A NEST STUDY
LEAST FLYCATCHER

Lawrence L. Bowman

August 6, 1934

This study was made at the University of Michigan Biological station, Douglas lake, Cheboygan County, Michigan, between the dates of June 23, and July 28, 1934. The study was inspired by a requirement in the course of Ornithology* 189

Nest.

The nest was located on June 23rd at 7 P.M. a half dozen hours of frantic searching of the hillside above camp, preceded the discovery. During this search many old nests and an abundance of Cedar Waxwing nests were discovered. The nest of the Least Flycatcher was found in a rather open section on top of the hill, ~~fifty~~ yards beyond (southerly) the west gravel pit in camp. It was in the fork of one of a pair of Birch trees, eleven feet up, in a crotch formed from two small limbs branching from the main trunk. Its shape was cup shaped, measuring in diameter, outside 3 inches, and inside 2 1/2 inches; and in depth, outside 2 inches, and inside 1 1/4 inches. The materials of composition were: inside lining of fine grass, fine root fibers, fine bark shreds and soft wads of plant down. The bulk of the nest was of bark fibers, paper (badly weathered) shreds of birch bark and course grass. The nest contained on first examination a large string hanging carelessly from one side and extending along one of the limbs which supported it, but this was gone on June 30th and was probably the work of the abundant Waxwings who were practicing nest building at that time. When the nest was found it contained four eggs.

white to pale creamy white, no visible markings, and shaped rounded ovate. Their measurement was .63 X .51 inches. Mr. Hinds informed me that he had examined the nest on the 21st and that it had contained 3 eggs, so apparently I had found a nest which had just attained its quota of eggs and was in the process of incubation.

Incubation Period.

I had every reason to believe that incubation was in progress when the nest was discovered and had probably started on the 22nd or 23rd of June. The female bird was on the nest at discovery and refused to leave until she had been punched gently with a stick. In the succeeding 15 days of the incubation period, I visited the nest 20 times and found the bird on the nest on each occasion. I frightened the female off the nest on 6 occasions, and after I entered the blind, she returned always within 4 minutes. She remained quite quiet as a rule and the only movements I noted, were a squirming as though turning the eggs, on two occasions, preening of feathers once, and a fairly constant movement of the head for the purpose of detecting the source of sounds and seeing the various sources of alarm near by. The position of the bird on the nest seemed to be affected by 2 stimuli. One was the position of the blind, and the other, the position of the sun. The blind was erected on the 28th of June and the bird generally kept an eye on it, no matter what was the direction of the main axis of the body. In making observations throughout the incubation period I never saw the female face the sun directly. She was either in direct opposition to it or at right angles to it.

The male remained in the trees and saplings within 50 yards of the nest and was occasionally heard to utter his call of "che bec". At no time did I observe the female feeding and at no time did I see the male bring her food.

Hatching and Development of Young.

On July 9, upon my return from an all day field trip I found two of the young hatched, one egg punctured and empty and one egg as yet apparently good. This made the incubation period from 16-17 days which was unusually long. In searching the literature I found that the greatest period given was 14 days and varied from 12-14 days.* Since the female was so diligent about her task of incubation, the only reason I can see for the slow time is the comparatively cool summer season. (See graph of weather) (Plate #I)

In my measurements of the birds, I measured and weighed one daily at about 9 P.M. and weighed the other two every other day. The weight of the one bird was found to be 1.13gr. On the 10th after the remaining bird had hatched

* Forbush E.H., Birds of Massachusetts and other New England States
Barrows W.B., Birds. Michigan Bird Life
Bendire Charles, Life Histories of North American Birds.

I weighted all three with the following results. —

Newly hatched bird (youngest)	1.45 gr
One weighed previous day	1.76 gr
Remaining bird	2.1 gr.

The development of the young was rapid as can be seen on the graph of development shows. (also see Table #IV) The average gain of weight per day for the first 11 days was approximately .8-.9 gr. In weight the tendency was to finish the nesting period quite near the same. The 12th day showed a decline of weight, possibly due to increased activity or to increased energy loss from growth. The nestlings became so active on the 21st of July that I did not attempt a measurement after that, though they remained in the nest until the 25th. An interesting item is that the youngest bird had as great a weight on the 12th weighing as the original heaviest one. Also, that the one which was taken daily and wrestled through a measurement exercise ended as the heaviest of the three.

Some of the outstanding features of the development of the young in chronological order were. —

1st Day. - Feather tracts covered with short down

2nd Day - Down seemed a bit more lengthened and prominent.

3rd Day - Feather buds beginning to swell.

4th Day - Feather buds more pronounced

5th Day - Primary buds especially enlarged.

6th Day - Increased enlargement of all feather buds. Primary buds broken through. Eyelids seperated. Activity increased. Bird was able to stand on feet and tarsus.

7th Day Very Active, all feather tracts growing out, tail feathers visible.

8th Day - Bristles noticeable at base of upper mandible. Feathers growing generally.

9th Day - Upper mandible darkening in color. Feathers releasing vanes from sheaths at tips. Down very much diminished being prominant on head and back.

10th Day - Physical Activity very great, feathers unsheathing and giving a more mature appearance to the young.

11th Day Activity such that handling bird is difficult. More layard feathers of tail and flanks unsheathing. Attempts to use wings noted. Tertieries developing.

12th Day Buffy endings of secondaries and tertiaries conspicuous. Feathers on back and below just about cover the bare regions.

13th Day Alertness of eyes evidcat. Just a few tufts of down noticeable on head. Base of tail feathers sheathed as yet. Tail much slower in growth than primaries. Oil gland is quite swollen. Bristles above mandible prominent. Bill dark or blackish above, brownish below.

14th Day Nest activities quite strenuous, such as squirming, fighting for position, flapping and stretching of wings. Aside from the shortness of the tail, they look quite mature

15th day + 16th Day - A general increase in activity in the nest. One climbs out on limb. Could leave the nest if they so desired.

See Table or Plate # II III + IV

Departure of Brood.

On July 21st when the nestlings were 12 days old, the one bird on which I had been making measurements, left the nest while I was weighing the other two. No searching would reveal its whereabouts so. I decided that one of the brood was definitely gone. Mr. Wright and I were in the blind at 5 P.M. on the next morning to see the other two leave but were destined for disappointment. The adults were nearby calling their "whit" call. The young were chirping a response. At 6:15 P.M. the female came into the tree and called and at 6:20 P.M. came near to the nest and called. At 6:22 P.M. the parent birds, apparently realizing that their efforts to rout the young were hopeless, came with food. Thus the period during which the parents refrained from feeding the young was at least one hour and 22 minutes. At 2:00 PM on the same day (The 22nd) I found the stray nestling in a bush about thirty yards from the nest. I replaced it only to have another one fly off the nest into the Pteris about 15 yards distant. After getting this one back in the nest I hovered the nestlings for a few minutes and then quietly entered my blind. Shortly, the same one that had just flown, worked its way out on a limb to a position about a foot from the nest. There it sat in varying positions for the remainder of the day (22nd) and all of the 23rd. It seemed as though the parent birds fed the fledgling on the limb less frequently than the other nestlings. On the morning of the 24th all three nestlings were in the nest. There they remained and were fed regularly until they left. The brood left on the 25th of July, sometime between

the hours of 7 A.M. and 12:30 P.M. This made their nesting period 16 days. This, again, was an unusually long time. According to authoritative sources* the young remained in the nest for nearly two weeks in one source and 14 days in the other. I believe that they remained for several days within 200 yards of the nesting site, though I couldn't prove it by producing the young. The adult parent was seen near by on the 26th and the 28th. (Saw 2 Least Flycatchers 75-100 yards from nest Aug. 2, 1934)

Behavior of the Birds.

1. Calls.

The adult birds gave several types of calls during the period of observation. The chebec call was given very sparingly being heard on only a few occasions, and these being heard mainly during incubation given by the male from a near by tree while the female was setting on the nest.

The most common call was a sharp "whit," sometimes repeated several times. This call was given very sparingly during incubation but was quite commonly heard after the nestlings had arrived. It was given when the nest was disturbed or intruders caused alarm.

Another utterance of the bird was one given when the nest was approached with food. It consisted of a subdued twitter, seemingly held back in the throat. The young would respond to this note by craning their necks.

The young were first noted to produce sound when they were 8 days old. The sound was a weak little "chip." This call was apparently prompted by hunger or

*. Forbush E.H., Birds of Massachusetts and other New England States.
Roberts T.H., Birds of Minnesota.

discomfort.

II. Food Procurement and Feeding of Young.

The food of the Least Flycatcher is, as far as my observations were concerned, and as far as the observations of others have found, almost entirely of insects. It was very difficult to see the exact type of insect being fed to the young as often the exchange was too speedy or the view was hidden. However, I did see the following orders of insects represented.- Diptera Coleoptera, Lepidoptera, Orthoptera and Ephemerida, although undoubtably other orders furnished their representatives.

Evidence pointed to the fact that the Least Flycatcher gets food from the leaves and ground as well as from the air, since there was included in the menue a cricket, and several green larvae.

As stated before, I did not observe the female feeding or being fed during incubation. After the hatching, both adults shared in the feeding of the young. At first, I believe that the male did the most of the food getting as I found him bringing food to the female as she hovered the young, and she would take it and either give it to the little nestlings or eat it herself. When she fed it to the young she would

first mull it around in her mouth to crush it before passing it to the nestling. After the young were a few days old the female did not have to remain at the nest, and then she seemed to exceed the male in food procurement. (However, my identifications of sex in the parents was quite uncertain and is open to much error) After the nestlings were several days old the adults would come and go bringing food, and as a rule ~~the~~ if one was sitting on the edge of the nest it would leave on the approach of the mate. Lingering of the adults after a feeding was common but not prolonged longer than a few minutes.

The actual act of feeding was done in the ordinary Passerine way. The young would stretch up their necks and open wide their mouths at the approach of a parent and the adult would then place the morsel into the open mouth and at times pick at it to turn it around if it was especially large, to make an easier ingress of the morsel. The adults were observed to pause momentarily before feeding after alighting on the edge of the nest as though considering which should get the food but it is unlikely that this was the reason.

As near as my observations showed the parents maintained no regular schedule of feeding. That is, they would feed quite often during one period of one day and be very irregular at the same time the next day (See Feeding Chart #V) The nestlings were not fed in rotation but more or less by the law of averages. One might be fed two or three

times in a row and then be missed a time or two.

III Sanitation in the Nest.

This item was cared for in several ways depending on the age of the nestling. In the beginning the excrement was removed on the average of once to every 2(+) feedings. This ratio became farther apart as the young aged. At first the male took most of the excrement. The procedure was as follows. The young one was fed and then the male or sometimes female would pick at some spot at the posterior end of the nestling and generally get a response consisting of a tilting upward of the posterior end and the voiding of the excretion. This was taken in the bill of the adult and immediately swallowed. After the first five days the proceedure was slightly altered. The young did not need stimulation aside from being given food. During this period there was about 3½ feedings to every removal of excrement. The adults stopped eating the excreta when the young were 7-8 days old and after that time they merely carried it away and presumably dropped it nearby. The adult had to be quite adept at the task of catching the feces when the young

were quite large, as they ~~were~~ dropped the wastes over the side of the nest and the adult had to reach far over and snatch the excrement from the air. The folly of it all was seen in the case of the nestling which sat out on the limb. The parents insisted on following the same procedure on it as in the nestlings even though there was no danger of unsanitary conditions developing from dropping the feces.

See Table # V

IV Miscellaneous Items of Interest.

There were several interesting behaviors displayed by these birds, especially the adult birds.

On one occasion, when the young were 5 days old, a may beetle was placed in the nest at about 7:30. The female tried to remove it but failed and the male ~~and~~ appeared and also tried, emitting a "Peek". However the beetle would not budge and finally the female appeared and settled on the nest for the night.

On another occasion, when the nestlings were about a week old, Mr. Hinds gave me a young Cedar Waxwing to board in the nest. It was only a few days younger and a bit larger than the Flycatchers. The morning after

its introduction it was gone, probably removed by the parents and destroyed by the ground rodents.

Another interesting feature was the action of the female on a warm afternoon. She sat on the sunny side of the nest with her back to the sun and held her wings akimbo, acting as a sunshade for the young.

The action of the nestling that sat on the limb for so long was interesting but seemed to indicate dumbness more than any thing.

When the young were 2 days old the female was hovering them and the male was doing most of the feeding. On one occasion he returned to the nest, gave the female a morsel. He sat on the edge of the nest a bit, looking critically at every detail of it and uttering a chickering call, and finally he placed one foot on the back of the female, cocked his head to the side and looked down at her with a most affectionate expression. He then left and the female raised up and fed a nestling.

The awakening of the bird was observed on two occasions. At about 4:30 P.M. the female would begin to squirm on the nest. The nestlings also would begin to move about. Finally, on one occasion she left voluntarily at 5:06 and on another occasion the male appeared at 5:00 P.M. with an insect and the female left. The time at which the female went on the nest in the evening was 8:45-9:00 P.M.

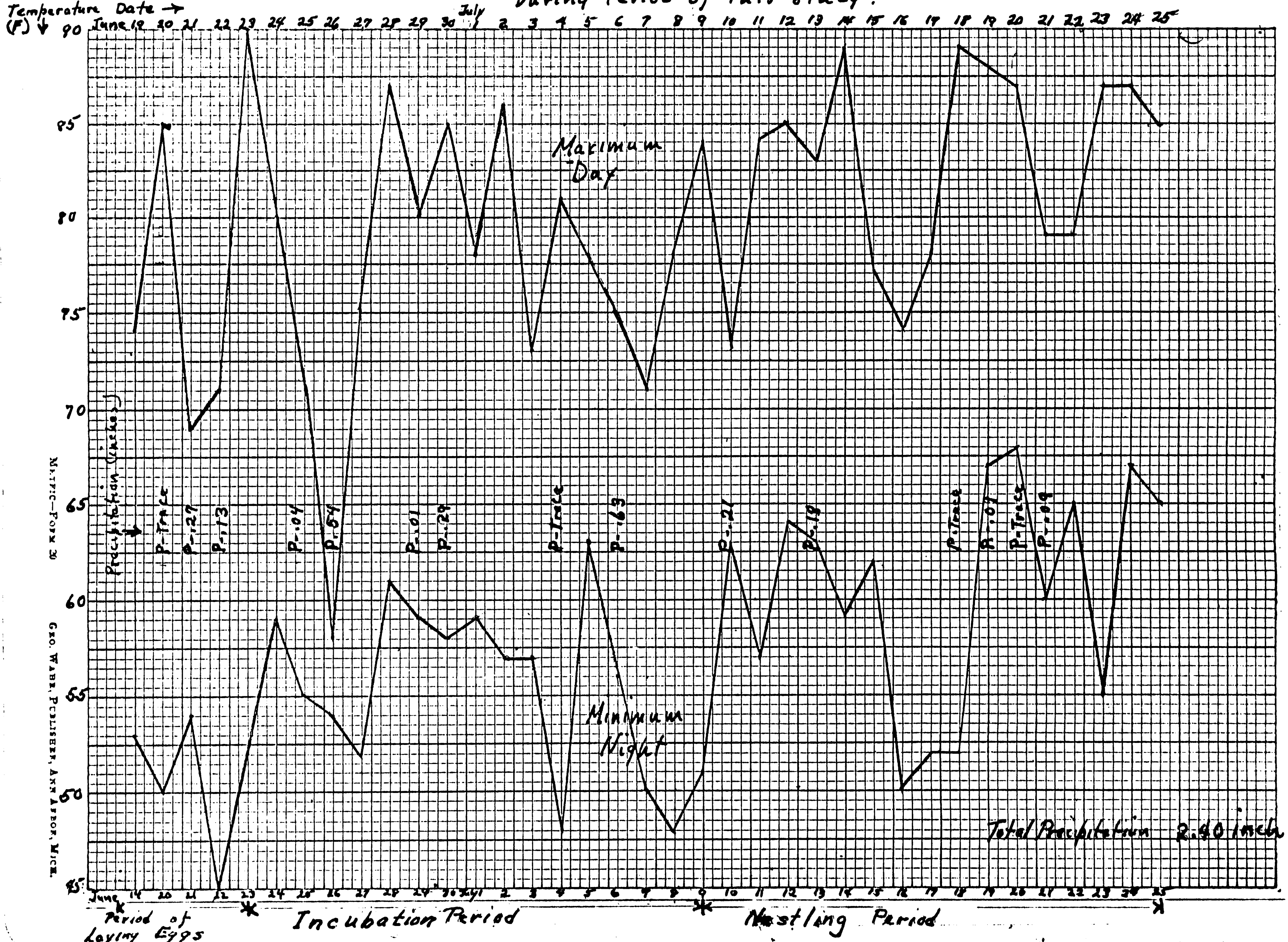
Conclusion

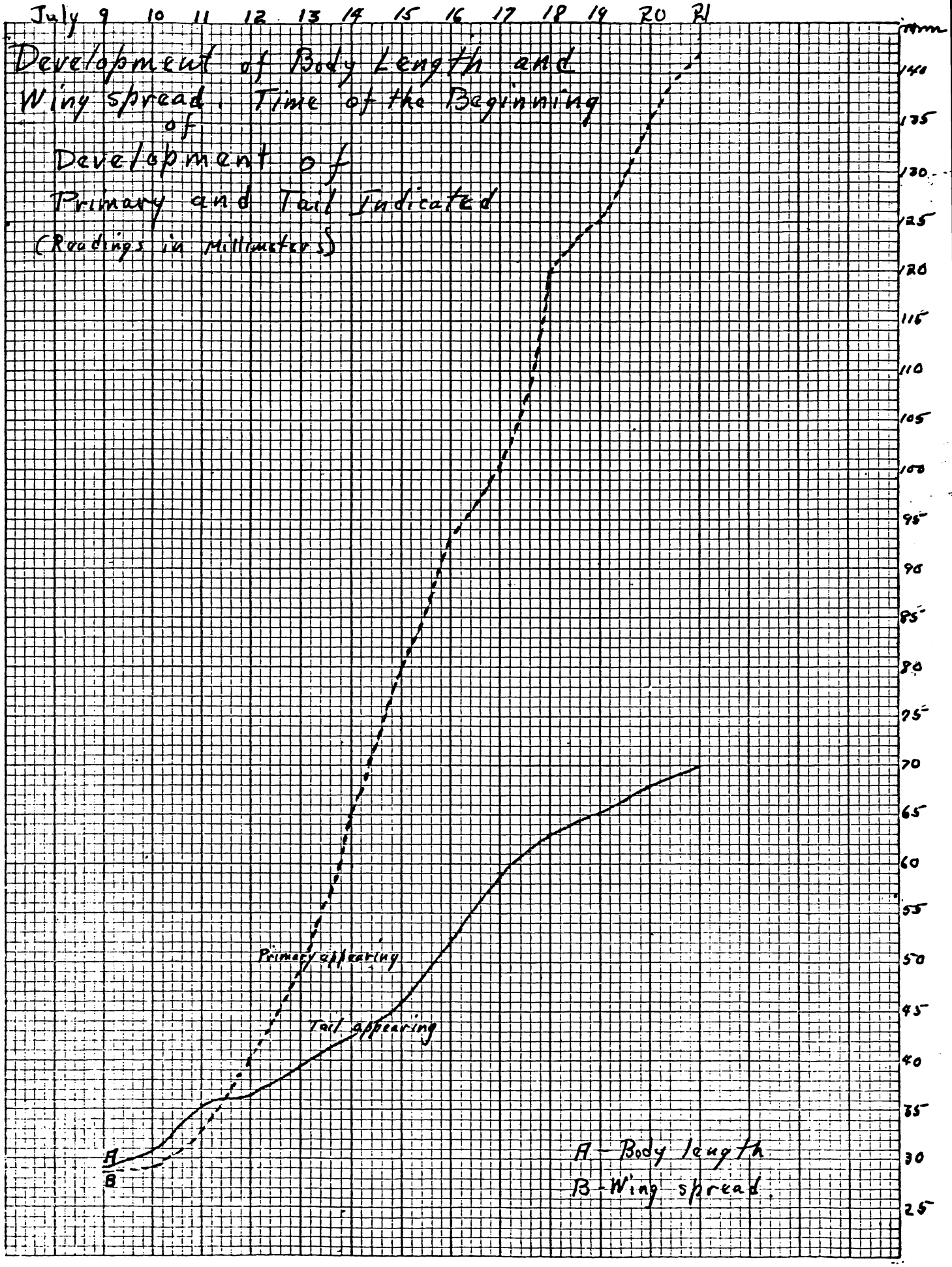
This study was very interesting to the observer and opened his eyes to several new ideas about birds. It also proved to be valuable practice in observation and bird measurement. However, I cannot say that the study is of much scientific value for the following reasons.

1. Too few nests observed.
2. Times observed too few.
3. Hours of observation not planned well enough.
4. Measurements inaccurate because of inexperience of measurer
5. Observer's failure to know what to look for.
6. Inability of observer to be present at the blind during crucial moments, such as hatching and departure of the young.

PLATE I

Maximum Day and Minimum Night Temperatures During Period of this Study.

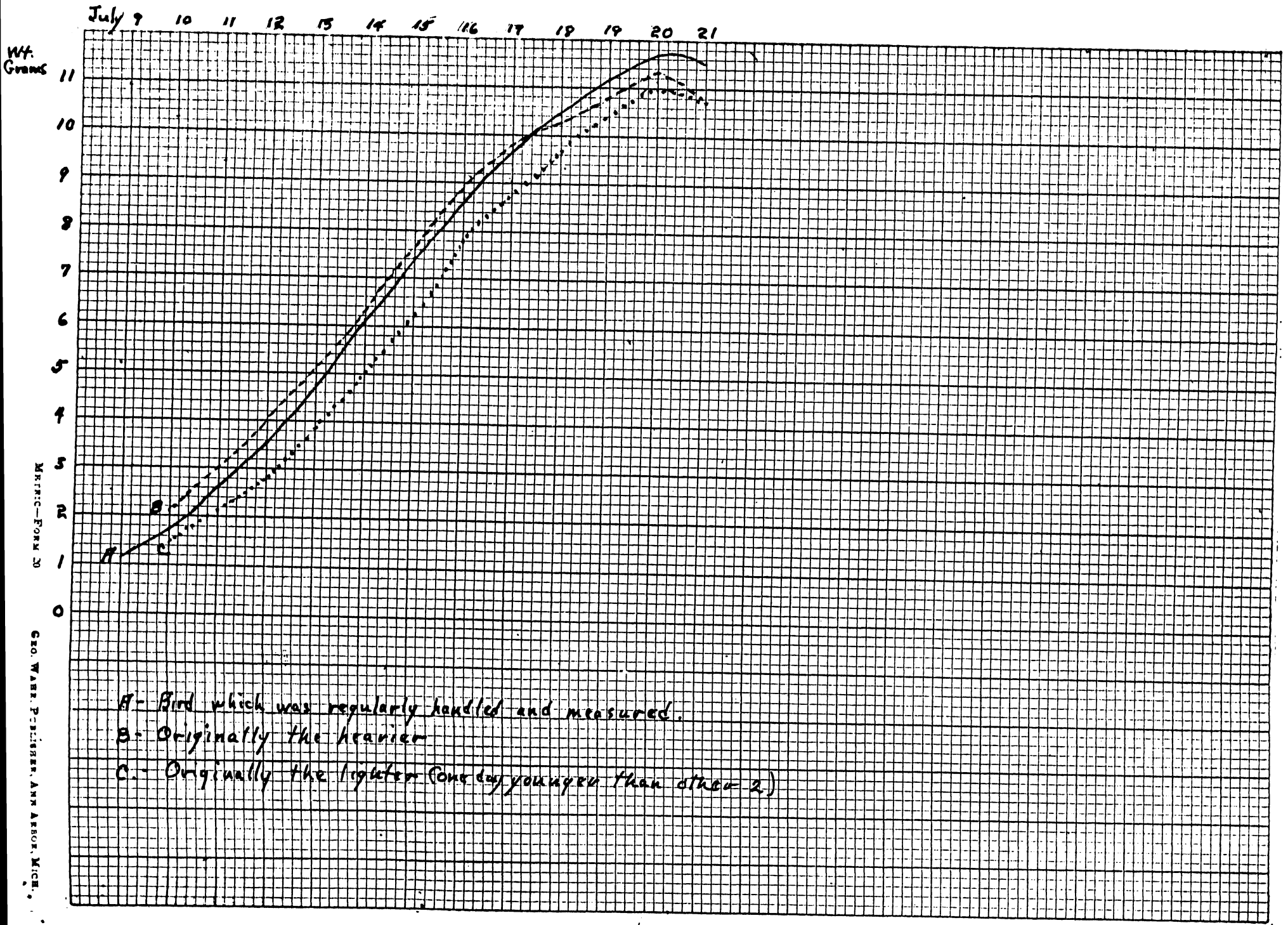




METRIC—FORM 20 GEO. WAHR, PUBLISHER, ANN ARBOR, MICH.

Development in weight

PLATE # III



A- Bird which was regularly handled and measured.

B- Originally the heavier

C- Originally the lighter (one day younger than other 2)

MERRIC—FORM 20 GEO. WAHR, PUBLISHER, ANN ARBOR, MICH.

TABLE # IV

DAILY DEVELOPMENT OF NESTLING LEAST FLYCATCHER

Douglas Lake Michigan July 1934 L.L. Bowman

	7/9/34	7/10/34	7/11/34	7/12/34	7/13/34	7/14/34	7/15/34	7/16/34	7/17/34	7/18/34	7/19/34	7/20/34	7/21/34
	gr	gr	gr	gr	gr	gr	gr	gr	gr	gr	gr	gr	gr
Weight	1.13	1.76	2.63	3.55	4.78	6.15	7.4	8.15	9.67	10.44	11.18	11.67	11.57
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
Length	29mm	31	35.5	36.5	39.5	45	46	52.5	59	63	65	68	70
Tail	—	—	—	—	—	3 pin	2.0	3	4	5	6.5	8.1	12
Bill	3.5mm	4	4.5	5.6	6	6.5	6.5	6.7	7.5	7.5	8.5	8.5	8.7
Bill-Eye	6	7	8	8.8	9.8	10.2	10.8	11	12	13.3	13	14	14.9
Bill-Gape	5	5.5	6	7.8	8.0	9	9.9	10.7	10.8	11.2	12	12.5	13
Bill Nostril	1.6	2	2	2	2.2	3	3	3.4	4	4	5	5.0	5
Eye Diameter	6.5	5.8	5.6	6	7	5	5	5	5	5.2	5.3	5.1	6
Extent	28.5	29	33	40.2	50	65	80	93	100	120	125	135	142
Wing Right	11.7	10.8	12	13.8	18	20	23.4	31	39	43	50	56	59
Primary	—	—	—	—	3 pin	1.8	4.5	6	9	11	17.2	29	21
Foot Body	11	12	15	17.5	19.5	35.5	38.7	40.2	43.5	47.2	49.5	51.5	53
Tarsus-Toe	9.5	11.2	12.5	14	16.5	19	21.5	22	24.3	26.5	28.5	28.5	30
Foot	5	6	5.5	6.8	8	10	9.5	11	11	10.6	12.5	13	13
Right Foot													
Toe	3½	3½	4	4.2	5.2	6.2	7	7	7.5	8.1	8	8.1	8.1
1. Nail		1.3	1	1.2	1.6	1.6	1.8	2	2.2	2.8	2.4	2.6	3
Toe	3.5	4	5	6	6.8	6.9	8.2	9	9.5	9	9	10	10.5
2 Nail	1.5	1.4	1.5	2	2	2.1	2.3	2.3	2.6	3	3.5	3.5	4
Toe		3.8	4	4.2	5.5	5.5	6.5	6.5	6.8	6.8	7	8	7.5
3 Nail		1.4	1	1.2	1.8	2	2.0	2	2.3	2.3	2.5	3	3
Toe		2.5	4	5	6.2	6.5	7.5	8	8.3	8.5	8.5	10	10.2
4. Nail		1.3	1.5	2	2.5	2.2	2.4	3	3.2	3.8	4.5	4.5	4.8