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A HISTORY OF CERTAIN GREAT HORNED OWLS

By CHARLES R. KEYES

WITH THIRTEEN PHOTOS

MY experiences with Great Horned Owls, especially with a pair which has been under my observation for several years, have often suggested a contrast and comparison with Mr. Finley's work on the California Condor. In several respects our subjects and experiences show a certain broad resemblance. Both birds belong to the family of birds of prey, the one being the largest of the North American vultures, the other the greatest of all the owls. The Condor has passed into legend and literature as the largest bird of flight and the most graceful when on the wing; the Great Horned Owl occupies a place no less important in legend and literature as the symbol of brooding wisdom and solemn mystery. In both our studies too the rare privilege was enjoyed of extending our observations over the whole home period of the bird's life, from the eggs in the nest to the young ready for their first excursion into the outside world.

In most respects, however, our stories are as much in contrast as they could well be. The Condors had their home in one of the wildest and most inaccessible of Californian mountain regions; from their nest rim the owls could look out upon five farm houses, with their numerous outbuildings, and one school-house, all within a radius of five hundred yards and all neighbors of other homesteads and school-houses set down in the very peaceful and non-mountainous state of Iowa. The Condors, in their wild environment, were tame and well-disposed from the first and grew constantly more docile as the study of their home life proceeded, proving to be, apparently, the gentlest of all the raptorial birds; the Great Horned Owls, with surroundings that would seem to teach peace, had bad dispositions to begin with and these constantly grew worse until, after six weeks of suspense and with the longest of our claw marks still unhealed, my assistant and I felt a sense of relief when the young owls finally took to the tree tops, leaving us with fairly whole physi-

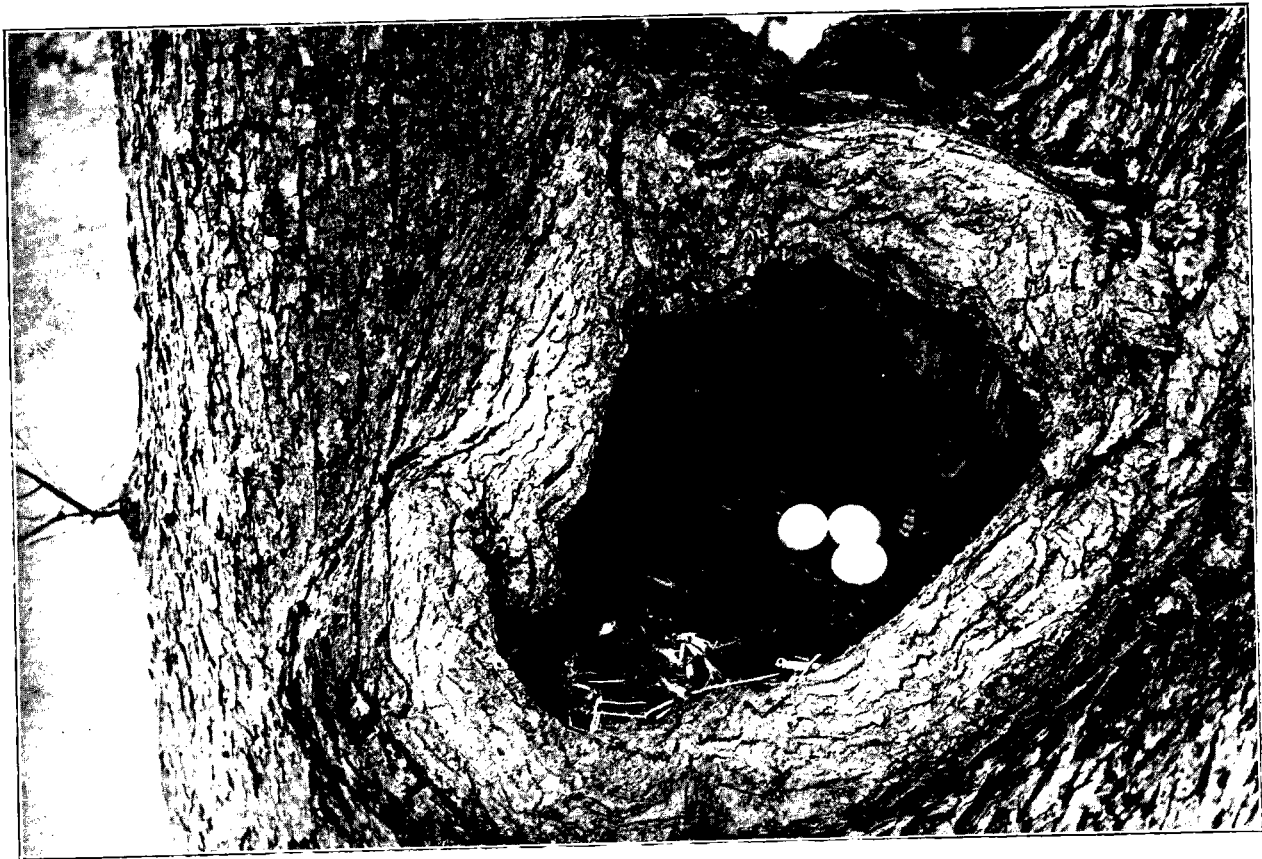


Fig. 1. THE HOME OF THE GREAT HORNED OWLS AS TAKEN ON APRIL 7, 1906

ognomies and the feeling that we had done the best we could, under the circumstances, to preserve the record of an unusual set of conditions. The Great Horned Owls had proved to be, without much doubt, the fiercest of all the birds of prey. In one further respect, unfortunately, our experiences were in contrast to those of Mr. Finley and Mr. Bohlman. We found it impossible, by any means at our command to secure satisfactory negatives of the adult birds.* We were unable to take them at distances of less than thirty feet and in every case they so blended with their background of gray bark, or gray bark and patches of snow, as not to be worth while. We regretted our inability to try the effect of a blind to operate from, but the mechanical difficulties in the way of such an attempt demanded more time for their solution than we had to give. We therefore gave our attention to the nest and contents, or rather as much attention as the old birds would allow us to give. As the adults were necessarily much under observation it is hoped that a record of their conduct may add some interest to the present article.

The beautiful deciduous forest, stretching for miles along the north bluffs of the Cedar River to the west of Mt. Vernon, had by 1890 been reduced to various detached groves of from ten to a hundred or more acres each in extent. About February of this latter year I was hunting through one of the larger of these



Fig. 2. THE OWLS' NESTING TIME; FROM TOWN THE TIMBER TRACT AND ENVIRONMENT ARE SEEN IN PANORAMIC VIEW

groves which, if one struck straight across the fields, was only a mile and a half from town. I remember watching the short, uneasy flights of a Great Horned Owl, but without locating his mate. I also remember talking with Mr. McFarland, a sturdy Scotchman who has occupied his homestead just across the road from the owls' hunting grounds since the early fifties, and learning that "big hoot-owls have always been in that timber." Soon after, the great oaks and hard maples of the eastern two-thirds of the grove fell under the ax, leaving to the west only a twenty-five acre remnant and, in the cut-over area, only some old white elms and a few young maples and lindens. Among these latter the forest soil soon gave way to a thick carpet of blue grass and so what had been heavy forest was gradually transformed into a rather open and still very beautiful timber pasture. It was taken for granted that the owls had moved elsewhere and for a series of years what had been famous "Sugar Grove" was practically forgotten. From 1901 on, however, my way several times led across the pasture and into the timber tract and I was surprised to note there each time the presence of Great Horned Owls. Once or twice I even

* The portrait of the adult owl shown herewith (p. 7) was taken several years ago from a fine specimen brought in to the Cornell College biological laboratory. The picture was made by a student of zoology, who left the negative as property of the college.

took some pains to find a possible nesting site. There appeared to be none, so I concluded that the owls were merely transients. On February 6, 1906, just at nightfall a friend and I were walking along the public highway which forms the north boundary of the pasture and the woods. Suddenly the hooting of big owls boomed out from a nearby linden of the timber pasture and there, sure enough, were both birds engaged in ardent courtship and not minding our presence in the least. They stood facing each other on the same branch and, with feathers ruffled and heads bobbing, were hooting in low tones as they side-stepped toward one another and greeted one another with low bows. Finally they flew away, side by side, into the timber tract. That these were transient birds was beyond belief; so, on February 17, after allowing what seemed to be a fair margin of time, I decided to give the vicinity a thorough search. To make the story short the nest was at last found in the very place where previously it had not seemed worth while to look. It was not in the heavy timber at all but in one of the large elms of the pasture and, moreover, hardly more than fifty yards removed from the above-mentioned public road where teams were constantly passing. Toward the south the view was wild, open, and picturesque enough; to the west, north and east, at distances varying from 200 to 500 yards, were the school-house and farm houses as above stated.

A more fortunate set of conditions for the study of the owls' home life could hardly be hoped for. The short distance from town has already been indicated. The nest was in a large shallow hollow, 28×32 inches in diameter at the bottom, with an entrance 18×20 inches in diameter set at an angle of 45° and facing towards the southeast. The hollow was only 8 inches deep on the exposed side, thus permitting fairly good illumination. Of still more importance the nest site was only 22 feet from the ground and a strategic branch some five feet above the nest afforded a point of attachment for a ladder combination from which pictures might be taken. As Great Horned Owls generally make use of old hawks' nests placed in the tops of the largest trees the good fortune of this modest elevation can readily be appreciated. At the very moment when this nest was discovered a second pair of these birds were domiciled in a Redtail's nest placed in a tall white elm in heavy timber three miles and a half to the northwest and just ninety-two feet above the ground! Further, the proximity of farmhouses made certain the necessary supply of ladders and ropes. Mr. Benedict, who lived just across the road and only two hundred yards to the east, and Mr. McFarland, whose house stood only seventy-five yards farther to the east, were our interested and generous benefactors. Our opportunities were indeed great and, as I said, we greatly regretted our inability to make better use of them.



Fig. 3. ADULT MALE GREAT HORNED OWL;
DURING A DAY'S CAPTIVITY HE WAS
SILENT, PROUD AND DEFIANT

The weather on February 17 was fairly moderate, with the snow melting slightly, though the preceding days from February 6 had been stormy enough, with temperatures as severe as ten below zero. But the sitting bird was wonderfully protected from the storm winds of the north and west and flushed from three large perfect eggs that lay in the slight hollow of the decayed wood on the north side of the cavity. It seemed to me out of the question, with such temperature as February and March were sure to bring, to obtain any pictures without having the owls put their date a little later in the season; so, after a little quick thought, I pocketed these eggs and went home. My conviction that the owls would not abandon so ideal a site after a probable occupancy of years was fully confirmed when, on March 23, three more eggs were found, just like the first and lying in exactly the same little hollow.

Saturday, April 7, was the first warm day of spring. On this day Mr. W. W. White, a student in Cornell College, and I made the first attempts to secure pictures of the owls' home and surroundings. Mr. White's ingenuity proved greater than



Fig. 4. A PORTION OF THE OWLS' HUNTING RANGE AS SEEN FROM THE PUBLIC HIGHWAY; NEST TREE ON EXTREME RIGHT

my own and to him are to be credited the scheme for getting a camera within range of the nest and the successful picture of the eggs *in situ*. He also took the front view of the nest tree, looking northwest and showing the general situation and the interesting structure of the big elm itself. I merely helped him with the necessary ladders and ropes. Our two twenty-foot ladders, lashed together and drawn up with a guy rope so as to rest on the aforesaid strategic branch, made anything but a solid foundation from which to work. Nevertheless all the near views of the nest were taken from this unsteady perch, the camera being tied with strings to the sides and rungs of the topmost ladder.

On April 14 two young were found in the nest and the remaining egg was much pipped. Both young were entirely blind and only one gave much sign of life. This was done by uttering a querulous little note somewhat like that of a very young chicken when excited but not sufficiently frightened to peep. The older one was able to hold its head up slightly while the smaller was entirely help-

less. Both shivered as if from cold, the day being cool and showery. In the nest cavity were a headless Bobwhite and the hind parts of an adult cotton-tail rabbit. The weather conditions prevented our trying to secure a negative. On April 19 only two young were found in the nest, with nothing at all to indicate the fate of the third egg. The young appeared quite lifeless, allowing their bills, which were of a slaty color with darker tips, to rest in the decayed wood of the nest bottom. The feather sheaths were pushing out on the dorsal and scapular tracts, and at the tips of these the brown juvenile plumage was beginning to show. The primary quills were also sprouting but the feathers themselves were still entirely



Fig. 5. THE OLD ELM WITH THE NEST CAVITY IS IN ITSELF A NATURAL CURIOSITY;
VIEW NORTHWEST

concealed. The nest cavity contained a headless adult rabbit and a headless coot, also the hind parts of a young rabbit about the size of a striped gopher. No assistant was available on this day. On April 21 the young showed very noticeable increase in size, the brown feathers now showing all over the dorsal and scapular areas. The eyes had partially opened in the form of a rather narrow ellipse. Still quite listless the young emitted the querulous note as described but did not snap their mandibles. The view inside the nest hollow was rather a pitiful one. In addition to half a coot and half a rabbit (probably the leavings of two days before) there

lay scattered about four young cottontails hardly as large as an adult striped gopher. Two were whole, one headless, and only the hind parts of the fourth remained. A high wind and a chilly day caused Mr. White and me to lose this extraordinary picture. By April 26 the eyes of the young birds were nearly or quite open, the



Fig. 6. FEBRUARY 7, 1907; THE GRAY PLUMAGE AND WHITE THROAT PATCH OF THE OLD OWL, SITTING ON THE RIM OF THE NEST CAVITY BLEND PERFECTLY WITH THE BARK AND SNOW

iris being of a milky yellow or light lemon yellow. The mandibles, which were now grayish yellow in color, were snapped vigorously. The primary quills were an inch and a half long, the feathers just beginning to show at the tips. The food in

the nest consisted of the hind parts of an adult cotton-tail, an entire striped gopher and a headless Bob-white. Various feathers of a Flicker also indicated a capture of this species. I was again without an assistant. On April 28, with the help of Mr. George H. Burge, I was able to repeat Mr. White's performance of three weeks before and get a successful negative of the nest and contents. The young were now two weeks old, still quite drowsy and inert, and entirely disinclined to open their eyes toward the light. The only food in the nest was the hind quarter of an adult cotton-tail.

Thus, for 1906, weather conditions thought to be insuperable and frequent inability to get a helper when one was needed had permitted a net return of only three



Fig. 7. MARCH 16, 1907; WHERE THE DEAD ARE MORE IN EVIDENCE THAN THE LIVING; OWLETS FOUR TO EIGHT DAYS OLD

good negatives. Further trips were made alone to the owls' home and a few further observations recorded. By May 9 the young seemed to have doubled in size and were wide-awake and combative. In size they were even then, at three and a half weeks, as large in appearance as a two-thirds grown Plymouth Rock hen. In the nest lay the hind quarters of an adult rabbit, a headless young rabbit about one-third grown, and a large headless brown rat. Being away from town myself, on May 16 Mr. White, with a student assistant, went to the timber pasture intending to secure a fourth picture. The nest was found empty, the owlets having occupied it this season only about four weeks. Soon after that, as I learned from one of the neighbors, two little girls gathering flowers in the timber tract came across both

owlets as they were scrambling along the ground and evidently still unable to fly. The girls reported the strange creatures to a hired man who was temporarily in the neighborhood and he hunted up the "varmint" and clubbed them to death. The real neighbors of the owls would not have done this. They were all interested in the big birds and all reported that their large flocks of chickens had not suffered from their presence.

A further word should be added on the behavior of the adult birds during the first season. With two of us at the nest their demonstrations, although energetic enough, never proved dangerous. Both birds merely came near, flying back and forth at distances varying from thirty to a hundred feet, snapping their mandibles, ruffling their feathers, and hooting out vigorous protests. It was different when one person was at the nest alone. On April 28 I had arrived at the



Fig. 8. MARCH 30, 1907; THE BEGINNINGS OF INTELLIGENCE; OWLETS EIGHTEEN TO TWENTY-TWO DAYS OLD

old elm about twenty minutes ahead of Mr. Burge and, standing on the next to the top round of a twenty-foot ladder, was making some examination of the young and the other contents of the nest cavity. The ladder necessarily stood as nearly vertical as possible to reach the cavity at all and, as the big tree was about five feet in diameter just below the hollow, the hold was none too secure. Fortunately a small horizontal branch shot out from the heavy trunk on the northeast side and against this the top three inches of the ladder found some support. Without this I dislike to think what might have happened when that stunning blow came in from the south quarter. It came absolutely unexpected and was so violent as to leave the left side of my head quite numb. With my hand I discovered that blood was running down my cheek and a quick glance around showed my assailant stepping

up and down on a nearby limb and clearly ready to come again. Under the circumstances I slid down the ladder to firmer vantage ground. The slash which began on the left cheek and ran across the left ear was rather ugly but not dangerous. Considering the eight claws of a Great Horned Owl, each an inch and a quarter in length, I had gotten off easily. Evidently only one claw had taken effect, the curvature of the great tree trunk and my clinging position over the nest rim having given, doubtless, some protection. The numbness was probably caused by the stroke of a rushing wing.

When on May 9 I was again compelled to visit the nest alone I knew what to expect and so was constantly on my guard. About three seconds study of the young birds and nest contents was alternated with about the same amount of scrutiny of the immediate horizon. In this way it was possible to define an adult owl's manner of attack. Three times on this occasion one of the birds flew in from a neighboring tree and with strong stroke of wing came straight at my head. It was not at all the stoop of hawk or falcon, but rather the onrush of a heavy projectile with a very flat trajectory. Like a large projectile too the flight was visible and so all the more disconcerting; unlike a projectile it was noiseless as a flying shadow. Audubon speaks of the hunting flight of the Great Horned Owl as being incredibly swift and, kind reader, I am quite ready to agree with him. The big bird, perched on a branch from thirty to fifty feet away, first shifts nervously from one foot



Fig. 9. APRIL 13, 1907; OWLETS OF VARIOUS MINDS; AGE THIRTY-TWO TO THIRTY-SIX DAYS

to the other, then launches swiftly into space. There is just time to brace oneself a little, swing one's cap, and quickly duck one's head as the great missile rushes past. The owl keeps straight on her course and alights with heavy impact on a branch of a neighboring tree. Here she faces about and very likely comes straight back again. This process became finally a bit too exciting and, after making certain that the headless quadruped lying in the nest over behind the owlets was just a big house rat, I slipped down the ladder and went home.

February 7, 1907, was cold and clear after the terrific snow storm of the night before. On this day Mr. James R. Smith, a young farmer of the vicinity who had always been interested in birds and who was destined to be my skillful assistant throughout the season, accompanied me to the snow-covered timber pasture. As we approached the nest tree of the year before a fox squirrel leaped from one of the smaller adjacent trees and, starting up the big elm, ran along the rim of the great knot-hole which formed the owls' doorway and scampered on to a topmost branch. If the owl were at home the saucy fellow surely passed within ten inches of her face.

For a moment we felt dubious as to the nest being occupied. As we approached the tree, however, a Great Horned Owl flew from one of the higher branches, aroused either by the squirrel or, more likely, by our own approach. This was more favorable. We gave the tree a few kicks, when the sitting bird hopped up lightly to the rim of the cavity, looked across the white landscape for several seconds, then spread her nearly five feet of wings and flew silently away.

Our first mistake for 1907 was in not looking into the nest on this first day. Our reasons for not doing so were the belief that the set of eggs could hardly be complete at this time and especially the fear that the egg or eggs could not stand exposure even for a short time on so cold a day. My present belief is that this fear was unfounded. Just two days later, on February 9, at about three o'clock in the afternoon, I visited the nest again and found the set of three eggs complete.



Fig. 10. APRIL 18, 1907; AT THE BASE OF THE OLD NEST TREE; YOUNG THIRTY-SEVEN TO FORTY-ONE DAYS OLD

These were lying in a slight hollow as before, but as far back in the cavity as possible. Except for a small space about the eggs the house was filled, even to the door sill, with snow. It was a picture indeed, but one over which we did not dare tarry in freezing weather. All the eggs were nest-stained and it did not look as if any one of them had been laid that day. However, this was uncertain and I had lost a possible opportunity of learning just when the set became complete. This was regrettable, for no one seems to know the period of incubation of an egg of the Great Horned Owl. The older ornithologists made their guess at three weeks. Bendire later expresses his belief that this period is too short and that four weeks is probably nearer to the truth. I have not determined the point though my data still possesses some interest. Toward the end of the month I

began to visit the nest as often as possible to ascertain as nearly as I could when the chicks appeared and how long the hatching process lasted. It was not until March 6, at 2 p. m., that I found one of the eggs pipped, a small round area no larger than a pea being broken. On March 7 at the same hour the broken area was the size of a dime. I could distinctly hear, however, several times repeated, the low twittered note of the still imprisoned chick. The other eggs still showed no sign. Bad weather and pressure of other work now prevented a further visit until March 11, at two-thirty o'clock. Two very callow owlets were now in the nest and one slightly pipped egg. The young birds were not completely protected by their white down as yet, the bare skin being visible between the tracts. On March 16 three young owls of different sizes were found in the nest, one being quite markedly smaller than the other two. The query remains: how long does it



Fig. 11. APRIL 22, 1907; DORSAL AND LATERAL VIEWS; AGE FORTY-ONE TO FORTY-FIVE DAYS

take a Great Horned Owl's egg to hatch? The above are the data kept and anyone can make estimates on them. It seems certain that these birds did not lay an egg oftener than once in two days and that the period of incubation could not have been less than thirty days, with the probabilities on the side of a rather longer period.

For our second year's work we had the experience of the first to go on, we were more confident of the owlets' ability to bear exposure, and so decided to photograph them at least once a week, let the weather offer what it would. And the offerings were of sufficient variety! On March 16, with the young from four to eight days old approximately, the temperature was well above freezing and comfortable, but we were unable to expose a plate until 4 p. m., the sun became covered with black clouds, and we were on the shady side of the tree. We were not hopeful, but a long exposure accomplished our purpose. In addition to the parts of three adult cotton-tails and one Bob-white which the camera shows, a

fourth rabbit and a second Bob-white, also a plump field mouse, do not appear in the picture, being tucked away under the over-hanging roof to the left or buried under other remains. It was chilly on March 30 and a high wind was blowing in from the northwest. On April 13 we had a regular northwest gale to contend with and freezing temperature added. We varied our work with the camera by runs across the frozen timber pasture. Why it was that our negatives taken on these last two dates did not show motion we have never satisfactorily explained to ourselves, for only time exposures could be used. Certain it is that both the big elm and our nearly thirty-foot stretch of ladder were swaying back and forth under the lash of that roaring wind. The gentle rain that was falling when, on April 18, Mr. Benedict helped me bring the now lively owlets to the base of the old nest tree, proved to be really no obstacle at all. It splashed water against the lens of the camera but the negatives gave no sign. The first fine weather of spring was calling forth the backward buds of the young hard maples when, on April 22, the owlets posed for the last time on an old oak stump just east of the nest tree. The weather encountered on dates not mentioned was composed of variations of the above, but the rule was freezing temperatures with high winds. Under all the conditions the young owls thrived and did not seem to mind seriously our intrusion into their home life.

During the season of 1907 the food contents found in the nest cavity reach the following total: five Bob-whites, two meadow mice, one domestic pigeon, one Flicker, two American Coots, one King Rail, nineteen adult cotton-tails. This list is not, of course, an accurate account of the various captures brought to the nest. It merely records what was seen there on the sixteen trips made. The same bird or mammal was doubtless sometimes counted twice and captures were in all probability brought in of which no remnants were seen. I think not more than three different Bob-whites were seen, quite likely only two, and the number of cotton-tails is also probably too high. The fact seems to be that both birds and quadrupeds of the larger size, after being eaten from the head to the tougher hind parts, were then left two or three days untouched and finally removed from the nest altogether. These were not dropped about the base of the tree, however, and in fact no trace of food remnants were found at any time except in the nest itself. That some refuse was removed from the nest seems probable from such facts as the following. The above mentioned two Bob-whites, one meadow mouse, and four rabbits found in the nest cavity on March 16 were all in fairly whole condition, aside from the heads. On March 23 parts of five rabbits were found, represented by the hind quarters only, and one Bob-white with the breast eaten away. These were mostly rather dessicated remnants and I took them to be, for the most part, leftovers from the week before. On March 30 the nest was entirely clean except for a freshly killed white pigeon. Generally speaking the nest cavity was well kept, a fact which seemed to indicate removal of the excrement of the young by the old birds.

Our second season's active work with the owls was not without its exciting features. Twice when alone I had had, in spite of close watchfulness, pretty close brushes with one of the old birds. But it was not until the young were removed from the nest for the last two attempts to get clearer pictures that there was any real element of danger. With the three pugnacious owlets grouped on the ground at the base of the nest tree both old birds now closed in, teetering and dancing and hooting on branches about thirty feet from our heads or brushing close past us as they took up new positions or sought for an opening. Mr. Benedict, who was my

helper this time, literally stood guard *over* me as, with camera close to the ground, I stooped under the focusing cloth. Except for his full-voiced yells and well-aimed sticks I am sure my position would have been utterly untenable.

The last try for pictures, when the young were placed on the old stump a few feet to the east of the big elm, did not pass off so smoothly. Whether the city friend who had become interested in the proceedings and who was this time trusted as my body guard was less effective with voice and missiles than he should have been or whether the owls no longer feared an ordinary demonstration, it would be hard to say. Two of the youngsters were already on the oak stump and I was somewhere aloft in quest of the third. Presumably I was either just reaching over the nest rim for the last snapping owlet or else had just started down with him. My memory has never been clear on the point nor was my excited friend ever able



Fig. 12. APRIL 22, 1907; A FRONTAL VIEW; TWO DAYS LATER ALL WERE IN THE TREE TOPS

to elucidate fully. At any rate my position for the moment must have been strategically bad. The sharp cry "Look out!" barely gave me time to duck my head, when a resounding whack was administered across my shoulders. This was not damaging, but the return stroke would come quickly and doubtless be better placed. It came and I ducked again, but not quite far enough, or possibly not at exactly the right instant. The shock was profound. The list of damages showed three scalp wounds from an inch to nearly three inches in length, while my cap had disappeared entirely from the scene. This was later found under a tree some hundred yards to the south, a punctured souvenir of our last intimate contact with the Great Horned Owls.

After each sitting the young were replaced in the nest and two days after the stormy last one, on April 24, the house was found empty and the family was in the

tree-tops. It will be noted that the owlets remained in the nest about two weeks longer in 1907 than in 1906. One youngster was in the very top branches of the old elm of his nativity, fully fifty feet above the deserted home or more than seventy feet above the ground; another was a hundred yards away in the timber tract and some eighteen feet up in a linden; both were motionless and inconspicuous among the budding branches. In the time at disposal the third brother could not be found. Two days before this the young had shown neither inclination nor ability to fly. It seems certain that no one of them could have mounted a vertical

distance of fifty feet through any powers of his own. The conclusion seems inevitable that in some way the old birds carried the young to the places where I found them. But the secret belongs to the owls, for no one witnessed the leave-taking.

A little more than two months passed by and on a walk through their now heavily-foliaged retreat two great heavy owls, seemingly, and doubtless actually, larger than adults, were startled from the ground near some prostrate tree trunks, from which they flew slowly into the nearby trees. Almost at the same moment a third dropped from the lower branches of an oak and took up a new position deeper in the shadows of the woods. So far as mere size was concerned the owlets had reached and even surpassed the adult owl estate, though probably still under the care and tutelage of their elders. From now on they would need to shrink and harden into the strength and agility necessary to enter the competition of adult owl life and maintain themselves in the general struggle for existence.

February of 1908 again found Mr. Smith and me rapping anxiously at the old elm of the timber pasture. With the facilities at our disposal we could accomplish little more with the young birds, but during the year we had formulated a plan by which there might be a bare pos-



Fig. 13. THE OWL HOME OF 1908; A VAIN
LOOK ALOFT

sibility of securing a portrait of the old owl as she sat within her doorway. Our hopes were raised by the reports of both Mr. Benedict and Mr. McFarland that, as the nesting season approached, the owls had been heard hooting as usual. Our misgivings began when we found piled about the nest-tree the cord-wood from a number of the neighboring young lindens. The old nest cavity was found empty. The owls were able to endure intrusion into their home life for two seasons, but evidently did not take kindly to radical changes in their immediate environment.

A mile west of the old home is another forest fragment of perhaps sixty acres

and in this a pair of Red-tailed Hawks had built their bulky aerie in a tall white ash tree, seventy-five feet from the ground. Following the custom of most of their tribe when suitable hollow trees are no longer to be had, the big owls appropriated this new refuge and in it, in spite of rain, sleet, snow, and wind, successfully raised their brood. To be sure we had no exact proof that these were the very owls with which we had dealt in other years, nevertheless we felt morally certain. The new locality was the nearest available one and for many years, until 1908, had not boasted its pair of owls.

The years 1909 and 1910 add nothing new to the history of the owls except that, in the former year, a January gale destroyed the nest in the ash tree and the valiant pair were apparently forced to a new, but similar, retreat. Their history, so far as we were concerned, was a closed one. During the season of 1907 I had located five pairs of Great Horned Owls within a radius of seven miles of Mt. Vernon. None of these could be intimately studied except the pair whose history I have tried to trace. In February of 1910 I again tried to locate breeding birds of this species, but without success. In spite of the big fellow's tenacity in clinging to a locality once chosen, in spite of his cleverness in escaping observation, it almost seems now that the coming of the wanton shot-gun army and the going of the protecting forests were gradually making the Great Horned Owl, along with many another species without which the woods are stiller and humanity poorer, in the more settled parts of our country at least, a member of a vanishing race.

NESTING OF THE CALIFORNIA CUCKOO

By ALFRED C. SHELTON

WITH ONE PHOTO

RUSSIAN River, flowing through northern Sonoma County, and emptying into the Pacific Ocean at Duncan's Mills, receives one small tributary from the south, designated on the map as Laguna de Santa Rosa. In the locality of which I write, about five miles southeast of Sebastopol, this stream, known locally as the "Lagoon", becomes, after some winter storm, a turbulent river, flooding acres upon acres of bottom land. In summer its course is marked by a chain of long, rather narrow ponds, many of which are deep. The banks, and much of the intervening space between these ponds, are covered with a thick growth of willow, small ash and scrub oak, while the whole is tangled together with an undergrowth of poison-oak, wild blackberry and various creepers, forming, as it were, an impenetrable jungle, hanging far out over the water. Occasionally there is an opening in the brush, and in such a case, the bank is fringed with pond-lilies and tall rushes, and here may be caught black bass and cat-fish, together with an occasional trout. To one who may perchance take an interest in the feathered inhabitants, this old lagoon has an especial attraction, for it is a breeding home of the California Cuckoo.

Of all migratory birds breeding in this vicinity, the Cuckoo is the last to arrive in the spring, usually appearing during the latter part of May or the first week of June. Upon its arrival, this bird keeps to the higher land, among the oaks and other timber, for a period of two or three weeks before retiring to the willow bottoms to breed. During this period it is wild and shy and difficult to