appeared in a spot of moonlight not more than thirty feet from me. I called to him thinking it was a dog which had lost its way. As soon as he heard my voice he directed his ears toward me, gazed for a moment and then wheeled around and leaped into the underbrush. The general behavior of the animal and the large bushy tail lead me to believe it was a fox on one of his nightly patrols in search of food." (I was told subsequently that foxes are common among the dunes of Sandy Neck and no doubt a large part of the living of these beasts during the summer months, consists of unfortunate young herons which frequently fall from the crudely built nests).

"11:00 P.M. I am leaving the rookery to return to my camp. I can hear the calls of the adult birds flying back and forth above me from their fishing grounds to the rookery. When I reached the brink of the sea wall, I crouched in the tall sea grass to watch about twenty Herons which were fishing along the edge of the water. The Herons, while thus stalking their prey appeared like stone images of the birds, but at irregular intervals, a splash, a gulp, or a squawk revealed that these fishers were alert and far from 'asleep on the job.'"

(To be concluded.)

Searles Biological Laboratory,
Bowdoin College, Brunswick, Me.

NOTES ON THE SHORT-EARED OWL.

BY CHAS. A. URNER.

ON or about May 22, 1922, the nest of a Short-eared Owl (*Asio flammeus*) containing six eggs was found by a farmer's boy on a stretch of open salt hay marsh near Elizabeth, N. J. So closely did the bird sit that it was accidently struck by the scythe and its legs injured. One egg, nearly ready to hatch, was broken. The remaining eggs were left undisturbed but they had disappeared the next morning, though the two adults were frequently seen in the vicinity.

Two adult birds, probably the same pair, I saw flying about not

far from this nesting site on May 30, when I visited the locality. One was calling.

On June 24, my second visit, one bird met me, evidencing alarm by its calls and actions. After careful search in the thick salt hay I started the mate—apparently the same bird that had been injured, since it had difficulty in alighting, and when hunting, as I observed later, used its bill exclusively in attacking its prey, diving to the ground headlong and sometimes repeatedly as it flew low over the marsh. The locality from which the injured bird arose—thick salt hay and higher rank growths—contained many small nested spots, much down and a number of small pellets, all, on a merely superficial examination, containing the remains of mice. I was unable to locate the young though the constant anxiety of the adult made me certain of their presence.

On July 1, my next visit, the adult met me as before and I finally located three young. Two were well feathered and able to fly. The third was only able weakly to clear the grass, flying barely fifty yards at a time. There may have been more young birds since the parent continued to manifest concern after the three had left. The wounded adult I did not find though a bird that might have been it appeared later and settled in the grass where the young had disappeared. The pellets about the spot from which the young were flushed all contained the remains of mice though they were not carefully examined for evidences of bird remains.

The possibility occurred to me that the uninjured adult had moved the five remaining eggs when the nest was disturbed on May 22 and that the hatching had been completed near the spot from which I flushed the young—about 150 to 200 yards from the old nest. The association of the wounded adult with the young birds gives some color to this theory, though there is of course chance that the young were from another brood and that the association was accidental. A second pair of adults I had frequently observed about a mile from this locality, but never nearer.

The nest found by the boy, which I collected, was composed almost entirely of salt hay, and was about nine inches in diameter and an inch and a half to two inches thick. The broken ends of the upper layers of hay in the nest showed relatively fresh fractures.

The ground, immediately about the nest for a distance of four inches had apparently been almost cleared to furnish material and on one side the thick stubble still stood as if the matted dried grass had been broken off by the bird's bill. The presence of feathers (apparently owl's feathers) throughout the mass of the nest furnished additional evidence that this species of owl actually constructs its own nest.

On July 4, 1922, while crossing still another section of the marsh —a well-drained piece a considerable distance from the previously mentioned localities—I came upon a Short-eared Owl which by its actions indicated the presence of a nest or young. Careful hunting finally brought its reward. The mate rose, almost from under my feet, from a clump of goldenrod, a thick growth about two to two and a half feet high. In the shaded center of this clump was the nest, containing one egg and two young which I estimated to be somewhere between 9 and 13 days old, my estimates being based on observations of another brood the previous year. The young were still downy, wing quills half an inch long in one and better developed (an inch or more) in the other. They measured five and five and a half inches long as they squatted in the nest. Both parents appeared about normal and were uninjured.

The nest, almost two inches thick, was composed of salt hay with a little coarser material—dry weed stalks. It was about ten inches in diameter and literally carpeted with the feathers of small birds. At its edge was a freshly-killed Sharp-tailed Sparrow (*Passerherbulus caudacutus*). I found no remains of mice and only one small pellet composed apparently of feathers.

On July 23, my next visit, I found one adult hunting nearby, an unhatched egg in the nest, and one young bird about seventy-five feet from the nest. The other I could not find in the thick cover. The deserted nest contained some feathers of small birds but not nearly as many as on July 4. These feathers could hardly have blown away from the well-protected retreat in which the nest was placed, and evidently most of them had either been consumed or carried off.

The young bird was well-feathered and nearly full sized. It was unable to fly though it flapped its wings and could just raise itself from the ground. When approached closely it snapped its bill

and turning on its back, fought with its feet as is the habit of young Harriers. Fresh pellets in the vicinity showed on casual examination the remains of mice. These were collected and sent to Mr. W. DeW. Miller of the American Museum of Natural History for thorough examination.

On August 2, I flushed one young bird from the ground not far from the old nest after both parents had appeared and hovered near, one calling nervously. Evidently the young bird was still being fed since I presume that evidences of parental concern in birds continue only as long as the young are dependent upon the adults for food. In this instance it would appear that the young owl remained in the vicinity of the nest about six weeks from the date of hatching and had not yet acquired complete independence on August 2.

The time from hatching to flight, while not exactly determinable from my incomplete observations, I would estimate as a month or perhaps a few days over—in this case somewhere between 31 and 36 days. This would tend to support the theory that the eggs were moved by the owls in the first-mentioned case, since the period from May 22, when the eggs, about ready to hatch, disappeared, to July 1 when the young birds in that vicinity were found full grown and able to fly, was 39 days.

An additional fact which tends to support this theory that Short-Eared Owls sometimes move their eggs or helpless young lies in a comparison of the two nests found this year with that containing the brood of eight downy young found in the same general vicinity, May 14, 1921, and described by the writer in 'The Auk', Vol. XXXVIII, No. 4, p. 602. Both the nests found in 1922 were fairly thick masses of hay, etc. That of 1921 "but a handful or two of matted hay . . . little more than was to be found covering all the ground thereabouts." As was then stated an unusually high tide inundated almost all the marsh on May 4–5, 1921. The spot where the young were found ten days after this inundation was not flooded, and the absence of a typical nest under the birds may thus be considered significant.

The inference also seems fair, in connection with this and the previous year's observations, that during the early stages of their development young Short-eared Owls in this locality are fed

chiefly on small birds; small mammals later on making up a more prominent part of their diet.

After collecting the second nest (that found July 4) I discovered under it, as a foundation, a well decayed mouse nest made of fine grasses, and of some bulk. Removing the mouse nest I made a further interesting discovery. Directly beneath it was a more or less discolored white egg, one side slightly cracked as if from freezing, the dimensions corresponding to the egg of the Short-eared Owl. It was elliptical in shape while the unhatched egg found in the 1922 nest on the same spot was more pointed. Under the cracked egg could still be seen the outline of a well-rotted nest, presumably from the 1921 season. This is quite convincing evidence that the Short-eared Owl may occasionally return to an old nesting site, though I am uncertain how to explain the lateness of the 1922 nesting at a spot used the previous year.

In connection with the above notes a description of the calls of the Short-eared Owl may be of interest. I have heard at least five distinct calls, but since in none does a definite consonant sound occur their exact description by syllables is impossible.

The call I have heard most frequently uttered when the nesting site is closely approached, but which I have also heard during fall and winter, is a short, accentuated, rather high-pitched and rasping note, resembling the barking of a small animal. Its quality, loudness and pitch differ somewhat between different birds, possibly between the sexes. (Such a difference in pitch is noted between the rolling calls of the male and female Harrier.) This note of the Short-eared Owl is short, occupying from a fifth to half a second. It is usually uttered in doublets or triplets, and might, in the latter case, be written "*wak, wak, wak*" or "*yak, yak, yak.*" At times however individuals are found which string out the series to seven or eight and on rare occasions I have heard as many as sixteen in a row. When more than three "*waks*" are uttered the rate is usually quite rapid—four or five to the second.

The second call, uttered singly or with an appreciable pause between, is of much the same quality as the first but of longer duration (one half to one second), and not so loud or sharply accentuated. It may be written "*w-a-a-a-k.*"

The third call is also rather high-pitched, longer than the first,

but of varying length. It is a little less harsh but of rather unpleasant quality. It may roughly be described by the syllables "*wä' u*," the "*wä'*" more or less prolonged and the "*u*" short. At its longest however it is rarely over a second's duration, and sometimes it is contracted to one syllable, as "*wow.*" I have heard this call only when the nest is first approached. It, and the second call, apparently denote less intense excitement than the first.

The fourth call is a rather long drawn, rasping note of one or two seconds' duration, without noticeable accent and of a quality suggesting sawing or filing. This call is heard as the bird comes to the ground to attract the attention of the invader when the nest is approached. It is uttered in series, the quality often gradually changing into the fifth call—a clear whistle-like squeal, sometimes short and sometimes long-drawn. No doubt there are still other calls I have not been fortunate enough to hear.

There is also a sharp snap of the bill heard both from adults and young.

The intensity of the tumbling demonstrations of the parents and the frequency of the cries when one draws near the nest vary considerably between different individuals, and also apparently in the same individual at different times. Some drop fluttering to the ground as if wounded and in dire distress; others merely sail down. Some call almost incessantly; others rarely. Some stay close to the intruder; others fly off. The male I believe, as with the Harrier, is usually the more aggressive. As a rule the bird comes closer to the intruder the nearer he draws to the nest and this trait can be made use of in locating nests and young. The usual position of the adult, when one approaches the nest, is overhead.

An interesting performance occasionally seen when the nest is visited is a steep dive toward the ground by the adult, the outstretched wings being brought together under the body as the bird descends, the ends being clapped together rapidly, the sound being distinctly audible when the bird is within one hundred feet.

Eaton, in his 'Birds of New York,' 1914, Vol. 2, p. 114, says, in referring to the Short-eared Owl: "This is the most silent of our Owls, and even when defending itself or its nest makes only a

sharp snapping sound with its beak." It would be interesting to know the basis of this statement. Certainly the latter part does not hold true of the birds of this species nesting on the Elizabeth marshes.

When hunting afield, either in broad day or in semi-darkness the local Short-eared Owls either sit motionless upon a post or the ground, or range about. flying relatively low over the marsh, as does the Harrier. One local bird however (and one only) I have frequently observed following the tactics of the Sparrow Hawk, flying at a somewhat greater height than the Harrier, and, when attracted by some movement below, "standing still" in the air with tail down and wings beating, in characteristic Sparrow Hawk poise. The identity of this bird I was able to establish on different occasions since it was one of the parents of the young birds found July 1.

In conclusion I will relate an incident that may throw some light on the menu of the Short-eared Owl and the relative uses of its senses of sight and hearing when hunting in the dusk. As I crossed the marsh well after sunset on the evening of August 9 I heard in the distance the call of Yellow-legs feeding. I answered. Suddenly a Short-eared Owl came out of the growing darkness and dove at my straw hat. He missed it by inches. I whistled the Yellow-legs call again. He turned and dove at me the second time with no end of determination in his manner. Six times I whistled and six times he turned and swooped at me, finally alighting on a mud pile nearby to look the situation over more carefully. I stood in the open marsh with no protection. Had I whistled in the daylight he would have shown no interest. Apparently he did not recognize me as a human in the dusk. He struck on the impulse of his ears—not his eyes. And apparently he knew the taste of Yellow-legs.

614 Cleveland Ave., Elizabeth, N. J.