procedure was followed at the approach of the male each time.

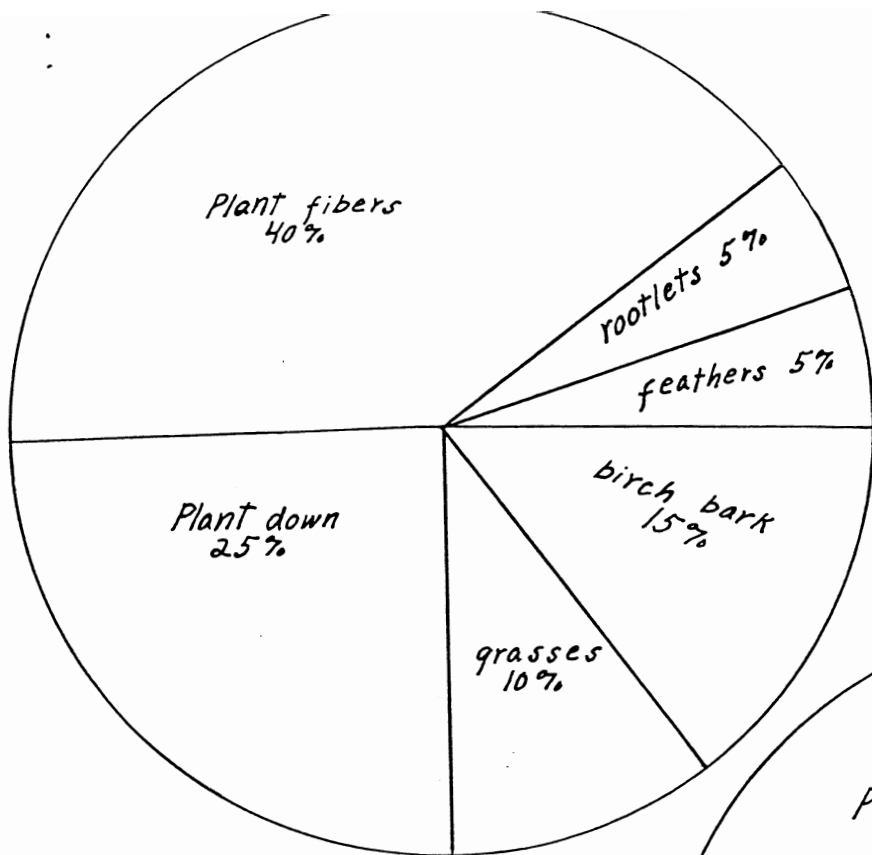
During the hour and a half of observing, the young were fed by the male 12 times and by the female but three times. The female was always watching me, while the male was almost oblivious of my presence.

Twice the male was observed to swallow, or apparently so, the excrement of the young birds. Always he seemed to be looking the nest over for presence of excrement.

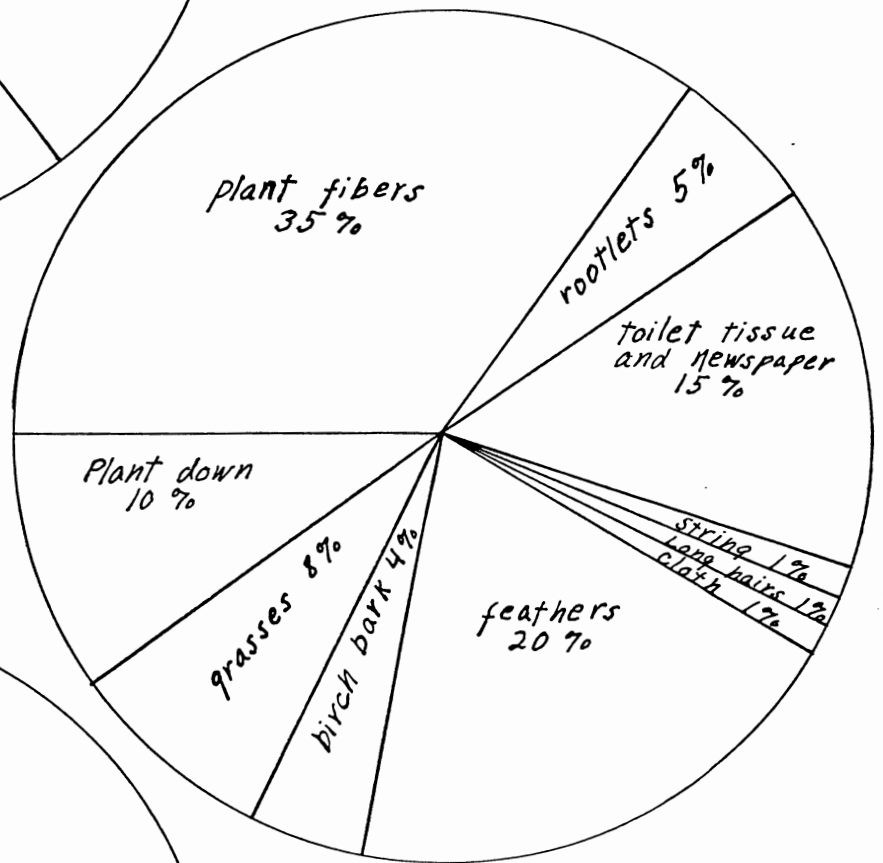
The food fed consisted of insects always, but what kind I was unable to determine, as I could only see the legs on either side of the bill. The food was shoved down their throats in the characteristic fashion of birds, and once, when the young failed to swallow the food immediately, the insect was removed and put into another mouth. At no time were they observed to feed by regurgitation. When off the nest, the female usually caught a few insects for herself, but only occasionally did she return with food to the nest.

Birds #1 and #3 were weighed and measured at 7 P.M. and each had gained about .8 grams. Bird #1 showed the beginning of feather tracts down each side of the back and along sides and flanks. Also the edge of the wings were very much darkened, showing that the flight feathers were beginning to form. All their eyes were still closed.

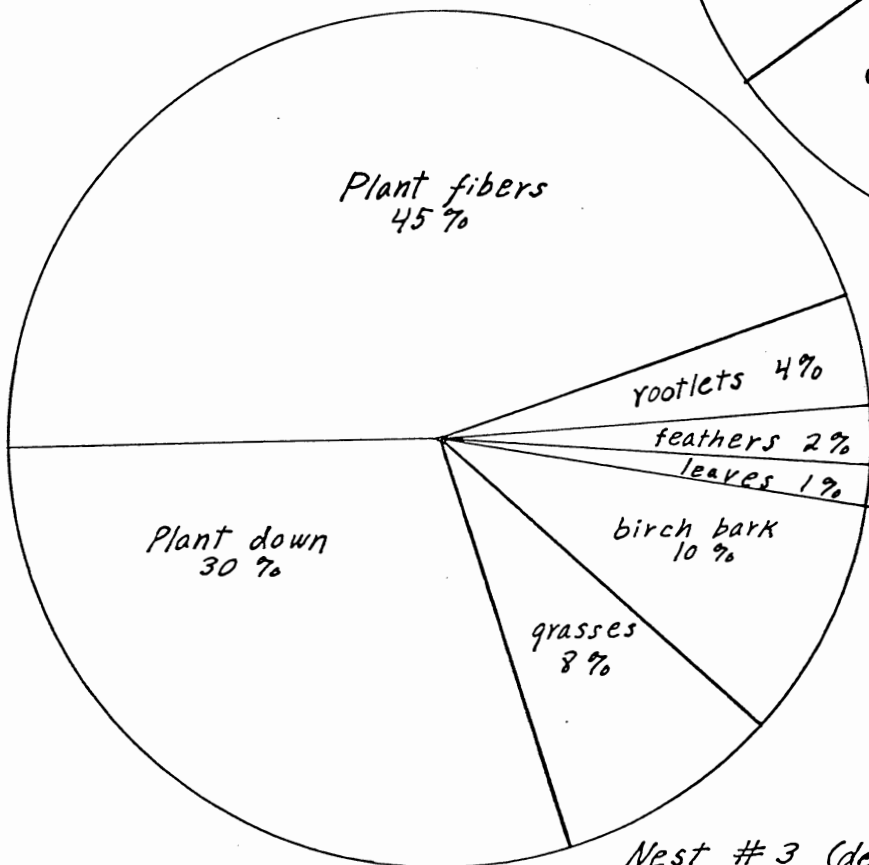
July 12th 1934 - Observed nest for 1½ hrs. from 8:30 till 10:00 A. M.. During most of the time the female was on the edge of the nest, from which the sun was coming, incidentally that being also the direction from which the wind was coming. Only occasionally did she hover the young and then only for a few minutes. While sitting here her mouth was opened quite wide most of the time as though she ^{were} panting from the heat. Often she remained here while the male fed the young, but generally she would fly away and catch a few insects for herself. Not once did she return to the nest with food for the young. This morning during the period of observation the male fed the young eleven times, and swallowed the excrement of the young three times. Once the food was a spider, but most of the time it seemed to be flies or true bugs. Once the fly had such long legs that it had to be tucked into the nestling's mouth. All the young were observed to do considerable picking at wings and body as though removing lice, and this together with constant stretching of their necks constituted their only exercise.



Nest #1
(deserted)



Nest #2 (one observed)



Nest #3 (deserted)

Variations in kind and amount of materials used in the nests of the least flycatcher (*Empidonax minimus*).

(Estimated volumetrically)

Bird # 3	7-8	7-9	7-10	7-11	7-12	7-13	7-14	7-15	7-16	7-17	7-18	7-19	7-20
Weight		1.5 g.	2.11 g.	2.99 g.	4.22 g.	5.3 g.	6.45 g.	7.71 g.	9.02 g.	9.97 g.	10.7 g.	10.82 g.	11.99 g.
Length		34 mm.	37 mm.	39 mm.	42 mm.	43 mm.	49 mm.	54 mm.	58 mm.	68 mm.	68 mm.	68 mm.	72 mm.
Tail		—	—	—	—	—	5 mm.	1.6 mm.	2.5 mm.	4.5 mm.	6.6 mm.	9 mm.	11.5 mm.
Bill		3 mm.	4 mm.	4.8 mm.	5 mm.	6 mm.	6.2 mm.	7.2 mm.	6 mm.	6.2 mm.	7.2 mm.	7.2 mm.	7.2 mm.
Bill-Eye		6.5 mm.	6.6 mm.	8 mm.	8.1 mm.	10.2 mm.	10.9 mm.	11 mm.	13 mm.	13.2 mm.	13.2 mm.	13.4 mm.	14 mm.
Bill-Gape		5.8 mm.	6.1 mm.	7.6 mm.	8.2 mm.	9 mm.	9 mm.	10.2 mm.	10.4 mm.	11.5 mm.	12 mm.	12.8 mm.	13 mm.
Bill-Nostril		2 mm.	2 mm.	2.8 mm.	3 mm.	3 mm.	3.4 mm.	3.5 mm.	4 mm.	4.1 mm.	5.1 mm.	5.1 mm.	5.2 mm.
Eye diameter		3.2 mm.	3.2 mm.	3.9 mm.	3.9 mm.	4 mm.	4.3 mm.	4.5 mm.	5 mm.	5 mm.	4.5 mm.	5.5 mm.	5.5 mm.
Extent		26 mm.	34 mm.	34 mm.	40 mm.	42 mm.	51 mm.	61 mm.	72 mm.	82 mm.	97 mm.	120 mm.	132 mm.
Right wing		11 mm.	11.8 mm.	12.6 mm.	15 mm.	17 mm.	22 mm.	24 mm.	27.5 mm.	28 mm.	40.5 mm.	44.5 mm.	51 mm.
Primary (lat)		—	—	—	barely showing	1 mm.	3.2 mm.	5.7 mm.	7.2 mm.	9.4 mm.	12.4 mm.	16 mm.	20 mm.
Foot-body		11 mm.	12 mm.	15.4 mm.	17 mm.	20.2 mm.	22 mm.	30 mm.	31 mm.	37.9 mm.	38.9 mm.	38.9 mm.	40 mm.
Tarsus-toe		9 mm.	11.8 mm.	12 mm.	15 mm.	17 mm.	20.8 mm.	22.6 mm.	23.7 mm.	25.8 mm.	27.6 mm.	27.6 mm.	28 mm.
Toe #1 (hind)		3.8 mm.	3.9 mm.	3.9 mm.	5.6 mm.	6.2 mm.	6.4 mm.	7.2 mm.	7.9 mm.	8.5 mm.	9.4 mm.	9.6 mm.	10 mm.
Nail #1		1 mm.	1.2 mm.	1.8 mm.	2 mm.	2 mm.	2.2 mm.	2.5 mm.	2.5 mm.	3.1 mm.	3.2 mm.	3.4 mm.	
Toe #2 (outer)		3 mm.	4 mm.	4.5 mm.	5.5 mm.	6.0 mm.	6.2 mm.	7.1 mm.	7.4 mm.	7.4 mm.	8 mm.	8 mm.	8 mm.
Nail #2		1.3 mm.	1.4 mm.	1.5 mm.		1.6 mm.	1.6 mm.	2 mm.	2 mm.	2.2 mm.	2.2 mm.	2.2 mm.	
Toe #3 (mid)		4 mm.	4 mm.	5.5 mm.	5.8 mm.	6 mm.	7.5 mm.	7.6 mm.	8.2 mm.	8.9 mm.	9 mm.	9.1 mm.	10 mm.
Nail #3		1.2 mm.	1.6 mm.	1.8 mm.		2 mm.	2.2 mm.	2.2 mm.	2.2 mm.	2.2 mm.	2.5 mm.	3 mm.	
Toe #4 (inner)		2.3 mm.	3.5 mm.	4.2 mm.	4.3 mm.	5 mm.	5.6 mm.	5.8 mm.	6.8 mm.	6.9 mm.	7 mm.	7 mm.	7.5 mm.
Nail #4		1.2 mm.	1.5 mm.	1.6 mm.		2 mm.	2 mm.	2.1 mm.	2.1 mm.	2.3 mm.	2.4 mm.	2.5 mm.	

Bird #1	7-8	7-9	7-10	7-11	7-12	7-13	7-14	7-15	7-16	7-17	7-18	7-19	7-20
Weight	1.6g.	2.2g.		4.13g.		6.6g.		8.96g.	9.99g.		10.49g.		10.52g.
Length	30mm	35mm		44mm.		49mm		53mm	58mm		74mm		82mm
Tail	-	-		-		1mm		3mm	4.5mm		9mm		13.8mm
Bill	3.8mm	4mm		4.8mm		5mm		6.5mm	6.2mm		7mm		7.1mm
Bill-eye	7.2mm	8mm		9mm.		10mm		12mm	13mm		15mm.		14.6mm
Bill-gape	5.9mm	6mm		8mm.		9.2mm		10.8mm	11mm		12.4mm		13.2mm
Bill-nostril	2.5mm	2.8mm		2.8mm		3.6mm		3.6mm	4mm		4.5mm		5.2mm
Eye diameter	3.2mm	3.2mm		3.2mm		4.2mm		4.5mm	4mm		5mm.		5.5mm
Extent	28mm	35mm		42mm.		64mm		85mm	87mm		120mm		142mm
Right Wing	8.2mm	12mm		15.3mm		20.6mm		25.5mm	30.4mm		31.5mm		47mm
Primary (1st)	-	-		-		2.5mm		3.5mm	5.5mm		15.2mm		21mm
Foot-body	12mm	14.2mm		18.2mm		23mm		26.6mm	36.6mm		37.2mm		37.2mm
Tarsus-toe	9mm	10.3mm		14.2mm		20mm		24.2mm	26mm		26.5mm		26.5mm
Toe #1 (hind)	5mm	5.2mm		5.8mm		7mm		8mm	8mm		9mm		9mm
Nail #1	1.2mm	1.2mm		2.3mm		2.8mm		2.9mm	3mm		3.6mm		
Toe #2 (outer)	3mm	3.6mm		4.3mm		6.2mm		6.5mm	6.8mm		8mm		8mm
Nail #2	1mm	1mm		1.1mm		1.5mm		1.5mm	2mm		2mm		
Toe #3 (mid.)	4mm	4.5mm		5mm.		8.2mm		8.5mm	8.6mm		11.2mm		11.2mm
Nail #3	1mm	1.5mm		1.8mm		2mm		2mm	2mm		2.2mm		
Toe #4 (inner)	3.5mm	4mm		4mm		4.8mm		6.5mm	6.8mm		6.8mm		7mm
Nail #4	1.2mm	1.2mm		1.6mm		1.8mm		1.8mm	2.3mm		2.3mm		

	Average Original measurement	Average final measurement	Average daily rate of Increase	Number of times increas- ed over original.
Weight	1.58g.	10.49g.	.7g.	6.6
Extent	28. mm.	135 mm.	8.7 mm.	4.8
Tarsus-toe	9.3 mm.	26.8 mm.	1.4 mm.	2.8
Toes	3.5 mm.	8.8 mm.		2.5
Length	31.3 mm.	76.0 mm.	5.3 mm.	2.4
Bill-Gape	5.7 mm.	13.1 mm.	.59 mm.	2.3
Toe-nails	1.2 mm.	2.7 mm.		2.25
Bill	3.4 mm.	7.0 mm.	.29 mm.	1.8

Some figures on growth rate of the 3 birds, arranged in the order of times increased over the original measurement.

Date	Time of observation	Male		Female	
		Fed Young	Removed Excrement	Fed Young	Removed Excrement
7-11	7:25-9:00 A.M.	12	3	3	
7-12	8:30-10:00 A.M.	12	3		
7-13	8:25-9:00 P.M.	1			3
7-15	8:05-9:05 P.M.	2	2		
7-17	5:38-5:55 P.M.	5	2	2	1
"	8:55-9:15 P.M.	0			
7-18	3:30-5:30 A.M.	3	1	4	1
	8:05-9:20 A.M.	11		1	
7-19	12:35-1:05 P.M.	3			
7-20	5:10-6:12 P.M.	3	1	1	
	Totals	52	12	16	5

Summary of Nesting Activities

grams-

11

10

9

8

7

6

5

4

3

2

1

0

Date - 7-8 7-9 7-10 7-11 7-12 7-13 7-14 7-15 7-16 7-17 7-18 7-19 7-20

1.65g
1.6g
1.5g

10.99g

10.52g

9.95g

— Bird #1 } As referred to
— Bird #2 } in text of paper
— Bird #3 }

Comparison of the Increase in weight
of three nestling least flycatchers,
from day of hatching till leaving nest.

(Note that last one to hatch increased most)
(This one also was measured every day)

H.F. Wright