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NOTES ON THE DEVELOPMENT OF YOUNG SCREECH OWLS

WITH FIVE ILLUSTRATIONS

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ON MAY 23, 1925, a female Southern California Screech Owl (*Otus asio quercinus*) and her brood of three young were discovered in a cavity about fifteen feet up in a rather small sycamore (*Platanus racemosa*) at Claremont, California (fig. 86). The entire family received bands, and although none of the youngsters has as yet been retaken, the old bird, no. 290928, was found at home on February 6, 1926. On May 28 of the same year another brood of three was banded; and the adult was still using the same cavity when visited the following February, 1927. By March 31, 1927, there was one egg, and when visited April 14 the nest contained a set of four which was moderately incubated. Two weeks later the eggs were upon the point of hatching, and as the object of this study was to observe the development of the young birds, a visit was made every other day throughout their nest life. The following report upon this family has been condensed from my field notes.

April 14, 1927. Female sitting upon four moderately incubated eggs. Weights of eggs (in grams): 19.9, 19.8, 19.0, 20.0.

May 1. Female in nest. Weights of eggs (in same order as above): 18.1, 17.8, 17.1, 18.1. The first and third are pipping.

May 3. Female present. Conditions unchanged except for a few more cracks in one of the eggs, inside of which the bird can be heard moving.

May 5. Female in nest. Three young hatched and about 2¼ inches long. Fourth egg unhatched. Weights: No. 295321, 23.6; no. 295320, 21.5; no. 295319, 20.7; no. 295318 (unhatched), 17.8.

May 7. Female covering the young. Eyes not yet open. "Egg tooth" prominent. Bill and claws bluish-gray. The youngsters whimper continually, and for the most part lie prone upon the ground. When placed upon the scale pan, however, they are able to stand up, although somewhat weakly. The first three to hatch are now about 3¾ inches in length, the fourth being 2¼ inches. Weights: No. 295321, 36.2; no. 295320, 36.3; no. 295319, 33.9; no. 295318, 19.3.

May 9. Female present. General behavior of the young as before, as well as color of soft parts. Down is about ¾ inch in length. (See fig. 87.) A headless young Brewer Blackbird (*Euphagus cyanocephalus*) in the nest. Weights: No. 295321, 48.8; no. 295320, 51.2; no. 295319, 47.1; no. 295318, 26.3.

May 11. Adult in nest. When first taken from the cavity, all four young snap their beaks after the manner of the parent. Egg tooth no longer present on two of the birds and dropped off when touched in the case of the others. Length of first three about 3¾ inches, the fourth being 3 inches. Weights: No. 295321, 65.4; no.

295320, 63.9; no. 295319, 57.6; no. 295318, 32.4. No. 295319 has eyes partly open, and when touched on the bill it feebly bites at the proffered finger. However, although it can stand up to its full height, and move forward a few steps, the ability to distinguish objects seems lacking.

May 13. Female present, but contrary to her usual custom offered no resistance. The weather is warm, and in order to escape the heat she has squeezed behind an upthrust piece of wood which separates her from the young. The eyes of the first three young are now open and the panting youngsters make strenuous efforts to escape when exposed to the hot sun. Weights: No. 295321, 83.6; no. 295320, 78.2; no. 295319, 73.0; no. 295318, 46.5. Lengths, in same order: $4\frac{3}{8}$, $4\frac{1}{2}$, $4\frac{1}{2}$, and $3\frac{1}{2}$ inches.



Fig. 86. HOME SITE OF THE FAMILY OF SOUTHERN CALIFORNIA SCREECH OWLS WHICH WERE MADE SUBJECTS OF THE STUDY DETAILED IN THE ACCOMPANYING TEXT.

May 15. Nest visited at dusk. Young very quiet, like so many inanimate lumps, in contrast to their lively behavior at the previous visit, when exposed to the hot sunlight. Weights: No. 295321, 87.2; no. 295320, 101.7; no. 295319, 81.9; no. 295318, 67.5. Both adults were flying about in the tree, and while weighing the young I

was struck several times on the top of the head as they swooped by. These hostilities were for a while without any harmful results; but as I was returning the youngsters to the nest, one of the old birds, presumably the female, struck me on the chest, and after fluttering down to my knees, flew to a nearby branch and prepared for another onslaught. By this time the light had become so dim that it was impossible to evade these attacks, and after receiving the next blow squarely in the eye, it seemed advisable to retreat before the consequences became serious.

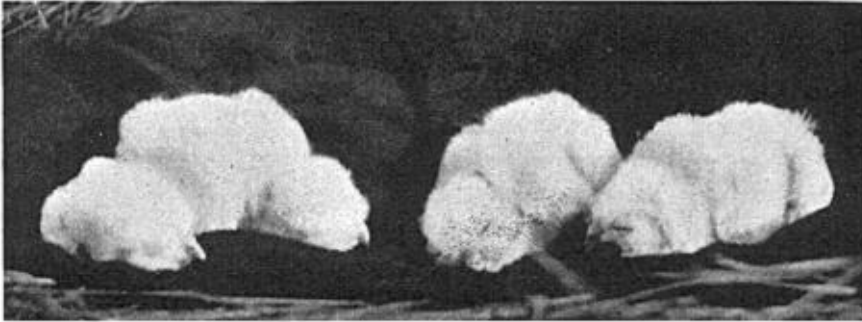


Fig. 87. YOUNG OF SOUTHERN CALIFORNIA SCREECH OWL IN CHARACTERISTIC POSE WHEN THREE TO FIVE DAYS OLD.

May 17. Female in nest as usual. The young are quiet, since the heat is not great. No. 295319 hoots feebly, in a tone similar to that of the adult, but the rest are silent. Weights: No. 295321, 95.8; no. 295320, 93.5; no. 295319, 86.5; no. 295318, 68.7. Lengths, in same order: $4\frac{3}{4}$, $4\frac{3}{4}$, $4\frac{3}{4}$, and 4 inches.



Fig. 88. YOUNG OF SOUTHERN CALIFORNIA SCREECH OWL IN PUFFED-OUT POSE WHEN SOME FOUR WEEKS OLD.

May 19. Adult present. All four young snap their beaks when handled, and can stand up and look about; but as yet they make no definite efforts to escape. Weights: No. 295321, 110.0; no. 295320, 111.7; no. 295319, 107.5; no. 295318, 92.3. Lengths, in same order: 5, 5, $5\frac{1}{4}$, and $4\frac{1}{4}$ inches. No. 295319 hoots continually and

is the most aggressive of the four. When a finger is advanced, it sways from side to side with wide-open eyes and snapping bill, after the manner of the adults. The eyes of no. 295318 are just opening, and are as yet mere slits.

May 21. A headless young Brewer Blackbird, one-half grown, in the nest, but the adult owl is absent. All four young snap their bills as soon as my hand enters the cavity, but when on the ground no effort is made to crawl away, and when not disturbed they lie motionless wherever laid. Beaks gray, becoming lighter toward the tips; claws slaty-gray, becoming blackish at the points. Weights: No. 295321, 111.2; no. 295320, 105.3; no. 295319, 103; no. 295318, 78.2. Lengths, in same order: $5\frac{1}{4}$, $5\frac{1}{4}$, $5\frac{1}{4}$, and $4\frac{3}{4}$ inches. No. 295319 is more aggressive than ever, and squawks continually. Eyes of no. 295318 not yet widely open.



Fig. 89. YOUNG SOUTHERN CALIFORNIA SCREECH OWL, WITH TIGHTLY COMPRESSED PLUMAGE WHEN FRIGHTENED BY PASSING TRUCK. SHOWS ALSO WEIGHING APPARATUS.

A comparison of the above figures with those of the previous visit shows a failure to increase in weight which is quite unaccountable. Although all seem perfectly healthy, only no. 295321 has gained at all, and this to a negligible degree, while the other three youngsters have actually lost, to an extent which varies from four percent in no. 295319 to fifteen percent in the case of no. 295318.

May 23. From this time on, the adult is no longer found in the nest. Weights: No. 295321, 112.1; no. 295320, 105.3; no. 295319, 107.2; no. 295318, 78.9. No. 295319 is more aggressive and noisy than ever, biting at my fingers and shrinking back with open beak when touched. Conditions with regard to weights much as before except that no. 295319 has commenced to gain.

May 25. Like the adult, these young owls defecate copiously when handled,

probably from nervous excitement. Claws now a dark slate color. Weights: No. 295321, 132.9; no. 295320, 102.2; no. 295319, 137.3; no. 295318, 101.5. When set down in the grass no. 295320 made for cover. No. 295319 increasingly vigorous, but still harmless. No. 295318 snaps bill but is less obstreperous than the others. With the exception of no. 295320 all show a marked increase in weight.

May 27. While one of the youngsters was being photographed the remaining three crawled into the dry grass, and although none traveled over four feet, they were all completely hidden. Weights: No. 295321, 138.4; no. 295320, 117.9; no. 295319, 124.1; no. 295318, 110.5. Examination of these weights shows a decline for no. 295319, although the others, including no. 295320, are upon the increase.

May 29. A headless immature House Finch (*Carpodacus mexicanus frontalis*) found in the nest; also an adult female of the same species, with the brain eaten away. Weights: No. 295321, 143.5; no. 295320, 126.9; no. 295319, 128.5; no. 295318, 123.9. No. 295319 attacks my outstretched finger pugnaciously, using beak but neither wings nor feet. Hoots as before, swaying from side to side with wings outspread. When placed on the sunlit road it hopped and flapped energetically for shelter. All four birds are once more gaining weight.

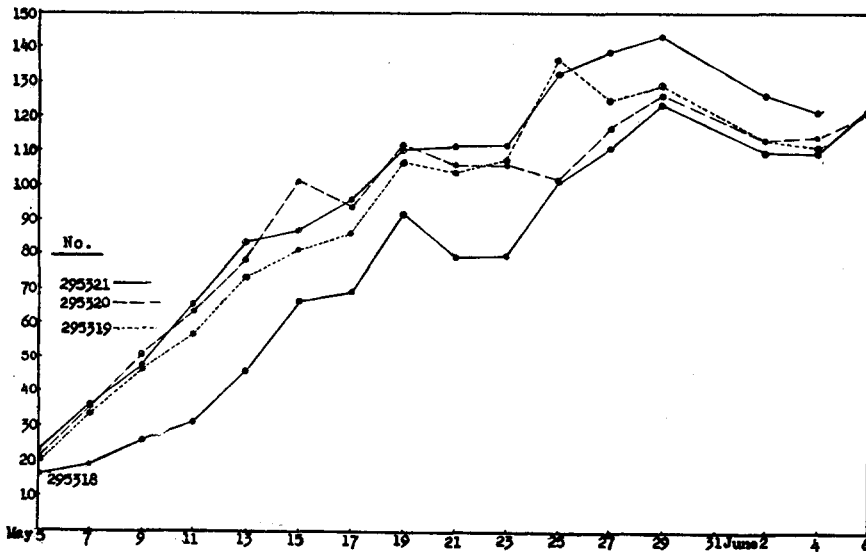


Fig. 90. GRAPH SHOWING FLUCTUATIONS OF WEIGHTS (IN GRAMS) OF YOUNG SOUTHERN CALIFORNIA SCREECH OWLS WITH ADVANCING AGE.

May 31. No visit made.

June 2. Two of the youngsters had climbed up the sides of the cavity past the entrance, and were some three feet from the bottom of the nest. When disturbed in any way these birds puff out their feathers, giving them a deceptively bulky appearance, as illustrated in figure 88. Figure 89 shows no. 295321 when startled by a passing truck. At the unaccustomed sound every feather has relaxed, causing the bird to appear much thinner than usual. Weights: No. 295321, 126.1; no. 295320, 113.9; no. 295319, 113.3; no. 295318, 109.2.

June 4. This time all the youngsters except no. 295321 were found clinging above the nest opening. The birds can still be handled with safety, although there is a definite tendency to use beak and claws for defense. Weights: No. 295321, 122.2; no. 295320, 114.3; no. 295319, 111.7; no. 295318, 109.5. Nos. 295321 and 295319 show a loss of weight, while the other two have not gained appreciably.

June 6. Nos. 295321 and 295319 no longer present. No. 295318 hooted for the first time, and in a weak, wheezy tone. When fighting it lies upon its back and

uses its claws, which can inflict considerable pain, although unable to draw blood. Both birds show a considerable gain since the preceding visit. Weights: No. 295320, 121.7; no. 295318, 122.8.

After this the nest was not visited again, but for more than a week the old birds could be heard after dark, calling back and forth in the vicinity.

In closing, two features seem to deserve special mention. One is the fact that after the eggs had first begun to pip, more than three days elapsed before the time of hatching. The other is the unaccountable fluctuation in the weights of the youngsters, as illustrated by the graph (fig. 90). A similar, although less pronounced, variation has been observed by the writer in the development of young golden eagles, but it is not possible to draw conclusions regarding its significance without further data.

Pomona College, Claremont, California, January 28, 1928.