

NOTES ON THE GROWTH AND BEHAVIOR OF YOUNG
GOLDEN EAGLES.

BY E. L. SUMNER, JR.

(Plates VII-X).

ON April 26, 1925, a nest of the Golden Eagle (*Aquila chrysaetos*), containing two young, was discovered in a ninety foot sycamore (*Platanus racemosa*) growing in hilly pasture land of the eastern part of Los Angeles County, California. Frowning cliffs and lofty mountain heights have no part in the landscape of this region, where the gently undulating hills are treeless save for scattering patches of oaks (*Quercus agrifolia*) and the straggling lines of sycamores which rise from the canyon bottoms and mark the water courses. Rather is it a land of Buzzards and ground squirrels; and the great pile of sticks which stood up against the horizon some sixty feet from the ground seemed strangely out of place amid these unromantic surroundings.

Numbers 237542 and 237543 were placed on the young birds, and constitute the first banding record for this species in the files of the Biological Survey. The young Eagles were covered with a down which varied from a quarter to a half inch in length, and through which the dark wing-feathers were pushing their way, giving the birds a somewhat spotted appearance. Both adults were perched in the vicinity upon our arrival, but showed the characteristic unconcern of these birds by silently slipping away, not to reappear during our stay.

On February 18 of the following year the female flushed from a set of two practically fresh eggs, now in the collection of the writer, but the next year the unusual happened, and on February 27, 1927 the nest was found to contain *three* eggs, whose incubation was judged to be one week. These were undisturbed, and from this time on a visit was made each Sunday, at which time the weights of our subjects were recorded, and photographs taken, in addition to as many notes of interest regarding their development as the scant time available permitted. The following report has been condensed from my weekly notes, the individual identity of the



YOUNG GOLDEN EAGLES IN NEST APRIL 26, 1925.

young birds being maintained by bands which were changed each week to accommodate growth.

February 27, 1927. The female flushed from three eggs at a distance of 100 feet, showing in her reluctance to leave, less than her usual wariness. She disappeared immediately, not to be seen again that day. Weights of eggs (in grams):

No. 465252	No. 465251	No. 3
143.0	143.4	133.7

March 20, 1927. Female flushed at 225 feet; male observed circling about, a quarter of a mile to the south. Both departed, not to return while we were there. A very audible chirping sound came from the nest at regular intervals.

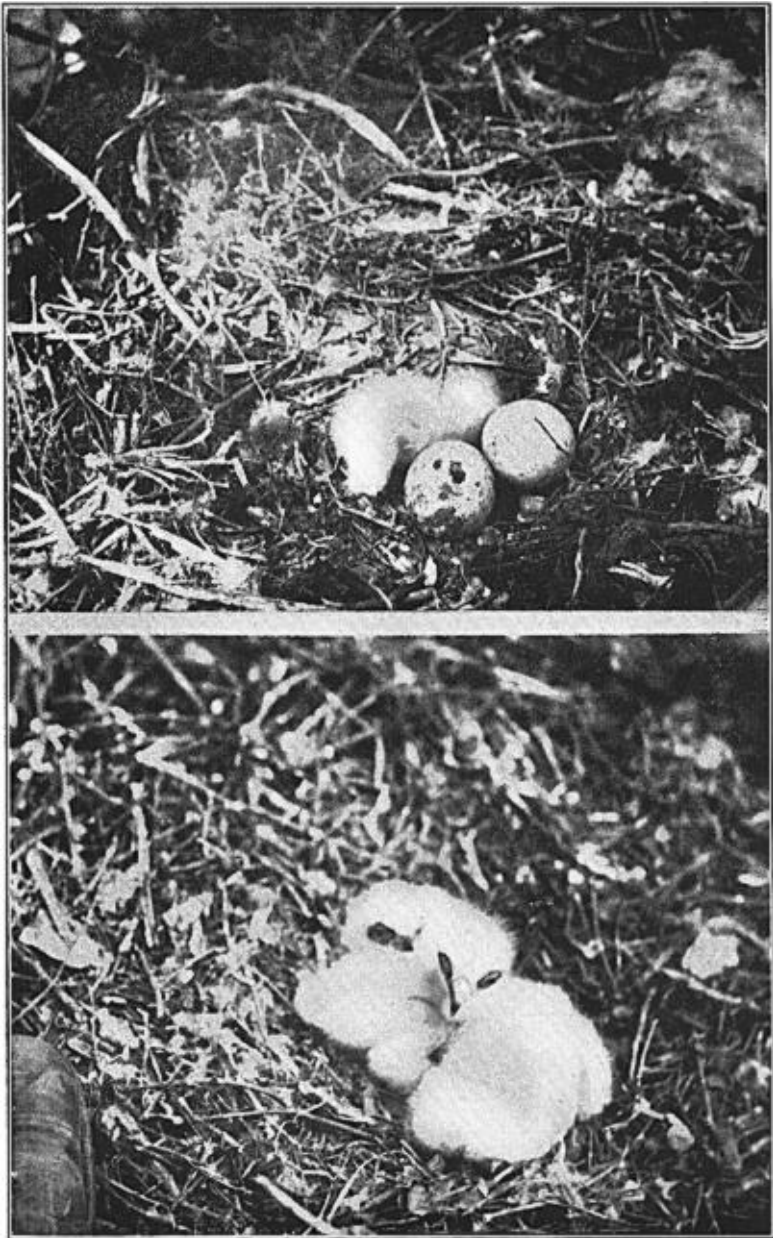
No. 465252 just hatched; weight of chick 105.0. Iris cloudy brown; eyes not fully open. Bill black, with hook not very prominent; "egg tooth" very noticeable. Skin around base of bill yellow. Feet and legs yellowish flesh-color; claws slightly paler. Down of two lengths: a thick dirty white covering about one-half inch in length overlaid by a scantier and somewhat longer growth. Bird unable to distinguish objects, and chirps incessantly.

No. 465251 on the point of hatching; a hole in the side of the egg through which the head of the chick can be seen. This bird also chirps, but less frequently. Weight 128.6.

No. 3 silent. Weight 126.2.

A headless ground squirrel (*Citellus beecheyi fisheri*) in the nest. Shell of first chick had been removed and fragments were picked up beneath the tree.

March 27, 1927. Age one week. Female flushed at 450 feet, and flew over the nest twice, at a considerable height, before leaving. All three young hatched and able to take notice of moving objects. Even when I am eleven feet above the nest they stretch their necks forward, chirp for food, and follow my movements with open bills. When a finger is offered to them their cries become more vigorous and feeble attempts are made to bite it, while small bits of ground-squirrel meat are eagerly swallowed. The posterior half of a freshly killed Crow in the nest, as well as the older remains of three ground-squirrels, some of them



YOUNG GOLDEN EAGLES.

UPPER: MARCH 20, 1927; JUST HATCHING.

LOWER: MARCH 27; ONE WEEK OLD.

decayed and full of maggots. The two halves of the third egg shell, which were picked up on the ground below, show that the line of cleavage occurs at the greatest diameter of the egg.

Although made as large as possible the previous week, the band on the largest bird, number 465252, is now so tight as to cause a noticeable swelling of the foot. A larger size substituted, and the inflammation much reduced in half an hour. Iris, skin at base of bill, and feet, as before, but claws are grayish, becoming darker at the tips. Chirps only when disturbed. When looking about, this bird can stand upon its tarso-metatarsus and stretch its neck to the fullest extent.

	No. 465252	No. 465251	No. 3
Weight.....	357.3	232.3	98.2
Length.....	8 in.	6½ in.	4¼ in.

April 3, 1927. Age two weeks. Behavior of female as before. Only the first two chicks now present, the fate of the smallest being left to conjecture. The day is damp and cloudy, and when lowered to the ground for more careful study both evidently feel the cold. They chirp continually, and while No. 465252 remains wherever put, the smaller chick refuses to keep still for any length of time, and persists in crawling away. Egg tooth less conspicuous, owing to increased size of bill. Color of soft parts as before, except that claws are darker.

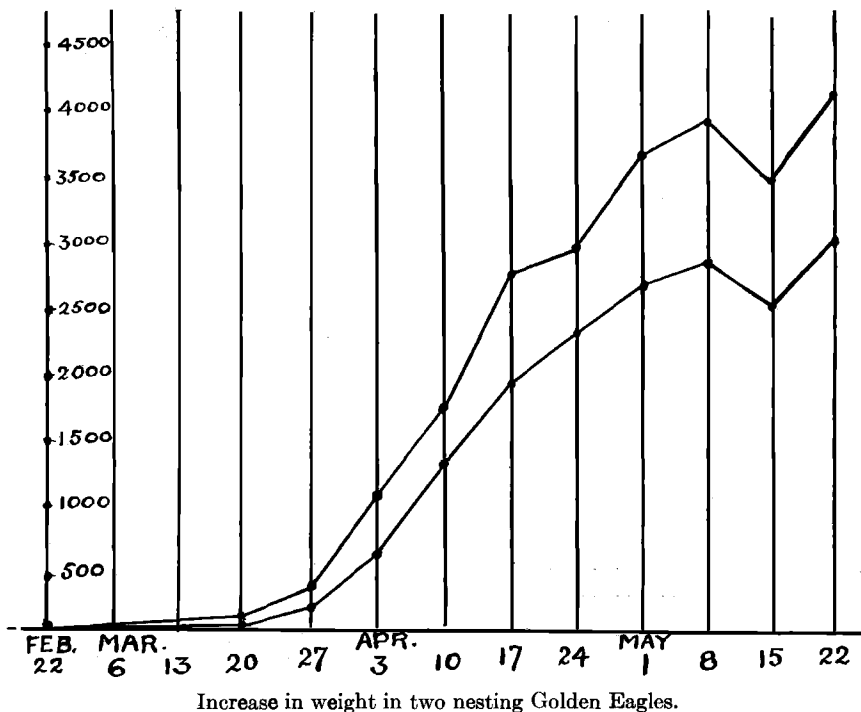
	No. 465252	No. 465251
Weight.....	1022.7	584.7
Length	12 in.	8.5 in.

No. 465252—A few primary pin feathers faintly showing through the skin. Chirps in a much deeper tone than other bird. Band found to have chafed enough to draw blood, but foot apparently uninjured.

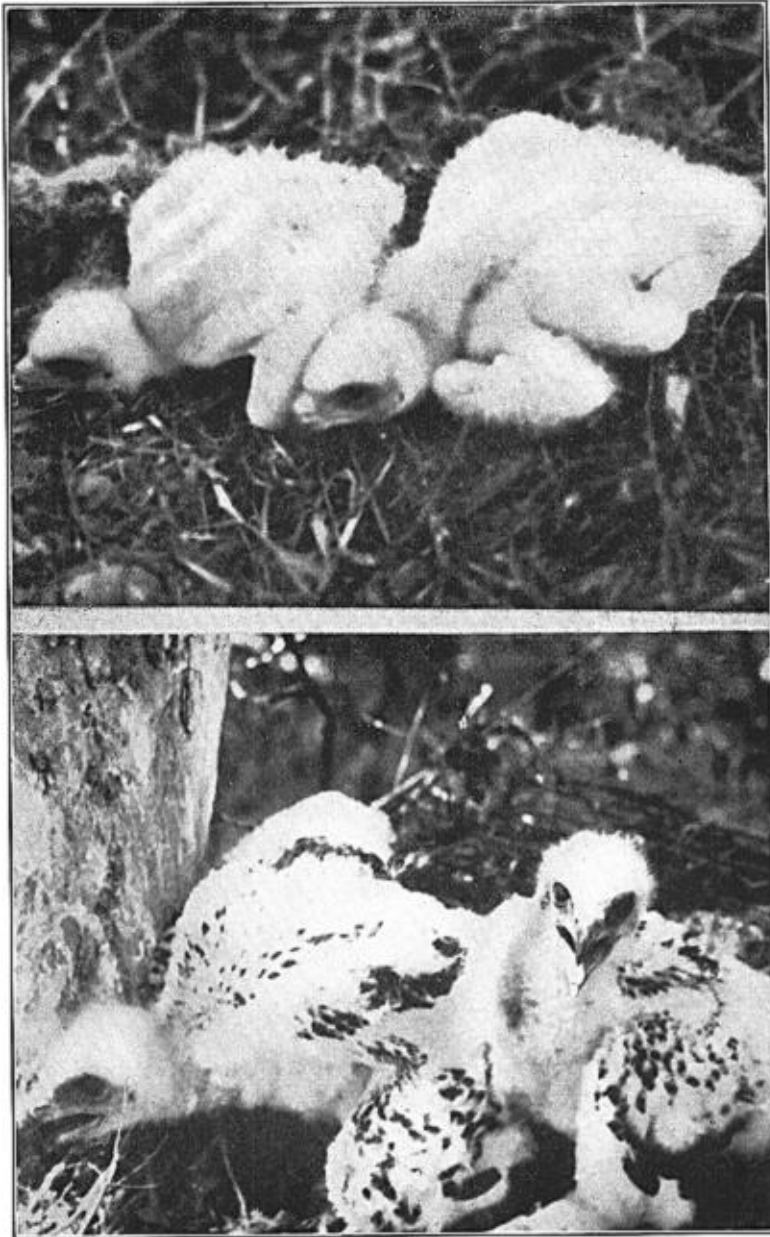
A fresh supply of green material, chiefly weeds, always present in the nest. When venting their excreta, the young turn their backs to the edge of the nest and discharge to a distance of seven feet clear of the edge, the ground and foliage beneath being spattered on all sides. The feathers of a Meadowlark (*Sturnella neglecta*) observed, as well as the usual remains of ground-squirrels.

April 10, 1927. Age three weeks. Female flushed from a

nearby fence post, disappearing as usual. The morning began in fitful sunlight, but when I was half way up the tree rain commenced to fall, and continued steadily for most of the day and all that evening. Both youngsters rear up with open beaks in feeble menace when I climb over the edge of the nest, but soon settle down, remaining silent and motionless when undisturbed. The thick covering of down seems fairly adequate to shed the



rain, which is coming down quite hard, but it seems probable that the parent would furnish additional protection if we were not present. As soon as they are set down, both birds chirp and run to the opposite edge of the nest from me, making photography difficult, especially since they refuse to remain facing my direction, and the rain prevents anything but hurried work. Claws black; budding wing-feathers about a quarter inch long.



YOUNG GOLDEN EAGLES.

UPPER: APRIL 3; TWO WEEKS OLD.

LOWER: APRIL 24; FIVE WEEKS OLD.

	No. 465252	No. 465251
Weight.....	1662.4	1272.7
Length	13 in.	10.2 in.

A piece of ground-squirrel, and part of a cottontail (*Sylvilagus audubonii sanctidiegi*) in the nest, but decaying remains of previous kills no longer present.

April 17, 1927. Age four weeks. As we were arriving the adult appeared from the north and flew to within 300 feet of us before leaving. Five minutes later she came back, flying straight for the nest and carrying a branch of green oak leaves, some of which are found in the nest at every visit. When about 200 feet away, however, she again caught sight of us, dropped the branch, and flew away, not to be seen again.

The second and smaller youngster is much the more lively and aggressive. When I climb over the nest it rears up and waddles toward me hissing, with open beak and wings upraised. The larger bird, on the contrary, lies quietly in the nest, offering resistance only when handled. Both struggle and chirp vigorously when picked up, but although their claws and feet are, for the size of the birds, enormous, they are harmless and incapable of doing injury. As the bill continues to grow, the egg-tooth becomes less and less noticeable, and is now but an insignificant excrescence. The wing quills are now two inches long, of which a half inch has burst from the sheath.

	No. 465252	No. 465251
Weight.....	2668.8	1880.9
Total length	17 in.	14.5 in.
Total wing spread.....	34 in.	26 in.
length of hind claw.....	1¼ in.	1½ in.

Remains of several ground-squirrels in the nest, the top of which is gradually becoming flattened and packed down.

April 24, 1927. Age five weeks. Female seen only for an instant—sailing away. The smaller bird is as usual the aggressive one, advancing with open beak, and feebly striking my feet with up-raised wings, while uttering its hissing gasp. Iris brown; skin at base of bill, and feet, as before, but claws darker. Egg-tooth barely visible. Wing feathers five inches long, two inches of which have burst from the sheath.

	No. 465252	No. 465251
Weight.....	2870.0	2270.0
Total length.....	19 in.	16.5 in.
Total wingspread.....	43 in.	38 in.
Length of tail quills.	2.7 in.	2.5 in.
of which there has burst out 1 in.		$\frac{7}{8}$ in.
Bird very quiet, its few protests often being uttered in a tone much deeper than the original falsetto chirp		Bird obstreperous, but silent except for hissing.

The nest, owing to its position on the crotch, is smaller than the average for this species, being only four feet in diameter; and since our weekly visits were beginning to produce a very evident effect upon the foundations, it was wired securely in place at this time. The usual green material present, as well as the customary ground-squirrel remains.

May 1, 1927. Age six weeks. Adult observed several times flying about. The smaller bird is more hostile than ever, striking feebly with outstretched claws in addition to the hissing and the buffeting of wings. Although usually silent when handled, this bird, when it does protest, shows no change in voice from the first high pitched tone. The larger youngster is as quiet and docile as usual, taking no notice of me except when handled. When aroused it occasionally squeals in its earlier high pitched voice, but usually with the deeper note. Egg-tooth hardly discernible. Iris and soft parts as before. Wing feathers seven inches in length, of which four inches have burst from the sheath.

	No. 465252	No. 465251,
Weight.....	3581.7	2606.7
Total wingspread.....	48 in.	46 in.
Length of tail quills.....	4.5 in.	4 in.
of which there have burst out 2.5 in.		1.5 in.

Green material present as usual, but no food. Although the nest itself is quite clean, with but a slight odor and few flies; the circle of excrement below is now forty feet in diameter and all the immediate leaves and branches are encrusted with white.

May 8, 1927. Age seven weeks. Adults not seen. The smaller eaglet uses its talons occasionally, but may still be handled with perfect safety; the larger youngster is as docile as ever. On



YOUNG GOLDEN EAGLES.

UPPER: MAY 1; SIX WEEKS OLD.

LOWER: MAY 15; EIGHT WEEKS OLD.

being lowered to the ground, both display considerable ability in locomotion, using both wings and legs when retreating into the long grass, but no attempt at flight is made, and when returned to the nest their customary quiescence is resumed. The inefficiency of the disproportionately large feet is well illustrated by the difficulty shown in perching. When placed together on a limb with a diameter of about four inches their grip is too weak to hold them upright for any length of time, and a tumble follows every undue movement.

The birds, although so large, still maintain their usual prone position in the nest when undisturbed. This attitude, so characteristic of young raptors and which is to be observed in many of the photographs, renders them invisible from below, and perhaps there is some measure of protection to be derived from this, as well as the saving of energy.

Egg-tooth no longer visible. Total wingspread 51 inches. Length of primary quills nine inches, of which 5.5 inches have burst out. Length of tail quills six inches, of which three inches have burst.

	No. 465252	No. 465251
Weight.....	3851.7	2801.7
Total length.....	26 in.	24 in.

The nest has become much flattened during the past week, testifying to the increased activity of the young birds, and the surface has become trodden into a litter of pulverized animal and vegetable matter. Very little green material noted, but many pellets of hair, these being observed for the first time, and consequently preserved. For several weeks two pairs of house Finches (*Carpodacus mexicanus frontalis*) have been nesting in the crevices of the under side of the nest.

May 15, 1927. Age eight weeks. Female observed soaring over a nearby hill as we approached. The larger bird is less sluggish than heretofore, occasionally showing resistance, and uttering at times a deep, rasping croak, unlike any sound made previously. Its smaller nest mate has now abandoned the old prone attitude and stands up most of the time, gazing out across the hills. Iris still brown. Skin at base of bill yellowish. Feet yellowish flesh; but claws now jet black.

	No. 465252	No. 465251
Weight.....	3401.7	2441.7
Total wingspread.....	62 in.	53 in.
Length of primary quills.....	11 in.	10 in.
of which there have burst out	7 in.	7 in.
Length of tail quills.....	7 in.	6 in.
of which there have burst out	5 in.	4.5 in.

The above record shows an actual loss in weight on the part of both youngsters from the figures of the preceding week which is quite unaccountable. However, since there is no indication of ill health or weakness it may be due to the increased exercise which the trampled surface of the nest indicates. The usual ground-squirrel remains present.

May 22, 1927. Age nine weeks. Female flew by the nest and was seen no more. The actions and general appearance of the young Eagles are much as before. The chief gain seems to have been one of strength, but they are as devoid of aquiline hauteur and ferocity as ever. Nevertheless, although no such tendency is evinced at present, both should fly during the coming week.

	No. 465252	No. 465251
Weight.....	4061.7	2981.7

Not only has the loss of the previous week been made up, but a considerable increase over the maximum weight of two weeks ago is noted. The posterior portions of two rabbits in the nest.

May 29, 1927.—Tenth Week. When we approached the tree for the last time the adult was seen flying over a hill, but the young were gone, and the nest—empty but for a piece of gopher snake—was trampled so flat as to give it the appearance of long disuse.

In summarizing these observations it might be remarked that not only was the male Eagle never flushed from the nest, but indeed was seldom observed even in the vicinity; a circumstance which indicates that the female does most of the work involved in rearing the young.

An examination of the weekly record of weights brings to light an interesting problem. A comparison of these birds, when last weighed with the only other datum at my command, an adult male which weighed 4169.4, serves to emphasize the lightness of the

smaller bird. However, although the disparity between the two birds may be explained as indicative of a difference in sex, the larger individual being the female, yet there seems to be no adequate explanation for the simultaneous and practically equal loss of weight which occurred during the eighth week, and which in each case was followed by an identical recovery. That this phenomenon has more than a merely individual application, and is based upon some change in the relation of increased exercise to food supply, is indicated by the fact that the same peculiarity has been observed by the writer in the growth of young Screech Owls (*Otus asio quercinus*).

In this experiment the most striking feature is the singular good fortune which has attended every observation. For the first eight weeks each visit seemed to presage disaster. First it was feared that the eggs would be chilled, exposed as they were for so many hours in weather which was usually cold and cloudy. Then, when the young were small, the danger of chilling seemed even more imminent, especially on the occasion when it rained. Again, it was feared that the parents would lose patience at so many visits and desert; and once, when the youngsters had begun to run about on the ground, and continued to stagger about aimlessly when returned to the nest, it seemed likely that they would walk blindly over the edge.

In addition to this good fortune there has been much else to be grateful for, particularly the generosity of Wright M. Pierce in furnishing part of the equipment.

*Pomona College, Claremont,
California.*